

How Does Nonprofit Revenue Diversification Affect Revenue Volatility Before, During, and
After External Crisis?

by

SU YOUNG CHOI

(Under the Direction of Rebecca Nesbit)

ABSTRACT

Nonprofit organizations widely adopt revenue diversification with the belief that it improves their fiscal stability and increases the provision of charitable services. However, this belief tells us little about the effects of revenue diversification during crises. This dissertation examines the impact of revenue diversification on revenue volatility, particularly in the context of systematic risks such as the 2008 Great Recession, using panel data from 2004 to 2012. The findings reveal that while revenue diversification lowers revenue volatility under normal conditions, this effect diminishes during economic downturns, compared to the levels observed before the recession. This finding challenges the assumption that diversification is a universally effective financial strategy. Second, this study identifies variations in the stabilizing effects of different revenue sources, demonstrating that certain revenue sources offer greater financial resilience than others during economic downturns. These findings underscore the importance of understanding the varying stability of revenue streams and their compositions to ensure financial resilience in times of crisis. Third, the findings highlight that the effectiveness of revenue diversification depends on the nature of nonprofit services, with organizations providing crisis-responsive services exhibiting greater financial stability. This dissertation concludes that a one-

size-fits-all approach to revenue diversification can yield unintended and often detrimental outcomes. Moreover, the study contributes to the theoretical discourse on nonprofit financial management by integrating insights from Resource Dependence Theory (RDT), Modern Portfolio Theory (MPT), and Benefits Theory to explain the conditional effectiveness of revenue diversification. Finally, it offers practical guidance for nonprofit leaders, emphasizing the need for strategic revenue composition rather than indiscriminate diversification to enhance financial resilience in times of economic uncertainty.

INDEX WORDS: Nonprofit Financial Management, Revenue Diversification, Revenue Volatility, Economic Crisis, Resource Dependence Theory, Modern Portfolio Theory, Benefits Theory, Financial Stability

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VOLATILITY BEFORE, DURING, AND AFTER EXTERNAL ECONOMIC CRISIS?

by

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DEDICATION

To my incredible mother, Yanghee Kim, whose boundless love and sacrifices gave me the strength to reach this milestone. I hope you are resting in peace, knowing that this achievement is as much yours as it is mine.

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CHAPTER 1: INTRODUCTION

Nonprofit organizations stand as vital bastions of hope and support, particularly in times of crisis. They deliver essential aid to vulnerable populations, bridge societal needs gaps, and bolster community and civic engagement (Johnson, 2011). In these critical moments, their ability to uphold societal well-being relies heavily on their financial stability (Young & Searing, 2022), which ensures their impact and long-term sustainability. Given the unpredictability of external funding and economic shocks, effective financial management, particularly through minimizing revenue volatility, remains a central challenge in nonprofit financial management.

Revenue volatility is a crucial indicator of nonprofit financial health, as it reflects the degree of fluctuation in an organization's income over time. High revenue volatility can lead to operational disruptions, reduced program effectiveness, and increased organizational uncertainty (Kingma, 1993; Mayer et al., 2012; Mayer, 2022; Wicker et al., 2015). It affects an organization's ability to plan long-term, allocate resources efficiently, and maintain services during economic downturns. Nonprofits experiencing significant revenue fluctuations may struggle to meet fixed costs, retain staff, or sustain service delivery, ultimately jeopardizing their mission. Given these risks, understanding the factors that drive revenue volatility, particularly during economic crises, is essential for strengthening nonprofit financial sustainability.

Scholars often advocate revenue diversification as a strong strategy for minimizing financial instability (or revenue volatility) in the nonprofit sector (Carroll & Stater, 2009; Mayer et al., 2014; Wicker et al., 2015). The premise is that diversified revenue streams reduce dependency on any single funder, thereby insulating organizations from financial shocks. However, despite extensive research on its benefits in normal economic conditions, its

effectiveness during periods of macroeconomic instability, such as economic crises, remains poorly understood. This gap is particularly consequential as economic downturns tend to disrupt all revenue streams simultaneously and regularly occur (Johnson, 2011), raising questions about whether diversification can genuinely buffer nonprofits from financial distress or if its advantages diminish during times of crisis.

This dissertation seeks to empirically evaluate the extent to which revenue diversification and individual revenue streams contribute to nonprofit financial stability, with a specific focus on the 2008 Great Recession. Unlike prior research, which has primarily analyzed post-recession data or focused on regional samples (Hu & Kapucu, 2017; Lin & Wang, 2016; Morreale, 2011; Wicker et al., 2015), this study leverages a nine-year nationwide panel data (from 2004 to 2012) from the Urban Institute's National Center for Charitable Statistics (NCCS). This broader dataset allows for a more comprehensive examination of revenue dynamics before, during, and after the Recession, offering new insights into the relationship between revenue composition and financial volatility across economic cycles.

The study is grounded in a theoretical framework that integrates Resource Dependence Theory (RDT), Modern Portfolio Theory (MPT), and Benefits Theory. The literature review and hypothesis development build upon existing research, followed by three sets of empirical analyses: (1) the sector-wide impact of revenue diversification on revenue volatility, (2) the role of primary revenue streams in mitigating revenue volatility, and (3) the differential effects of revenue diversification across nonprofit subsectors.

The findings reveal that the effectiveness of diversification is not universal. First, sector-wide analysis shows that diversification provides a stabilizing effect under normal conditions but fails to insulate nonprofits from financial shocks during recessions. Next, analysis of primary

revenue streams underscores the importance of government grants and program service revenue as stabilizing forces, whereas investment income increases volatility, particularly during crises. Finally, the effectiveness of revenue diversification is highly contingent on organizational context. Education, healthcare, and human service nonprofits, which rely on stable revenue sources and provide essential services, show no significant benefit from diversification. In contrast, arts, culture, and public and social benefits nonprofits, which depend more on discretionary income and private donations, initially benefit from diversification, but this advantage disappears during recessions and becomes destabilizing in post-recession periods.

These insights add nuance to the ongoing debate about the role of revenue diversification in promoting financial sustainability, offering practical implications for nonprofit managers seeking to enhance fiscal resilience during periods of economic uncertainty. In practical terms, the findings suggest that nonprofit financial strategies should extend beyond diversification alone. Organizations that secure stable revenue streams, such as program service fees, should prioritize reinforcing their primary sources of income while strategically leveraging countercyclical funding, such as government funding, to maintain financial stability during economic crises. However, all nonprofits are advised to maintain financial reserves and adopt adaptive financial planning approaches to enhance fiscal resilience during economic downturns. By integrating multiple financial management strategies, nonprofits can better navigate financial uncertainties and sustain their missions in times of crisis.

CHAPTER 2: THEORETICAL FOUNDATION¹

This chapter presents a comprehensive exploration of three pivotal theoretical frameworks to discern the impact of revenue composition on the financial health of nonprofit organizations: resource dependence theory (RDT), modern portfolio theory (MPT), and the benefits theory of nonprofit financial health. Each theory, with its distinct lens, offers unique insights and perspectives into the intricate relationship between revenue sources and an organization's fiscal well-being. Before delving into the interplay between these theories and their implications for responding to crisis, an in-depth exposition of each theory is provided, laying the groundwork for a nuanced understanding of their collective relevance to the study.

2-1. Resource Dependency Theory

Resource dependence theory (RDT), as posited by Pfeffer and Salancik (2003), emphasizes how organizations manage their dependence on external resources by navigating power dynamics and relationships within their external environment. RDT asserts that organizations are not isolated entities but rather open systems (Malatesta & Smith, 2014), continuously engaging with their surroundings by exchanging resources and information and thus being influenced by various external factors. These interactions inevitably shape the organization's strategies and structure as it adapts to external pressures and opportunities.

¹ Choi, S. Y. 2025. *Nonprofit and Voluntary Sector Quarterly*.
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The core of RDT lies in the contention that organizations require essential resources to function and succeed, but these vital resources often reside outside their boundaries, necessitating relationships with external entities to procure those resources. This dependence creates power imbalances, as external resource providers can exert significant influence over the dependent organizations, shaping their strategies, decision-making, and overall stability. Hodge and Piccolo (2005) argue that resource dependence plays a critical role in shaping an organization's strategic behavior, often exerting a stronger influence than internal factors like size, age, or governance structures. When nonprofits rely heavily on a single external funding source, they may face constraints in decision-making, reduced operational flexibility, and heightened financial vulnerability. For example, nonprofits that are heavily dependent on government grants and contracts are particularly vulnerable to shifts in policies or donor preferences. A report by the Bridgespan Group, written by Shah (2012), found that during the 2008 recession, nonprofits with a substantial reliance on government grants and contracts experienced severe funding cuts, directly impacting their ability to maintain services. This financial instability highlights how shifts in government policies or fiscal constraints can create substantial risks for resource-dependent organizations. Furthermore, Guo (2007) found that nonprofits with higher dependence on government funding tend to have less independent and representative boards. As government funding increases, nonprofit boards may shift from active governance to a more symbolic role, primarily serving to legitimize the organization rather than to provide independent oversight. In such cases, board members may have reduced influence over decision-making, as the organization prioritizes alignment with government expectations over broader community representation and mission-driven leadership. Thus, managing resource

dependence through diversified revenue strategies becomes critical for long-term stability and resilience.

Nonprofit Strategic Responses to Resource Dependence

To mitigate the risks associated with resource dependence, organizations employ various managerial strategies aimed at reducing reliance on specific resources, expanding their overall resource pool, or reshaping their external environment. Pfeffer and Salancik (2003) argue that organizations can manage power imbalances and originally introduced five options, including mergers or acquisitions, resource pooling through joint ventures or alliances, creating interlocking boards of directors, taking political actions for favorable policies, and executive succession (Hillman et al., 2009). Among the approaches they outline, three strategic responses are particularly relevant to nonprofits: 1) revenue diversification, 2) joint ventures or alliances, and 3) political engagement. This section focuses on these three strategies, as they directly address financial vulnerabilities, resource scarcity, and external regulatory pressures within the nonprofit sector.

Firstly, revenue diversification is well recognized as a crucial strategy for nonprofits to reduce their dependency on a single funding source, spread operational risks, enhance revenue stability, and strengthen resilience. In the context of RDT, Pfeffer and Salancik (2003) discuss mergers and acquisitions as effective means to expand an organization's internal resource base, reduce competitive pressures, and improve bargaining power over resource acquisition.

However, mergers are less common in the nonprofit sector, as Piana (2010) notes, and may not always align with the principles of transaction cost economics (Malatesta & Smith, (2014). In

contrast, revenue diversification has emerged as a more practical and widely adopted strategy for managing resource dependency within a single nonprofit organization.

By adopting a diversification approach, nonprofits directly address the power imbalances inherent in resource dependence. Expanding access to a variety of funding sources reduces an organization's dependence on any single external entity, thereby decreasing its vulnerability to external control. This strategy distributes financial dependence across multiple funding streams, such as individual donations, government grants, program service fees, and investment income, thereby increasing an organization's bargaining power in resource negotiations. For example, a nonprofit organization that traditionally relies on government grants might expand its revenue streams by developing fee-for-service programs or establishing partnerships with corporate sponsors. This diversification not only reduces dependence on government funding but also enhances the organization's bargaining position when negotiating terms with any single funding source. A more diversified revenue base reduces external control and strengthens organizational independence, as nonprofits are less beholden to the conditions set by dominant funders.

Additionally, diversification helps nonprofits better manage the scarcity of resources by broadening the scope of financial opportunities. By accessing multiple funding streams, nonprofits can build a more resilient financial foundation capable of withstanding fluctuations in any single revenue stream (e.g., Carroll & Stater, 2009; Green et al., 2021). As a result, nonprofits gain greater flexibility and stability, even in resource-constrained environments.

Empirical studies provide strong evidence that revenue diversification reduces resource dependence and enhances nonprofit financial stability. Khieng and Dahles (2015) found that Cambodian nonprofits with diversified funding were less susceptible to donor influence,

increasing strategic autonomy. Similarly, Mitchell (2014) showed that U.S. nonprofits relying on multiple revenue sources faced less external control, allowing for mission-driven decision-making.

Diversification also mitigates financial vulnerability. Chang and Tuckman (1994, 1996) found that nonprofits with multiple revenue streams were more resilient to financial shocks, while Froelich (1999) highlighted that dependence on a single funding source heightened exposure to instability. Similarly, Carroll and Stater (2009), along with Mayer et al. (2014), demonstrated that revenue diversification reduced revenue volatility, helping nonprofits maintain consistent operations.

Beyond financial stability, Hung et al. (2024) and Kim (2017) found that nonprofits with diverse revenue sources had greater flexibility in service delivery and improved program outcomes. Moreover, Lu et al. (2020) and Mayer (2023) showed that revenue diversification lowered the risk of nonprofit dissolution by buffering against funding disruptions.

Taken together, these studies suggest that revenue diversification not only stabilizes finances but also strengthens nonprofit resilience and autonomy, making a key strategy for long-term sustainability.

Secondly, engaging in joint ventures or alliances is another strategic response for nonprofits seeking to reduce resource dependence while enhancing operational capacity. These partnerships enable nonprofits to pool their resources, expertise, and capabilities, thereby expanding their operational reach and strengthening resource networks without compromising autonomy (Iyer, 2003; Piana, 2010). By collaborating with other organizations, nonprofits can gain access to vital resources, such as funding, staff, technology, or facilities that might

otherwise be limited or inaccessible. A notable example is Habitat for Humanity, which has successfully formed alliances with corporations, faith-based organizations, and local governments to expand its affordable housing initiatives (Crutchfield & Grant, 2012). By partnering with businesses for in-kind material donations and with local governments for land and policy support, Habitat for Humanity has reduced its financial dependence on any single donor while significantly increasing its capacity to build homes. This case illustrates how alliances can provide nonprofits with critical resources while mitigating financial vulnerability and enhancing sustainability.

From the RDT perspective, joint ventures or alliances reduce environmental uncertainty by leveraging collaborative advantages. Through the exchange of information, knowledge, and expertise, nonprofits can better navigate external challenges and make more informed decisions. This collective intelligence mitigates the risks associated with over-reliance on specific funders or other resource providers. Furthermore, partnerships enhance bargaining power, enabling organizations to negotiate more favorable terms with external stakeholders. By pooling resources and working together, nonprofits in these partnerships gain greater autonomy and flexibility, reducing any single entity's control over their operations. Associations like the National Council of Nonprofits (NCN) can be a good example. NCN brings together thousands of nonprofit organizations across the United States to advocate for favorable policies, funding, and regulatory environments. By leveraging the collective power of its members, NCN negotiates more effectively with government agencies and philanthropic foundations, ensuring that nonprofits receive fairer contract terms, reduced administrative burdens, and improved funding structures. This collaborative approach enables individual nonprofits to gain greater autonomy and flexibility, reducing their vulnerability to unilateral decisions by funders and policymakers.

Empirical studies further affirm the benefits of joint ventures, including improved resource accessibility, innovation, and organizational resilience (Proulx et al., 2014; Woznyj et al., 2023; Zeimers et al., 2019). However, as Malatesta and Smith (2014) argue, these partnerships also present challenges, such as aligning divergent objectives and values and sustaining effective communication and coordination. Managing shared resources, preserving organizational autonomy and identity, building and maintaining trust, and navigating cultural differences are other significant challenges that necessitate strategic management and commitment (Piana, 2010). The need for quick adaptability, especially in crises, can further expose limitations in such partnerships, where consensus or coordination among multiple parties is necessary. Given these complexities, joint ventures and alliances may not be widely adopted as revenue diversification, which allows nonprofits to maintain greater financial independence and managerial discretion while mitigating resource dependence.

The third approach focuses on political actions as a strategic means of mitigating resource dependence in nonprofit organizations. This approach involves active engagement in the political arena, aiming to influence policies, such as securing increased public funding or advocating for regulatory changes that facilitate access to essential resources. Pfeffer and Salancik (2003) argue that when dependencies cannot be effectively mitigated through other means and the resources necessary for coordinated action are dispersed; organizations can turn to lobbying or advocacy to shape the external environment in ways that align with their mission and resource needs.

For nonprofits heavily reliant on government resources, political actions can play a vital role in securing favorable policies and public funding (Leroux & Goerdel, 2009; Mosley, 2012). By advocating for flexible funding mechanisms or regulatory changes, organizations can reduce

their dependency on specific external funders and shift the power balance in their favor. For example, securing more flexible government funding or loosening regulatory constraints can give organizations greater operational autonomy.

However, this strategy is not universally applicable across all nonprofits. Organizations that do not heavily rely on government funding or are less affected by regulatory changes may find political actions less viable. Additionally, political actions can present significant challenges, particularly for organizations that must balance advocacy efforts with maintaining nonpartisanship (Beaton et al., 2021). Nonprofits must ensure that their advocacy efforts comply with legal restrictions. Furthermore, engaging in political activities often requires substantial resources – both financial and human, which may be scarce, especially for smaller organizations (Leroux & Goerdel, 2009). Sustaining long-term advocacy efforts is also challenging, as they require persistent engagement and resources but often do not yield immediate results (Child & Grønbjerg, 2007). Additionally, the risk of potential backlash or negative public perception, particularly in contentious policy areas, necessitates a cautious approach, potentially leading to crowding out donors (Berry, 2004). Thus, while political action is a potent strategy for nonprofits that depend heavily on government funding or are affected by political changes, it demands careful consideration of the potential ethical, financial, and reputational risks involved.

How RDT Advocates Revenue Diversification for Nonprofit Organizations

Upon outlining nonprofits' potential strategic approaches to avoid resource dependence, diversification stands out as a particularly relevant and common strategy for mitigating risks associated with resource dependency. Mitchell (2014) contributes to this discourse by examining

practical strategies nonprofits employ in response to resource dependence. He argues that while nonprofits can simply adapt to their circumstances by adjusting their programming to suit donor preferences or even shape their external environments through deliberate strategic actions, a prevalent strategy is to avoid external control by diversifying revenue streams. Similarly, Searing et al. (2021) found that revenue diversification is a commonly employed financial strategy due to its practicality and feasibility, making it an accessible means for nonprofits to enhance financial resilience while maintaining operational autonomy.

Revenue diversification directly addresses RDT's primary concerns, diminishing reliance on external entities for critical resources and enhancing power by granting nonprofits greater control over their financial resources. Unlike joint ventures or political endeavors, which are subject to external factors and political climates, revenue diversification offers a more stable, sustainable financial strategy. This approach safeguards nonprofits against donor preference changes, economic downturns, and policy shifts, thereby mitigating the risks of resource dependency and enhancing organizational autonomy (Rose, 2011). With this autonomy, nonprofits can maintain mission fidelity without external pressures.

However, not all research aligns with these findings. Some studies have yielded varying and even conflicting results, with some studies highlighting the benefits of revenue concentration, such as a swift expansion of revenue growth in an organization (Frumkin & Keating, 2011; von Schnurbein & Fritz, 2017), improved performance (Grønbjerg, 1992), and growth in unrestricted net assets (Chikoto & Neely, 2014). Revenue diversification also presents undeniable drawbacks that can complicate its application for nonprofits, including increased administrative costs (Frumkin & Keating, 2011; Kingma, 1993), low fundraising efficiency (de

los Mozos et al., 2016), and crowd-out effects of private donations caused by government funding, or earned incomes (Mayer et al., 2014).

These divergent findings in the empirical literature on nonprofit revenue diversification can partly be attributed to the varying measures of nonprofit financial vulnerability used in these studies (Prentice 2016). This methodological variance reflects the complexities involved in studying nonprofit financial dynamics and contributes to the inconsistent results across different investigations. This variability in research focus and design is echoed in two meta-studies by Hung and Hager (2019) and Lu et al. (2019), which synthesized existing empirical studies and found that revenue diversification has little or no effect on mitigating nonprofit financial vulnerability. However, these studies primarily examined diversification under normal economic conditions and did not account for the role of external shocks, such as economic recession, which can fundamentally alter the financial landscape for nonprofits. This limitation highlights the need for a more nuanced examination of revenue diversification, particularly in the context of financial crises (Mitchell & Calabrese, 2019).

Revenue diversification still remains a widely adopted strategy in the nonprofit sector. A more refined understanding of its effectiveness necessitates an analysis of its role in buffering against external shocks—an area where MPT provides valuable insights. Unlike prior studies that focus on revenue diversification’s impact under stable conditions, MPT considers how diversification can influence financial stability during periods of economic uncertainty. The following section introduces MPT as a complementary theoretical framework, providing a more nuanced perspective on revenue diversification and its potential limitations, particularly in times of external crises.

2-2. Modern Portfolio Theory

Modern Portfolio Theory (MPT), introduced by Markowitz (1952), offers a financial framework for optimizing investment portfolios by balancing risk and returns. According to MPT, investors can minimize the overall risk of their financial portfolios by diversifying their investments across various assets with different risk profiles. In the context of MPT, risk is directly tied to volatility: higher volatility implies greater uncertainty and, therefore, higher risk. MPT posits that by spreading investments across a range of assets, overall portfolio risk can be reduced while still achieving desirable returns. The central principle of MPT lies in diversification.

MPT operates under two fundamental assumptions. First, it assumes that investors are risk-averse, meaning that they prefer portfolios with lower volatility for a given level of return (Mangram, 2013). The objective, therefore, is not solely to pursue high returns but to attain these returns with the least amount of volatility possible. Second, MPT assumes that the performance of distinct assets (or revenue streams) is not correlated with each other (Mangram, 2013). In other words, when some assets or revenue sources underperform, others may perform well, thereby stabilizing the overall portfolio. Consequently, the strategic blend of diverse, low-correlated revenue sources can result in a balanced portfolio, optimizing income stability for an acceptable level of risk.

Nonprofit Finance through the Lens of MPT

While MPT was initially developed for financial investments, its principles have been applied to the studies of nonprofit financial management (e.g., Grasse et al., 2016; Jegers, 1997; Kingma, 1993; Mayer et al., 2014; Qu, 2016; 2019). Nonprofits, like for-profit entities, must balance return and risk, though these concepts are defined differently in a nonprofit context. In nonprofits, “return” refers to the organization’s financial stability, which ensures the continuation of services and mission fulfillment rather than profit maximization (Jegers, 1997). On the other hand, “risk” refers to the volatility of revenue flows or unpredictability, which may threaten the organization’s ability to sustain operations or even lead to organizational failure.

Revenue volatility poses a critical risk for nonprofit organizations because it directly undermines their ability to engage in effective long-term planning and sustain their operations. Unpredictable revenue fluctuations, whether due to unexpected shortfalls or even unanticipated increases can prevent organizations from making informed financial decisions regarding staffing, programming, and resource allocation (Markowitz, 1952). When revenue declines, nonprofits may be forced to reduce services, cut staff, or delay projects, jeopardizing their mission and operational continuity. On the other hand, sudden revenue spikes, though seemingly positive, can challenge organizational capacity and planning, as nonprofits may struggle to scale operations in line with their mission and strategic objectives (Froelich, 1999; Kingma, 1993). Thus, nonprofit managers aim to minimize revenue volatility while maximizing income predictability and stability to ensure nonprofit organizations' long-term sustainability and resilience.

In this context, MPT suggests that nonprofits should diversify their revenue sources in such a way that the decline of one revenue source can be offset by the stability or growth of

others. For example, if government funding is cut, a well-diversified nonprofit may rely more on private donations or program service fees to maintain operations.

Some empirical studies that apply MPT to revenue diversification examine the impact of revenue diversification and show its positive impact on revenue stability (Carroll & Stater, 2009; Chang & Tuckman, 1994; Hung & Hager, 2018; Lu et al., 2019), yet other studies focus on determining the optimal combinations of revenue streams by applying MPT to reduce unpredictability and enhance financial stability (Mayer et al., 2014; Qu, 2016; 2019). However, studies such as Mayer et al. (2014) and Grasse et al. (2016) reveal that not all revenue streams contribute equally to financial stability, and nonprofits must carefully evaluate the risk-return profiles of individual revenue streams when diversifying their revenue portfolios.

How MPT Advocates Revenue Diversification for Nonprofit Organizations

Early studies by Chang and Tuckman (1991) advocated revenue diversification as a means of reducing nonprofit financial vulnerability, identifying revenue concentration as one of four indicators of financial vulnerability, alongside the administrative cost ratio, operating margin, and equity balance. Kingma (1993) was one of the first to empirically apply MPT to nonprofit revenue management, testing the impact of revenue diversification on revenue fluctuation. His study underscored the critical importance of considering not only the variance of individual revenue sources but also the covariance between them, how these streams interact with one another. This insight emphasized that while revenue diversification is beneficial, it is not just about increasing the number of revenue sources but about strategically balancing those with low correlations to minimize financial risk in line with the predictions of MPT.

Mayer et al. (2014) extended Kingma's work by examining the impact of revenue diversification on volatility and expected revenue. Their findings suggest that the effect of diversification varies depending on the compositional changes in the revenue portfolio. For example, replacing earned income with donations reduces volatility and lowers expected revenue, while replacing investment income with donations reduces volatility and increases expected revenue. These findings reinforce that different revenue streams have distinct risk-return profiles and that nonprofits must consider these differences when diversifying their revenue sources.

Similarly, Qu's studies (2016; 2019) showed that the effectiveness of revenue diversification varies depending on a nonprofit's primary revenue source. Organizations primarily reliant on commercial income, for example, may face lower overall revenue volatility with greater revenue concentration, while nonprofits dependent on donations or government funding benefit more from diversification. Moreover, Qu emphasized that the covariance between revenue sources plays a significant role in determining portfolio risk, meaning that simply adding more revenue streams does not guarantee reduced volatility. Nonprofits must, therefore, not only diversify their revenue sources but also understand how correlated these sources are, as highly correlated revenue streams may fail to provide the intended financial stability. Effective revenue management requires carefully balancing revenue sources to achieve an optimal combination of risk and return while minimizing the likelihood of simultaneous declines across multiple streams.

MPT ultimately advocates for revenue diversification as a strategy to reduce financial risk in nonprofit organizations, but it also highlights important caveats. As these studies indicate, the relationship between diversification and financial stability is complex and influenced by the

risk-return characteristics of individual revenue streams and their correlation with each other. While diversification can reduce the risks associated with over-reliance on a single source, nonprofits must assess both the volatility of each revenue stream and how these streams interact to achieve financial resilience.

Consequently, MPT offers nonprofit managers a strategic framework for optimizing their revenue compositions to maximize financial stability. By emphasizing the importance of revenue source variance and covariance, MPT provides a nuanced approach to revenue diversification that can help nonprofits reduce financial risk and ensure long-term sustainability. However, nonprofits must remain mindful of the unique characteristics of their revenue streams and the broader economic environment in which they operate. The following section explores benefits theory, which provides a framework for understanding how nonprofits should consider their revenue portfolios (especially, revenue diversification) based on the nature of their service models and the types of benefits they provide.

2-3. Benefits Theory of Nonprofit Finance

Benefits theory of nonprofit finance offers a framework for understanding how revenue strategies should align with the nature of services provided. Developed by Dennis Young (2007; 2017), benefits theory posits that the beneficiaries of a nonprofit's services determine the most appropriate funding sources. For example, Young (2007) explains that nonprofits delivering services resembling public goods, such as research institutes or environmental organizations, are better suited to receive government funding. Since these services benefit society broadly and generate diffuse public value, public sector support is thus justified and strategically sound. In

contrast, nonprofits offering more individualized services, such as healthcare and cultural performance, are typically sustained through fee-for-service income, aligning with the private benefits these programs provide to users. However, as Young (2017) argues, not all beneficiaries can afford the services they need. For some programs targeting vulnerable populations, such as homelessness services or food banks, nonprofits tend to rely on government grants or private donations. These services function as redistributive goods – critical offerings that are necessary for societal well-being but financially inaccessible to low-income individuals. Government and philanthropic funding ensure that these essential services are available, promoting social equity while fulfilling the nonprofit’s mission.

Empirical Applications of Benefits Theory

A growing body of research affirms the principles of the intrinsic connection between service provision and organizational finance outlined by benefits theory. For example, the survey study done by Wilsker and Young (2010) found that nonprofits focusing on private benefits, such as recreational activities, often rely on earned income, while those providing public benefits, like cultural institutions, tend to depend on government funding and private donations. Using a larger sample of nonprofits, Fisher et al. (2011) further identified that public-serving nonprofits predominantly secure funding from government grants and donations, while private-serving organizations lean toward earned income. Similarly, Kim (2017) highlighted that performing arts nonprofits with public access offerings are more likely to receive government funding, demonstrating the alignment between public benefits and public financing.

In addition, Young (2017) argues that nonprofits achieve financial well-being and sustainability by aligning the nature of the services provided with revenue choices. Liu and Kim (2022) provide empirical evidence that nonprofits whose revenue streams closely align with the benefits they provide tend to exhibit stronger financial health. Their study demonstrates that when a substantial portion of a nonprofit's revenue is derived from sources that directly correspond to the nature of its services, the organization experiences greater financial stability as reflected in key indicators such as solvency, profitability, liquidity, and margin ratio. Young and Searing (2022) further emphasize the importance of leveraging existing revenue streams alongside diversification efforts to build resilience against crisis. These insights underscore the importance of strategic alignment between an organization's mission and financial structure. They also suggest that effective financial management involves more than diversification: it requires revenue choices that reinforce the organization's purpose and service delivery.

How Benefits Theory Advocates Revenue Diversification

While RDT and MPT emphasize revenue diversification as a strategic tool to mitigate financial risks, benefits theory explains that diversification emerges organically from the alignment between a nonprofit's services and appropriate funding sources (Young, 2007; 2017). The theory acknowledges that while diversification is beneficial, not all nonprofits have equal access to diverse revenue streams. Specifically, the degree to which nonprofits can diversify their revenue structure depends on the variety of services offered: Organizations providing a range of services across multiple benefit categories are more likely to achieve a diversified revenue base.

Empirical findings generally support benefit theory, which posits that nonprofit revenue structures align with the types of benefits they provide, private benefits funded through fees, collective benefits supported by government and philanthropic contributions, and redistributive benefits primarily sustained by public and charitable funding (Aschari-Lincoln & Jager, 2016; Fisher et al., 2011; Kim et al., 2017; Wilsker & Young, 2010). However, evidence regarding the alignment between mixed-benefit services those that combine elements of private, collective, and redistributive benefits and revenue diversification remains inconsistent. Fisher et al. (2011) and Lu and Shon (2024) could not confirm a meaningful link that nonprofits that provide services to mixed beneficiaries are more likely to diversify their revenue compositions. Lu and Shon (2024) attributed this insignificant relationship to the limitations of nonprofit classification systems, such as the National Taxonomy of Exempt Entities (NTEE) codes, which may fail to accurately capture the nuanced nature of service benefits. Further research is needed to determine whether mixed-benefit nonprofits inherently pursue greater revenue diversification strategies or if other factors shape their financial strategies.

Benefits theory suggests that pursuing diversification for its own sake may not always yield positive outcomes. Instead, it is more effective to strategically align revenues with the organization's mission. In other words, diversifying revenue streams should complement, rather than conflict with, the nonprofit's purpose and mission. By doing so, nonprofits can strengthen their financial health while remaining true to their service objectives.

Taken together, RDT, MPT, and benefits theory provide a comprehensive framework for understanding nonprofit financial management and the role of revenue diversification in mitigating financial risks. RDT highlights the vulnerability that arises from reliance on a single dominant funding source, suggesting that revenue diversification can enhance organizational

autonomy and resilience by reducing dependence on external resource providers. MPT complements this perspective by emphasizing the importance of balancing each revenue stream's return and risk to minimize overall financial instability, recognizing that diversification alone does not guarantee stability—organizations must also consider the covariance between revenue sources. Finally, benefits theory provides a normative perspective, asserting that the financial structure of a nonprofit should align with the nature of the benefits it provides, influencing both its revenue diversification strategies and financial sustainability.

Despite their contributions, these theories individually present limitations in explaining how revenue diversification functions under varying economic conditions. While RDT underscores the risks of dependence, it does not fully address how diversified revenue portfolios behave during external shocks such as economic recessions. MPT offers a financial risk-management perspective but has limited empirical validation within the nonprofit sector, as much of its support comes from studies in corporate finance. Similarly, benefits theory explains why nonprofits pursue certain revenue strategies based on their service models but do not assess whether diversification effectively stabilizes finances, particularly in crisis scenarios. These gaps in theoretical explanations necessitate a more integrated approach that examines the role of diversification across different revenue structures and economic contexts.

This study seeks to bridge these gaps by integrating insights from all three theoretical perspectives to examine how revenue diversification affects nonprofit revenue volatility before, during, and after a major economic crisis. By synthesizing these theories, this research develops testable hypotheses that address both sector-wide patterns and revenue-specific dynamics while also considering the varying service types that nonprofits provide. The next chapter reviews relevant empirical literature and formalizes hypotheses to assess whether revenue diversification

reduces financial vulnerability in the nonprofit sector and how its effectiveness varies across different economic periods, revenue compositions, and nonprofit subsectors.

CHAPTER 3: LITERATURE REVIEW AND HYPOTHESIS

The exploration of revenue diversification in nonprofit organizations has been a subject of extensive academic inquiry, emphasizing its potential to enhance fiscal stability and mitigate risk by reducing dependency on a single funding source. However, while research generally supports the benefits of diversification under normal economic conditions, its effectiveness during systematic crises, such as the 2008 Great Recession, remains under-explored. Given that economic downturns fundamentally alter revenue flows across all sectors, it is critical to assess whether diversification continues to serve as a stabilizing strategy or, conversely, if its benefits diminish during periods of financial instability.

This chapter reviews existing literature to develop hypotheses on the role of revenue diversification in nonprofit financial stability before, during, and after a crisis. First, it examines the overall impact of revenue diversification on revenue volatility, drawing from theoretical and empirical perspectives. Second, it evaluates the resilience of individual revenue sources, such as government grants, private donations, program service revenue, and investment income, to assess how different funding courses contribute to financial stability during economic distress. Finally, it considers the influence of nonprofit service types, recognizing that organizations in different subsectors, such as arts, education, healthcare, human services, and public and social benefits, may experience sector-specific financial risks, even when their revenue structures are diversified.

By synthesizing findings from prior research, this chapter aims to clarify the conditions under which revenue diversification functions as a reliable financial strategy and where its limitations emerge. Understanding these dynamics is crucial for nonprofit managers and policymakers, providing insights into how nonprofits better anticipate financial risks and adapt their revenue strategies to withstand economic crises more effectively.

3-1. Hypothesis Development 1: Revenue Diversification during a Systematic Crisis

This section examines how RDT and MPT explain the effectiveness and limitations of revenue diversification during a systematic crisis. While both theories support diversification as a means of financial stability under normal conditions (Markowitz, 1952; Pfeffer & Salancik, 2003), economic crises disrupt financial structures, potentially diminishing their effectiveness. RDT highlights the challenges of external resource dependencies, which may become more pronounced in times of crisis, while MPT underscores how increased correlations between revenue sources can limit diversification's risk-mitigating effects. By integrating these theoretical perspectives with existing empirical research, this section develops a testable hypothesis on whether revenue diversification remains a viable financial strategy during and after the Recession compared to the pre-recession.

1) RDT and the Limitation of Revenue Diversification in Times of Crisis

RDT explains how crises exacerbate existing power imbalances as resources become scarcer and competition for them intensifies. In times of crisis, the power wielded by those

controlling these resources grows as their support becomes more crucial and more challenging to secure. Funders may impose stricter conditions, shift their priorities, or limit available resources in anticipation of further hardship. As a result, nonprofits are often compelled to conform to external demands at the expense of their organizational autonomy. During stable periods, revenue diversification typically helps reduce dependency on a single funding source. However, in crises, this strategy may lose its effectiveness as multiple revenue streams are simultaneously affected, thus amplifying dependency (Pfeffer & Salancik, 2003).

The 2008 Recession offers a compelling example. During the recession, government grants shrank due to budget cuts, private donations fell as donors faced economic uncertainty, and earned income from services dropped with reduced consumer spending (Boris et al., 2010; Johnson, 2011). Even nonprofits with multiple revenue streams struggled to adapt to these widespread disruptions. Tightened restrictions and shifted priorities further constrained nonprofits' flexibility and financial options. Therefore, while effective under normal conditions, a nonprofit manager's ability to reduce dependency and balance power dynamics is significantly limited during crises.

Moreover, revenue diversification is not a quick-response strategy for crises. It requires significant planning, sustained investment in cultivating new revenue channels, and long-term relationships with diverse donors (Frumkin & Keating, 2011; de los Mozos et al., 2016; von Schnurbein & Fritz, 2017). This slow, deliberate process may not align with the urgent need for swift, agile responses that crises create. For nonprofits, rapidly adapting or expanding revenue diversification during a crisis is often impractical, as the development of new funding streams typically requires long-term strategic efforts that do not yield immediate returns.

Instead, the administrative and financial burdens of maintaining multiple revenue streams become overwhelming, particularly as demand for services surges during economic uncertainty. Lin and Wang (2016) affirm that the complexities associated with managing diversified streams often overwhelm organizations when they are most vulnerable. In crisis scenarios, the scarcity of diverse funding sources deepens nonprofits' dependence on their primary funders, exacerbating existing dependencies. This heightened reliance undermines the power balance that revenue diversification is designed to ensure. Additionally, the increased administrative complexity and financial burdens further strain organizational resources, making nonprofits more vulnerable to external pressures rather than more resilient. As these pressures mount, the effectiveness of revenue diversification diminishes, leaving organizations more dependent on primary funders and less capable of maintaining autonomy and financial stability in times of crisis.

2) MPT and the Limitation of Revenue Diversification in Times of Crisis

MPT also provides valuable insights into how revenue diversification might limit risk in normal conditions but is less effective during crises. MPT suggests that diversification reduces overall risk by balancing low-correlated revenue streams, thus stabilizing revenue flows. However, MPT distinguishes between two types of risks: systematic and unsystematic risk. Systematic risks, also known as market risk, arise from macroeconomic factors like economic recessions, political instability, or a global health pandemic, which simultaneously affect all types of revenue sources. On the other hand, unsystematic risk, often referred to as specific risk, originates from internal factors within an organization or specific to a particular industry or source of revenues. Examples of unsystematic risk include changes in management, shifts in

organizational policies, unexpected financial obligations, or revenue-specific fluctuations. MPT accentuates the benefits of diversification in normal market conditions, yet it also recognizes the potential for systematic risks to undermine this strategy during systematic crises (Markowitz, 1952).

Systematic crises, such as the 2008 Recession, expose the limitations of MPT's diversification strategy. A core assumption of MPT is that diversification works best when revenue sources are uncorrelated. However, economic downturns often increase correlated reactions across various revenue sources (Kearns, 2007), reducing the strategy's ability to counterbalance adverse outcomes. Findings from financial markets support this, as asset correlations tend to increase during market downturns, limiting the effectiveness of diversification (Longin & Solnik, 2001; Sandoval & Franca, 2012). Similarly, in the nonprofit context, revenue sources that typically operate independently may experience simultaneous declines during periods of systematic crisis, such as recessions. This was evident during the 2008 financial crisis, where donations and all types of investment earnings decreased (Boris et al., 2010). Even traditionally stable revenue streams, such as government grants, became less reliable as public funding diminished due to budgetary constraints (Johnson, 2011). When revenue sources become more correlated during crises, the risk-reducing benefits of diversification are undermined, leaving nonprofits vulnerable to revenue instability.

Jegers (1997) argues that the traditional concept of systematic risk is less meaningful in the nonprofit context as nonprofits do not prioritize profit maximization but rather mission fulfillment. While nonprofits may not be directly motivated by financial returns, systematic risks still pose significant threats to their financial sustainability. Nonprofits reliant on external funding sources, like government grants and private donations, are still susceptible to the same

macroeconomic fluctuations as for-profit organizations. For instance, during the 2008 crisis, public funding was cut due to government budget constraints, and private donations plummeted as individuals faced economic uncertainty (Johnson, 2011). Considering that an increasing number of nonprofits rely on investment incomes, they are equally exposed to market risks, making the management of systematic risk essential. Therefore, systematic risks must be accounted for in financial management.

3) Empirical Evidence and the Hypothesis

Empirical evidence suggests that while revenue diversification is often promoted as a financial stability strategy for nonprofits, its effectiveness during periods of systemic crisis remains uncertain. Prior studies on the 2008 Recession highlight that diversified revenue streams did not shield organizations from financial hardships. For example, Hu and Kapucu (2017) and Lin and Wang (2016) reported that nonprofit managers viewed diversified revenue streams as a financial threat rather than a safeguard during the 2008 Recession. The administrative complexities and increased costs associated with maintaining multiple revenue streams under extreme economic conditions made diversification difficult to sustain. Some nonprofits even had to cut expenses to restructure their operations to adapt. However, these studies were geographically and nonprofit sub-sectorally limited, primarily focusing on human services organizations in Florida and New Jersey, potentially restricting their generalizability.

Similarly, Wicker et al. (2015) found that revenue diversification was more effective in mitigating organization-specific risks (unsystematic) than broader economic disruptions (systematic) for German nonprofit sports clubs. The findings indicate that while revenue

diversification may protect against organization-specific risks, such as declining membership, the loss of a key sponsor, or fluctuating event revenues, which primarily affect individual organizations rather than the entire sector, it is less effective in addressing broader economic disruptions like recessions. However, this study has several limitations. First, its exclusive focus on German nonprofit sports clubs raises concerns about the generalizability of the findings to other nonprofit sectors and the U.S. context. Second, the study's approach to decomposing revenue volatility into its organizational-specific and systematic components has methodological limitations. Revenue volatilities are rarely independent; in practice, they often interact. Moreover, the study defines systematic risk primarily through national GDP fluctuations, which may not fully capture the complexity of macroeconomic crises and their sector-specific impacts.

These studies collectively suggest that revenue diversification provides limited protection in times of systemic crises. Existing studies have largely examined revenue diversification under normal conditions or within limited nonprofit subsectors, leaving a gap in understanding how nonprofits navigate systemic financial shocks. Studies that examine diverse geographic regions, pre- and post-recession periods, and a broader range of nonprofit subsectors are essential to strengthening the theoretical foundations of nonprofit financial management and informing more effective strategies for resilience during economic downturns.

Building on insights from both RDT and MPT, this study empirically examines how revenue diversification interacts with revenue volatility during the 2008 Recession compared to more stable economic periods. Revenue volatility, defined as fluctuations in an organization's revenue over time, is a key indicator of nonprofit financial health during economic downturns. While both theories suggest that revenue diversification typically helps stabilize finances under normal conditions, they also indicate that its effectiveness may be significantly reduced during

periods of systematic crises. This study tests whether the 2008 Recession moderates the relationship between revenue diversification and revenue volatility, potentially diminishing the protective benefits of diversification. Based on this rationale, the following hypothesis is proposed:

Hypothesis 1: Systematic risk (especially the 2008 Recession) moderates the relationship between revenue diversification and revenue volatility, leading to the dissolution of the typically negative relationship between these variables.

3-2. Hypothesis Development 2: Dynamics of Revenue Sources in Response to a Crisis

Building on the theoretical insights provided by MPT, this section examines how different revenue sources influence nonprofit revenue volatility under both stable and crisis conditions. Specifically, it develops hypotheses on how government grants, private donations, program service revenue, and investment income contribute to financial stability or exacerbate revenue fluctuations. By analyzing the distinct characteristics and risk profiles of each revenue stream, this section aims to provide a more nuanced understanding of their role in shaping nonprofit financial resilience during economic disruptions.

Nonprofits typically access various revenue streams, including government grants, individual or corporate contributions, earned income, investment income, and bequests. Each resource offers distinct advantages and challenges in terms of stability, predictability, and risk (Froelich, 1999; Kingma, 1993). According to MPT, the effectiveness of revenue diversification is shaped not only by the number of revenue streams but also by the risk-return profiles of each

source and the correlations between them. During economic downturns, these correlations tend to increase, diminishing the effectiveness of diversification as a risk mitigation strategy. For instance, revenue streams that are typically stable, such as government grants or ticket sales income, may become more volatile during crises, while investment income is often directly impacted by market fluctuations.

This section will delve deeper into the dynamics of these revenue streams, analyzing how they function during normal economic periods and crises, such as the 2008 Recession. In times of crisis, all revenue sources may shrink to some extent, but the extent and duration of these disruptions can vary depending on the organization's primary source of revenue. Understanding how these revenue streams interact and contribute to overall financial stability is essential for assessing diversification strategies' effectiveness during economic instability.

This study examines the impact of financial turmoil on four key revenue streams: 1) government grants, 2) private donations, 3) program service revenue, and 4) investment income. Through a detailed analysis of each revenue stream's performance during crises, this section aims to develop four hypotheses that will assess the resilience of these revenue streams under systematic risk conditions. These hypotheses will provide a framework for understanding how different types of revenue streams contribute to financial stability (or volatility) during the 2008 Recession.

1) Government Grants

Government grants refer to direct financial support from local, state, or federal agencies to support nonprofit operations or specific projects, offering a relatively predictable and stable

revenue stream compared to other revenue sources, like donations or earned income (Froelich, 1999). However, this stability is contingent upon government budget priorities, political shifts, and economic conditions. It is important to distinguish direct government support from indirect forms such as contract revenue, Medicare payments, or college loan programs (Salamon, 2002), which are categorized separately as program service revenue in IRS Form 990 filings. This study focuses exclusively on direct financial support provided through government grants.

Empirical evidence suggests that reliance on government grants can enhance revenue stability due to their relative predictability (Kingma, 1991). However, government funding tends to be pro-cyclical, shrinking when government budgets tighten during economic downturns (Exley et al., 2023; Steinberg, 2018). Indeed, previous studies indicate that nonprofits dependent on government funding experienced revenue reductions during the 2008 Recession (Pettijohn et al., 2013). As government agencies faced budget constraints, they reduced grant allocations, leaving many nonprofits financially strained during an already challenging economic environment.

Despite this pro-cyclical tendency, there is evidence that government grants remained relatively stable during the 2008 Recession in some cases (Morreale, 2011; Salamon et al., 2009). For instance, Morreale's (2011) study, although limited to the New York metropolitan area between 2007 and 2010, found that nonprofits relying on government grants experienced more revenue stability. This resilience can be attributed to emergency relief measures such as the American Recovery and Reinvestment Act (ARRA) of 2009, which provided substantial federal funding to support nonprofits during the crisis (Johnson, 2011). However, some human service nonprofits, which play a vital role in serving those in need, are major beneficiaries of these relief

funds (Nicholson-Crotty & Nicholson-Crotty, 2015). Nevertheless, government stimulus packages can offset the decline in government grants.

These findings suggest that while government grants are generally more stable, they may still be affected by external economic factors during times of crisis. However, nonprofits that rely on government grants could experience less revenue volatility during a crisis than pre-crisis periods, partly due to emergency relief programs and other government interventions. This leads to the following hypothesis for testing:

Hypothesis 2a: Nonprofit organizations with a higher proportion of revenue from government grants will experience lower revenue volatility during and after the crisis compared to pre-crisis levels.

2) Private Donations

Private donations include contributions from individuals, endowments, foundations, and corporations. This revenue stream is inherently volatile and unpredictable, influenced by various factors, such as socio-economic gains, sociological perspective, social responsibility, and donor characteristics (Froelich, 1999; Kingma, 1993). This volatility can intensify during economic downturns, as private donations are strongly correlated with macroeconomic variables like GDP, stock market performance, and unemployment rates (Keating et al., 2005; List & Peysakhovich, 2011; Steinberg, 2018). Consequently, nonprofits that rely primarily on private donations often face more significant financial risks during economic downturns (Carroll & Stater, 2009; Hodge & Piccolo, 2005; Morreale, 2011).

The 2008 Recession exemplified this risk: private donations significantly declined due to high competition for limited philanthropic resources (Lee & Shon, 2018). According to the Giving USA report (2013), private donations dropped by 3.2% in 2008 and a further 3.6% in 2009, one of the most significant declines in donation history. However, it should be noted that some nonprofits, particularly in religion, human services, and healthcare, saw an increase in donations during this period (McKeever et al., 2016). Furthermore, despite the initial decrease, private donations rebounded relatively quickly, with total charitable contributions increasing by 3.8% in 2010 and reaching record highs by 2019 (Giving USA, 2020). These fluctuations illustrate the erratic nature of private donations, especially in times of economic turmoil.

Therefore, this study posits that nonprofits with a higher reliance on private donations are more likely to experience increased revenue volatility during and after crises. This leads to the following hypothesis:

Hypothesis 2b: Nonprofit organizations with a higher proportion of revenue from private donations will experience higher revenue volatility during and after the crisis compared to pre-crisis levels.

3) Program Service Revenue

Program service revenue refers to earned income generated from fees, sales, and charges for goods and services directly related to the nonprofit's tax-exempt purpose. As the largest nonprofit funding stream (McKeever et al., 2016), it provides a level of predictability and control for organizations, as nonprofits have some flexibility in adjusting prices and service offerings to meet changing economic conditions (Froelich, 1999). Studies have also shown that revenue from

commercial activities, such as fees for services, enhances a nonprofit's financial flexibility and autonomy, thereby increasing its capacity to withstand financial challenges and sustain operations (Carroll & Stater, 2009; Lu et al., 2020; Mayer et al., 2014; Morreale, 2011).

However, the reliability of this resource can vary depending on the source and payment method. During the 2008 Recession, nonprofits relying on fee-based government contracts encountered challenges due to canceled or reduced contracts, late payments, and decreased reimbursement rates (Boris et al., 2010; Never & de Leon, 2014; Pettijohn et al., 2013; Piatak & Pettijohn, 2021). Additionally, nonprofits that relied on commercial operations such as ticket sales, memberships, or other consumer-driven services faced declines in revenue as consumer spending decreased and events were canceled due to economic uncertainty (Toepler & Wyszomirski, 2012).

Despite these obstacles, nonprofits that relied heavily on program service revenue were found to be less affected by the Recession compared to those dependent on other revenue sources (Carroll & State, 2009; Keating et al., 2005). This relative resilience may be attributed to their ability to adjust service offerings and fee structures in response to economic conditions.

Based on this reasoning, the following hypothesis is proposed:

Hypothesis 2c: Nonprofit organizations with a higher proportion of revenue from program service revenue will experience moderate revenue volatility during and after the crisis compared to pre-crisis.

4) Investment Income

Investment income refers to returns from various financial instruments, including securities, interest, dividends, and capital gains². As an increasingly popular revenue source for nonprofits, investment income offers an alternative means to generate financial resources without the need for direct fundraising efforts. In 2013, about 20% of nonprofits generated at least 5% of their income from investments, accounting for approximately 5% of total nonprofits (McKeever et al., 2016). This financial base provides nonprofits with added profitability and autonomy by creating a source of revenue independent from external controls (Heutel & Zeckhauser, 2014a). However, not all nonprofits are able to generate investment income; in general, only large nonprofits with sufficient financial assets can enjoy the benefits that investment income brings (Heutel & Zeckhauser, 2014b). Managing investments often incurs additional costs and requires careful oversight to protect these assets, collectively referred to as slack resources (Bowman et al., 2007).

Investment income is inherently volatile and closely linked to the macroeconomic environment, making it particularly sensitive to economic downturns (Mayer et al., 2014). Nonprofits that rely heavily on investments are more exposed to financial market fluctuations, making them particularly vulnerable during economic downturns. For example, the 2008 Recession led to severe financial market declines, significantly impacting nonprofit investment portfolios and causing substantial revenue losses (Steinberg, 2018). This volatility contributed to

² For consistency, this study includes royalty income within investment income. In the old form, royalty income was reported on line 7, part I, as an 'other investment income item.' However, the new form lists royalty income separately.

heightened financial risks and increased the likelihood of organizational dissolution for nonprofits with a substantial reliance on investment income (Lu et al., 2020).

Mayer et al. (2014) also caution nonprofit managers against attempting to stabilize revenue portfolios simply by balancing investment income, earned income, and donations. They argue that while increased reliance on investment income may have its benefits, such as offering additional financial resources and independence, it comes at the cost of less stable revenue. Instead, nonprofit managers should focus on maintaining relatively large shares of earned income and donations while keeping the proportion of investment income smaller to avoid destabilizing their revenue base during periods of economic uncertainty.

The volatility of investment income, especially during periods of financial crisis, underscores its unpredictability as a revenue source. Unlike other revenue streams, such as government grants or program service revenue, investment income is highly sensitive to shifts in stock market performance, interest rates, and other external economic factors. Therefore, nonprofits that depend on this income stream face elevated financial risks during economic downturns, further destabilizing their revenue portfolios and overall financial health. Based on these considerations, this study posits the following hypothesis:

Hypothesis 2d: Nonprofit organizations with a higher proportion of revenue from investment income will experience greater revenue volatility during and after the crisis compared to pre-crisis.

3-3. Hypothesis Development 3: Dynamics of Service Needs in Response to a Crisis

The nonprofit sector comprises a wide array of organizations, offering distinct goods and services that range from healthcare and education to social services, arts and culture, and environmental conservation. These service areas not only reflect the sector's broad mission but also require tailored financial strategies, each with unique challenges for revenue management. Benefits theory provides a valuable framework for understanding the distinct revenue compositions required by these organizations. It posits that the availability of revenue streams varies based on the nature of services provided. When nonprofits align their financial strategies with their service offerings, they are better positioned to achieve financial health and sustainability, even during economic downturns (Young & Searing, 2022). In this context, benefits theory emphasizes that nonprofits should fully leverage their given revenue potential. For organizations with diverse beneficiaries and service types, no single income source should dominate. Instead, diversification arises naturally, and the primary focus should be on ensuring that no viable funding opportunities aligned with the organization's mission remain untapped (Young, 2017). This perspective thus underscores the importance of analyzing the impact of revenue diversification in relation to the nature of the services provided.

Despite substantial research on revenue diversification, most studies focus either on sector-wide trends (Carroll & Stater, 2009) or specific subsectors such as arts and culture (Grasse et al., 2016; Kim, 2017), sports clubs (Wicker & Breuer, 2014), or human services (Grønbjerg, 1992). However, as Hung and Hager (2019) highlight, revenue diversification operates differently across subsectors, suggesting that the financial resilience of nonprofits varies depending on the services they provide. Their meta-analysis finds limited and mixed evidence of the benefits of diversification but underscores the need for subsector-level research to capture the

full picture. Thus, the current study seeks to discern the varied impact of revenue diversification on revenue volatility during crises based on the nature of the services a nonprofit provides.

Benefits Theory and Nonprofit Sub-Sector Analysis

The effectiveness of revenue diversification becomes more complex when considering how different nonprofit subsectors respond to crises. Benefits theory emphasizes that the success of revenue diversification depends not only on the number of revenue streams but also on how well these streams align with the organization's services and societal needs. However, during crises, such as the 2008 Recession or the COVID-19 pandemic, the demand for certain services shifts significantly. For example, nonprofits providing healthcare, housing, and food assistance experienced increased demand, attracting additional funding from government and philanthropic sources (Salamon et al., 2009). Conversely, nonprofits focusing on arts, culture, and recreational programs may experience decreased demand during a crisis and may struggle to maintain their revenue base, even if they have diversified revenue streams in place (Toepler & Wyszomirski, 2012). This dynamic highlights the importance of aligning revenue strategies with changing service needs to manage financial volatility during economic disruptions effectively.

Diversification might not be a panacea; nonprofits' ability to effectively manage revenue volatility during economic downturns can be deeply influenced by the type of services they provide and the societal needs they address.

To this end, the study employs the National Taxonomy of Exempt Entities- Core Codes (NTEE-CC) to group nonprofits based on their core mission and activities. Although limitations exist in accurately capturing all nuances of service benefits, the NTEE-CC remains a widely

accepted classification system, facilitating consistent comparisons across organizations (Chang & Tuckman, 1994; de los Mozos et al., 2016; Qu, 2016; 2019). This taxonomy provides a structured way to categorize nonprofits into service areas such as arts, healthcare, education, and human services, enabling researchers to analyze how different nonprofit subsectors respond to economic crises and offer insights into which subsectors are more resilient to revenue volatility during economic disruptions.

The NTEE-CC classifies nonprofits into 26 major groups under ten broad subsectors. This study focuses on five key nonprofit subsectors: 1) Arts, Culture, and Humanities, 2) Education, 3) Healthcare, 4) Human services, and 5) Public and Social Benefits subsectors because these five subsectors experienced dramatic shifts in demand during the 2008 Recession (McCambridge & Dietz, 2020). Furthermore, these five areas showcase diverse financial structures and funding sources.

Finally, the study adopts the subsector-specific analysis using the NTEE-CC rather than beneficiary identification because categorizing nonprofits by beneficiary types—individual, group, public, or mixed—is more challenging and relies heavily on subjective interpretation. By using an established classification system such as the NTEE-CC, the analysis facilitates consistent comparisons across organizations, enhancing data reliability and aligning the research with previous research. More critically, the changing demands for services during the economic crisis are better captured by sub-sectors, such as the increased demand for healthcare, food assistance, or housing and the reduced focus on arts and cultural activities. Capturing these dynamics through subsector-specific analysis can offer deeper insights into how revenue strategies need to adapt in response to societal shifts.

Building on in-depth observations of each subsector and the theoretical underpinnings, this study develops hypotheses to explore the differential impacts of the 2008 Recession on these subsectors. The focus is on understanding how revenue diversification and composition influence the financial resilience of nonprofits, highlighting the varying capacities of subsectors to withstand economic disruptions.

1) Arts, Culture, and Humanities

The arts, culture, and humanities subsector includes a diverse range of organizations, including museums, performing arts centers, media groups, art education institutions, and historical societies. Despite its cultural significance, this subsector represents a relatively small fraction of the nonprofit sector, accounting for around 9.9% of all nonprofits and contributing only 1.9% of the sector's total revenue in 2012 (McKeever & Pettijohn, 2014). The revenue structure of these nonprofits is notably complex and multifaceted. Data from McKeever et al. (2016) indicate that 44% of arts organizations' revenue originates from private donations, including individual contributions, corporate sponsorships, and foundation grants. Program service revenue, which encompasses admissions, ticket sales, and tuition fees, contributes another 35%, while government grants and investment income account for 10% and 9%, respectively. This composition underscores a diversified revenue structure that, while varied, mainly relies on both private contributions, notably endowments, and significant earned income.

The diversified revenue streams found in arts nonprofits align well with benefits theory, which posits that nonprofits should structure their financing to match the types of benefits they provide to their communities (Fisher et al., 2011; Young, 2017). Arts and culture nonprofits

serve a broad spectrum of beneficiaries, ranging from individual patrons seeking tailored experiences like artistic performances to larger communities that benefit from cultural enrichment, community engagement, and heritage preservation. This wide-ranging service provision is mirrored in their revenue structures, which are among the most diversified in the nonprofit sector (McKeever et al., 2016). The high level of revenue diversification observed among these organizations not only reflects a strategic response to the varied preferences of their patrons but also serves as a protective measure against power imbalance and financial volatility by spreading revenue risks across multiple revenue streams. Empirical studies reinforce the benefits of revenue diversification within the arts and culture subsector, demonstrating that diversification enhances performance (Kim, 2017), bolsters overall financial health (Liu & Kim, 2022), and promotes organizational sustainability (Hager, 2001).

Despite these theoretical advantages, arts and cultural nonprofits are known to be highly vulnerable to economic downturns. These organizations often experience pro-cyclical financial tendencies: During economic booms, their revenues grow disproportionately, with above-average growth rates compared to other nonprofit subsectors (Toepler & Wyszomirski, 2012). This vulnerability is largely driven by their reliance on discretionary spending, such as donations and ticket sales, which tend to decline during periods of economic instability. The 2008 financial crisis highlighted these challenges, as theaters, museums, and orchestras faced severe revenue contractions due to canceled events, reduced ticket sales, and diminished government support (Diet et al., 2014; Hoye, 2009; Salamon et al., 2009).

A key question is whether revenue diversification mitigates or exacerbates financial instability for arts and culture nonprofits during economic downturns. MPT, while advocating for diversification under normal conditions, suggests that revenue diversification may not fully

insulate organizations from financial volatility during systemic economic crises, as correlations between revenue sources tend to increase (Markowitz, 1952). However, benefits theory suggests that arts nonprofits are particularly well-positioned to leverage diversified revenue streams due to the broad array of benefits they provide. This alignment could act as a financial buffer during crises. The extent to which this alignment between revenue composition and service delivery enhances financial resilience remains an empirical question.

Therefore, this study hypothesizes that while arts and culture nonprofits are financially vulnerable during economic downturns, those with diversified revenue streams will continue to experience lower levels of revenue volatility during and after a crisis compared to pre-crisis levels. The insights from this analysis will offer valuable contributions to nonprofit financial management practices, particularly for arts and cultural organizations navigating economic uncertainty.

Hypothesis 3a: Arts, culture, and humanities nonprofit organizations with diversified revenue streams will experience decreased revenue volatility during and after the crisis compared to pre-crisis levels.

2) Education

The education nonprofit subsector encompasses various organizations, including K-12 schools, higher education institutions, vocational and technical schools, parent-teacher associations, and education support organizations. Together, these entities represent approximately 17% of the entire nonprofit sector in terms of both the number of organizations

and the aggregate revenue. Significantly, higher education institutions make up just 4% of the total number of educational nonprofits, yet they account for about 65% of this subsector's revenue (McKeever & Pettijohn, 2014). This reflects the dominance of a small number of large, financially robust entities, such as universities, private schools, and training centers, and the delivery of specialized, capital-intensive services that require considerable investments in infrastructure. In contrast, the education subsector also comprises a larger number of smaller, more specialized organizations, such as independent educational initiatives and local education nonprofits. Typically, these smaller entities are more susceptible to financial volatility due to their limited financial resources and reliance on a narrower funding base.

Education nonprofits rely on fee-for-service income streams, such as tuition, program fees, and course enrollments. Specifically, fee income accounts for 61% of total revenue in the education subsector (McKeever et al., 2016). Benefits theory provides a theoretical rationale for this high concentration on fee incomes as it emphasizes that revenue sources should align with the nature of the benefits provided (Young, 2017). Education services typically provide direct personal benefits to students or participants, including the acquisition of knowledge and skills, which justifies the reliance on service fees as a primary revenue source. In other words, education nonprofits naturally generate income from beneficiaries who directly reap the private benefits of the services provided, and they may not significantly benefit from diversification, as the nature of their services inherently limits the variety of feasible revenue streams.

This primary reliance on fee income is the best-suited revenue composition for this education subsector. Excessive efforts to diversify revenue streams could strain organizational management, as the pursuit of unrelated income sources may divert resources and exceed the organization's capacity to manage its core functions effectively. Thus, benefits theory would

recommend that education nonprofits maintain a more concentrated revenue base centered around service fees, aligning with their mission and financial strategies.

Education nonprofits demonstrated resilience during economic downturns, primarily due to their reliance on program service fees, which provide a stable and flexible revenue source that significantly contributes to the subsector's financial stability (Froelich, 1999). Another key aspect of resilience in the education subsector is the countercyclical nature of the demand for education. During economic recessions, education institutions, particularly higher education and vocational programs, often experience increased enrollment as individuals seek additional qualifications to enhance their employability in tough job markets (Long, 2014). This increased demand contributes to consistent revenue inflows, providing a stabilizing effect for education nonprofits even during periods of economic stress. Moreover, the essential nature of education service has historically led to government support during crises. Government funding often increases for educational institutions in response to heightened societal demand for accessible education, as evidenced during the 2008 Recession (Evans et al., 2019; Stewart & Smith, 2011). Education nonprofits were able to sustain and, in some cases, grow their revenue streams during this period, primarily through service fees and supplemental government aid, while limiting asset losses (McCambridge & Dietz, 2020). Research by Qu (2019) highlights that education nonprofits tend to have lower portfolio risk due to their reliance on service fees, which remain stable even in times of crisis. Despite excessive reliance on a single revenue source, education nonprofits exhibit financial resilience because of the great stability and flexibility associated with service fee income (Chen et al., 2024).

Given this financial structure, diversification may not provide stability for education nonprofits during crises and could instead introduce inefficiencies, including administrative complexity, without significant risk mitigation. Therefore, this study hypothesizes:

Hypothesis 3b: Education nonprofits with diversified revenue streams will experience increased revenue volatility during and after the crisis compared to pre-crisis levels.

3) Healthcare

The healthcare nonprofit subsector shares similar financial traits with the education subsector, including its reliance on fee-for-service income and its significant role within the broader nonprofit landscape. Healthcare nonprofits include hospitals, clinics, nursing facilities, and community health centers, accounting for approximately 17% of the entire nonprofit sector in terms of both the number of organizations and the aggregate revenue (McKeever et al., 2016). However, the healthcare subsector commands a disproportionately large share of overall nonprofit revenues and expenses. While healthcare organizations make up around 13% of all nonprofit entities, they are responsible for nearly 59% of the sector's total revenues and expenditures (McKeever & Pettijohn, 2014). This financial dominance is particularly driven by hospitals and primary care facilities, which constitute only 2.4% of the total nonprofit sector yet generate over half of its total revenue.

Healthcare nonprofits also predominantly rely on fee-for-service income. According to Caver and Im (2014), more than 90% of their revenue comes from program service revenue. Even excluding nonprofit hospitals, this fee income accounts for about 57%. This fee-based

structure reflects the direct personal benefits provided to patients, aligning well with benefits theory (Young, 2007; 2017). Healthcare services offer immediate and essential benefits to individuals, such as medical treatment, preventive care, and wellness support. Consequently, fee-for-service income serves as a natural and primary revenue source for this subsector, resulting in a concentrated, less diversified revenue base. Building on benefits theory, diversification efforts might be limited, as they could introduce inefficiencies by straining management capacity without adding significant financial stability.

However, a key distinction lies in how these payments are structured and collected. Unlike education nonprofits, which are largely dependent on direct payments from individuals for tuition and program fees, healthcare nonprofits operate within a more complex payment system that includes insurance reimbursements, patient fees, and government-funded programs such as Medicare and Medicaid. This distinction is critical because healthcare payments are often mediated by third-party payers, making revenue flows subject to regulatory changes, reimbursement policies, and fluctuations in public funding (Pettijohn et al., 2013; Piatak & Pettijohn, 2021).

Healthcare nonprofits demonstrated strong financial resilience during economic crises, driven by the essential nature of their services. The 2008 Recession, for example, did not lead to significant financial downturns for healthcare organizations, many of which maintained positive operating margins throughout the period (Singh, 2013). The consistent demand for healthcare services during crises, particularly in areas like emergency care, chronic disease management, and mental health, ensures stable revenue inflows through service fees, even in times of economic instability.

Furthermore, healthcare nonprofits benefited from increased government support during the 2008 Recession. Programs like Medicare and Medicaid continued to fund critical healthcare services, while additional government aid was provided to meet the heightened demand for health services during the crisis (Stewart & Smith, 2011). As a result, healthcare nonprofits were better positioned to weather the economic downturn compared to other organizations that provide non-essential services.

Given the essential nature of healthcare services, even during economic downturns and the stable revenue streams they provide, healthcare nonprofits may not experience significant advantages from diversification during and after crises. Instead, diversification could lead to increased revenue volatility as organizations attempt to manage disparate income streams that do not align with their core services. Thus, this study hypothesizes:

Hypothesis 3c: Healthcare nonprofits with diversified revenue streams will experience increased revenue volatility during and after the crisis compared to pre-crisis levels.

4) Human Service

The human service subsector covers a broad area of activity, including public safety, housing, employment, legal services, rehabilitation, food distribution, and programs designed to assist vulnerable populations. Representing 35.5% of all charitable organizations, the human service subsector is the largest in terms of the number of nonprofits but accounts for only 12.5% of the total revenue of the sector (McKeever & Pettijohn, 2014). This subsector includes predominantly small organizations.

Human service nonprofits build a strong financial relationship with government sources, particularly through government reimbursement payments for services provided to individuals eligible for public assistance (Smith, 2016). Nearly half of their revenue, approximately 47%, comes from fee-for-service income, with 25.8% generated from government contracts and 26.9% derived from private sources (McKeever et al., 2016). The remaining revenue is sourced from government grants (21.2%) and private donations (20.9%). However, investment income constitutes only 2.7% of the revenue portfolio, indicating a limited reliance on financial returns from assets. While the diversified nature of their revenue sources offers human service nonprofits a degree of financial stability, the significant dependence on government funding leaves them particularly vulnerable to changes in public funding policies and government budget cuts. As Grønbjerg (1991) points out, this reliance on government contracts and grants raises concerns about the long-term sustainability of their financial models, particularly in times of fiscal tightening or policy shifts.

According to benefits theory, human service nonprofits primarily seek government grants and fee income for services reimbursed by government programs because they provide ‘redistributive goods’—essential services that support low-income and vulnerable individuals who cannot afford them (Young, 2017). These nonprofits often provide critical public services on behalf of government agencies, helping address social equity and welfare issues. Consequently, government support is a natural fit and primary revenue stream for these organizations.

Benefits theory also explains that by generating positive community impacts (or ‘collective benefits’), these organizations are eligible for diversifying funding streams such as private, institutional donations, and government grants. However, while eligible, they still face

challenges in fundraising. In particular, securing substantial philanthropic contributions is still low compared to other sectors such as religious organizations or education: Over the last decade, an average of just 12% of private philanthropy in the US has gone to human services, while a third goes to religious organizations and 14 % to education nonprofits (NCCS, 2020).

Human service nonprofits have increasingly turned to revenue diversification strategies such as social enterprises, alternative earned income, and investments (Besel et al., 2011; Salmon, 2012; Smith, 2017). However, these efforts have not significantly reduced their reliance on government contracts and grants. This limited diversification, despite efforts to expand income sources, raises concerns about whether human service nonprofits can achieve financial stability through diversification. Studies suggest that diversification may not yield the expected benefits; in fact, some argue that it may increase management complexity and dilute mission focus, particularly in the human services field (Frumkin & Keating, 2011; Grønbjerg, 1991).

The 2008 economic crisis presented both challenges and opportunities for human service nonprofits. As demand for services such as emergency food distribution, homelessness prevention, and job training surged, these nonprofits faced increased financial strain. Never (2013) noted that all human service nonprofits experienced heightened financial stress, defined as reduced expenses but increased demand for their service, during the 2008 Recession compared to pre-recession levels. However, human service nonprofits exhibited significant resilience during this period. Government support, particularly through initiatives like the American Recovery and Reinvestment Act (ARRA) of 2009, provided critical financial support, helping to stabilize human service nonprofits despite the broader economic turmoil (Nicholson-Crotty & Nicholson-Crotty, 2015). Private donations also increased during this period, with human service organizations reporting a 15.2% increase in contributions from 2007 to 2010 (Giving USA,

2013). Government funding remained relatively stable, even in the face of budget cuts and payment delays (Besel et al., 2011; Park & Mosely, 2017; Pettijohn et al., 2013; Salamon et al., 2009). These factors helped minimize revenue fluctuations and dissolution risks within the subsector (Dietz et al., 2014). Interestingly, some reports indicated that human service nonprofits saw a 2% revenue increase during the crisis, compared to revenue declines across other subsectors (Pratt & Aanestad, 2020). However, this temporary stabilization was primarily attributed to increased government support and heightened private donations rather than the success of revenue diversification strategies.

Given the heavy reliance on government funding and the mixed evidence regarding the effectiveness of revenue diversification strategies in the human service subsector, it is unclear whether human service nonprofits with diversified revenues could effectively mitigate revenue volatility during economic crises. Nonprofits with a well-aligned revenue composition, where diversified streams correspond with their range of benefits, may benefit from greater resilience during crises. This alignment can provide these nonprofits with the ability to buffer against financial shocks, even if diversification is not a perfect solution. Given these considerations, the following hypothesis is proposed:

Hypothesis 3d: Human service nonprofits with diversified revenue streams will experience reduced revenue volatility during and after the crisis, compared to pre-crisis levels.

5) Public and Social Benefits

The public and social benefits subsector encompasses a diverse array of nonprofit organizations that aim to provide services or benefits to the public or specific social groups. This subsector includes organizations involved in civil rights and advocacy, community development, philanthropy, volunteerism and grant-making foundations, science, and technology, all of which contribute to enhancing public welfare. These nonprofits are engaged in a broad spectrum of activities, ranging from direct service provision to advocacy and research. In 2012, public and social benefits nonprofits represented 11.6% of all public charities and contributed 5.6% of total revenues in the nonprofit sector. (McKeever & Pettijohn, 2014).

According to benefits theory, nonprofits that offer public and collective benefits, such as those within the public and social benefits subsector, naturally attract government support and philanthropic contributions (Young, 2017). For example, civil rights groups or community development organizations that promote social equity and public welfare are typically aligned with revenue sources such as government grants, foundation-based donations, and private charitable contributions (Searing et al., 2021). In other words, these types of goods, often considered public or collective, do not typically generate income through fee-for-service models because there are few direct beneficiaries who are willing or able to pay for the services provided (Boris & Maronick, 2012). As a result, over 60% of their funding comes from public funding like grants, contributions, and gifts (McCambridge & Dietz, 2020). However, such heavy reliance on a few concentrated revenue streams exposes these organizations to substantial financial risk, particularly during economic instability (Qu, 2019).

Public and social benefit nonprofits are particularly vulnerable to economic downturns. The economic crisis of 2008 revealed the financial fragility of this subsector, which experienced significant declines in revenue, expenditure, and assets, as well as one of the highest closure rates in the nonprofit sector (Diet et al., 2014; McKeever & Pettijohn, 2014). High dependence on government grants and philanthropic contributions can put them at significant financial risk because public perception during crises often shifts toward prioritizing immediate needs, sidelining the "non-essential" services typically provided by public and social benefit nonprofits. This shift in priorities makes it difficult for these organizations to compete for limited emergency funding or philanthropic support (Diet et al., 2014).

There is a lack of comprehensive research on the role of revenue diversification within the public and social benefits nonprofit subsector. While revenue diversification is generally recommended across the nonprofit sector to foster financial independence from primary donors and promote revenue stability, its effectiveness in this subsector remains uncertain. This study seeks to explore whether public and social benefit nonprofits can reduce revenue volatility during crises through revenue diversification. Although diversification could theoretically provide greater financial stability, its actual impact in mitigating volatility during economic downturns remains uncertain due to the subsector's heavy reliance on public funding and philanthropy.

Hypothesis 4e: Public and social nonprofits with diversified revenue streams will experience reduced revenue volatility during and after the crisis compared to pre-crisis levels.

This chapter has synthesized theoretical perspectives and empirical literature to develop

hypotheses on how revenue diversification affects nonprofit financial volatility in the context of a systematic crisis. First, drawing on RDT and MPT, it examines the overall effectiveness of diversification before, during, and after a crisis. Then, considering the unique characteristics of revenue sources, it further evaluates the distinct behaviors of key revenue sources, such as government grants, private donations, program service revenue, and investment income under crisis conditions. Finally, using benefits theory, it explores how financial stability varies across nonprofit subsectors based on their revenue structures. Together, this study provides a structured framework for assessing the role of revenue diversification in nonprofit financial resilience. The next chapter outlines the research design and methodology, detailing the data sources, variables, and analytical techniques employed to test the hypotheses.

CHAPTER 4: RESEARCH DESIGN AND METHODOLOGY

4-1. Data Management

This study examines the relationship between revenue volatility and revenue composition during the 2008 economic crisis. The hypotheses were tested using a longitudinal panel dataset spanning nine years, from 2004 to 2012, to discern patterns and impacts of revenue diversification associated with these turbulent times. Data for this analysis were sourced from the Internal Revenue Service (IRS) Statistics of Income (SOI) data files developed by NCCS. The SOI data files are widely acknowledged as the definitive source for nonprofit financial data, providing comprehensive financial details through stratified probability samples of IRS Form 990 (NCCS Data Guidance 2006). This data includes all nonprofits with total assets exceeding \$30 million and features a representative sample of smaller organizations stratified and weighted by their asset size. As a result, the dataset addresses the inherent skewness in IRS nonprofit data, which tends to favor medium and large nonprofits. Notably, the current research derives data from the old (2007 and prior) and new IRS Form 990 (2008 to present), requiring all variables to be matched across the two forms. This allows for a robust examination of the financial impacts across three distinct phases: before (2004 to 2006), during (2007 to 2009), and after (2010 to 2012) the Recession. This temporal segmentation allows for a comprehensive comparison of revenue volatility across different economic conditions.

The sample was created in stages, following NCCS guidelines and recommendations from Bowman and colleagues (2012).³ The initial sample size was 131,433 observations. First, to ensure a focus on public charitable nonprofit (501(c)(3)) organizations, the sample was refined by systematically excluding entities that did not meet this classification. Specifically, private foundations, social welfare (501(c)(4)) agencies, foreign-based organizations, government entities, and independent sector organizations operating in U.S. territories or military installations overseas were removed. Second, this study used panel data. If an organization filed two returns in one year, only the latter was included (NCCS data guideline, p.6). Third, only functioning organizations were included: nonprofits were dropped if their total expenses were less than the sum of depreciation and interest paid or if their total assets and total liabilities were less than zero. Fourth, group returns were excluded. Finally, the study compared the analysis outcomes in three different periods (before, during, and after the recession) by examining changes in revenue volatility. To accommodate this goal, the study dropped organizations that did not report data for at least seven years during the nine-year period in order to sufficiently capture changes. In this way, this study examines only organizations with at least one data report in three periods: before (from 2004 to 2006), during (from 2007 to 2009), and after (from 2010 to 2012) the recession. This strategic approach helped to preserve a substantial proportion of the dataset, ensuring that the sample remains representative and spans all three periods of interest.

Table 1 summarizes the sample selection process and the proportion of the sample meeting each criterion. The final dataset yielded unbalanced panel, which includes 90,109

³ Bowman et al. (2012, pp. 571-574) recommended eight filters. The current study applied all except SEAS, the accrual accounting filter, and IRS form 990-EZ. The first two filters were not applied because data are not available in the old 990 Form. Finally, the SOI data includes small nonprofits using form 990-EZ, stratified and weighted by asset level, in order to represent the sector.

observations across 10,661 disparate nonprofit organizations. Most nonprofits are observed annually under analysis (6,710 nonprofits, accounting for 60,390 or 67.02% of the total observations). However, due to some missing control variables, 89,009 observations from 10,636 nonprofits comprised the final sample for analysis. The sampling unit is a nonprofit organization that filed IRS Form 990 from 2004 to 2012.

[Insert Table 1 here]

4-2. Variables

Dependent Variable

The dependent variable, revenue volatility, is defined as the absolute value of the deviation of actual revenue from expected revenue, divided by expected revenue, with each nonprofit exhibiting a unique growth trend as derived from regression analysis. This measure captures the percent deviation between actual and expected revenue: lower revenue volatility indicates smaller deviations from expected revenue and thus greater financial stability, whereas higher volatility signifies larger deviations, pointing to revenue instability. Extensive finance studies have used this concept of revenue volatility to assess revenue portfolio stability, both in discussions of state and local tax revenues (Afonso, 2017; Carroll, 2009; Carroll & Goodman, 2011) and nonprofit revenue volatility (Carroll & Stater, 2009; Mayer et al., 2014; Wicker et al., 2015). It is important to note that revenue volatility, as measured here, represents the magnitude of deviation from expected revenue without indicating whether it is above or below the expected

amount due to its absolute nature. For a detailed breakdown of the variable definitions and measurements used in this analysis, refer to Table 2.

[Insert Table 2 here]

Independent Variables

The primary independent variables analyzed in this study include the revenue diversification index (RDI) and the proportion of revenue from each of the four revenue streams. The RDI, computed via the Herfindahl-Hirschman Index (HHI), measures a nonprofit's revenue diversification among the four revenue sources, where 0 represents full concentration and values approaching 1 indicate high diversification. Chikoto and colleagues (2016) noted that the effect of RDI varies depending on the chosen revenue streams. To ensure consistent results, this study focuses on four revenue streams—government grants, private donations, program service revenue, and investment income—chosen based on their demonstrated reliability across varying numbers of funding sources in past research (Chikoto & Neely, 2014; Kim, 2017; Yan et al., 2009) and their larger effect sizes (Hung & Hager, 2019).

The proportion of revenue from each of the four sources is computed as four additional independent variables. To ensure consistency, these revenue categories align with those used in the RDI calculations. This research uses data from both the old IRS Form 990 (2007 and prior year) and the new IRS Form 990 data (2008 to present), requiring the variables to be carefully matched across the two forms to maintain comparability. Table 3 presents how each revenue source is defined, matched, and estimated.

[Insert Table 3 here]

To test the third set of hypotheses, nonprofit subsectors are categorized according to the National Taxonomy of Exempt Entities-Core Codes (NTEE-CC), a widely recognized standard used by both the IRS and Urban Institution's NCCS. The NTEE-CC system organizes nonprofits based on their primary mission and activities and divides them into 26 service types that are collapsed into ten major groups: arts, culture, and humanities (A), education (B), environment and animals (C, D), health, (E, F, G, H), human services, (I, J, K, L, M, N, O, P), international, foreign affairs (Q), public, societal benefit (R, S, T, U, V, W), religion-related (X), mutual/membership benefit (Y), and unknown (Z). Due to its ambiguous nature, this study excludes the 'unknown' or 'unclassified' group (Z). The research then narrows its focus to five distinct subsectors for in-depth analysis: (1) arts, culture, and humanities, (2) education, (3) health, (4) human service, and (5) public and social benefits. These subsectors represent 94.03% of the total sample, encompassing 84,711 observations across 10,025 nonprofit organizations. The remaining 5.97% (5,398) of the sample consists of miscellaneous types of organizations, such as those related to the environment and animals, international and foreign affairs, mutual and membership benefits, and religion. Due to limited data observations, the current study does not explore these subsectors in detail for separate analysis.

Table 4 presents the composition of nonprofit subsectors compared to the distribution of all registered U.S. nonprofits in 2012, using data from the NCCS 2012 dataset. The sample in this study largely mirrors the national distribution of nonprofits. Although there is a slight overrepresentation of education and healthcare nonprofits, targeted subsequent analyses specifically excluding higher educational institutions and nonprofit hospitals within the education and health subsectors should address this oversampling issue. It should be noted again that the current study focuses on an in-depth examination of only five major subsectors.

[Insert Table 4 here]

Interaction with the 2008 Recession

The 2008 Recession was operationalized as a dummy variable and incorporated as a moderating factor in this analysis. The Business Cycle Dating Committee of the National Bureau of Economic Research (NBER) reported that the 2008 Recession started in December 2007 and officially ended in June 2009 and lasted for 18 months. However, considering the mid-2007 collapse of the housing market and supporting evidence from prior studies (Lee & Shon, 2018; Never, 2013), this study defines the recession period from 2007 to 2009. Given that the economic downturn's effects varied across nonprofits and were not confined to the officially designated recession period (Pettijohn et al., 2013), the current study also examines impacts after the official recession ended, that is, from 2010 to 2012 (three years). To establish a baseline for comparison, the study set the baseline for a three-year period before the 2008 Recession, from 2004 to 2006. Accordingly, the study set three different time frames to capture the impact of the 2008 Recession on revenue volatility: pre-Recession (2004 to 2006),⁴ the Recession (2007 to 2009), and post-Recession (2010 to 2012).

Three models were developed to accurately measure the impact of RDI on revenue volatility. Though three models were applied to accurately measure revenue volatility, they all used the same baseline, the 'before' period (2004 to 2006), a period of GDP growth. In the first model, the value of the 'during and after' periods (2007 to 2012) dummy variables take a value of 1 and 0 otherwise (from 2004 to 2006). The average value of revenue volatility during the period 2007-

⁴ The 2001 recession, lasting from March to November (eight-month) (NBER 2003), had lingering effects, with national unemployment peaking at 6 percent in June 2003 (BLS 2018). Despite this, GDP growth resumed in 2002 and peaked in July 2003. Therefore, this study assumes the 2001 recession's impact dissipated by the end of 2003.

2012 was compared to that of the ‘before’ period (from 2004 to 2006). In the second model, the ‘during (2007 to 2009)’ dummy variable equals to 1 and 0 otherwise, and ‘after (2010 to 2012)’ variable equals to 1 and 0 otherwise. The baseline (from 2004 to 2006) value was compared to values of both ‘during (2007 to 2009)’ and ‘after (2010 to 2012)’. In the third model, 2007, 2008, 2009, 2010, 2011, and 2012 were coded 1; 2004, 2005, and 2006 were coded 0. This model can compare and analyze baseline value with annual values from 2007 to 2012, respectively, in order to examine to what extent the impacts of the RDI on revenue volatility (DV) interact with different time periods of the 2008 Great Recession, including before, during, and after.

Control Variables

The study also employed several control variables to limit the influence of confounding and other extraneous variables. The age of the organization was assessed using NCCS Business Master Files (BMF) data, with the IRS determination letter rule date serving as a proxy for years of operation (Mayer, 2023; Searing, 2018). Organizational ecologists suggest that organizational life cycle stages reflect their accumulated learning and experience (Cafferata et al., 2009; Freeman et al., 1983), with older organizations being more effective at fundraising (Hager et al., 2001) and having greater income stability (Denison et al., 2019). This variable was particularly crucial for examining the resilience of newer organizations during external crises. Due to missing values and inaccurately reported rule date information in the BMF files, some organizations had negative values for their age. All negative values were adjusted to zero to correct for these anomalies and ensure data accuracy.

The study controlled for organizational size, which is closely related to a nonprofit's economics of scale and capacity to offer goods and services (Calabrese, 2012; Carroll & Stater,

2009). For example, smaller nonprofits were more likely to experience revenue declines and closure during the 2008 Recession (Dietz et al., 2014). The size was measured by total assets, with the natural logarithm⁵ addressing data skewness. Additionally, the natural log of total expenses was also included to further account for size effects on revenue volatility, as expenditure levels also represent organizational scale during financial disruptions.

Financial flexibility was quantified through three measures: debt margin, total margin, and surplus margin (Carroll & State, 2009; Mayer et al., 2014). A high debt margin implies limited financial flexibility due to increased debt burdens, whereas high total and surplus margins indicate an organization's ability to adapt and maintain stability through effective profit generation and resource management.

Community-level variations can also influence nonprofits that operate within them (Grønbjerg & Paarlberg, 2001; Paarlberg et al., 2018). Due to the concern that high competition and limited access to funding opportunities can also fundamentally threaten revenue stability, the number of nonprofits per county and median household income are added to the analysis. The number of nonprofits in each county was calculated using NCCS BMF data from 2004 to 2012 to address potential funding competition in areas with a large number of nonprofits. Median household income at the county level, based on the 2000 Census data (repeated for 2004 to 2008) and ACS5 data from 2009 to 2012. Affluent communities may have more fundraising opportunities for nonprofits (Wolch & Geiger, 1983).

⁵ Because the log of zero and negative values is undefined, the study adds a constant number to ensure values can be log-transformed and observations are not dropped.

Finally, the study considered the State of Location variable to account for the impact of state-specific regulations on nonprofits' financial environment. For example, while most states exempt nonprofits from income taxes, Washington State does not. According to the National Council of Nonprofits, nonprofits across different states may face varying exemptions from corporate, sales, use, or property taxes, and differences in state laws regulating nonprofit activities. These legal differences can potentially affect nonprofits' ability to generate their revenues. To capture these state-level regulatory variations, the study includes a set of 51 dummy variables representing each state and the District of Columbia. This approach allows the analysis to isolate the potential influence of individual state policies on nonprofit financial performance. All financial variables were measured in dollar terms and adjusted for inflation using the Consumer Price Index (CPI) to reflect their value in 2012 dollars.

4-3. Empirical Models

Building upon the data management strategies outlined previously, this study employs empirical models to test hypotheses concerning the impact of revenue diversification on revenue volatility during different economic periods, specifically during the 2008 financial crisis. The analytical framework is presented through three main equations.

Equation 1 is designed to test the first hypothesis regarding the impact of the revenue diversification index (RDI) on revenue volatility in general:

$$Y_{it} = \beta_0 + \beta_1 RDI_{it} + \beta_2 2008\ Crisis_t + \beta_3 (RDI_{it} * 2008\ Crisis_t) + \beta_x All\ Controls_{it} + u_i + \varepsilon_{it} \quad (1)$$

Here, revenue volatility, Y_{it} , is the dependent variable, measured as the absolute difference between expected and actual revenue for nonprofit organization i in year t . The independent variable, revenue diversification index, RDI_{it} is the independent variable quantifying the extent of revenue diversification. An interaction effect between RDI_{it} and a set of binary variables representing the 2008 *crisis* _{t} accesses the dynamic impact of economic turbulence. The model also integrates $\beta_x All\ Controls_{it}$, encompassing a vector of all control covariates to account for other factors influencing volatility. u_i is an organization-specific effect, and ϵ_{it} is an error term that varies over both a nonprofit, i , and a year, t .

Equation 2 addresses the second set of hypotheses by examining the interaction effects between the four nonprofit primary revenue sources and the 2008 Recession:

$$\begin{aligned}
 Y_{it} = & \beta_0 + \beta_1 Revenue\ Sources_{it} + \beta_2 2008\ Crisis_t \\
 & + \beta_3 (Revenue\ Sources_{it} * 2008\ Crisis_t) + \beta_x All\ Controls_{it} + u_i \\
 & + \epsilon_{it}
 \end{aligned} \tag{2}$$

In this model, *Revenue sources* _{it} , is a group of independent variables that includes the proportion of the organization's revenue from government grants, private donations, program service revenue, and investment income, respectively. To account for potential revenue composition effects, the proportions of the other three revenue sources are included as control variables in each model. This formula helps explore how different revenue sources interact with economic conditions precipitated by the 2008 crisis, illuminating their roles in mitigating or exacerbating revenue volatility.

Additionally, while prior research often integrates subsectors merely as control variables (for example, Carroll & Stater, 2009) or as moderators (for example, Hung & Hanger, 2019)

within broader analyses, this study proposes conducting distinct empirical estimations for each subsector. This approach offers a more nuanced analysis by avoiding the oversimplification of merely using subsector dummy variables. Treating subsectors independently provides deeper insights into the specific dynamics within each one. To further investigate how the effects of revenue diversification on revenue volatility differ across primary nonprofit subsectors, thereby testing the third set of hypotheses, this study replicates the econometric model used in Equation 1 for each of the five subsectors under examination. Maintaining methodological consistency allows for meaningful comparative analysis, highlighting potential differences and similarities in how revenue diversification strategies affect financial stability during periods of economic fluctuations across the subsectors.

Finally, the analytical framework, fixed-effects panel analysis, is adapted here to test these three groups of hypotheses. This model controls for all the time-invariant characteristics of the individual nonprofit organizations, thus eliminating the impact of omitted time-invariant variables on the dependent variable, revenue volatility.

Diagnostic tests ensured the estimation was unbiased and the models correctly specified. First, the Hausman test rejected random effects in favor of fixed effects. A fixed-effects Model 1 is employed to control for unobserved heterogeneity across organizations. Second, Woodbridge's test (Woodbridge, 2002; Drukker, 2003) showed that this panel model had serial correlation problems, as the test result could reject the null hypothesis of no first-order autocorrelation ($p < 0.05$). Third, the modified Wald test for groupwise heteroscedasticity rejected the null hypothesis of homoscedasticity. The analysis needs to control for panel-level heteroscedasticity and autocorrelation. Consequently, this study used a one-way fixed-effect model with robust standard

errors (i.e., a Huber-White robust standard error) to control for panel-level heteroscedasticity and autocorrelation.

CHAPTER 5: MAIN RESULTS

Having outlined the research design and methodology in Chapter 4, this chapter proceeds to present the findings of the study. This chapter is structured to explore the impacts of revenue diversification and revenue composition on nonprofit organizations, beginning with a descriptive analysis that sets the context by highlighting key trends and changes in financial indicators during the study periods: before, during, and after the 2008 Recession. The main results then quantitatively assess the relationships established in the first and second sets of hypotheses, supported by robustness checks to validate the reliability of these findings.

Subsequently, the focus shifts to a detailed nonprofit subsector analysis, where similar analytical rigor is applied to uncover patterns and variances across different segments of the nonprofit sector. Each section is designed to build upon the previous, ensuring a comprehensive understanding of how revenue strategies and environmental factors interplay to affect the fiscal health of nonprofits.

5-1. Revenue Diversification and Sector-Wide Revenue Volatility

1) Descriptive Analysis of Revenue Trends

Table 5 presents descriptive statistics for key variables across three different economic periods, in addition to overall figures. The mean revenue volatility is 1.06 percent. During the pre-recession period (2004 to 2006), the average revenue volatility stood at 0.986 percent, rising

significantly to 1.223 percent during the recession (2007 to 2009). T-tests confirmed these significant fluctuations between three different periods: revenue volatility significantly increased during the Recession (2007 to 2009) compared to the pre-Recession (2004 to 2006) levels (p-value < 0.01) and then decreased during the post-Recession (2010 to 2012), averaging 0.958 percent (p-value < 0.01). These trends suggest a temporary yet impactful financial instability during the economic downturn.

Additionally, the debt margin increased significantly, indicating a high insolvency rate, while the surplus margin declined and reached negative values. This trend suggests that many nonprofits faced insufficient revenue to cover their expenses during this period of heightened economic uncertainty. Overall, nonprofits experienced reduced financial flexibility, and some may have even been at risk of ceasing operations during this period.

[Insert Table 5 here]

Figure 1 also shows that the 2008 Recession had a negative impact on nonprofits' revenue growth, with growth rates dropping in 2007 and reaching near-zero levels in 2009. This drop underscores the financial challenges faced by nonprofits during the economic downturns, as many struggled to maintain revenue levels. A significant rebound in revenue growth occurred in 2010, likely due to an influx of government emergency funds and increased philanthropic giving from individuals and foundations responding to heightened demand for services during the crisis. However, this surge in 2010 was short-lived, as the growth rate returned again to the lows experienced in 2009. This trend implies that while there was a temporary recovery, the growth of nonprofit organizations stagnated over the recession period, indicating long-term financial strain compared to the pre-Recession years.

Figure 2 tracks the trajectory of revenue volatility, which increased from 2007 to 2009, peaked during the recession, returned to pre-recession levels in 2010, and reached its lowest point in 2011 before slightly rising in 2012. The post-recession increase in revenue volatility suggests either a further decline in revenue or dramatic growth following rapid recovery. Given the nature of revenue volatility measured in absolute terms, specific revenue increases or decrease trends remain ambiguous. Regardless of whether revenues were rising or falling revenues, many nonprofits likely faced strategic planning and budgeting challenges, as low revenue predictability complicates future revenue estimations.

[Insert Figure 1 here]

[Insert Figure 2 here]

2) Sector-Wide Impacts of Revenue Diversification

Table 6 presents the effects of the RDI on revenue volatility across the three periods: before, during, and after the Recession. In the before-recession period, all three models indicate that the RDI had statistically significant negative effects on revenue volatility ($p\text{-value} < 0.01$), suggesting that revenue diversification effectively lowered revenue volatility under normal economic conditions.

However, this stabilizing effect did not extend through the Recession. In Model 1, where the Recession (2007 to 2012) is included as a moderating variable, the significant negative relationship between RDI and revenue volatility shifts to a positive, albeit statistically insignificant relationship. This finding suggests that the Recession diminished the stabilizing role

of diversification. Both during and after the Recession, nonprofits with diversified revenue streams did not experience a statistically significant reduction in revenue volatility relative to pre-crisis levels.

These results support Hypothesis 1, indicating that the 2008 Recession moderated the relationship between revenue diversification and revenue volatility. This disappearance of the stabilizing effect aligns with MPT, which posits that revenue streams become more correlated during economic crises, reducing the benefits of diversification (Markowitz, 1952). The results underscore the complexity of using diversification as a protective measure under economic stress.

In the post-Recession period (2010-2012), no statistically significant relationship continues between RDI and volatility, likely due to lingering economic challenges. This period was marked by slow GDP growth (averaging around 2%), high unemployment rates (near 9%), and stagnant charitable giving as a percentage of GDP (Reich & Wimer, 2012). These factors may have contributed to continued revenue instability, limiting the effectiveness of diversification strategies during the recovery phase. Future studies should extend the analysis beyond this period to assess the long-term effectiveness of diversification strategies in fully post-recession environments.

[Insert Table 6 here]

To further verify this finding, a robustness check was conducted by narrowing the Recession period to two years (2008 to 2009), which captures the most intense phase of the downturn. This re-defined analysis indicated a 0.108 percent point increase in revenue volatility ($p\text{-value} < 0.05$) during the Recession, while diversification lowered a 0.156 percent point of

volatility ($p\text{-value} < 0.01$) (see Appendix Table 4). This shift corroborates the change in the role of revenue diversification during times of economic crisis, confirming that diversification, while beneficial in stable periods, may exacerbate volatility when economic instability is heightened.

Some of the control variables in the models showed consistent and significant impacts on revenue volatility across all models. First, higher expenditures were associated with reduced revenue volatility. Expenditures are an indicator of a nonprofit's financial capacity to address social demands during crises. Organizations with higher expenditures typically offer more services and have larger staff, enjoy broader popular support, and possess adequate funding, all of which contribute to their ability to absorb shocks and remain resilient. Second, two measures of financial flexibility, debt margin, and total margin, demonstrated significant influences on increasing revenue volatility over time. Nonprofits with high debt levels face greater revenue instability, as the burden of interest payments and liabilities can strain resources during economic downturns. Furthermore, nonprofits with excessive assets may experience a notable decrease in their asset values and heightened operating expenses due to their fixed costs, making them less agile and less effective in responding to changing economic conditions (Hu & Kapucu, 2017; Hung & Hager, 2019). Lastly, a higher surplus margin helped lower volatility. Organizations with high profitability were better equipped to reduce revenue volatility throughout the period than higher retained assets.

Finally, the analysis also found some significance on nonprofit subsector control variables, and the impact of the 2008 Recession manifested heterogeneously across nonprofit subsectors. Increased volatility was notably observed in the arts and culture, international affairs, and public and social benefits subsectors during this period. In contrast, education, healthcare, and human service subsectors witnessed relatively stable revenue inflows. This heterogeneity

underscores the need for the in-depth analysis provided in Chapter 5-2, which elucidates the varying effects of revenue diversification across different nonprofit subsectors.

3) Robustness Checks

In any rigorous examination of data, it is imperative to ensure that findings are not merely coincidental or subject to specific conditions but are indeed sturdy across various scenarios. The current part is dedicated to this purpose. It delves into supplementary analyses and tests designed to challenge, validate, and reinforce the conclusions drawn from the primary results. By considering alternate scenarios, variables, or methodologies, this section provides a holistic assurance of the research's reliability and validity, underscoring its credibility and relevance in the broader context. Specifically, this section conducts four key robustness checks: (1) addressing outliers in the sample to assess their influence on revenue volatility estimates, (2) distinguishing higher education institutions and nonprofit hospitals within their respective subsectors to account for their financial structures, (3) testing an alternative definition of the Recession period to evaluate whether findings hold under different time frames, and (4) employing a dynamic panel model to control for potential endogeneity and further validate the causal relationships. Through these additional analyses, this section aims to comprehensively assess the reliability and validity of the study's findings.

Addressing Outliers in the Sample

Upon examining the data, the dependent variable, revenue volatility, was highly skewed. To address this skewness, a natural logarithm transformation was applied to the total revenue before calculating revenue volatility. This transformation is a standard statistical approach used

to reduce the influence of extreme values and ensure the data is better suited for linear regression models.

Despite this transformation, a few significant outliers were identified. As shown in Table 5: Descriptive Statistics, the average revenue volatility ranged between 0.958 and 1.223 percent points across the study periods, with an overall mean of 1.06. However, the maximum revenue volatility reached 100 percent points, signaling the presence of extreme data points.

These outliers are primarily due to three organizations (ID numbers 4870, 5539, and 9368), accounting for 26 observations, resulting from one or two years of zero revenue within their nine-year panel data. These zero-revenue years created extraordinarily high revenue volatility values, which could potentially distort the overall results. As demonstrated in Appendix Table 1, excluding these outliers reduces the maximum revenue volatility to 42.981 percent points.

Further validation was carried out through supplementary sensitivity analyses that omitted these significant outliers, juxtaposing these outcomes with the complete sample data. As illustrated in Appendix Table 2, the findings were consistent with the results from the full dataset (see Table 6), emphasizing the exclusion of outliers did not materially affect the overall conclusions concerning the negligible impact of revenue diversification on revenue volatility during crisis across all considered models. The minimum impact of these outliers can be attributed to the fact that, given the nature of panel data, the focus on long-term revenue trends across a nine-year period is more meaningful than revenue volatility caused by a single-year anomaly.

Consequently, the study concludes that the presence of these outliers does not significantly alter the overall results. As a result, the decision to retain these outliers in the final analysis ensures that the findings are robust and representative of the entire sample, confirming the reliability of the conclusions drawn from the data.

Distinction in Higher Educational Institutes and Nonprofit Hospitals within each Subsector

Higher education institutions and nonprofit hospitals hold distinct positions within the nonprofit sector due to their larger organizational size, significantly greater financial scale, and heavy reliance on program service fees as a primary revenue source. Unlike most other nonprofits, these institutions operate with substantial budgets, complex financial structures, and extensive revenue portfolios, often supported by endowments, investment assets, and large operating reserves. Their financial resilience during crises is largely attributed to their stable fee-based income streams, which provide consistent revenue flows even in economic downturns (Carroll & Stater, 2009; Froelich, 1999; Lu et al., 2020; Mayer et al., 2014; Morreale, 2011). Additionally, their ability to leverage financial reserves and expansive endowments further differentiates them from smaller nonprofits with more constrained financial flexibility (Dietz et al., 2014).

Given these structural distinctions, separate analyses are necessary to accurately capture the financial dynamics within the education and healthcare subsectors. The additional analyses were carried out excluding these two subsectors (Refer to Appendix Table 3). The results were largely consistent, showing minimal variation across models, indicating that their distinctive characteristics had little impact on the relationship between revenue diversification and volatility.

Across all periods sector-wide, the study found no significant relationship between revenue diversification and revenue volatility.

Different Time Period of the 2008 Recession

In this robustness check, the study redefines the time periods of the 2008 Recession to better assess the concentrated effects of the crisis on revenue volatility. Instead of delineating three equal three-year periods for each crisis state: before (2004 to 2006), during (2007 to 2009), and after (2010 to 2012), the recession period is shortened to the two-year span from 2008 to 2009. This adjustment aligns with the officially recognized timeframe, as the 2008 Recession began in December 2007 and concluded in June 2009. Additionally, data on private contributions reveals that donations in 2007 (the first year of the recession) were higher than in the pre-recession years (2004-2006) and post-recession years (2010-2012), even after adjusting for inflation (Giving USA, 2019, p. 43). This suggests that 2007, despite being within the recession timeline, might not have reflected the most severe financial strain and thus is excluded from the recession period.

Re-running the models with this revised recession timeframe (2008-2009) confirmed that the moderating effects of the economic downturn were most acute during this specific period. In these alternative models, the baseline value is the average impact of revenue diversification on volatility from 2004 to 2007. As shown in Appendix Table 4, the RDI had a stabilizing effect on revenue volatility during the pre-Recession period (from 2004 to 2007). However, the relationship between RDI and revenue volatility shifted during the Recession (2008 to 2009). Specifically, Model 2 indicates that a 1-unit increase in RDI led to a 0.108 percent point increase in revenue volatility during the recession, with a statistically significant p-value of less than 0.05.

Rather than mitigating risk, diversification amplified revenue volatility during the most economically challenging conditions.

This finding underscores the limitations of revenue diversification as a risk management tool in times of severe crisis. While diversification may generally provide financial stability under normal economic circumstances, the extreme pressures of the recession appear to have diminished its effectiveness, amplifying volatility instead.

Dynamic Panel Model

The present study originally considered the inclusion of a lagged dependent variable, revenue volatility from the previous year, based on a finding by Carroll and Stater (2009) that identified a statistically significant impact of lagged revenue volatility on nonprofit revenue volatility. Carroll and Stater (2009) further elaborated that the inclusion of a one-year lag of all non-dichotomous control variables could ensure the right causality direction between the dependent variable (DV) and independent variables (IV), as follows:

$$\text{Revenue Volatility } (DV_n) \leftarrow \text{Lagged value of Revenue Diversification } (IV_{n-1}) + \text{Revenue Volatility } (DV_{n-1})$$

This approach aims to reduce the possibility of reverse causality as follows:

$$\text{Revenue Volatility (DV)} \rightarrow \text{Revenue Diversification (IV)}$$

However, it should be noted that their study did not account for ‘Nickell bias’ when incorporating lagged dependent variables and other control variables into the fixed effects panel

models. Nickell bias, named after Stephen Nickell (1981), who first discussed it in detail, refers to a specific issue that arises in panel data econometrics when a Model includes a lagged dependent variable and is estimated using fixed effects. In the fixed effects models where the dependent variable's past value (lags) are used as predictors, the lagged dependent variable likely correlates with the fixed effects, leading to biased estimates.

Carroll and Stater (2009) opted against using an instrumental variable approach, believing that a delay in the effects of revenue diversification on revenue volatility was more realistic by stating, *“Even though I could alternatively estimate our econometric model using the instrumental variables approach, I believe it is more realistic for there to be a delay in revenue volatility changes resulting from increased revenue diversification (as well as other potentially endogenous independent variables). (Carroll & Stater, 2009 Page. 958)”*

Nevertheless, given the potential for Nickell Bias, I re-evaluated the inclusion of the lagged variables in my model. First, I included the lagged dependent variable- revenue volatility (Y_{it-1}) to my analysis and replaced the revenue diversification index (RDI) with its lagged value (RDI_{n-1}). Then, I re-ran the models with these adjustments. This methodological adjustment yielded results consistent with my reported findings (see Table 6), as shown in Appendix Table 5, thereby affirming the robustness of my findings.

Second, to further address the significant impact of lagged revenue volatility, as highlighted by Carroll and Stater (2009), I considered including a lagged dependent variable and other independent variables in my models. At the same time, I also took account of the potential bias (correlated with the fixed effects in the error term), as indicated by Nickell's bias in fixed effects models. Thus, I rerun my models by using a Dynamic panel model, adopting the General

Method of Moments (GMM) difference estimator, as proposed by Arellano and Bond (1991). The results, presented in Appendix Table 6, again aligned with my initial findings.

Considering these observations, showing consistent results with or without adding the lagged revenue volatility and applying different methodological approach, I have decided to exclude the lagged values of variables from my analysis for the following reasons:

First, the primary objective of this study is to compare the impact of revenue diversification on volatility across three distinctive periods surrounding the 2008 Recession: before, during, and after the recession. The dynamically fluctuating macroeconomic environment during this period suggests that the financial indicators (e.g., revenue volatility, debt, margin, expenses) of the same year may have a more immediate impact on nonprofit organizations than lagged variables. Thus, drawing analytical outcomes using data from each specific period provides a clearer picture of the impacts.

Second, a simpler model enhances understandability. If consistent results are obtained across different methodologies, a less complex model is preferable. Additionally, a fixed effects model without lagged variables avoids the loss of numerous observations.

These methodological considerations provide comprehensive insight into the approach taken. Finally, I have incorporated a one-way fixed effects panel model into this study, prioritizing immediate financial impacts and model simplicity.

5-2. Influence of Primary Revenue Streams on Revenue Volatility

The study now shifts the focus to a more specific analysis of how four primary revenue streams— government grants, private donations, program service revenue, and investment income— contributed to revenue volatility before, during, and after the 2008 Recession. By running separate regression analyses for each revenue type, this analysis aims to uncover nuanced insights into how each revenue stream contributed to overall revenue volatility during periods of economic stress. The results will help identify which streams were most susceptible to fluctuations and provide strategic insights for nonprofits managing diverse funding sources in times of economic uncertainty.

1) Descriptive Patterns across Primary Revenue Streams

Table 5 presents the overall distribution of four primary revenue sources, revealing trends across the pre-Recession, Recession, and post-Recession periods. Program service revenue remained the primary income stream, accounting for an average of 52.6% of total revenues, a pattern consistent with findings from the Urban Institute’s annual report on the nonprofit sector (McKeever & Pettijohn, 2014). This proportion rose to 57.7% during the Recession, reflecting an increased reliance on program fees during economic downturns. Investment income and private donation followed at 21.5% and 17.8% respectively; however, both decreased pre-Recession, falling to 19.1% and 15.1%. Finally, government grants, which comprised 7.7% of revenue before the recession, increased slightly to 9.1% during the Recession before returning to 7.6% in the post-Recession period.

2) Empirical Findings on Revenue Stream Contribution to Volatility

This section presents the findings from the individual analyses of each revenue stream, providing insights into the role each stream played in influencing revenue volatility across different economic periods.

Government Grants

Table 7 presents the impact of individual revenue streams on revenue volatility during and after the recession. First, the results support Hypothesis 2a, indicating that an increase in the proportion of government grants is associated with greater financial stability during economic downturns. Specifically, a one-unit increase in the proportion of government grants correlates with a 0.309 percentage point decrease ($p\text{-value} < 0.01$) in revenue volatility during the Recession (2007 to 2009). This relationship underscores the critical role of government funding in buffering nonprofit revenues against economic shocks, offering immediate stability amid elevated social demand and resource scarcity.

However, this stabilizing effect of government funding appears limited to times of economic hardship. During periods of economic prosperity (2004 to 2006), the analysis reveals a statistically significant rise in volatility associated with higher proportions of government grants: across all three models, volatility increased by approximately 0.370 percentage points ($p\text{-value} < 0.01$). After the Recession's peak, the volatility-reducing impact of government grants diminishes. Both Model 2 and Model 3 indicate an uptick in revenue volatility from 2010 to 2012, though this shift does not reach statistical significance. In sum, the volatility-reducing effects of government grants appear temporary, primarily benefitting organizations during periods of acute economic distress.

Government grants, along with additional stimulus packages (e.g., ARRA), are instrumental in addressing the escalating social demands for public goods and services during macro-economic downturns. During Crises, government funding typically increases or at least remains stable, providing nonprofits with a vital financial buffer. Nonprofits may actively seek to increase their share of these immediate and stable funding sources to meet urgent service demands during crises (Johnson, 2011; Morreale, 2011). However, emergency funding initiatives like ARRA are designed as short-term interventions rather than permanent financial support (Shah, 2012).

This study does not directly test the impact of such emergency funding on revenue volatility, leaving open the possibility that such relief efforts may have contributed to the observed stabilization. Additionally, it is essential to recognize that the extent of government support varies significantly depending on the nonprofit's mission, operational capacity, and geographic location: all organizations do not benefit equally from such funding (Lu, 2015). This variability suggests that while government grants may remain stable revenue sources during periods of acute economic distress, their long-term stabilizing effects remain uncertain.

Private Donations

The results for private donations stand in contrast to Hypothesis 3b, which anticipated heightened revenue volatility for nonprofits with a larger proportion of private donations during and after crises. Contrary to this expectation, private donations contributed to financial stability. In the pre-Recession (2004 to 2006), all three models reveal a statistically significant positive association between a higher proportion of private donations and increased revenue volatility.

However, this relationship shifted during and after the Recession, with private donations instead correlating negatively with volatility. Specifically, Model 1 indicates that a one-unit increase in the proportion of private donations is associated with a 0.182 percentage point decrease in revenue volatility ($p\text{-value} < 0.01$) over the period from 2007 to 2012. While Model 3 identifies an initial volatility increase in the first year of the Recession (2007) by 0.268 percent point ($p\text{-value} < 0.01$), it quickly subsided. By the end of the observed year (2012), volatility relying on private donations had significantly reduced their volatility. From 2010 to 2012, nonprofits with a high proportion of private donations reduced their volatility by an average of 0.292 percentage points ($p\text{-value} < 0.01$). Model 3 further emphasizes the ongoing stabilizing role of private donations since 2008.

These results suggest that while private donations may fluctuate in the short term, they can ultimately help restore organizational stability during economic downturns. This finding aligns with List and Peysakhovich (2011), who demonstrated that macroeconomic downturns do not substantially impact private donations, even though these increase significantly during economic upturns. The current work confirms that while private donations exhibited some fluctuations, they remained relatively stable during and after the recession, often surpassing the resilience of other revenue streams. Indeed, Casey (2016), tracking various private giving patterns throughout the 2008 Recession, found conflicting evaluations ranging from increases to decreases; however, the majority of these reports indicated that private giving rebounded from its lowest points in 2009. One possible explanation is that increasing social demand during the recession could offset any intent to reduce giving. Alternatively, these results could reflect the effects of escalated and intensified fundraising efforts by charities during and after the recession, as suggested by Lee and Shon (2018), Meer et al. (2017), and Smith (2022). Overall, the findings

suggest that private donations can act as a stabilizing force, enhancing nonprofit resilience against economic fluctuations, particularly in post-recession periods.

Program Service Revenue

The analysis strongly supports Hypothesis 2c, demonstrating that program service revenue significantly stabilizes revenue streams during economic fluctuations. A one-unit increase in the proportion of program service revenue is associated with a 0.309 percentage point reduction in revenue volatility in the post-recession period ($p\text{-value} < 0.01$).

This stabilizing effect was especially pronounced during the Recession (2007 to 2009) when program service revenue contributed to a 0.615 percentage point decrease in volatility. Notably, this trend held steady in the pre-Recession (2004-2006), further underscoring the resilience provided by program service revenue across varying economic conditions. However, in Model 3, 2012 data reveals a modest reversal, with a 0.082 percentage point increase in volatility ($p\text{-value} < 0.1$). While this analysis' reliance on the absolute value of revenue volatility prevents a detailed exploration of the mechanisms behind these shifts, the overall evidence suggests that program service revenue acts as a significant stabilizing factor during economic downturns.

The decrease in revenue volatility for nonprofits reliant on program service revenue aligns with broader findings in nonprofit finance. McCambridge and Dietz (2020) found that nonprofits in higher education and healthcare, which often rely heavily on program service revenues, managed to maintain stability during economic turbulence. This suggests that program service revenue functions as a financial buffer during crises, providing a relatively consistent

income stream even as other sources shrink, making an attractive option for nonprofits seeking financial stability.

However, the shift towards program service revenue, while stabilizing for some nonprofits, also signifies a broader trend towards commercial revenue sources, as discussed by Eikenberry and Kluver (2004). While adapting to economic pressures is essential for organizational sustainability, nonprofits must carefully balance these financial strategies with their core missions and the communities they serve, ensuring that financial decisions enhance rather than undermine their foundational goals.

Investment Income

The analysis lends strong empirical support to Hypothesis 2d, revealing significant financial challenges for nonprofits reliant on investment income during economic fluctuations. Revenue volatility for these nonprofits increased markedly, with a 1.393 percentage point surge during the Recession (2007 to 2009, $p\text{-value} < 0.01$) and a 0.280 percentage point increase after (2010 to 2012, $p\text{-value} < 0.01$), exhibiting the highest volatility observed in this study. This trend indicates pronounced revenue fluctuations for these nonprofits with high investment income compared to pre-Recession levels, when it contributed to financial stability, acting as a financial buffer in times of economic prosperity.

However, this dependence became a vulnerability under significant external economic pressures, potentially jeopardizing a nonprofit's overall financial stability. This finding extends the insights by McCambridge and Dietz (2020), who documented significant investment income losses during the recession. The impact was particularly acute in higher education and private

foundations, which suffered notable setbacks due to stock market downturns and other investment losses (Young & Searing, 2022). Steinberg (2018) illustrated that even nonprofits with sizeable endowments were not insulated from this trend, as they faced diminished dividends and capital gains. Furthermore, these financial challenges were compounded by donor restrictions on the use of funds, limiting operational flexibility during critical times (Qu, 2020). Collectively, these findings suggest that while investment income can be beneficial in prosperous times, it can present significant liabilities during economic downturns, necessitating a more balanced and cautious approach to this revenue source.

[Insert Table 7 here]

5-3. Subsector-Specific Effects of Revenue Diversification

The analysis now turns to a more detailed investigation of specific nonprofit subsectors. This section will dissect how the impact of revenue diversification on revenue volatility differs by nonprofit subsectors, providing nuanced insights that could inform targeted strategies for managing revenue volatility. The section begins with a descriptive analysis that sets the stage for understanding the unique dynamics within each subsector, followed by detailed main results and further robustness checks to validate these findings.

1) Descriptive Patterns across Subsectors

Table 8 presents the descriptive statistics for the five distinct nonprofit subsectors examined in this study, highlighting notable variations in revenue volatility, RDI, and revenue compositions across these subsectors, particularly during the Recession period from 2007 to 2009. Public and social benefits nonprofits experienced the highest revenue volatility, with average volatility rising from 1.63 percent point pre-recession to a peak of 2.28 percent point during the Recession before decreasing slightly to 1.65 post-recession. Similarly, arts and cultural nonprofits saw increased volatility, with some organizations reaching a maximum of 100 percent points during the Recession, indicating severe instability for some. These two subsectors exhibited the highest levels of revenue volatility, reflecting their financial vulnerability during the Recession.

Conversely, healthcare nonprofits displayed the most stability, with the lowest mean volatility across all periods and only a moderate increase during the Recession years. This stability likely reflects the essential and consistently demanded nature of healthcare services, which remain relatively insulated from broader economic trends. Education and human service nonprofits also maintained relatively lower levels of volatility, with mean volatility rising only modestly during the Recession, though both sectors showed occasional peaks likely driven by outliers rather than widespread instability.

[Insert Table 8 here]

Figure 3 further illustrates these differences: Arts and cultural nonprofits, along with public and social benefits organizations known for their elevated revenue volatility, faced substantial fluctuations, particularly peaking in 2009. In contrast, human service, education, and

healthcare nonprofits, subsectors generally characterized by lower revenue volatility, exhibited greater financial stability, showing only minimal financial perturbations. These patterns underscore the differentiated impacts of economic cycles on nonprofit subsectors, with more essential services like healthcare, education, and human services exhibiting greater resilience in times of economic stress.

[Insert Figure 3 here]

Next, Table 8 also provides insights into revenue diversification and composition across the different nonprofit subsectors. Arts and culture nonprofits exhibited the most diversified revenue streams, with a mean RDI of 0.54. Their revenue sources are fairly balanced across private donations, program service revenues, and investment income, reflecting a broad approach to financing. Education nonprofits also showed a relatively high level of diversification (RDI: 0.44), depending primarily on fee-for-service income (for example, tuition) but also receiving additional support from investment income (for example, endowment dividends). The public and social benefits sector showed a moderate diversification level (RDI: 0.37), with funding from investment income, private donations, and program fees.

On the other end of the spectrum, subsectors supporting private interests demonstrated a high dependence on program service revenue. The healthcare sector heavily relied on program service revenue, comprising over 70% of their total revenue. Similarly, human service nonprofits leaned heavily on program service fees but also received substantial support from government grants and charitable donations. Overall, these revenue distributions align with national patterns reported by McKeever et al. (2016), reflecting typical funding structures in the U.S. nonprofit landscape.

These varied revenue compositions correspond with Young's (2017) benefits theory of nonprofit finance, which asserts that a nonprofit's financing sources correspond to the public or private nature of the services they provide. Furthermore, this analysis illustrates how nonprofit subsectors respond differently to economic downturns, influenced by their diversification strategies and composition of revenue sources. Healthcare and education nonprofits that deliver essential services tend to exhibit less revenue volatility and rely heavily on program service revenues. In contrast, arts and culture, along with public and social benefits nonprofits – which maintain more diversified revenue streams- experience greater fluctuation in revenue. The following sections will explore these dynamic relationships in more depth, examining how these factors contribute to resilience or vulnerability in times of economic stress.

2) Empirical Findings on Revenue Volatility by Subsector

The regression results for the five major nonprofit subsectors are presented in Table 9 and Table 10. The test results support Hypotheses 3b through 3e, while Hypothesis 3a is not supported as the direction of the effect was opposite to what was expected. A summary of these test results is provided in Table 11. This unexpected result is further examined in the discussion section. These results underscore the varying impacts of revenue diversification on revenue volatility across different nonprofit subsectors. Especially during economic crises, the effectiveness of revenue diversification in stabilizing revenue appears to be contingent on the mission areas in which a nonprofit organization operates.

[Insert Table 9 here]

Arts, Culture, and Humanities Nonprofits

The analysis does not support Hypothesis 3a, but instead reveals the complex relationship between revenue diversification and revenue volatility across different economic phases. As shown in Table 9, revenue diversification generally reduces revenue volatility for arts nonprofits. Across the entire period analyzed, a higher RDI is significantly associated with lower volatility ($\beta = -0.619$, $p\text{-value} < 0.01$), indicating that, on average, diversified revenue streams contribute to financial stability. However, this stabilizing effect weakens during economic downturns. When accounting for the Recession period, the results show that the crisis significantly increased revenue volatility ($\beta = 0.689$, $p\text{-value} < 0.01$), while the negative effect of RDI remains but is slightly reduced ($\beta = -0.519$, $p\text{-value} < 0.01$). Further analysis incorporating an interaction between revenue diversification and the recession period finds no statistically significant relationship, suggesting that diversification does not provide additional protection during crises. Notably, the crisis period in this analysis spans from 2007 to 2012.

To further explore how the effectiveness of diversification varies across economic phases, Table 10 presents results distinguishing between before (2004 to 2006), during (2007 to 2009), and after the Recession (2010 to 2012) periods. All models indicate that revenue diversification significantly reduces volatility in stable economic times. However, its stabilizing effect disappeared during the Recession and appeared to contribute to increased volatility after the Recession. Specifically, Model 2 reports that from 2010 to 2012, a higher RDI is associated with a 0.442 percent point increase in volatility ($p\text{-value} < 0.1$), suggesting a potentially destabilizing effect. Model 3, providing a year-by-year analysis, reinforces this finding, indicating significant increases in revenue volatility tied to diversification, particularly in 2011 ($\beta = 0.623$, $p\text{-value} < 0.05$) and 2012 ($\beta = 0.587$, $p\text{-value} < 0.1$).

These findings suggest that while diversification is beneficial in general, it does not provide stability during the peak of an economic downturn and may even exacerbate financial fluctuations in prolonged economic downturns. As illustrated in Table 8, arts and cultural nonprofits were among the hardest hit during the 2008 Recession, experiencing heightened revenue volatility. As Toepler and Wyszomirski (2012) posited, their financial vulnerability could be largely due to their reliance on discretionary income sources, such as ticket sales and private donations, which tend to decline sharply during economic crises. These results suggest that for arts nonprofits, diversification alone is not a sufficient safeguard against economic downturns and may introduce additional instability as organizations attempt to recover in the post-recession period.

Education Nonprofits

The analysis results did not support Hypothesis 3b, which posited that revenue diversification would increase revenue volatility for education nonprofits during and after the Recession. Instead, the findings show that revenue diversification had no statistically significant impacts on revenue volatility for education nonprofits across all examined periods. As shown in Table 9, revenue diversification does not meaningfully alter financial stability in this subsector, indicating that it neither increased nor decreased volatility in any economic condition. When controlling for the Recession period (2007 to 2012), the crisis itself significantly increases revenue volatility ($\beta = 0.435$, $p\text{-value} < 0.01$). However, further analysis incorporating an interaction term also fails to show a statistically significant effect, indicating that diversification does not meaningfully influence revenue volatility even during economic crises.

To further examine these trends, Table 10 presents results across different phases of the Recession. Consistent with the findings in Table 9, revenue diversification does not exhibit a significant effect in any period. This suggests that regardless of economic climate, education nonprofits maintain relatively stable revenue patterns, largely unaffected by diversification strategies. The absence of significant findings may be attributed to the unique financial structure of education nonprofits, which are predominantly funded through tuition and fee-for-service income. These revenue sources are relatively stable, aligning with benefits theory, which suggests that revenue structures should reflect the nature of the benefits provided (Young, 2017). The findings in Table 7 further support this, showing that program service revenue stabilizes nonprofit finances, insulating them from revenue fluctuations.

Additionally, education nonprofits often experience counter-cyclical demand during economic downturns, as individuals seek to enhance their qualifications in a challenging job market, leading to higher enrollment rates (Long, 2014). This pattern helps not only sustain revenue from service fees but sometimes grow their revenue streams during the recession (McCambridge & Dietz, 2020; Steinberg, 2018). Furthermore, the essential nature of education also attracts substantial government and private support during crises, such as emergency funds (e.g., ARRA) and protective policies aimed at mitigating the negative impacts of economic downturns (Evans et al., 2019).

The composition of revenue sources in this subsector is not uniform across all organizations. Despite the dominant portion of tuition fee income, higher education institutions, such as private universities, generate substantial investment income from endowments or businesslike income, and separate accounts held with banks (Gaver & Im, 2014; Hodge, 2023). Moreover, other educational nonprofits, often smaller in size, receive substantial government

funding. For instance, some educational organizations that provide supplemental learning opportunities, such as charter schools, after-school programs, or enrichment courses, are primarily financed through public funding, particularly government funding (Kelley et al., 2024). Therefore, additional robustness checks were conducted to investigate further, focusing especially on higher education institutions within the education subsector due to their significant financial presence: running the same models by either including or excluding higher educational institutions. The results of these analyses mirrored the overall findings, showing only minor variation but similar, indicating no significant effect of revenue diversification on volatility (see Appendix Table 8). These results indicate a consistent trend across the education subsector where diversification does not appear to influence revenue stability for these organizations, irrespective of economic conditions.

Overall, these findings suggest that revenue diversification is neither a necessary nor an effective risk management strategy for education nonprofits. Instead, the stability of their primary revenue sources, such as tuition and program service fees, plays a more critical role in ensuring financial resilience. The presence of counter-cyclical demand and external financial support may further diminishes the relevance of diversification as a strategy for mitigating revenue volatility in this subsector.

Healthcare Nonprofits

The findings provide partial support for Hypothesis 3c. As shown in Table 9, revenue diversification is associated with lower revenue volatility in general economic conditions ($\beta = -0.128$, $p\text{-value} < 0.05$), indicating that a diversified revenue portfolio helps stabilize financial

inflows for healthcare nonprofits. Further analysis incorporating an interaction term reveals a statistically significant positive coefficient ($\beta = 0.107$, $p < 0.1$), suggesting that diversification contributes to increased revenue volatility during economic downturns. This finding suggests that while revenue diversification generally promotes stability, its benefits may diminish or even reverse, during crises, particularly in the healthcare sector.

Table 10 further explores how these effects evolve across different phases of the recession. During stable economic times (2004 to 2006), revenue diversification contributed to reducing revenue volatility, aligning with traditional financial stability strategies. However, this stabilizing effect was disrupted during the recession (2007 to 2009), where diversification became correlated with increased volatility. Model 1 demonstrates that a one-unit increase in the Revenue Diversification Index (RDI) corresponds to a 0.107 percentage point rise in revenue volatility from 2007 to 2012 ($p\text{-value} < 0.1$), while Model 2 shows a stronger effect with a 0.263 percentage point increase specifically during the recession period ($p\text{-value} < 0.01$). In the post-recession period (2010 to 2012), diversification effects reverted to pre-recession levels but did not reach statistical significance. This shift suggests that diversification strategies, which generally bolster financial resilience, may actually exacerbate financial instability in healthcare nonprofits during economic downturns.

A deep examination highlights that this effect is primarily driven by nonprofit hospitals. When analyzing nonprofit hospitals exclusively, diversification during the Recession resulted in a statistically significant 0.171 percent point increase ($p\text{-value} < 0.05$) in volatility, whereas excluding hospitals from the broader healthcare analysis rendered diversification effects on volatility insignificant across all models and time periods (see Appendix Table 9). These findings suggest that the destabilizing impact of revenue diversification in the healthcare sector is

primarily concentrated within nonprofit hospitals rather than community health centers or other healthcare-related nonprofits.

The broader healthcare subsector exhibited significant financial resilience with the lowest revenue portfolio risk (see Figure 3). As shown in Table 8, healthcare nonprofits have the lowest revenue portfolio risk, with program service revenue constituting 71% of total revenue and a relatively low average RDI of 0.23. Aligning with benefits theory, this revenue composition contributes to their financial stability, even during economic downturns. Reports following the recession highlight that healthcare nonprofits not only maintained stability but, in some cases, the 2008 economic downturn served more as an opportunity for growth than a threat, evidenced by increased revenues and lower rates of closure compared to other nonprofit subsectors (Dietz et al., 2014; McCambridge & Dietz, 2020; McKeever & Pettijohn, 2014; Singh, 2014).

The relative insignificance of diversification for general healthcare nonprofits (excluding nonprofit hospitals) can be attributed to their stable revenue sources and additional government support. These nonprofits, including community health centers and specialized clinics, rely primarily on government reimbursements, like Medicaid and Medicare. These sources provide a steady and predictable revenue flow even during economic downturns, as healthcare remains a critical and inelastic service (Froelich, 1999; McCambridge & Dietz, 2020). Furthermore, these healthcare nonprofits, often serving vulnerable populations, are buffered by increased government support during crises as public health needs grow. In such cases, consistent governmental backing effectively counteracts the need for extensive diversification by ensuring a steady revenue stream that aligns closely with their core mission.

In contrast, nonprofit hospitals do not benefit from diversification, and they experience heightened volatility during the recession period. That is, nonprofit hospitals with diversified revenue sources likely experience increased volatility during the recession period. Diversification may be destabilizing for nonprofit hospitals, particularly during economic downturns. Revenue diversification strategies that often include investing in new services or programs can lead to increased financial strain and revenue volatility when these extended services fail to generate expected revenue during a recession (Lin & Wang, 2016). Furthermore, hospitals operate with high fixed costs and substantial debt obligations for capital improvements and expansions. In the previous section, this study finds that debt margin is associated with increased revenue volatility. Thus, the additional managerial cost with diversified revenues along with the hospital's substantial fixed costs and debt obligations possibly makes organizations more vulnerable to economic downturns (Hu & Kapucu, 2017; Stewart & Smith, 2011). During the 2008 Recession, hospitals faced declining revenues due to reduced reimbursements from private insurers, while simultaneously experiencing increased demand for uncompensated care (American Hospital Association, 2009). The high operating costs, combined with additional managerial complexity from diversification, likely exacerbated revenue volatility for nonprofit hospitals.

In summary, while the healthcare subsector as a whole exhibits financial resilience due to stable revenue sources and consistent demand for its services (followed by additional government funding), nonprofit hospitals demonstrate the limitations of revenue diversification as a risk management tool. For hospitals, diversification appears to contribute to revenue volatility rather than mitigate it, underscoring the need for subsector-specific financial strategies that consider both operational costs and revenue stability. In contrast, for general healthcare

nonprofits (excluding hospitals), the findings align with those observed in the education subsector: revenue diversification is neither a necessary nor an effective risk management strategy. The reliance on stable, fee-based revenue sources, coupled with strong government support during crises, appears to ensure financial stability, making diversification largely irrelevant in mitigating volatility. These results highlight that the effectiveness of diversification depends not only on the economic climate but also on the fundamental revenue structures and service delivery models unique to each nonprofit subsector.

Human Service Nonprofits

The findings for human service nonprofits align closely with those observed in the education and general healthcare (except hospitals) subsectors. Hypothesis 3d was not supported, as revenue diversification in human service nonprofits did not significantly reduce revenue volatility during or after the Recession compared to pre-recession levels. Across all examined models, the relationship between diversification and volatility remained statistically insignificant, indicating that revenue diversification neither mitigates nor exacerbates financial instability for human service organizations.

The limited impact of revenue diversification within the human service subsector can largely be attributed to the stability of their primary revenue sources, which are predominantly government-related. In alignment with national trends, a substantial portion of human service nonprofit revenue in this study is derived from relatively stable government sources: program service fees, primarily from government contracts, constitute 56.4% of total revenue, while government grants account for 14%. Altogether, approximately 70% of revenue in this subsector

is government-funded (see Table 8). The analysis in Table 7 further confirms that government grants and program service revenue significantly lowered revenue volatility during the 2008 Recession, reinforcing prior research that highlights the stabilizing role of government support in this subsector. For example, Grønbjerg's study (1991) highlights that institutional-based funding, particularly from the government, leads to financial surpluses and stability due to its predictable nature. Piatak and Pettijohn (2021) further reinforced this, showing that nonprofits with a stable government funding base, such as federal contracts, experienced fewer fluctuations in revenue during the 2008 Recession. Given this funding composition, diversification efforts appear to provide little additional financial stability, as human service nonprofits already benefit from a relatively secure and predictable revenue base.

A key distinguishing factor of this subsector is the countercyclical nature of demand for its services during economic downturns. Human service nonprofits often experience heightened financial support during crises. The essential nature of the services provided by human service nonprofits becomes even more indispensable during economic downturns, as they address vital human needs, from food provision, homelessness support, and re-employment initiatives. Such enhanced importance can attract additionally available external financial aid or protection policies that selectively support nonprofits at the forefront of crisis response efforts. For example, many state governments actively engaged nonprofits during the 2008 Recession, ensuring they could maintain or even expand their range of services (Nicholson-Crotty & Nicholson-Crotty, 2015). In addition, private donations, particularly from corporations, increased during the 2008 Recession in response to the increasing public demand for human services (Reich & Wimer, 2012). These types of revenue sources maintained their stability even amidst economic downturns.

In sum, the findings suggest that human service nonprofits, similar to education and healthcare nonprofits (excluding hospitals), do not benefit from revenue diversification as a risk mitigation strategy. Instead, their financial stability is more directly linked to their strong reliance on government funding and countercyclical social demand.

Public and Social Benefits Nonprofits

The findings for public and social benefits nonprofits reveal a complex relationship between revenue diversification and revenue volatility, both stabilizing and destabilizing effects depending on the economic period. Hypothesis 3e, which posited that diversification would reduce revenue volatility during and after the Recession, is only partially supported. As shown in **Table 9**, revenue diversification is significantly associated with lower revenue volatility across the entire period ($\beta = -0.514$, $p\text{-value} < 0.01$), suggesting that, on average, a diversified revenue portfolio contributes to financial stability. This effect persists when accounting for the Recession period, where diversification continues to reduce volatility ($\beta = -0.430$, $p\text{-value} < 0.01$) despite the substantial increase in volatility associated with the economic crisis ($\beta = 1.028$, $p\text{-value} < 0.01$). However, the interaction term is not statistically significant, indicating that diversification does not significantly alter volatility patterns specific to the Recession period.

A more detailed analysis in Table 10 provides additional nuance to these findings. Revenue diversification effectively reduced volatility before and during the Recession. In particular, during the most severe years of the economic downturn (2007 to 2009), diversification contributed to a notable decrease in revenue volatility, with reductions of 0.594 percentage points ($p\text{-value} < 0.05$). This stabilizing effect is particularly noticeable in 2008 and

2009 (Model 3), with reductions in volatility of 0.738 and 0.963 percentage points (both $p < 0.05$), respectively.

However, this stabilizing effect of revenue diversification shifts in the post-recession period. The previously negative relationship between RDI and volatility flips to a positive association, with diversification contributing a 0.408 percentage point increase in volatility (p -value < 0.1). Model 3 further shows that in 2011 and 2012, RDI increased volatility by 0.594 and 0.623 percentage points, respectively (both p -value < 0.05). These findings suggest that while diversification can temporarily buffer these nonprofits during the recessions, it may have led to heightened volatility as organizations transitioned into the post-crisis conditions.

This volatility aligns with the revenue composition of public and social benefits nonprofits, which rely heavily on investment income (39.19%) and private donations (30.35%), both inherently tied to economic cycles and highly susceptible to market downturns. Notably, investment income, a primary revenue source for these nonprofits, is particularly vulnerable, as shown in previous analyses (see Table 7), likely driving the elevated volatility seen in all periods. These findings highlight the limitations of diversification when it involves inherently volatile revenue streams.

The public and social benefits subsector also includes diverse organizations, notably grant-making foundations (Group T in NTEE-CC), which redistribute funds to other charities, such as United Way, Fidelity Charitable, and United Jewish Appeal. Their reliance on investment income is more distinctive in one group in the public and social benefits subsector: investment income (53.57%) and private donations (39.35%). Robustness tests excluding and exclusively focusing on this distinctive group reveal notable differences (see Appendix Table

10). Excluding grant-making foundations from the analysis significantly reduces the observed effects of diversification on revenue volatility. When examining grant-making nonprofits separately, the results are more comparable to those from art and cultural nonprofits: the effects of diversification were insignificant during the Recession but contributed to increased volatility in the post-recession period.

In sum, revenue diversification offers short-term financial stability for public and social benefits nonprofits, particularly during crises, but it does not sustain long enough. The benefits of diversification appear to be contingent on organizational type, with grant-making foundations experiencing particularly increased volatility. Due to the absolute value of revenue used in this study, interpreting the increase in volatility observed among grant-making nonprofits in the post-recession period presents some limitations. The measure captures total fluctuation rather than distinguishing between positive and negative deviations, making it unclear whether the observed volatility represents financial growth, decline, or instability in revenue patterns. One possible explanation is that grant-making foundations, which experienced portfolio losses during the Recession, saw rapid revenue growth in the post-recession period as financial markets rebounded. Ultimately, any approach to revenue diversification for this subsector must consider the unique contexts, mission alignment, and funding mechanisms of each organization to determine if and when diversification will genuinely contribute to financial resilience.

[Insert Table 10 here]

Overall, this study's findings reveal that the effectiveness of revenue diversification and revenue composition for nonprofits varies significantly across different analyses. In the first analysis conducted at the sector-wide level, revenue diversification reduced revenue volatility

during stable economic periods but did not maintain this stabilizing effect through the recession and post-recession years. In the second analysis, focusing on the primary revenue source, the findings further underscored this complexity: government grants and program service fees provided reliable stability during downturns, while private donations offered some resilience, and investment income notably increased volatility. In the third analysis, the value of diversification is closely tied to each subsector's unique revenue composition and the essential nature of its services. For education, healthcare, and human service nonprofits, which rely on stable funding sources, diversification offered limited or no benefits; conversely, arts, culture, and humanities nonprofits, as well as public and social benefits organizations, faced heightened risks from their diversified, yet economically sensitive, revenue streams. All hypotheses and the following results of each five sub-sector analysis are summarized in Table 11.

[Insert Table 11 here]

Collectively, these results highlight the importance of a nuanced approach to revenue diversification in the nonprofit sector. The findings suggest that diversification may be more effective for certain subsectors and under specific economic conditions, underscoring the need for tailored financial strategies. The following discussion chapter will explore the implications of these findings in greater depth, examining how nonprofits can align revenue strategies with their mission, revenue sources, and sector-specific vulnerabilities to enhance financial resilience in times of economic uncertainty.

CHAPTER 6: DISCUSSION

6-1. Conditional Effectiveness of Revenue Diversification at the Sector-Wide Level

This study explored the role of revenue diversification in mitigating revenue volatility, particularly during the 2008 Recession. The findings reveal that while revenue diversification is effective in stabilizing nonprofit revenues during normal periods, its effectiveness diminishes during economic crises. This result challenges the prevailing assumption that diversification is a comprehensive financial strategy, particularly in times of systemic risk.

From a theoretical standpoint, these findings delineate a critical boundary condition for applying RDT to nonprofit finance, showing its limitations during periods of widespread financial distress. While RDT emphasizes revenue diversification as a means of reducing dependence on any single revenue source (Pfeffer & Salancik, 2003), the results suggest that diversification alone is insufficient when all revenue streams face simultaneous disruption, such as during economic crises. In contrast, MPT helps explain this outcome, as economic crises tend to increase correlations among revenue sources, thereby diminishing the protective benefits of diversification (Markowitz, 1952; Markowitz, 1952). These findings align with empirical research in financial markets, which demonstrates that diversification becomes less effective during periods of heightened market volatility (Longin & Solnik, 2001; Sandoval & Franca, 2012).

In addition, benefits theory provides additional insight by emphasizing that revenue diversification is most effective when revenue sources align with an organization's mission and

service model (Young, 2007; 2017). This study suggests that diversification yields financial stability when revenue streams are well-matched to the services a nonprofit provides, ensuring a predictable and mission-consistent funding base. However, during economic downturns, the advantages of diversification diminish if the revenue composition is not resilient to shifts in funding availability or changing service demands. This reinforces the idea that revenue strategy should not be driven solely by diversification but by a strategic alignment between financial structure and service provision, ensuring that revenue streams remain viable under different economic conditions. Thus, financial stability is not achieved merely by increasing the number of revenue sources but by structuring them in ways that correspond to an organization's service model and external funding environment.

The diminished effects of revenue diversification in this study also help contextualize the conclusions of Hung and Hager (2019) and Lu et al. (2019), whose meta-analyses found that revenue diversification has minimal or no effect on reducing nonprofit financial vulnerability. This study suggests that diversification's effectiveness is contingent on economic conditions; while beneficial in stable periods, it may fail to provide financial stability during economic downturns. This distinction highlights the importance of examining diversification's effects across different economic conditions to fully understand its impact on nonprofit financial stability.

These findings challenge the widely held belief that revenue diversification is a comprehensive risk mitigation strategy (Carroll & Stater, 2009; Chang & Tuckman, 1994; Greenlee & Trussel, 2000; Hager, 2001; Mayer et al., 2014; Trussel & Greenlee, 2004; Tuckman & Chang, 1991). Instead, as advocated by Mitchell and Calabrese (2019), a more critical perspective is necessary, especially during economic crises, where diversification alone may not

ensure financial stability. This perspective supports recent studies (Mosley et al., 2012; Searing et al., 2021) that highlight the ongoing preference among nonprofits to use revenue diversification as a primary strategy against economic instability.

Nevertheless, revenue diversification remains a widely adopted strategy (Mitchell, 2014; Searing et al., 2021), possibly driven by institutional isomorphism and normative pressures rather than empirical evidence of its effectiveness (Kerlin & Pollak, 2011; Lu et al., 2019). Many nonprofits often emulate the financial strategies of successful peers, especially under uncertainty, reinforcing mimetic isomorphism (Moreau, 2021). Beyond serving as a financial strategy, diversification is often perceived as a means of reinforcing mission support, strengthening community relationships, and enhancing organizational legitimacy. As a result, nonprofits may adopt diversification not solely for financial resilience but as a way to legitimize their foundation, increase autonomy, and survive in an increasingly competitive world (Lin & Wang, 2016; Prentice, 2016). Additionally, coercive pressures from funders and government bodies may further compel nonprofits to diversify their revenue streams, reinforcing its widespread adoption (Guo, 2007; Verbruggen et al., 2011).

In sum, this study underscores the conditional effectiveness of revenue diversification at the nonprofit sector-wide level, revealing that its benefits depend on the economy. These findings inform nonprofit financial management strategies, suggesting that diversification alone is not a sufficient safeguard against economic crises.

6-2. The Role of Primary Revenue Sources on Revenue Stability

My second analysis examines the role of each revenue source on nonprofit revenue stability. Government grants emerged as a stabilizing force, mitigating revenue fluctuations

during economic downturns but were less reliable post-recession. Program service revenue proved to be a significant stabilizer, whereas private donations showed resilience despite initial fluctuations. Investment income, however, introduced significant financial risk, reinforcing the need for cautious reliance on this revenue stream during crises. Nonprofits must strategically balance their portfolios by accounting for the unique risks and stabilizing effects associated with each stream during crises.

Next, another key part of this involves a detailed understanding of the covariance between revenue streams in times of crisis, which is beyond the scope of this study. However, existing literature suggests the presence of covariance and its influence on overall nonprofit financial statuses, most notably relationships between government grants and private donations (Simmons & Emanuele, 2004; counter-argument from Payne (1998)), between program service revenue and private donations (Hung, 2020; Kim, 2017), and between investment income and private donations (Mayer et al., 2014). A detailed exploration of how covariance between revenue streams differs in times of crisis is beyond the scope of this study. Nevertheless, this study conducted correlation tests across the examined periods: before, during, and after, using the total raw values of each revenue source. Appendix Table 7 presents the results, revealing weak but positive correlations between revenue streams, suggesting that different funding sources tend to move together, though not strongly. All correlations were statistically significant, but their magnitudes remained low, indicating that revenue streams are not highly interdependent. While some correlations slightly weakened during the Recession and rebounded post-Recession, no major shifts were observed across different recession periods. Future research should further explore the covariance between revenue streams to understand how different funding sources interact under economic stress.

Additionally, external factors often exert a more significant impact on nonprofit finance than the internal revenue portfolio during systematic risk events, thereby adding further complexity to the management of nonprofit finances (Prentice, 2016). For instance, government funding contributed to stabilizing nonprofit revenue streams during economic downturns. The possible explanation is that additional government funding, such as government stimulus findings or protective policies, can partially offset the variability of the internal revenue portfolio (Johnson, 2011).

These findings contribute to ongoing debates on nonprofit financial management, emphasizing that revenue diversification alone is insufficient in times of crisis. Instead, strategic revenue composition, balancing stable sources while minimizing reliance on volatile funding streams, is key to financial resilience.

6-3: Different Impacts over Nonprofit Subsectors

The findings from this subsector-based analysis provide important theoretical insights into the varying effectiveness of revenue diversification as a financial stability strategy across different nonprofit subsectors. Benefits theory posits that nonprofits should structure their revenue portfolios based on the nature of the benefits they provide, whether they primarily serve individual beneficiaries through direct services (private benefits) or contribute to broader societal welfare (public benefits) (Young, 2017). The results of this study confirm that diversification is not universally beneficial; rather, its effectiveness is highly contingent on both revenue structure and the essential nature of nonprofit services.

For education, healthcare, and human services nonprofits, which predominantly provide private benefits, revenue diversification had no significant impact on, and in some cases, even increased revenue volatility. The resilience of these subsectors originated from their heavy reliance on stable sources like government funding (e.g., grants and contracts), program service fees, and endowments, which reduce the necessity of diversification. For instance, nonprofit hospitals, which rely heavily on service fees from insured patients, experienced increased revenue volatility when diversifying. According to benefits theory, revenue concentration on fee income is the most appropriate funding model for service providers whose primary beneficiaries are individuals. Moreover, as Qu (2016; 2019) argues, adding additional revenue sources to an already stable revenue structure can introduce new risks if revenue streams exhibit negative correlations. These findings suggest that organizations in these subsectors might benefit more from reinforcing their core, stable revenue sources rather than adopting diversification strategies.

This study further extends benefits theory by demonstrating that financial resilience during economic downturns depends not only on the alignment between revenue composition and the types of benefits nonprofits support but also on whether these services are deemed essential during crises. For example, Human service nonprofits, despite theoretical support for revenue diversification, did not experience significant benefits from it. This outcome can be attributed to the fact that these organizations secure substantial counter-cyclical government funding, particularly during economic downturns, allowing them to maintain or expand essential services such as food distribution, homelessness assistance, and re-employment programs. Given the redistributive nature of the goods and services they provide, human service nonprofits are well-positioned for sustained government support, reducing the role of revenue diversification in stabilizing revenues.

In contrast, for arts, culture, and humanities nonprofits, as well as public and social benefits nonprofits, the alignment with diversification offers stability. However, this effect diminished during the Recession and became destabilizing in the post-recession period. Before the crisis, diversification may have provided financial resilience by enabling these organizations to draw from multiple revenue streams, offsetting fluctuations in individual funding sources. However, as MPT posits, the effectiveness of diversification breaks down during systemic crises because previously independent revenue streams, such as earned income, private donations, and investment income, become highly correlated. This pattern was particularly evident among arts nonprofits, whose financial instability was exacerbated by their reliance on discretionary spending (e.g., ticket sales, membership fees, and private donations), which declined sharply during the recession (Lindqvist, 2012; Toepler & Wyszomirski, 2012). Households and corporations prioritized essential spending, reducing both earned income and philanthropic contributions to the arts (Salamon et al., 2009). Compounding this challenge, government funding was redirected toward higher-priority services such as healthcare and human services, further constraining financial resources for arts organizations. Thus, despite having diversified revenue streams, these nonprofits could not compensate for the simultaneous decline across multiple funding sources, rendering diversification ineffective.

In sum, these findings underscore the context-dependent nature of revenue diversification as a financial management strategy. While diversification can enhance stability in some subsectors, it does not provide universal risk mitigation. Instead, its effectiveness is contingent on the stability of core revenue sources, the essential nature of the services provided, and the broader macroeconomic environment. Future research should further investigate how nonprofits adjust their revenue strategies post-crisis and explore alternative financial management

approaches that may complement or enhance revenue diversification in ensuring long-term financial resilience.

6-4. Limitations of the Study

Despite its contributions, this study has certain limitations that warrant discussion. One major constraint is the specific focus on the 2008 economic recession, which may limit the generalizability of the findings to other types of 'black swan' events, such as the COVID-19 pandemic, war, or natural disasters. Each of these crises presents a unique set of challenges and implications for nonprofits, suggesting that strategies effective in one context may not be transferable to another. This variability in the effectiveness of revenue diversification strategies across different crises can be partly attributed to fluctuations in the demand for goods and services provided by nonprofits. During a crisis, the core group of recipients or beneficiaries who rely on these services can change, altering the roles and functions that nonprofits serve. As a result, the strategies that might prove effective for financial stability in one type of crisis could be less successful in another. Therefore, while the current study offers valuable insights into how revenue diversification impacts financial stability during economic downturns, future research should aim to investigate its applicability in diverse crisis scenarios. This would provide a more comprehensive understanding of how nonprofits can navigate the multifaceted challenges posed by different types of catastrophic events.

A second limitation pertains to the complex heterogeneity within the nonprofit sector, both across and within specific subsectors. Despite focusing on subsector-level analysis to lessen the risks of overgeneralization, this study must acknowledge the diversity of operational structures, funding mechanisms, and service delivery models within these categories. Research

by Kim (2017) and Liu and Kim (2022) also underscores this diversity, particularly in the arts and cultural nonprofit subsectors. As such, caution is advised when extrapolating these findings to individual organizations within any given subsector. Nevertheless, this study aims to contribute valuable insights to the field of financial risk management for nonprofits.

Finally, although revenue diversification is a well-known financial strategy to reduce revenue volatility, another financial strategy could also be applied to nonprofits. In part, which could not be considered in this study due to the data limitation. For example, some important data, particularly restricted and unrestricted contributions, were unavailable from old IRS Form 990 data. Thus, this study could not separate unrestricted resources, which may be available in the event of a crisis, from restricted resources. Many nonprofits substantially depend on funds restricted by donors to certain uses. Even though data are available, the exact calculation of restricted funds is very tricky (Finkler et al., 2017). Similarly, the study could not consider the effects of operating reserves (Kim & Mason, 2020; Irvin & Furneaux, 2021; Tevel et al., 2015) and endowments (Bowman, 2002; Lerner et al., 2008), which are often expected to serve as a rainy-day fund (or a buffer) for responding to unexpected emergencies (Weisbrod & Asch, 2010). However, it should also be noted that recent empirical studies have challenged the use of those rainy-day funds, providing new considerations: nonprofits do not use their endowments as rainy-day funds (Qu, 2020), and operating reserves play limited roles in responding to unforeseen shocks (Calabrese, 2017). Future studies utilizing revised IRS reporting requirements could enable more precise analyses of these financial strategies, offering deeper insights into how nonprofits navigate financial uncertainty.

CHAPTER 7: CONCLUSION

This study offers several practical insights for nonprofit managers seeking to develop effective financial strategies during economic crises. While revenue diversification is often considered a key approach to financial stability, its effectiveness is not universal. Moreover, diversification can be beneficial in stable economic conditions but becomes less effective and in some cases destabilizing during periods of macroeconomic instability, such as the 2008 Recession. Thus, nonprofits should be careful when adopting diversification as a financial stability strategy, recognizing that diversification alone is insufficient for ensuring financial resilience. Instead of either over-relying on or entirely dismissing diversification, nonprofits must recognize its limitations and combine multiple strategies to mitigate risk and sustain operations during economic downturns.

Nonprofits should first secure immediately available funding sources, such as emergency government grants, and intensify fundraising efforts to meet growing demands or offset declines in other revenue streams (e.g., investment income). The findings highlight that government grants and program service revenues tend to provide a more stable financial foundation during economic downturns. Thus, nonprofit managers should strengthen their ability to access and manage these revenue sources, especially in crisis periods when external shocks create financial uncertainty.

In addition to revenue-side adjustments, nonprofits may explore additional risk management tools to enhance financial resilience. For example, cutback measures such as

reducing program size, scaling back employee benefits and staffing, and curtailing non-essential expenditures (Levine, 1978) can provide immediate fiscal relief during periods of financial stress. Empirical evidence from the 2008 Recession indicates that nonprofits widely employed such measures to maintain fiscal stability (Never & de Leon, 2014; Salamon et al., 2009). In addition, building financial resilience by reserving operational funds (Calabrese, 2013), securing endowments as a rainy-day fund (Qu, 2020), and preserving liquid assets to stabilize cash flow (Calabrese, 2012) will also help nonprofits sustain operations during periods of uncertainty.

Nonprofit managers must also recognize that risk tolerance and financial objectives vary by organization and tailor financial risk management strategies to their specific goals and tolerance levels during crises (Mitchell & Calabrese, 2019). For instance, larger nonprofits with high-risk tolerance, such as higher education and healthcare organizations, may expand services during crises, anticipating continued/increased public service demands possibly followed by government support. In contrast, smaller nonprofits, such as those in the arts sector, may need to scale back operations and seek alternative funding streams, like intensifying online fundraising or diversifying earned income. Regular assessment of revenue sources, economic conditions, and policy trends will enable nonprofits to proactively adapt their financial strategies to emerging challenges.

Finally, nonprofits must acknowledge that different types of systematic crises, whether economic recessions, public health emergencies, wars, or natural disasters, present distinct financial risks that require tailored responses. A uniform financial strategy is inadequate, as the nature and impact of each crisis vary significantly. To build long-term resilience, nonprofits should incorporate contingency planning that accounts for these diverse risks and prepares adaptive strategies accordingly. Future research should further explore the mechanisms that

contribute to nonprofit financial resilience in varying crisis contexts, providing deeper insights into how organizations can navigate uncertainty and maintain financial sustainability in an increasingly unpredictable environment.

TABLES

Table 1: Sample Creation

Sample Selection	n	Percent Selected	
Initial sample	131,433	100.00	
(1) Exclude organizations that are not public charities (not 501(c)(3))	129,575	98.59	
(2) Removed duplicates*	129,313	98.39	
(3) Exclude inactive organizations** and those with data errors	127,163	96.75	
(4) Exclude organizations filing jointly	126,839	96.50	
(5) Exclude organizations with fewer than seven years of records	90,109	68.56	
Total observations: 90,109 ($i = 10,661$; $t = 9$)			
Year Distribution	Year	n	percent
	2004	9,705	10.77
	2005	10,072	11.18
	2006	10,506	11.66
	2007	10,552	11.71
	2008	10,075	11.18
	2009	9,645	10.7
	2010	10,367	11.5
	2011	9,628	10.68
	2012	9,559	10.61
	Total	90,109	100

* In cases of duplicate reports, only the most recent submission was retained for analysis (National Center for Charitable Statistics (NCCS) data guideline, p.6)

** Nonprofits were excluded if their total expenses were less than the sum of depreciation and interest paid or if their total assets and total liability were negative.

Table 2: Variable Definitions and Measurement

Variable	Definition	Measurement
Dependent Variable		
Revenue Volatility (%)	The absolute difference between expected revenues and actual revenues, indicating the absolute percent deviation of actual revenue from expected revenue.	1) estimate a revenue growth trend for each organization i in year t by modeling the natural log of revenue (Rev_{it}) $Expected\ Rev_{it} = \exp(\beta_0 + \beta_1 t + \alpha_i)$ 2) calculate the absolute deviation of residuals. $Revenue\ Volatility_{it} = \left \frac{Expected\ Revenue_{it} - Actual\ Revenue_{it}}{Expected\ Revenue_{it}} \right \times 100$
Independent Variable		
Revenue Diversification Index (RDI)	Indicator for level of revenue diversification	$RDI = \frac{(1 - \sum_{i=1}^n R_i^2)}{(1 - 1/n)}$ Where n is the number of revenue streams, R_i is the proportion of each revenue stream. All negative values were set to equal to zero before the HHI index was calculated.
Revenue Source	1) Proportion of Government Grants 2) Proportion of Private Donations 3) Proportion of Program Service Revenue 4) Proportion of Investment Income	$\frac{Total\ Government\ Grants}{Total\ Revenue}$ $\frac{Total\ Private\ Donations}{Total\ Revenue}$ $\frac{Total\ Program\ Service\ Revenue}{Total\ Revenue}$ $\frac{Total\ Investment\ Income}{Total\ Revenue}$
2008 Recession Dummy	1) During and After Crisis 2) During Crisis or After Crisis 3) Years in Crisis	1 for 2007-2012 and 0 for 2004-2006 1 for 2007-2009 and 0 for 2004-2006 1 for 2010-2012 and 0 for 2004-2006 1 for each year from 2007 to 2012 and 0 for 2004-2006
Control Variable		
Age of the Organization (years)		= Fiscal year—Rule date
Organizational Size (ln)*		= ln(Total Assets)
Total Expense (ln)		= ln (Total Expenses)
Debt Margin		$\frac{Total\ Liability\ at\ End\ of\ Year}{Total\ Asset\ at\ End\ of\ Year}$
Total Margin		$\frac{Net\ Asset}{Total\ Revenue}$
Surplus Margin		$\frac{Total\ Revenue - Total\ Expenses}{Total\ Revenue}$
Subsector		Use a series of dummy variables based on the NTEE core codes, NTMAJ 10
Number of Nonprofits (county; per 1,000)		$\frac{The\ Number\ of\ Nonprofits\ per\ County}{1,000}$
Median Household Income (county) (ln)		=ln (Median household income per county)
State		A set of 51 dummy variables for 50 States + Washington D.C.

* (ln) refers to the natural logarithm.

Table 3: Nonprofit Revenue Stream and Its Sources

Revenue Stream	Definition and Source
1 Government Grants	Includes all amounts of government contributions in the form of grants or similar payments from local, state, or federal government sources, as well as foreign governments. (Old*: part I 1d; New*: part VIII 1e)
2 Private Donations	Includes all contributions, gifts, grants, or other similar amounts from the public (e.g., individuals, corporations, trusts, estates, and other entities), foundations, and other exempt organizations except governmental units. Net income from fundraising events is included here. (Old: part I 1a, 1b, 1c, 9a; New: part VIII 1a, 1c, 1d, 1f, 8a, 9a)
3 Program Service Revenue	Includes both resources that come directly from beneficiaries (as with fee payments or use of vouchers, i.e., childcare and substance abuse counseling) and those that come from government programs. Membership dues are included here. (Old: part I 2, 3; New: part VIII 1b, 2g)
4 Investment Income	Combines all separate investment revenues: investment incomes (e.g., dividends, interest, and other similar amounts), income from investment of tax-exempt bond proceeds, gross amount from sales of assets other than inventory, and other investment income. Royalty** incomes are included here. (Old: part I 4, 5, 7, 8a; New: part VIII column (A), lines 3, 4, 5, 7a)

Note: Definitions are based on the IRS 2007 and 2008 Form 990 instructions.

* Old comes from the IRS Form 990 before 2007; new comes from the Form 990 after 2008.

** Royalty incomes should be included in investment income in the current study: in the old form, royalty incomes were reported on line 7, part I, which is an 'other investment income item.' Royalty incomes are separately listed in the new form.

Table 4: Subsector Sample Selection

	Subsector*	Sample in the Study				All Registered Nonprofits in the U.S.**			
		Number of Sample Org. (total observations)		Total Revenue (2012)		All Registered Nonprofits in the US (2012)		Total Revenue (2012)	
		# of Org. (# of Total Obs.)	Percent (%)	Revenue (Billions)	Percent (%)	# of Org.	Percent (%)	Revenue (Billions)	Percent (%)
1	Art, Culture, and Humanities	683 (5,673)	6.41	11.69	1.10	28,482	9.9	31.3	1.9
2	Education	2,373 (20,337)	22.26	211.08	19.82	49,070	17.1	284.9	17.2
3	Environment and Animals	276 (2,316)	2.59	5.26	0.49	12767	4.5	15.5	0.9
4	Health	3,258 (27,774)	30.56	724.35	68.02	37,374	13.0	978.8	59.3
5	Human service	2,706 (22,640)	25.38	49.69	4.67	101,803	35.5	206.6	12.5
6	International, Foreign Affairs	141 (1,228)	1.32	13.94	1.31	6,100	2.1	29.3	1.8
7	Mutual, Membership Benefit	53 (456)	0.50	1.59	0.15	none	none	none	none
8	Public, Societal Benefits	1,005 (8,287)	9.43	44.54	4.18	33,282	11.6	92.3	5.6
9	Religion-Related	166 (1,398)	1.56	2.84	0.27	17,542	6.1	13.4	0.8

* Nonprofit subsectors are classified according to the NTEE CC-Major Group, which divides nonprofits into 10 categories. However, this study excludes the 'unknown' (or 'unclassified') group due to its undefined characteristics.

** Source: The Nonprofit Sector in Brief (2014) the Urban Institute, National Center for Charitable Statistics

Table 5: Descriptive Statistics

Variable	Obs. (n)	Min.	Mean				Max	Standard Deviation
			Before (2004~2006)	During (2007~2009)	After (2010~2012)	Overall		
Dependent Variable								
Revenue Volatility (%)	90,109	.0000	0.986	1.223	0.958	1.059	100.000	1.933
Independent Variable								
Revenue Diversification Index	89,219	0.000	0.369	0.316	0.365	0.350	0.999	0.285
Proportion of Revenue Source								
(1) Government Grant	89,219	0.000	0.077	0.091	0.076	0.081	1.000	0.212
(2) Private Donation	89,219	0.000	0.201	0.151	0.182	0.178	1.000	0.274
(3) Program Service Revenue	89,219	0.000	0.491	0.577	0.511	0.526	1.000	0.404
(4) Investment Income	89,219	0.000	0.232	0.181	0.233	0.215	1.000	0.305
Control Variable								
Organizational Age (years)	89,897	0.000	32.911	35.616	38.724	35.726	98.000	21.724
Organizational Size (\$)*	90,109	0.000	178,847,162	196,966,982	219,504,904	198,269,441	72,956,583,936	987,416,689
Total Expense (\$)*	90,109	0.000	81,091,937	91,272,024	100,876,393	91,000,841	39,582,830,592	447,653,816
Debt Margin	90,109	0.000	0.754	4.793	2.456	2.669	68,303.945	296.067
Total Margin	90,109	-254.709	3.757	5.418	8.297	5.804	75,587.977	257.558
Surplus Margin	90,109	-2,717.175	0.078	-0.173	-0.070	-0.055	1.000	9.729
Number of Nonprofits (county; per 1,000)	90,109	0.010	5.838	6.272	6.574	6.061	42.666	8.198
Median Income (\$)	90,109	19,108	63,333	57,510	60,588	60,476	133,925	15,339

Note: Some variables have missing values, including the proportions of revenue sources for 2008 due to unavailable reporting data and organization age due to missing ruling date information.

* Organizational size and total expense: Logged values were included in the analysis; however, original dollar values are reported here.

Table 6: Effect of Revenue Diversification on Revenue Volatility

Variable	Model 1			Model 2			Model 3		
	Baseline vs. 2007~2012			Baseline vs. During (2007~2009) & After (2010~2012)			Baseline vs. Yearly		
Dependent Variable = Revenue Volatility									
Revenue Diversity Index (RDI)		-0.194*** (0.058)		-0.176*** (0.059)		-0.182*** (0.063)			
Crisis (dummy variables)									
During the Recession (2007~2009)	2007	0.414*** (0.026)	0.222*** (0.028)	0.285*** (0.031)					
	2008			0.319*** (0.036)					
	2009			0.537*** (0.054)					
After the Recession (2010~2012)	2010		-0.148*** (0.039)	0.223*** (0.053)					
	2011			0.115*** (0.058)					
	2012			0.282*** (0.065)					
Interaction = Revenue Diversity Index (RDI) × Crisis (dummy variables)									
During the Recession (2007~2009)	2007	0.005 (0.040)	0.050 (0.047)	-0.002(0.055)					
	2008			0.076(0.069)					
	2009			0.056(0.073)					
After the Recession (2010~2012)	2010		-0.010 (0.045)	-0.069(0.057)					
	2011			0.066(0.054)					
	2012			-0.018(0.054)					
Control Variable									
Organization Age (years)		-0.059*** (0.003)		0.028*** (0.006)		-0.034*** (0.009)			
Organization Size (ln)		-0.010(0.027)		-0.010(0.027)		-0.005(0.027)			
Total Expense (ln)		-0.273*** (0.092)		-0.277*** (0.092)		-0.278*** (0.092)			
Debt Liability		0.000* (0.000)		0.000* (0.000)		0.000* (0.000)			
Total Margin		0.000** (0.000)		0.000** (0.000)		0.000** (0.000)			
Surplus Margin		-0.022** (0.009)		-0.021** (0.009)		-0.021** (0.009)			
Number of Nonprofits (county, per 1,000)		0.003(0.006)		0.003(0.006)		-0.005(0.009)			
Median Household Income (county, ln)		0.160** (0.079)		0.349*** (0.118)		-0.012(0.086)			
Constant		6.075*** (1.888)		1.133(2.155)		7.134*** (1.975)			
R-square		0.045		0.049		0.051			

Note: Standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Models were analyzed using robust standard errors clustered by the organization.

State and subsector dummy variables are included but omitted in the Table.

Table 7: Effect of Primary Revenue Streams on Revenue Volatility

(1) Government Grants				(2) Private Donations			(3) Program Service Revenue			(4) Investment Income				
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3		
Dependent Variable = Revenue Volatility														
Proportion of Each Revenue Stream	0.373***	0.377***	0.283***	0.441***	0.447***	0.434***	-0.063	-0.035	-0.154**	-0.228***	-0.282***	-0.202***		
	(0.101)	(0.101)	(0.105)	(0.105)	(0.105)	(0.105)	(0.061)	(0.061)	(0.064)	(0.066)	(0.067)	(0.069)		
Crisis (dummy variables)														
During the Recession (2007~2009)	2007	0.466*** (0.020)	0.289*** (0.020)	0.302*** (0.022)	0.485*** (0.024)	0.276*** (0.023)	0.232*** (0.023)	0.611*** (0.030)	0.586*** (0.032)	0.477*** (0.037)	0.284*** (0.019)	-0.049** (0.022)	0.146*** (0.021)	
	2008			0.497*** (0.030)						0.500*** (0.031)			0.808*** (0.063)	0.238*** (0.028)
	2009			0.621*** (0.043)						0.626*** (0.044)			1.153*** (0.064)	0.012 (0.041)
After the Recession (2010~2012)	2010	-0.154*** (0.033)		0.223*** (0.047)	-0.098*** (0.036)		0.262*** (0.047)	-0.163*** (0.041)		0.297*** (0.056)	-0.263*** (0.034)		0.081* (0.046)	
	2011			0.159*** (0.053)			0.214*** (0.053)			0.152** (0.069)			0.082 (0.053)	
	2012			0.295*** (0.060)			0.357*** (0.060)			0.246*** (0.066)			0.246*** (0.059)	
Interaction = the Proportion of Each Primary Revenue Source × Crisis														
During the Recession (2007~2009)	2007	-0.165*** (0.051)	-0.309*** (0.054)	-0.254*** (0.070)	-0.182*** (0.063)	-0.045 (0.067)	0.268*** (0.074)	-0.309*** (0.033)	-0.615*** (0.039)	-0.397*** (0.042)	0.760*** (0.055)	1.393*** (0.074)	0.559*** (0.070)	
	2008			-0.210*** (0.067)			-0.144 (0.125)			-0.527*** (0.066)			1.673*** (0.173)	
	2009			-0.563*** (0.084)			-0.278*** (0.100)			-1.096*** (0.066)			2.630*** (0.132)	
After the Recession (2010~2012)	2010	-0.004 (0.060)		-0.079 (0.065)	-0.292*** (0.072)		-0.251*** (0.087)	-0.023 (0.038)		-0.161*** (0.047)	0.280*** (0.058)		0.515*** (0.080)	
	2011			0.024 (0.082)			-0.305*** (0.082)			0.002 (0.045)			0.249*** (0.070)	
	2012			0.059 (0.074)			-0.330*** (0.082)			0.082* (0.045)			0.117* (0.067)	
Constant		7.607*** (1.881)	2.382 (2.034)	7.071*** (1.944)	7.380*** (1.851)	2.228 (2.018)	6.901*** (1.934)	7.879*** (1.864)	2.943 (1.969)	7.050*** (1.920)	7.687*** (1.871)	2.828 (1.947)	6.286*** (1.921)	

R-square	0.048	0.053	0.055	0.048	0.053	0.056	0.049	0.060	0.066	0.054	0.070	0.086
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Note: Standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Models were analyzed using robust standard errors, clustered by organization.

All control variables such as organizational, community-level, nonprofit subsector, state, and the proportions of other primary revenue sources are included but omitted from the Table.

Table 8: Descriptive Statistic by Nonprofit Subsector

	Revenue Volatility						RDI		Revenue (%)			
	Min.	Mean			Max	Standard Deviation	Mean	Standard Deviation	Government Grant	Private Donation	Program Fee	Investment Income
		Before (2004~2006)	During (2007~2009)	After (2010~2012)								
1 Art, Culture, and Humanities	0.00	1.58	1.84	1.40	100.00	2.93	0.54	0.28	8.11	33.79	29.912	28.98
2 Education	0.00	0.88	1.17	0.86	100.00	1.73	0.44	0.27	5.37	17.26	50.07	27.30
3 Health	0.00	0.68	0.88	0.72	30.11	1.51	0.23	0.25	4.85	7.77	71.08	16.30
4 Human service	0.00	0.93	1.03	0.86	100.00	1.80	0.35	0.29	14.09	16.12	56.40	13.39
5 Public and Social Benefits	0.00	1.63	2.28	1.65	28.87	2.48	0.37	0.28	9.66	30.35	21.71	39.19

Note: This Table focuses on five key subsectors as classified by the NTEE CC-Major Group, which categorizes nonprofits into 10 categories overall. Subtotals may not sum to totals because of rounding.

Table 9: Revenue Diversification and Revenue Volatility Across Five Nonprofit Subsectors

	(1) Art & Culture			(2) Education			(3) Healthcare		
Dependent Variable = Revenue Volatility									
RDI	-0.619*** (0.188)	-0.519*** (0.182)	-0.611** (0.266)	-0.081 (0.051)	0.006 (0.052)	0.042 (0.094)	-0.128** (0.065)	-0.086 (0.066)	-0.159** (0.0789)
Crisis*		0.689*** (0.122)	0.618*** (0.170)		0.435*** (0.034)	0.457*** (0.064)		0.310*** (0.028)	0.284*** (0.0331)
RDI×Crisis			0.128 (0.216)			-0.047 (0.097)			0.107* (.0651)
_cons	35.696 (17.118)	32.048 (16.649)	32.289 (16.776)	5.903 (2.357)	4.322 (2.382)	4.233 (2.396)	5.613 (1.330)	5.050 (1.817)	5.144 (1.806)
R-sq	0.266	0.273	0.273	0.147	0.156	0.156	0.103	0.109	0.110
Observation	5,641			19,981			27,518		

	(4) Human service			(5) Public & Social Benefits		
Dependent Variable = Revenue Volatility						
RDI	-0.091 (0.068)	-0.062 (0.068)	-0.086 (0.082)	-0.514*** (0.148)	-0.430*** (0.147)	-0.357* (0.201)
Crisis		0.219*** (0.032)	0.207*** (0.040)		1.028*** (0.099)	1.068*** (0.142)
RDI×Crisis			0.034 (0.068)			-0.107 (0.204)
_cons	6.955 (1.655)	6.508 (1.467)	6.538 (1.462)	4.439 (4.836)	-.932 (4.864)	-1.133 (4.949)
R-sq	0.086	0.088	0.088	0.037	0.057	0.057
Observation	22,435			8,103		

Note: Standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Models were analyzed using robust standard errors, clustered by organization.

All organization and community-level control variables are included but omitted in the Table.

* Crisis is a dummy variable, defined as 0 for 2004~2006 and 1 for 2007~2012.

Table 10: Effects of Revenue Diversification Across Different Phases of the 2008 Recession

		(1) Art & Culture			(2) Education			(3) Healthcare			(4) Human service			(5) Public & Social Benefits					
		Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3			
Dependent Variable = Revenue Volatility																			
Before the Recession (2004~2006)		-0.611**	-0.523*	-0.712**	0.042	0.077	0.102	-0.159**	-0.149*	-0.137*	-0.086	-0.076	-0.066	-0.357*	-0.301	-0.280			
		(0.266)	(0.268)	(0.282)	(0.094)	(0.095)	(0.101)	(0.079)	(0.079)	(0.081)	(0.082)	(0.083)	(0.086)	(0.201)	(0.202)	(0.212)			
Crisis (dummy variables)																			
During the Recession (2007~2009)	2007	0.618*** (0.170)	0.462** (0.180)	0.593** (0.244)	0.457*** (0.064)	0.266*** (0.066)	0.302*** (0.085)	0.284*** (0.033)	0.135*** (0.034)	0.217*** (0.033)	0.207*** (0.040)	0.116*** (0.044)	0.200*** (0.058)	1.068*** (0.142)	0.851*** (0.145)	0.748*** (0.159)			
	2008			-0.189 (0.229)												0.359*** (0.078)	0.287*** (0.040)	0.207*** (0.059)	1.101*** (0.195)
	2009			0.064 (0.521)												0.583*** (0.128)	0.442*** (0.066)	0.165*** (0.082)	1.791*** (0.316)
After the Recession (2010~2012)	2010	-0.565*** (0.237)		-1.087** (0.427)	-	0.203** (0.085)	0.222* (0.125)	-0.046 (0.052)	0.307*** (0.074)	0.002 (0.086)	-0.097 (0.064)	-0.007 (0.104)	0.178 (0.113)	-0.473** (0.184)		0.515* (0.283)			
	2011			-1.489*** (0.452)			0.171 (0.138)									0.273*** (0.080)	0.403 (0.281)		
	2012			-1.644*** (0.547)			0.213 (0.142)									0.443*** (0.088)	0.403 (0.335)		
Interaction = Revenue Diversity Index (RDI) × Crisis (dummy variables)																			
During the Recession (2007~2009)	2007	0.128 (0.216)	-0.122 (0.249)	-0.530 (0.344)	-0.047 (0.097)	-0.040 (0.104)	-0.090 (0.131)	0.107* (0.065)	0.263*** (0.076)	0.188** (0.088)	0.034 (0.068)	0.024 (0.070)	-0.077 (0.095)	-0.107 (0.204)	-0.594* (0.252)	-0.224 (0.295)			
	2008			0.317 (0.320)			0.270 (0.255)			0.357*** (0.124)			0.021 (0.100)			-0.738** (0.325)			
	2009			-0.447 (0.535)			0.024 (0.173)			0.292** (0.115)			0.156 (0.108)			-0.963** (0.416)			
After the Recession (2010~2012)	2010	0.442* (0.246)		0.198 (0.276)	-	-0.007 (0.112)	-0.074 (0.141)	-0.023 (0.075)	-0.005 (0.090)	-0.033 (0.094)	0.065 (0.085)	0.065 (0.085)	0.164* (0.100)	0.408* (0.220)		0.084 (0.292)			
	2011			0.623** (0.311)			-0.003 (0.143)			-0.005 (0.090)			0.032 (0.105)			0.594** (0.272)			
	2012			0.587* (0.355)			0.066 (0.124)			-0.032 (0.093)			-0.021 (0.108)			0.623** (0.270)			
_cons		32.289*	20.351	11.308	4.233*	-3.269	6.432**	5.144***	2.227	6.775***	6.538***	4.433***	5.102***	-1.133	-12.805**	4.399			
		(16.776)	(16.231)	(12.327)	(2.396)	(2.469)	(3.066)	(1.806)	(2.317)	(2.121)	(1.462)	(1.518)	(1.673)	(4.949)	(5.479)	(8.797)			
R-sq		0.273	0.279	0.282	0.156	0.164	0.166	0.110	0.113	0.115	0.088	0.090	0.091	0.057	0.072	0.077			
Observation		5,641				19,981				27,518				22,435			8,103		

Note: Standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
Models were analyzed using robust standard errors, clustered by organization.
All control variables are included but omitted in the Table.

able 11: Summary of the Findings in Subsector-based Analysis

Subsector	Benefit Group	Revenue Composition	Benefits Theoretical Support	Hypothesis: the effectiveness of RD on revenue volatility during a crisis	Testing Result
Arts and Culture	Diverse	Diversified	Fit for Diversification	RD → decrease volatility	Mixed Support → Insignificant and then Increase Volatility
Education	Private	Concentrated on tuition fee	Fit for Concentration on program service fee	RD→ increase volatility	Not Support → Statistical Insignificance
Healthcare	Private	Concentrated on a fee for service	Fit for Concentration on program service fee	RD→ increase volatility	Partially Supported → Only for Hospitals
Human Service	Private but Redistributive	Concentrated on government grants and contracts	Fit for Diversification	RD→ decrease volatility	Not Support → Statistical Insignificance
Public and Social Benefits	Public/Specific Social Group	Concentrated on government grants and private donations	Fit for Concentration on government grants & private contributions	RD→ decrease volatility	Mixed Support → Decrease and then Increase Volatility

FIGURES

Figure 1: Average Percent Growth in Nonprofit Revenue, 2004-2012

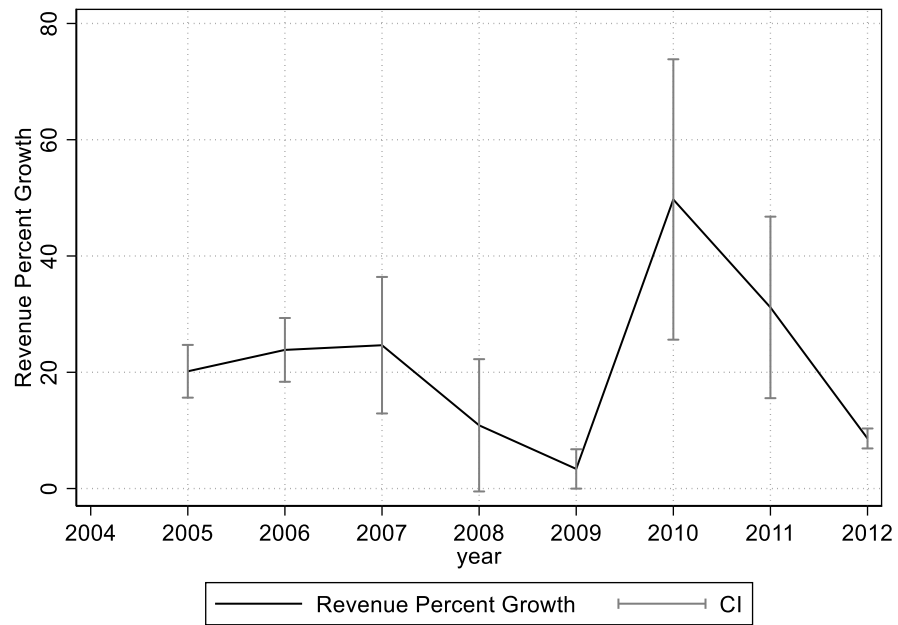


Figure 2: Nonprofit Average Revenue Volatility, 2004-2012

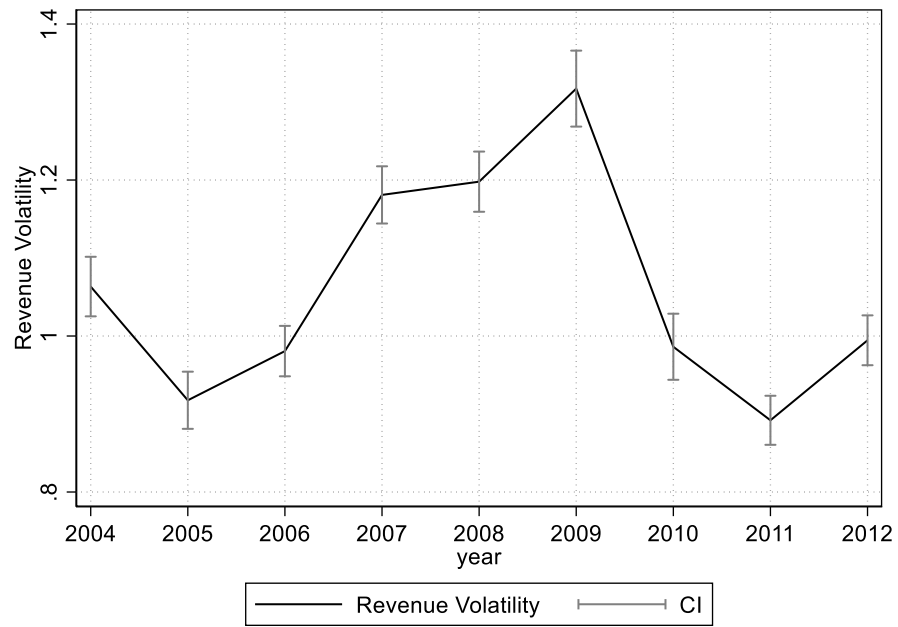
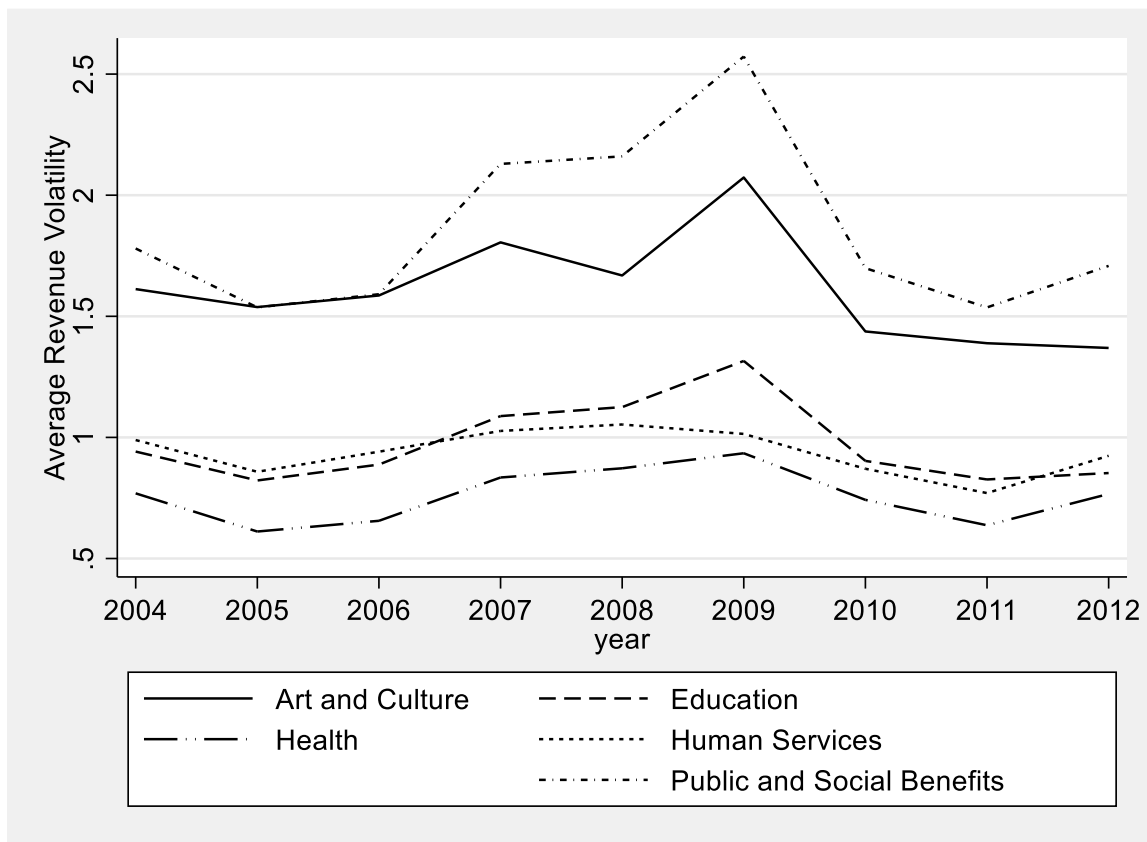


Figure 3: The Trend of Revenue Volatility Depending on Sub-Sectors



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APPENDIX

Appendix 1: Summary Statistics of Revenue Volatility _Excluding Outliers

	Observation	Mean	Standard Deviation	Min	Max
Revenue volatility	90,109	1.059	1.933	0	100
Revenue Volatility, Excluding Outliers	90,083	1.050	1.780	0	42.981

Appendix 2: Effects of Revenue Diversification on Revenue Volatility _Excluding Outliers

Variable	Model 1	Model 2	Model 3
	Baseline vs. 2007~2012	Baseline vs. During (2007~2009) & After (2010~2012)	Baseline vs. Yearly
Dependent Variable = Revenue Volatility			
Revenue Diversity Index (RDI) Before the Recession (2004~2006)	-0.162*** (0.044)	-0.144*** (0.045)	-0.146*** (0.047)
Interaction = Revenue Diversity Index (RDI) × Crisis (dummy variables)			
During the Recession (2008~2009)	2007	0.038 (0.044)	-0.015 (0.052)
	2008		0.070 (0.068)
	2009		0.052 (0.073)
After the Recession (2010~2012)	2010	-0.011 (0.043)	-0.067 (0.057)
	2011		0.064 (0.052)
	2012		-0.022 (0.051)
Constant	4.371*** (1.131)	-0.550 (1.515)	5.385*** (1.284)
R-square	0.044	0.049	0.051

Note: Standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Models were analyzed using robust standard errors clustered by the organization.

All control variables are included but omitted in the Table.

Appendix 3: Effects of Revenue Diversification on Revenue Volatility _Excluding Higher Education and Hospitals

Variable		Model 1	Model 2 Baseline vs. During (2007~2009) & After (2010~2012)	Model 3 Baseline vs. Yearly
Dependent Variable = Revenue Volatility				
Revenue Diversity Index (RDI)		-0.222*** (0.074)	-0.196*** (0.075)	-0.212*** (0.079)
Crisis (dummy variables)				
During the Recession (2007~2009)	2007	0.499*** (0.035)	0.299*** (0.038)	0.357*** (0.043)
	2008			0.357*** (0.048)
	2009			0.673*** (0.072)
After the Recession (2010~2012)	2010		-0.185*** (0.052)	0.234*** (0.069)
	2011			0.073(0.075)
	2012			0.242*** (0.083)
Interaction = Revenue Diversity Index (RDI) × Crisis (dummy variables)				
During the Recession (2007~2009)	2007	-0.025 (0.053)	-0.043 (0.062)	-0.086 (0.073)
	2008			-0.001 (0.084)
	2009			-0.102 (0.100)
After the Recession (2010~2012)	2010		0.027 (0.059)	-0.072 (0.076)
	2011			0.118* (0.072)
	2012			0.049 (0.071)
Constant		5.708*** (2.204)	0.462 (2.562)	6.681*** (2.188)
R-square		0.044	0.049	0.051
N		65,786	65,786	65,786

Note: Standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Models were analyzed using robust standard errors clustered by the organization.

All control variables are included but omitted in the Table.

Appendix 4: Effects of Revenue Diversification on Revenue Volatility _Different Time Period of 2008 Recession (Recession Defined From 2008 to 2009)

Variable		Model 1	Model 2	Model 3
		Baseline vs. 2007~2012	Baseline vs. During (2007~2009) & After (2010~2012)	Baseline vs. Yearly
Dependent Variable = Revenue Volatility				
Before the Recession (2004~2007)		-0.157*** (0.057)	-0.156*** (0.058)	-0.182*** (0.059)
Crisis (dummy variables)				
During the Recession (2008~2009)	2008	0.242*** (0.026)	0.092*** (0.028)	0.033 (0.031)
	2009			0.161*** (0.047)
	2010		-0.240*** (0.046)	
After the Recession (2010~2012)	2011		-0.342*** (0.041)	-0.433*** (0.050)
	2012			0.353*** (0.055)
Interaction = Revenue Diversity Index (RDI) × Crisis (dummy variables)				
During the Recession (2008~2009)	2008	0.018 (0.039)	0.108** (0.053)	0.076 (0.067)
	2009			0.056 (0.071)
After the Recession (2010~2012)	2010		-0.011 (0.042)	-0.069 (0.056)
	2011			0.067 (0.052)
	2012			-0.018 (0.052)
Constant		9.528*** (1.805)	1.971 (1.932)	4.077** (1.956)
R-square		0.040	0.048	0.049
N		89,009	89,009	89,009

Note: Standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Models were analyzed using robust standard errors clustered by the organization.

All control variables are included but omitted in the Table.

Appendix 5: Effects of Revenue Diversification on Revenue Volatility _Including Lagged Dependent Variables

Variable	Model 1 Baseline vs. 2007~2012	Model 2 Baseline vs. During (2007~2009) & After (2010~2012)	Model 3 Baseline vs. Yearly
Dependent Variable = Revenue Volatility			
Revenue Diversity Index (RDI_{t-1}) Before the Recession (2004~2006)	-0.191*** (0.057)	-0.095* (0.057)	-0.116* (0.059)
Interaction = Revenue Diversity Index $_{t-1}$ (RDI_{t-1}) $\times$ Crisis (dummy variables)			
During the Recession (2007~2009)	2007	-0.018 (0.048)	-0.092 (0.058)
	2008		-0.024 (0.066)
	2009		0.088 (0.078)
After the Recession (2010~2012)	2010	-0.026 (0.050)	-0.047 (0.070)
	2011		0.050 (0.057)
	2012		-0.081 (0.054)
Control Variable			
Revenue Volatility $_{t-1}$	0.081 (0.054)	0.083 (0.054)	0.082 (0.055)
Organization Age (years)	-0.053*** (0.004)	0.031*** (0.008)	0.093*** (0.019)
Organization Size (ln)	0.066** (0.033)	0.066** (0.033)	0.066** (0.033)
Total Expense (ln)	-0.224*** (0.072)	-0.226*** (0.073)	-0.227*** (0.072)
Debt Liability	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Total Margin	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Surplus Margin	-0.112*** (0.035)	-0.111*** (0.035)	-0.111*** (0.035)
Number of Nonprofits (county, per 1,000)	-0.004 (0.007)	-0.001 (0.007)	-0.005 (0.007)
Median Household Income (county, ln)	-0.255*** (0.099)	-0.059 (0.102)	0.076 (0.149)
Constant	7.699*** (2.091)	2.650 (2.102)	-0.861 (2.284)
R-square	0.079	0.082	0.082

Note: Standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Models were analyzed using robust standard errors clustered by the organization.

State and subsector dummy variables are included but omitted in the Table.

Appendix 6: Effect of Revenue Diversification on Revenue Volatility _Using the General Method of Moments (GMM) Difference Estimator

Variable	Model 1 Baseline vs. 2007~2012	Model 2 Baseline vs. During (2007~2009) & After (2010~2012)	Model 3 Baseline vs. Yearly
Dependent Variable = Revenue Volatility			
Revenue Diversity Index (RDI_{t-1}) Before the Recession (2004~2006)	-0.234*** (0.079)	-0.066(0.084)	-0.095(0.094)
Interaction = Revenue Diversity Index $t-1$ (RDI_{t-1}) $\times$ Crisis (dummy variables)			
During the Recession (2007~2009)	2007	0.011 (0.071)	-0.022 (0.070)
	2008		-0.067 (0.093)
	2009		0.050 (0.122)
After the Recession (2010~2012)	2010	-0.051 (0.095)	-0.029 (0.111)
	2011		0.066 (0.122)
	2012		-0.058 (0.124)
Control Variable			
Revenue Volatility $_{t-1}$	0.098(0.066)	0.101(0.066)	0.107(0.069)
Organization Age (years)	-0.014(0.014)	0.068*** (0.017)	0.059*** (0.022)
Organization Size (ln)	0.111** (0.049)	0.113** (0.049)	0.109** (0.049)
Total Expense (ln)	-0.139(0.097)	-0.144(0.097)	-0.150 (0.100)
Debt Liability	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Total Margin	0.006*** (0.001)	0.006*** (0.001)	0.006*** (0.001)
Surplus Margin	-0.054(0.038)	-0.053(0.037)	-0.054(0.037)
Number of Nonprofits (county, per 1,000)	-0.011(0.014)	-0.001(0.002)	0.006(0.008)
Median Household Income (county, ln)	-0.606** (0.261)	-0.311(0.267)	-0.398(0.241)
Constant	10.566*** (3.995)	1.568 (3.884)	1.821 (3.916)

Note: Standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Models were analyzed using robust standard errors clustered by the organization.

State and subsector dummy variables are included but omitted in the Table.

Appendix 7: Correlation Table between Revenue Sources in Three Periods

Variables	Before the Recession (2004~2006)				During the Recession (2007~2009)				After the Recession (2010~2012)			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
(1) Proportion of Government Grant	1.000				1.000				1.000			
(2) Proportion of Private Donation	-0.088***	1.000			-0.099***	1.000			-0.073***	1.000		
(3) Proportion of Program Service Fee	-0.282***	-0.568***	1.000		-0.364***	-0.588***	1.000		-0.295***	-0.557***	1.000	
(4) Proportion of Investment Income	-0.206***	-0.132***	-0.579***	1.000	-0.194***	0.007	-0.597***	1.000	-0.208***	-0.107***	-0.605***	1.000

Note: p<0.01, ** p<0.05, * p<0.1

Appendix Table 7: Correlation Table between Revenue Sources in Three Periods Using Raw Values of Each Resource

Variables	Before the Recession (2004~2006)				During the Recession (2007~2009)				After the Recession (2010~2012)			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
(1) Proportion of Government Grant	1.000				1.000				1.000			
(2) Proportion of Private Donation	0.201***	1.000			0.121***	1.000			0.195***	1.000		
(3) Proportion of Program Service Fee	0.101***	0.077***	1.000		0.086***	0.045***	1.000		0.098***	0.079***	1.000	
(4) Proportion of Investment Income	0.078***	0.060***	0.114***	1.000	0.143***	0.146***	0.399***	1.000	0.198***	0.220***	0.395***	1.000

Note: p<0.01, ** p<0.05, * p<0.1.

Appendix 8: Education Subsector Analysis

(1)				(2)			(3)						
Education All				Other Education except for Higher Ed.			Higher Education Only						
	Model1	Model2	Model3	Model1	Model2	Model3	Model1	Model2	Model3				
Dependent Variable = Revenue Volatility													
Revenue Diversity Index (RDI)	0.0419	0.0767	0.102	0.0262	0.0522	0.0734	0.0583	0.0525	0.0901				
Before the Recession (2004~2006)	(0.094)	(0.095)	(0.101)	(0.126)	(0.129)	(0.137)	(0.117)	(0.118)	(0.119)				
Crisis (dummy variables)													
During the Recession (2007~2009)	2007	0.457*** (0.064)	0.266*** (0.066)	0.302*** (0.085)	0.571*** (0.081)	0.343*** (0.086)	0.393*** (0.106)	0.282*** (0.071)	0.078 (0.075)	-0.0373 (0.102)			
	2008			0.359*** (0.078)			0.438*** (0.109)		0.238*** (0.069)				
	2009			0.583*** (0.128)			0.678*** (0.177)		0.424*** (0.121)				
After the Recession (2010~2012)	2010	-0.203** (0.085)	0.222* (0.125)	0.171 (0.138)	-0.171 (0.114)	0.291 (0.180)	0.243 (0.204)	-0.143 (0.091)	0.237** (0.092)	0.232** (0.110)			
	2011										0.213 (0.142)	0.257 (0.215)	0.385*** (0.116)
	2012												
Interaction = Revenue Diversity Index (RDI) × Crisis (dummy variables)													
During the Recession (2007~2009)	2007	-0.047 (0.097)	-0.040 (0.104)	-0.090 (0.131)	-0.079 (0.129)	-0.044 (0.143)	-0.157 (0.170)	-0.055 (0.109)	0.064 (0.114)	0.306** (0.152)			
	2008			0.270 (0.255)			0.566 (0.380)			-0.146 (0.158)			
	2009			0.024 (0.173)			0.0580 (0.232)			0.089 (0.214)			
After the Recession (2010~2012)	2010	-0.007 (0.112)	-0.077 (0.141)	-0.005 (0.143)	-0.072 (0.144)	-0.130 (0.187)	-0.111 (0.184)	-0.163 (0.119)	-0.148 (0.129)	-0.083 (0.136)			
	2011										0.060	0.047	-0.262**
	2012												

			(0.124)			(0.160)			(0.133)
Constant	4.233*	-3.269	6.432**	4.526	-3.259	6.933	9.978***	4.360	14.58***
	(2.396)	(2.469)	(3.066)	(3.040)	(3.141)	(4.492)	(2.989)	(3.295)	(4.235)
R-square	0.156	0.164	0.166	0.144	0.151	0.154	0.303	0.318	0.323
Observation	19,981			12,376			7,605		

Note: Standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
Models were analyzed using robust standard errors, clustered by organization.
All control variables are included but omitted in the Table.

Appendix 9: Healthcare Subsector Analysis

			(0.093)			(0.156)			(0.130)
Constant	5.144***	2.227	6.775***	2.835	-0.759	4.411*	6.218***	4.269**	6.453*
	(1.806)	(2.317)	(2.121)	(2.864)	(3.688)	(2.519)	(1.817)	(1.869)	(3.741)
R-square	0.110	0.113	0.115	0.124	0.129	0.133	0.159	0.161	0.163
Observation	27,518			11,900			15,618		

Note: Standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
Models were analyzed using robust standard errors, clustered by organization.
All control variables are included but omitted in the Table.

Appendix 10: Public and Social Benefit Subsector Analysis

(1)				(2)			(3)			
All Public and Social Benefit				Excluding Grant-making			Only Grant-making			
	Model1	Model2	Model3	Model1	Model2	Model3	Model1	Model2	Model3	
Dependent Variable = Revenue Volatility										
Revenue Diversity Index (RDI)	-0.357*	-0.301	-0.280	-0.258	-0.258	-0.173	-0.256	-0.120	-0.176	
Before the Recession (2004~2006)	(0.201)	(0.202)	(0.212)	(0.255)	(0.255)	(0.270)	(0.295)	(0.297)	(0.311)	
Crisis (dummy variables)										
During the Recession (2007~2009)	2007	1.068*** (0.142)	0.851*** (0.145)	0.748*** (0.159)	0.453** (0.193)	0.416** (0.189)	0.479** (0.210)	1.157*** (0.174)	0.929*** (0.236)	
	2008			1.101*** (0.195)			0.849*** (0.233)		0.928*** (0.191)	0.890*** (0.261)
	2009			1.791*** (0.316)			0.592 (0.362)		1.901*** (0.408)	
After the Recession (2010~2012)	2010	-0.473** (0.184)	0.515* (0.283)	0.199 (0.281)	0.153 (0.265)	0.486 (0.395)	0.754* (0.447)	-0.756*** (0.243)	0.173 (0.365)	
	2011								0.403 (0.335)	-0.0348 (0.370)
	2012									0.112 (0.448)
Interaction = Revenue Diversity Index (RDI) × Crisis (dummy variables)										
During the Recession (2007~2009)	2007	-0.107 (0.204)	-0.594** (0.252)	-0.224 (0.295)	-0.184 (0.253)	-0.279 (0.267)	-0.242 (0.350)	0.478 (0.299)	-0.228 (0.371)	-0.106 (0.481)
	2008			-0.738** (0.325)			-0.486 (0.353)		-0.305 (0.473)	
	2009			-0.963** (0.416)			-0.007 (0.398)		-0.550 (0.592)	
After the Recession (2010~2012)	2010	0.408* (0.220)	0.084 (0.292)	0.594** (0.272)	-0.0439 (0.310)	-0.341 (0.433)	0.129 (0.395)	1.005*** (0.323)	0.884** (0.392)	
	2011								1.035*** (0.398)	

	2012			0.623** (0.270)			0.065 (0.340)			1.161*** (0.411)
Constant		-1.133 (4.949)	-12.80** (5.479)	4.399 (8.797)	-6.157 (6.469)	-7.982 (6.988)	-6.987 (12.351)	13.05** (5.794)	-5.406 (6.701)	21.43*** (8.286)
R-square		0.057	0.072	0.077	0.049	0.050	0.053	0.257	0.277	0.281
Observation		8,103			3,643			4,460		

Note: Standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
Models were analyzed using robust standard errors, clustered by organization.
All control variables are included but omitted in the Table.

Appendix 11: Different Period Time (2008 to 2009) Frame Subsector Analysis

	(1) Art & Culture			(2) Education			(3) Healthcare		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Before the Recession (2004~2007)	-0.866*** (0.273)	-0.802*** (0.277)	-0.850*** (0.268)	0.137 (0.092)	0.111 (0.093)	0.082 (0.093)	-0.077 (0.078)	-0.078 (0.078)	-0.089 (0.078)

Crisis (dummy variables)

During the Recession (2008~2009)	2008			-0.564** (0.223)			0.090 (0.066)		0.034 (0.031)
	2009		-0.292 (0.228)	-0.416 (0.539)	0.333*** (0.061)	0.159** (0.064)	0.225* (0.115)	0.060* (0.031)	0.108* (0.057)
After the Recession (2010~2012)	2010	-0.184 (0.191)		-1.658*** (0.440)			-0.216** (0.107)	0.185*** (0.030)	-0.107* (0.064)
	2011		-1.507*** (0.290)	-2.151*** (0.461)		-0.276*** (0.085)	-0.345*** (0.116)	-0.170*** (0.052)	-0.220*** (0.068)
	2012			-2.397*** (0.566)			-0.383*** (0.116)		-0.130* (0.073)

Interaction = Revenue Diversity Index (RDI) × Crisis (dummy variables)

During the Recession (2008~2009)	2008			0.460 (0.320)		0.182 (0.126)	0.292 (0.252)		0.306** (0.121)
	2009		0.109 (0.302)	-0.304 (0.535)			0.048 (0.166)	0.286*** (0.091)	0.241** (0.111)
After the Recession (2010~2012)	2010	0.430* (0.225)		0.340 (0.270)	0.077 (0.096)		-0.054 (0.134)	0.040 (0.067)	-0.084 (0.092)
	2011		0.606** (0.235)	0.765** (0.306)		0.015 (0.102)	0.018 (0.135)	-0.075 (0.073)	-0.055 (0.089)
	2012			0.726** (0.339)			0.083 (0.115)		-0.083 (0.090)
_cons		37.391** (16.697)	16.477 (15.104)	7.555 (11.785)	12.098*** (2.604)	1.549 (2.787)	2.692 (3.015)	7.178*** (1.326)	2.838 (1.982)
R-sq		0.267	0.278	0.281	0.152	0.163	0.164	0.105	0.112
Observation		5,641			19,981			27,518	

		(4) Human service			(5) Public & Social Benefits		
		Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Dependent Variable = Revenue Volatility							
Before the Recession (2004~2007)		-0.103	-0.101	-0.086	-0.310	-0.270	-0.327
		(0.084)	(0.084)	(0.085)	(0.198)	(0.198)	(0.201)
Crisis (dummy variables)							
During the Recession (2008~2009)	2008	0.071* (0.043)	-0.004 (0.045)	0.026 (0.047)	0.706*** (0.143)	0.644*** (0.156)	0.415** (0.166)
	2009			-0.070 (0.067)			0.887*** (0.298)
After the Recession (2010~2012)	2010		-0.285*** (0.067)	-0.948*** (0.188)		-0.593** (0.263)	
	2011		-0.346*** (0.080)			-1.109*** (0.268)	
	2012		-0.213** (0.087)			-1.109*** (0.318)	
Interaction = Revenue Diversity Index (RDI) × Crisis (dummy variables)							
During the Recession (2008~2009)	2008	0.078 (0.072)	0.099 (0.083)	0.042 (0.096)	0.003 (0.202)	-0.738*** (0.281)	-0.685** (0.306)
	2009			0.177 (0.108)			-0.911** (0.401)
After the Recession (2010~2012)	2010		0.086 (0.082)	0.185* (0.098)		0.436** (0.213)	0.136 (0.283)
	2011			0.053 (0.101)			0.646** (0.268)
		2012		0.000 (0.105)	0.677** (0.263)		
_cons		7.712*** (1.730)		4.387*** (1.471)	3.562** (1.659)		9.908** (4.994)
R-sq		0.086	0.089	0.090	0.045	0.069	0.072
Observation		22,435			8,103		

Note: Standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
Models ere analyzed using robust standard errors, clustered by organization.
All control variables are included but omitted in the Table.