

FINANCIAL INDICATORS OF BANKRUPTCY RISK IN LOCAL GOVERNMENT
ENTITIES

by

Beth Parker Seymour

Dissertation

Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Business Administration

Liberty University, School of Business

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Abstract

The efficiency and stability of a local government can impact the lifestyle of its citizens. While Chapter 9 bankruptcies are not common, when they do occur, they can be disruptive and extremely costly. Scholarly literature on bankruptcy prediction focuses primarily on corporate bankruptcies. Therefore, a gap exists regarding predictors specific to municipal bankruptcies. This non-experimental quantitative study examined the relationship between the financial indicators of those government entities that have declared bankruptcy as compared to financial indicators from similar government entities that have not declared bankruptcy in order to identify possible predictors of bankruptcy. The analysis established that two financial ratios were successful as predictors for bankruptcy. These two predictors are the net asset ratio and the operating ratio. These ratios may be used by local government officials as early indicators of potential problems. In addition, potential lenders may use these ratios to help measure the solvency and stability of local government entities (LGEs). Lastly, the ratios may be used by citizens to better understand and become involved in local government decision making.

Keywords: bankruptcy, municipality, financial distress, financial ratios, state involvement, accountability, agency

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Approvals

_____	_____
Beth P. Seymour, Doctoral Candidate	Date

_____	_____
Dr. John R. Kuhn, Dissertation Chair	Date

_____	_____
Dr. James G. Ibe, Committee Member	Date

_____	_____
Dr. Edward M. Moore, Ph.D., Director of Doctoral Programs	Date

Dedication

To Ruth M. Parker, who gave me the gift of loving to learn. To my grandsons: Caleb, Ryan, Kane, Jake, and Luke. I hope to pass this gift on to you.

Acknowledgments

Thank you to my chair, Dr. John Kuhn for your support and guidance throughout this process. Thank you to Dr. Nicole Lowes and the administrative team for your helpful reviews and encouraging feedback. Thank you to my husband, David, who has supported me unfailingly and been my rock. Thank you to Dr. Michaelia Black for your support from day one in the first course to the final finished product. You are a wonderful example of a true friend. Finally, thank you to Dr. Amy Seymour for sharing your knowledge and expertise in statistical analysis. I am truly grateful to each of you.

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Section 1: Foundation of the Study

In the current economic environment, many municipalities have experienced financial distress. During a period where tax revenues have declined, the financial and service demands on local governments remain strong. If not properly addressed, this combination of factors can lead to the filing of bankruptcy by the municipalities. However, early detection of the likelihood of bankruptcy provides more time to address and possibly correct problems that could lead to bankruptcy.

This quantitative, non-experimental study was designed to identify possible predictors of bankruptcy filing within local government entities. Financial ratios taken from audited financial statements were used to compare local government entities that had filed bankruptcy to matching entities that had not filed for bankruptcy. Ratios were selected for analysis to address the liquidity, solvency, and profitability of the entities.

Background of the Problem

The provision for bankruptcy exists to give an organization time to reorganize and survive. If this is not possible, the organization is liquidated, and the assets are sold to pay creditors. In the past 40 years, over 1.8 million bankruptcy cases have been filed in the United States by businesses (Bernstein et al., 2019). Business organizations that are in financial distress may opt to file bankruptcy under Chapter 11 of the United States Bankruptcy Code. This provision allows for the reorganization of the business if this can be determined to be in the creditors' best interests. If not, the organization is liquidated and the net assets are sold to benefit creditors under Chapter 7 of the Code (Jaggia & Thosar, 2019; United States Courts, 2020).

Unlike corporations, municipalities do not have the option to turn to these chapters. Instead, their option is the lesser-used Chapter 9 in the Bankruptcy Code (Jones Day, 2010). The

Chapter 9 bankruptcy provision exists to provide protection to municipalities while they create a plan to restructure their debt (United States Bankruptcy Code, 2020). The sale of assets may not be forced by the courts, rather the role of the court is to approve or reject the municipalities' restructuring plan (Gramlich, 2011).

Since 1980, Chapter 9 has been used by municipalities 311 times. Special-purpose governments such as utility districts filed 181 of the 311 cases. General-purpose governments such as cities and counties make up 54 of the 311 cases. Hospitals, school boards, and other municipal authorities filed the remaining 76 cases (Spiotto, 2018). Some of the high-profile municipalities to use the Chapter 9 provision in recent years include Jefferson County, Alabama; Stockton, California; and Detroit, Michigan (O'Neill, 2020; Spiotto, 2018).

Much research has been done to predict the bankruptcy of corporations. Alaminos et al. (2016) analyzed 10 common financial variables used in bankruptcy prediction, which focused on profitability, debt, liquidity, and efficiency. Barboza et al. (2017) evaluated 11 predictive variables, of which four were used by Alaminos et al. (2016). When financial and corporate governance indicators were studied in conjunction, the results showed that solvency and profitability measures had the highest predictive qualities (Liang et al., 2016). While some of these indicators may apply to municipalities, others are not applicable. For example, those indicators focused on sales would not be applicable to predicting a municipal bankruptcy. This is because the primary revenue source for municipalities is not sales but taxes.

In addition to the indicators common to corporate bankruptcy prediction, other indicators may have a high impact on the likelihood of a municipal bankruptcy. For example, state and local governments still commonly use defined benefit pension plans. These plans place the risk of market losses on the governments. To help alleviate this risk, actuaries calculate the amount

municipalities should contribute to the pension trust fund each year. However, many governments regularly fund less than this actuarially determined amount. The degree of pension plan underfunding is often significant. While some plans are adequately funded, such as the Nebraska Schools plan with a funding percentage of 91% in 2019; others are well below the 80% common threshold of sustainability (Barth et al., 2018), such as the Chicago Police plan at 21% in 2019 (Public Plans Data, 2020). This severe underfunding of pensions was one of the factors that led to the bankruptcy of Detroit, Michigan (Jackson & Leary, 2016).

Scholarly literature on bankruptcy prediction focuses primarily on corporate bankruptcies. While there is research on municipal pension funding, the focus is on the pension funds themselves and the beneficiaries, rather than the government entities (Barth et al., 2018). Therefore, a gap exists regarding predictors specific to municipal bankruptcies.

Problem Statement

The general problem addressed by this study is the lack of financial indicators that can predict the bankruptcy of local government entities resulting in the inability of leaders to take corrective and timely action to prevent insolvency. While examining various potential predictors for financial crises at the state level, Mitchell and Stansel (2016) confirmed the lack of uniform indicators of governmental financial stress. The fiscal decline of Cleveland, Ohio, in the early 1970s highlighted the need to study factors contributing to potential local government bankruptcies (Deal, 2007). More recently, the lack of early detection of fiscal distress for the city of Detroit allowed the problem to build to a point that bankruptcy was the only option remaining (Jackson & Leary, 2016). In the search to predict municipal financial distress, Dove (2016) imposed binding financial constraints and measured the effect on the likelihood of financial

distress for municipalities in the late 19th century. This research highlighted the need for further research to examine these indicators in modern government practices.

The specific problem addressed in the study is the lack of financial indicators that can predict the bankruptcy of local government entities within the states that allow bankruptcy protection, resulting in the inability of leaders to take corrective and timely action to prevent insolvency. Of the 50 states, 27 have authorized municipal bankruptcies within their borders (Spiotto, 2018). Authorizations range from a general authorization for all taxing agencies or districts in Arkansas to conditional authorization requiring the written consent of the governor in Connecticut (K & L Gates, 2015).

Purpose Statement

The purpose of this non-experimental quantitative study was to examine the relationship between the financial indicators of those government entities that have declared bankruptcy as compared to financial indicators from similar government entities that have not declared bankruptcy in order to identify possible predictors of bankruptcy. Prior research has evaluated various financial indicators and models for predicting bankruptcy in corporations (Alaminos et al., 2016). This research adds to the body of knowledge through the identification of financial indicators that can predict the likelihood of financial distress and probable bankruptcy in local governments. Since 1980, there have been 311 Chapter 9 bankruptcy filings (Spiotto, 2018). Although rare compared to the number of corporate bankruptcies, Chapter 9 bankruptcy cases may involve the re-negotiation of millions of dollars of municipal debt and adversely affect the residents of these local governmental entities (United States Courts, 2020). This research provides local government leaders with additional tools to predict and possibly preempt bankruptcy.

Nature of Study

The nature of this study uses a quantitative, non-experimental, logistic regression design. This design was selected to identify which financial indicators are able to predict bankruptcy in local governmental entities. The independent variables were selected from the financial indicators found to predict bankruptcy in for-profit companies found in the current literature, which were relevant to governmental entities. In addition, financial indicators specific to municipalities were included as additional independent variables.

Discussion of Method

The quantitative method of research uses statistical techniques, measurements, and analysis to investigate relationships and generalize to a larger population (Halcomb, 2018; Liberty University, 2020). The quantitative method was chosen because the analysis was designed to identify the relationship between the independent variables, financial indicators, and the dependent variable, the likelihood of bankruptcy in municipalities (Morgan et al., 2013). Alternatively, the qualitative method considers primarily human perception and addresses the questions of how and why things work (Stake, 2010). This method was not appropriate for this study because the research does not rely on human perception, nor does it attempt to explain how or why.

Discussion of Design

Quantitative methods may be either experimental or non-experimental. Experimental design tests hypotheses by studying subjects before and after intervention to test for a cause-and-effect relationship. Variations of this experimental design include true experiments, quasi-experiments, and single subject experiments (Creswell, 2014). The experimental design was not selected for this study since no intervention was involved. In addition, the purpose of this

research was to discover a relationship between the independent variables and the likelihood of bankruptcy, rather than a cause-and-effect relationship.

Non-experimental designs consider independent variables that are not altered during the study. These variables have attributes that existed before the study and are not changed. This design is used to look for correlations between the dependent and independent variables (Morgan et al., 2013). Therefore, the quantitative non-experimental design was appropriate for this study since the purpose was to uncover relationships between independent variables and the filing of Chapter 9 bankruptcy.

The logistic regression design was appropriate for this study because it is used for predicting a dependent dichotomous variable from two or more independent variables (Morgan et al., 2013). This study sought to predict the filing of Chapter 9 bankruptcy, the dichotomous dependent variable, in relation to multiple independent variables.

Other multivariate correlational designs considered but not selected are multiple regression and discriminant analysis. The multiple regression design is used when the dependent variable can be explained in a normal or continuous scale (Gall et al., 2010). This was not chosen in this study because the dependent variable in this study is dichotomous, either the municipality did or did not file for bankruptcy. The discriminant analysis design is appropriate when the dependent variable is dichotomous, and the independent variables are normal or continuous. This is not appropriate for this study because some of the independent variables were nominal (Morgan et al., 2013).

Summary of the Nature of the Study

As previously discussed, this study used the quantitative method of research. This study sought to explore the relationships among variables without intervention, thus a non-

experimental design was chosen. This research was designed to determine if a statistically significant relationship exists between selected financial indicators and the likelihood of municipal bankruptcy.

Research Question

This study examined the correlation between financial indicators and the likelihood of bankruptcy in local government entities. Prior research has shown that various financial indicators predict bankruptcy in for-profit companies (Alaminos et al., 2016). In order to determine if there are financial indicators for local government entities, the following research question was developed:

RQ1. To what extent can financial indicators predict the bankruptcy of a local government entity?

Hypothesis

H₀

There is not a statistically significant relationship between selected financial indicators and the likelihood of bankruptcy by a local government entity.

H₁

There is a statistically significant relationship between selected financial indicators and the likelihood of bankruptcy by a local government entity.

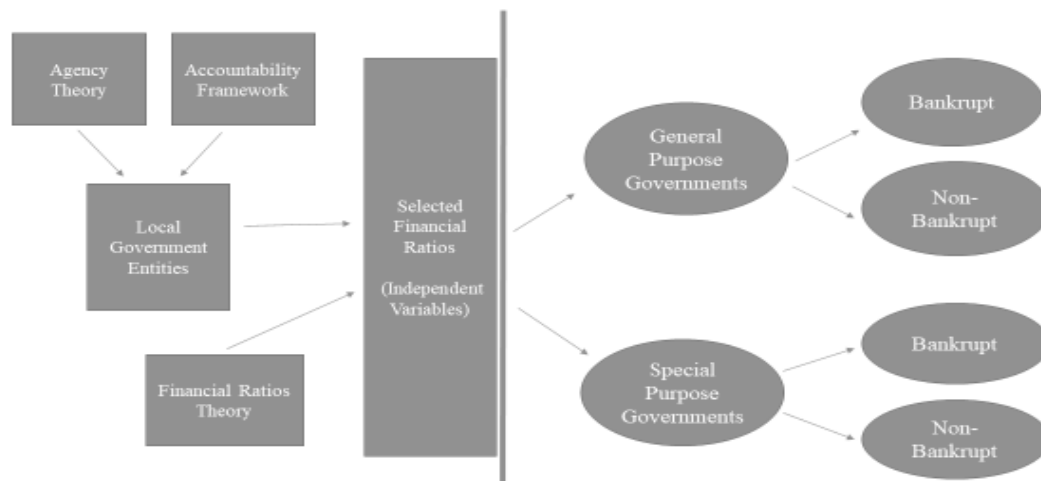
Theoretical Framework

The theoretical framework for this study was based on three theories: the agency theory, the accountability framework, and the financial ratio theory. The first two theories provide the rationale for governmental accounting and explain how and why it differs from corporate for-profit accounting (Governmental Accounting Standards Board, 2017; Mohr, 2017). The financial

ratio theory describes how accounting data from financial statements has predictive value regarding an entity's financial position and that financial ratios taken from that data may be used to predict the likelihood of financial distress or failure (Altman, 1968; Beaver, 1966).

Figure 1

Theoretical Framework



Discussion of Agency Theory

The agency theory addresses a situation where one person or group (principal) engages someone else (agent) to act on their behalf. The agent has an obligation to consider the best interests of the principal. However, if the interests of the agent conflicts with the interests of the principal, the agent may not honor that obligation (Pepper, 2019). This theory has long been associated with business entities since corporate shareholders (principals) often hire managers (agents) to run their companies.

However, this theory has an application in government as well (Mohr, 2017). When governmental leaders are elected, there is an inherent expectation that they will represent the citizens that elected them. In addition, citizens support the government primarily through

involuntary taxes. Therefore, citizens are funding a government and in many cases, they must count on their representative to speak for them (Patton et al., 2019). Like managers in a business that do not consider shareholders' best interests, leaders that do not consider the best interests of the citizens violate a trust. When this happens, agency costs borne by the citizens result (Pepper, 2019).

The accounting profession has a responsibility to prepare objective, transparent, and reliable financial statements for government entities in accordance with generally accepted accounting principles (GAAP). These financial statements include an approved budget and any variances that have occurred over the reporting period. This process of accountability to the citizens is one of the primary ways of assuring an alignment between the citizens and those they elect (Patton et al., 2019).

Discussion of Accountability Framework

The concept of accountability is the framework on which governmental accounting is based. At its most basic form, accountability is “the obligation to explain and justify conduct” (Bovens, 2007, p. 450). While corporate and governmental accounting have many things in common, the idea of ownership is a fundamental difference. In the corporate environment, revenues are generated primarily by exchange transactions and shareholders own the company. Success is often measured by these owners as profitability. In the governmental environment, revenues are generated primarily by non-exchange transactions such as tax levies and the entities have no owners. The primary stakeholders are the taxpayers and accountability is necessary to evaluate the success of the governmental leadership (Patton et al., 2019).

Accountability, as applied to governmental accounting, requires governmental leaders to provide transparent and relevant information to the stakeholders in a timely manner. This

information is often presented in published financial statements and meets the citizens' right to know the source of revenues and how those revenues were spent (Governmental Accounting Standards Board, 2017). Accountability also requires that the stakeholders are able to evaluate and question the content of the statements (Bovens & Wille, 2020).

Discussion of Financial Ratio Theory

In the 1960's, Beaver (1966) proposed that accounting data taken from financial statements could be used to predict the failure of companies. Financial ratios were used to represent this accounting data. This univariate study was specifically designed to measure the predictive ability of selected ratios. This research examined the predictive ability of 30 ratios and found that net income to total debt predicted financial failure 92% of the time at a point one year before failure (Bellovary et al., 2007).

Building on the success of Beaver, Altman (1968) measured the success of financial ratio prediction using multiple discriminant analysis. This method allowed for the assessment of five variables and the interactions between them. Predictions of bankruptcy were made using data from one to five years prior to failure. Predictive accuracy at one year was 95% and declined in years two through five (Altman, 1968; Bellovary et al., 2007).

Since these early studies, much research has been done to predict bankruptcy using financial ratios. Some researchers focused on particular industries such as manufacturing firms or banks. Other research was more general. The number of independent variables, financial ratios, used ranged from one to 57 (Bellovary et al., 2007). Additional methods used include logit analysis, probit analysis, neural networking, logistic regression, and partial least squares logistic regression (Bellovary et al., 2007; Jabeur, 2017). In spite of the fact that some research

has begun to include governance indicators, financial ratios as still considered primary predictors of bankruptcy (Liang et al., 2016).

Discussion of Relationships between Theories and Variables

The agency theory and accountability concept are the frameworks by which municipalities operate. Elected or appointed leaders serve the citizens as their agents. They do this by following the laws and adhering to the budget. The results of those efforts are published in financial statements for the citizens to evaluate.

From the accounting data in the financial statements, financial ratios are calculated. These ratios are indicators of the financial health or financial distress of the entity (Lin et al., 2018). Based on this financial ratio concept, selected ratios from municipalities should be able to offer insight into the financial health or distress of a local government entity.

Summary of the Theoretical Framework

This study was based on three theoretical frameworks. The agency theory and the accountability framework are the overarching principles behind local government. Citizens elect or appoint leaders to carry out their collective wishes. Published financial statements reveal to the citizens the degree to which the leaders succeeded. Financial ratios, taken from these statements, reveal the financial stability or instability of the entity, which is predictive of the likelihood of success or failure.

Definition of Terms

Definitions of terms used in this study are listed below to provide clarity in how they are used.

Accountability Framework. In general, accountability is the obligation to explain one's actions to others in a relationship (Bovens, 2007). In the context of government accounting, this

includes the preparation of publicly available financial statements that are transparent, reliable, and relevant (Governmental Accounting Standards Board, 2017).

Agency Costs. Costs that arise when agents seek their own benefits rather than the best interests of those that hired them (Pepper, 2019).

Agency Theory. Agency theory addresses the relationship between a principal and the principal's agent, when the two may have separate motivations and self-interests (Panda & Leepsa, 2017).

Chapter 9. For this study, Chapter 9 refers to the chapter in the United States Bankruptcy Code that applies to municipal bankruptcies (United States Bankruptcy Code, 2020).

Component Unit. This is a legally separate governmental unit. Officials of a primary government are financially responsible for component units (Patton et al., 2019).

Comprehensive Annual Financial Report. This report is a collection of financial data prepared annually by state and local governments. It includes audited financial statements, management's discussion and analysis, and additional statistical information (Patton et al., 2019).

Default. In the context of governments, default is the failure to pay an obligation (Chaudhury et al., 2019).

Defined Benefit Plan. A pension plan for employees where specific benefits are promised at retirement. The employer bears the risk associated with underfunding (Barth et al., 2018).

Defined Contribution Plan. A pension plan for employees where specific contributions are made during employment. The employee bears the risk associated with underfunding (Barth et al., 2018).

Exchange Transaction. This type of transaction involves the giving of goods or services with a corresponding and proportionate return (Granof et al., 2016).

General-Purpose Government. A government entity that is defined by a geographic location, such as a city, town, county, or village is a general-purpose government (Granof et al., 2016).

Infrastructure. Stationary capital assets that can be preserved to provide service for an extended time. Examples of infrastructure are bridges, railroads, wastewater treatment plants, and highways (Patton et al., 2019).

Insolvency. The narrow definition of insolvency is the inability to pay debts in a timely manner (United States Bankruptcy Code, 2020). However, since 2013, courts have been taking the broader view of insolvency to include the inability to provide necessary services (Chaudhury et al., 2019).

Inter-period Equity. This concept requires that revenues for a certain period be sufficient to cover the services provided in that period (Governmental Accounting Standards Board, 2017; Patton et al., 2019).

Municipality. Section 101(40) of the United States Bankruptcy Code (2020) defines a municipality as a: "political subdivision or public agency or instrumentality of a state." This includes the general-purpose entities such as cities, towns, and villages, as well as special-purpose entities such as utility districts, hospitals, school districts, sanitary districts, and highway authorities (Jones Day, 2010; Veis, 2019).

Non-Exchange Transaction. This type of transaction involves the giving of goods or services without a corresponding and proportionate return (Granof et al., 2016).

Primary Government. General-purpose governments are primary governments. In addition, legally separate and fiscally independent special-purpose governments are also primary governments. Primary governments exclude component units (Patton et al., 2019).

Special-Purpose Government. A government entity that is defined by a specific purpose, rather than a geographic area. Examples include a utility district, school district, or highway authority (Granof et al., 2016; Veis, 2019).

Assumptions, Limitations, Delimitations

The assumptions, limitations, and delimitations of the study are discussed below. These provide information regarding any assumptions made, the limitations of the study, and the scope of the study.

Assumptions

Assumptions are unverified facts that are believed to be correct (Liberty, 2020). The lack of verification may pose a possible risk to accuracy. The financial data used in this study was obtained from the Comprehensive Annual Financial Report of each of the selected municipalities when available. If this report was not available, audited financial statements were used. This information is assumed to be accurate and complete. The Comprehensive Annual Financial Reports and financial statements are audited by independent organizations. This is generally an independent CPA firm. However, occasionally, the auditing body is an agent of the respective state government. These independent audits minimize the risk of inaccurate or incomplete information.

In addition, it is assumed that the filing of Chapter 9 is undesirable and should be used only as a last resort. While there are times that this act can provide relief from debtors, it is preferable that financial stress be addressed and remedied without resorting to bankruptcy

(Buccola, 2019; Spiotto, 2012). Therefore, local government leaders will benefit from predictors to bankruptcy.

Lastly, it is assumed that municipal bond financing and defined benefit pension plans are common to most municipalities (Adelino et al., 2017; Chen, 2018). Bondholders and pensioners are two of the primary parties with claims to municipal funds. Much of the bankruptcy negotiations revolve around these two groups (Dick, 2018).

Limitations

Limitations refer to restrictions in a study that could restrict its generalization (Morgan et al., 2013). A limitation of this study is that data from only one year prior to bankruptcy will be analyzed. If several years prior to bankruptcy were considered, it is possible that trend implications would be available. However, this limitation is minimized by the fact that prior research has shown that financial ratios' predictive ability is most accurate at one year prior to bankruptcy and decreases with each additional year out from failure (Acosta-Gonzalez et al., 2019; Bellovary et al., 2007; Jabeur, 2017).

The occurrence of natural disasters or wide-spread economic events such as pandemics, weather related incidents, or severe supply shortages could limit generalization of the results of this study. This type of event could cause or accelerate the need to file for bankruptcy (Maher et al., 2020). The existence of federal and state aid for municipalities that experience these events helps to minimize this limitation.

Delimitations

Delimitations refer to the scope or relevant range of research (Liberty, 2020; Warren et al., 2020). The sample of this study was limited to municipalities within states that allow bankruptcy protection for their municipalities. This includes 12 states that give specific

authorization, 12 additional states that give conditional authorization, and three states that provide limited authorization (Spiotto et al., 2016). Therefore, states that prohibit Chapter 9 filing or do not provide authorization have been excluded.

A further delimitation of this study is that only financial indicators were evaluated for predictive ability. There may be other external variables that could project the likelihood of bankruptcy. For example, the probability of financial distress might be inferred from certain governance or economic factors. These factors were not considered in this study, thus limiting the scope of the research.

Significance of the Study

The declaration of bankruptcy by a municipality is usually an act of last resort (Spiotto et al., 2016). Common results of financial stress and the resulting declaration of bankruptcy include credit rating downgrade, higher cost of borrowing, loss of image, exodus of residents and businesses, higher taxes, loss of services, loss of jobs, and decreased maintenance on infrastructure (Gramlich, 2011; MacKay, 2017). Early action by a municipality could be the key to avoid bankruptcy. Jackson and Leary (2016) pointed out that the lack of early detection of fiscal distress for the city of Detroit allowed the problem to build to a point where bankruptcy was the only option remaining. The identification of financial ratios which predict severe financial distress and possible bankruptcy could provide a tool for government leaders to detect problems early enough to prevent bankruptcy.

Reduction of Gaps

There is a gap in the current literature regarding predictors of bankruptcy for municipalities. Scholarly research pertaining to predictors of bankruptcy focuses primarily on corporate entities (Alaminos et al., 2016; Barboza et al., 2017; Bellovary et al., 2007; Lin et al.,

2018; Succurro et al., 2019). Research focused on forecasting for municipalities has targeted specific revenue streams (Kovari, 2020; Williams & Kavanagh, 2016), cash flows (Iskandar et al., 2018), and procurement irregularities (Sun & Sales, 2018). This study has expanded upon the prior research to fulfill a gap in the literature by identifying potential financial predictors of bankruptcy for municipalities.

Implications for Biblical Integration

God has given us His Word to provide His guidance and instruction in our daily lives. One of the common themes throughout His Word is stewardship. We are to be good stewards of the resources in our lives. Stewardship is closely aligned with the two primary frameworks of this study: accountability and agency.

In the book of Matthew, Jesus relates the parable of the talents. A man, about to travel, distributed his gold to three of his servants. One received five bags of gold, one received two bags of gold and the last received one bag of gold. Upon the man's return, he called the servants to account for how they handled the gold. The first two servants had invested their employer's gold and doubled the amount they had been allotted. Pleased with this behavior, the man rewarded them by giving them more authority. However, the servant who had received one bag of gold had hidden the money in a hole in the ground. Angered with this behavior, the man took the one bag away from him and gave it to the first servant who had been wise (Matthew 25:14-28, NIV).

In this parable, the man held his servants accountable for their actions. The faithful servants were rewarded, and the unfaithful servant lost all responsibility. David echoes this in the book of Psalms: "Give them according to the work of their hands; render to them what they deserve" (Psalm 28:4, NKJV). In the New Testament, the apostle Paul states, "The sullen servant

who does shoddy work will be held responsible” (Colossians 3:25, MSG). Scripture clearly supports accountability for actions.

This parable also demonstrates the agency theory. The gold that these servants were investing was not their own. It belonged to their employer. His expectation was that they would invest the gold in order to promote his best interests. Jesus repeats this principle in the book of Luke: “And if you have not been faithful in what is another man’s, who will give you what is your own?” (Luke 16:12, NKJV).

In a democracy, citizens expect leaders to be accountable for their actions. This is often accomplished through audited financial statements, which include a comparison of actual revenues and expenditures to budgeted revenues and expenditures. In addition, leaders should act in the best interests of those who elected them as opposed to their own best interests. As those men and women who are gifted with the ability to lead embrace accountability and the obligation to serve others, great things can be accomplished in local governments.

Benefit to Business Practice and Relationship to Cognate

The field of accounting is central to the prediction of bankruptcy by financial ratios. Accountants prepare objective and transparent financial statements to inform stakeholders of the financial condition of an entity (Warren et al., 2020). The ratios are a by-product of the underlying accounting data gathered by accountants into financial statements (Beaver, 1966).

More specifically, government accountants prepare governmental financial statements in accordance with the Governmental Accounting Standards Board (GASB). These statements are tailored to meet the specific needs of the governmental stakeholders. In addition, many municipalities provide additional information to the public in the form of a Comprehensive Annual Financial Report. Through the information provided in this report, stakeholders should

be able to evaluate the government's overall financial condition, accountability to the budget, and effectiveness of service efforts (Patton et al., 2019). The validity and predictability of ratios derived from these statements is entirely dependent upon the accuracy of the financial statements.

Summary of Significance of the Study

This study was designed to identify financial ratios, taken from government financial statements, which have predictive ability regarding financial distress and bankruptcy. There is currently a lack of research in predictive measures for bankruptcy in municipalities. The identification of these ratios may be used by government leaders, auditors, lenders, and other stakeholders to detect problems early enough to correct them.

A Review of the Professional and Academic Literature

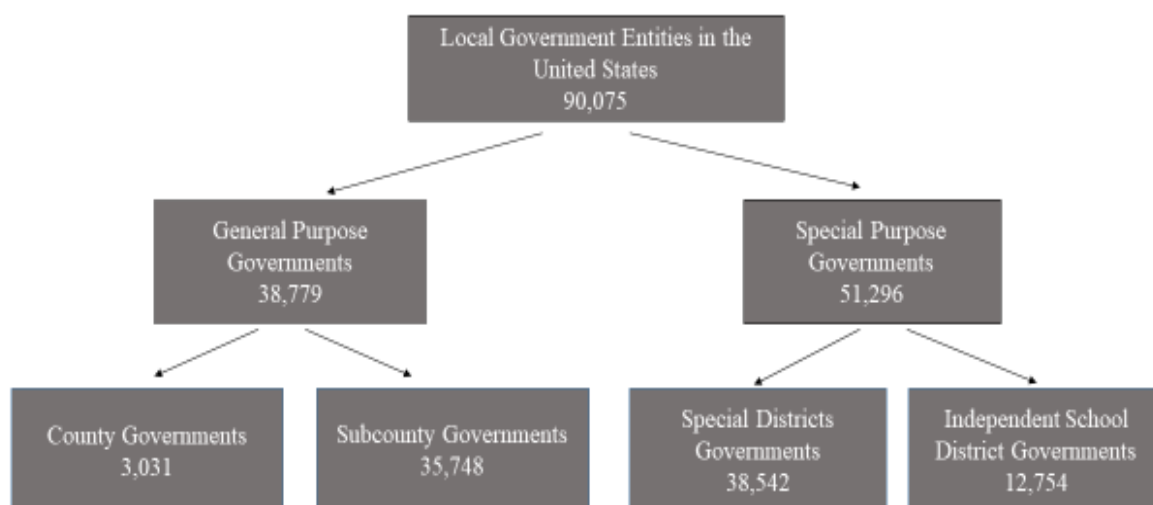
From the earliest days of this country's existence, certain rights and responsibilities have been reserved for the state and local governments. Among those is the right to issue debt. George Washington and Alexander Hamilton were among those who believed that the repayment of state and local debt reflected on the reputation of the nation (Spiotto, 2012). Therefore, it was imperative that these governments not default of their debt.

However, since the early years of the United States, many factors have stressed the finances of local governments. Nationwide or regional economic downturns, such as the great recession of 2008, have weakened the financial base of many local businesses or residents (Hendrick & Degnan, 2020). This weakening often results in a decrease in tax revenue for state and local governments (Adelino et al., 2017; Chernick & Reschovsky, 2017). Demographic changes, such as those that occurred in the city of Detroit, Michigan, may lower the primary revenue sources and discourage new sources (Jackson & Leary, 2016; Maher et al., 2020).

Unexpected events such as natural disasters, pandemics, or major plant closures may push local governments into an unsustainable position (Dzigbede et al., 2020; Zender & Deal, 2016).

Investment losses, as those experienced in Orange County, California, in 1994, may be unrecoverable. Financial pressure at the national and state levels may result in less funding available to local government entities in the form of grants (MacKay, 2017; Trussel & Patrick, 2018). Finally, mismanagement by local officials may be the cause of fiscal stress in local governments (Maher et al., 2020; Zender & Deal, 2016).

The Federal Bankruptcy Code defines the term *municipality* as a "political subdivision or public agency or instrumentality of a State" (United States Bankruptcy Code, 2020; Yang, 2019c). Per the 2017 U.S. Census, there are over 90,000 local government entities or municipalities in the United States (see Figure 2). Many of these municipalities are general-purpose districts such as counties, cities, villages, and townships. The remainder are special-purpose districts such as utility districts, libraries, and school districts (Dick, 2018; O'Neill, 2020; United States Census Bureau, 2020).

Figure 2*Local Government Entities in the United States 2017*

Note. Adapted from “Local Governments by Type and State: 2017,” by U.S. Census Bureau, 2020.

Ideally, local governments maintain revenue levels equal to or above expenditure levels. The primary revenue stream for local governments is property tax (S. Kim et al., 2020; Patton et al., 2019). Other revenue streams include sales taxes, charges for services, federal and state grants, contributions, interest income, forfeitures, and fines (Patton et al., 2019; Park, 2017; Su, 2020). These revenues serve to pay for the needs of the communities such as education, roads, utilities, police and fire protection, libraries, and health care (Giblin & Nowacki, 2018; Government Accountability Office, 2019; Mahdavi & Westerlund, 2017).

When revenue levels fall below expenditures, fiscal stress may result (Gorina et al., 2018). If this condition is not corrected, municipal leaders in many states may choose to declare Chapter 9 bankruptcy. Between 2001 and 2017, 123 local government entities have filed for Chapter 9 relief (Murphy & Cook, 2018). These municipalities vary in type and size (see Table 1).

Table 1*Number of Bankruptcies Filed Since 2001*

Type of Entity	Number of Bankruptcies Filed Since 2001
General Purpose	31
Special Purpose – Health Care	32
Special Purpose – Other than Health Care	60
Total	123

Note. Adapted from “Local Governments Rarely File for Bankruptcy,” by Murphy & Cook, 2018.

The Chapter 9 filings that have received the most attention have been large general-purpose governments (Maher et al., 2020). Most of these have been large cities or counties that became financially insolvent. These bankruptcy filings affected thousands of stakeholders. Three of the most significant Chapter 9 filings in recent history are the city of Detroit, Michigan (Jackson & Leary, 2016); Jefferson County, Alabama (Deal, 2007); and San Bernardino, California (Maher et al., 2020).

Detroit, Michigan, filed for Chapter 9 bankruptcy in the summer of 2013. Considering the obvious downward economic trends of the city over the past 20 years, this was a logical next step. By 2013, Detroit had experienced a severe population decline, an increase in crime and unemployment, inadequate public services, and poorly maintained infrastructure. Pension obligations were severely underfunded and total debt was \$18 billion (Jackson & Leary, 2016). While not surprising, this bankruptcy captured the attention of the country as the largest municipality to file for bankruptcy to date (Leary & Jackson, 2017; Stone et al., 2015).

Jefferson County in Alabama is another well-publicized bankruptcy case. This county filed for Chapter 9 bankruptcy relief in November 2011. Many factors contributed to the county's financial problems. In 1996, the county was required to make repairs to a severely inadequate sewer system. When costly efforts to repair the system failed, an even more costly effort to rebuild the system became necessary. Widespread corruption compounded the situation. All of this came on the heels of a weakened local economy and approximately \$25 million in cleanup costs from recent tornadoes (Zender & Deal, 2016). Just months before, in March 2011, the county's occupational tax was ruled unconstitutional. This tax had supplied approximately 30% of the county's operating funds (Spitotto et al., 2016). Audit and legal fees relating to the bankruptcy were over \$30 million. These factors contributed to an increase in residents' sewer bills of over 368% and a guarantee of a series of additional increases well into the future (Crenshaw, 2019).

San Bernardino, California, filed for Chapter 9 protection in August 2012. Governance issues and mismanagement had accumulated to the point that the city could not pay its debts. Partially due to the high turnover of city leaders, the structure and organizational plan was unclear and confusing (Farmer, 2016).

Some municipal bankruptcies involve special-purpose governments. These agencies of the state are not defined by a geographical boundary. The most common special purpose government districts are hospitals, transit systems, utility districts, and school districts (Chaudhury et al., 2019). The most common special-purpose governments to declare bankruptcy in recent years are hospitals or health care related entities (Murphy & Cook, 2018). However, in 2019, 21 local sanitation utility entities in Nebraska filed for Chapter 9 relief (Chapman et al., 2020).

While the number of government bankruptcies are small compared with corporate bankruptcies, the costs can be high and have an adverse effect on multiple stakeholders (Buccola, 2019; Cohen et al., 2017). In addition to the direct costs of lawyers and managers, a downgrade in credit rating may cause borrowing costs to rise (Adelino et al., 2017). To compensate for these costs, city leaders may consider raising taxes or reducing services. Employees may be laid off, maintenance on infrastructure may be deferred, and pensions may not be adequately funded. All of these consequences further damage the reputation of the municipality (Chapman et al., 2020; Gramlich, 2011).

This section reviews the history of municipal bankruptcies, including theoretical frameworks of municipalities and the evolution and application of municipal bankruptcy law. Current predictors of commercial bankruptcies and municipal financial stress are examined. The early identification of financial stress on a municipality can provide time to address problems and possibly avoid the need to file for Chapter 9 relief (Bateni & Asghari, 2020; Spiotto et al., 2016). Finally, several issues of special significance to municipalities are considered, including pension funding and state responses to fiscal stress.

Overview of Municipal Bankruptcy

Need for Municipal Bankruptcy Law. By 1934, members of Congress estimated that more than 1,000 municipalities were in default (Spiotto, 2012). Nonpayment of property taxes was a major reason municipalities did not have enough revenue to pay their debts. As they are today, property taxes were the primary source of revenue for local governments during the Great Depression (Chernick & Reschovsky, 2017).

States were unable to adequately address the financial stress of the local entities. The U.S. Constitution specifically denies to states the right to create any law that would impair

contractual obligations of local governments (U.S. Const. art. I, § 10). Therefore, once a municipality had entered into a contractual obligation, the state could not alter that contract to provide relief for the municipality.

Provisions existed for the bankruptcy of businesses. However, these provisions allowed for the liquidation of the entity at risk (Bernstein et al., 2019). Since liquidation is not an option for a municipality, local government entities could not apply these provisions (United States Courts, 2020).

Creation and Evolution of Municipal Bankruptcy Legislation. To address this need, in 1934, Congress approved emergency bankruptcy legislation for municipalities. This law provided for the adjustment of municipal debt. It was passed as Chapter IX to the 1898 Bankruptcy Act (Wiggins, 2017).

Chapter IX provided for a voluntary plan of readjustment to the local entity's debt. To qualify for this relief, an agreement must be reached between the municipality and two thirds of the creditors. Once such an agreement had been made, the agreement would be enforced by the federal court system (Spiotto, 2012).

Between 1934 and 1936, there were numerous challenges to Chapter IX. Opponents charged that the 1934 Act infringed upon states' rights and violated the "Law impairing the Obligation of Contracts" (Wiggins, 2017, p. 4). In 1936, the Supreme Court ruled that this law was a violation of the 10th Amendment and states' rights. Thus, it was ruled unconstitutional (DeJong & Dougherty, 2020). At the time, there were almost 90 petitions pending under this legislation (Spiotto, 2012).

In 1937, Congress passed a second municipal bankruptcy legislation. This legislation was similar in substance to the prior law. However, the 1937 version added provisions that ensured

there was no violation of the 10th Amendment. Included in those provisions were the specific denial of federal jurisdiction over municipal property or revenues and an affirmation that states cannot impair contractual obligations. The Supreme Court upheld this version of the act in 1937 (United States Courts, 2020).

Since 1937, there have been some modifications to the bankruptcy legislation. In 1946, the applicability of the act was broadened to include additional public entities. In addition, municipalities were granted a temporary stay of proceedings upon filing a Chapter IX claim (Spiotto, 2012). In 1978, the act became part of the 1978 Bankruptcy Code and was renamed from Chapter IX to Chapter 9 (Wiggins, 2017).

Application of Chapter 9.

Purpose of Chapter 9. The intent of Chapter 9 legislation is to provide protection from creditors to allow municipalities time to create a new financial plan. The municipality should propose a plan that restructures its debt to terms and amounts that are realistic to be paid. It should also map out a sustainable strategy for the future running of the municipality (Gramlich, 2011; United States Courts, 2020).

Requirements for Filing. Chapter 9 relief is only available to municipalities. The Bankruptcy Code defines a municipality as “a political subdivision or public agency or instrumentality of a State” (United States Bankruptcy Code, 2020). Included in this definition are general-purpose governments such as cities, townships, and counties; as well as special-purpose governments such as school districts, utility districts, hospitals, transit systems, and jails (Chaudhury et al., 2019). States are not eligible to file for Chapter 9 relief (DeJong & Dougherty, 2020; Gramlich, 2011; Spiotto et al., 2016).

Four conditions are required in order for a municipality to file for Chapter 9 relief. The first condition is that the municipality be in a state that allows Chapter 9 filing (Gramlich, 2011; Jones Day, 2010; United States Courts, 2020). Recalling the history of the original Chapter IX legislation in 1934, the writers of Chapter 9 have recognized the states' rights to allow or disallow municipal bankruptcy filings within each state. This requirement was strengthened in 1994 after the state of Connecticut attempted to block the Chapter 9 filing of Bridgeport. Since that time, specific written permission must exist for a municipality to file for this relief instead of a general authorization (Spiotto et al., 2016; Yang, 2019a). As of 2020, 27 states have given this permission to their municipalities (DeJong & Dougherty, 2020). Of these states, 12 have placed conditions on the approval. For example, Michigan requires that the local government declare a financial emergency and attain the governor's approval. Three states have placed limits on the approval. For example, Illinois now limits the right to file Chapter 9 only to the Illinois Power Agency. Of the remaining 23 states, Georgia and Iowa specifically deny the right of their municipalities to file for Chapter 9 relief. The others do not provide specific bankruptcy authorization for their local government entities (Spiotto et al., 2016).

The second requirement to file for Chapter 9 relief is that the municipality be insolvent (DeJong & Dougherty, 2020; Jones Day, 2010; United States Courts, 2020). In this context, a municipality is generally considered insolvent if it is not able to pay the payments on its debt or if it is not making those payments (Chaudhury et al., 2019; United States Bankruptcy Code, 2020). The rationale is that if a municipality is able to pay its debts, then it does not need to restructure those debts (Chaudhury et al., 2019).

A secondary use of the term insolvent has to do with the services offered by the municipality. Residents and businesses of a municipality typically expect to receive services

such as police protection, fire protection, road maintenance, health care facilities, education, mass transportation, and garbage collection in exchange for their taxes. When a situation devolves to the point that these services cannot be delivered, this is considered to be “service delivery insolvency” (Chaudhury et al., 2019, p. 495). Examples of service reduction include the reduction of office hours for government employees, decreased trash collection, layoff of police and firefighting personnel, and decreased maintenance on local infrastructure (The PEW Charitable Trusts, 2016). As service insolvency develops, residents and businesses may leave the municipality. This reduces property and business tax revenues, which worsens the fiscal condition. In light of these two views on insolvency, many courts have begun to consider the inability to deliver services as well as the inability to pay debts. The argument is that it would be better to restructure debt sooner rather than pay debt payments with funds that would cause the loss of services (Chapman, 2021; Chaudhury et al., 2019; Dick, 2018).

The third requirement is the desire to institute a plan for debt adjustment. The usual interpretation of this is that the filing of Chapter 9 must be voluntary and initiated by the municipality. Another entity cannot force a municipality to seek Chapter 9 relief (DeJong & Dougherty, 2020; United States Courts, 2020). However, some interpret this to mean that the municipality must have a sincere intention to adjust the debt and not just buy time (Jones Day, 2010).

The final requirement is that the municipality must attempt to gain creditor approval for filing (United States Courts, 2020). The courts prefer that an agreement be reached between the municipality and a majority of creditors that stand to be impacted by the filing. However, when that is not possible, this requirement is satisfied when the municipality has made a good faith attempt to reach an agreement. Alternatively, as in the bankruptcy case of Detroit, this

requirement is satisfied when negotiation is impracticable (Jackson & Leary, 2016; United States Courts, 2020).

Costs of Filing. The most evident cost of filing for Chapter 9 relief is the probability of increased borrowing costs. Municipalities often borrow money through the issuance of municipal bonds. These bonds may be general obligation bonds, which are backed by the good faith and credit of the municipality. These are typically financed by property taxes. Other bonds are revenue bonds. These are often secured by a specific revenue stream (Wiggins, 2017). An example would be a bond to build a toll road, which is financed by tolls from the completed project. When bankruptcy procedures are initiated, credit ratings may drop and the interest rates on these bonds may rise to cover the perceived additional risk (Li et al., 2018). There have been cases where just talking about the possibility of filing Chapter 9 by council members caused an increase in interest rates (Jones Day, 2010).

High legal fees are also a result of filing Chapter 9. Particularly when the issues are controversial and contentious, legal fees can be significant and uncertain (MacKay, 2017). In the case of Detroit, the legal fees were over \$170 million. Although the state of Michigan assisted Detroit in the payment of these fees, funds were still diverted from other governmental uses (Spiotto et al., 2016).

Process of Filing Chapter 9. The process begins when the municipality voluntarily requests Chapter 9 protection from its creditors by filing a petition with the court (Governmental Accounting Standards Board, 2009; United States Courts, 2020). Creditors or other interested parties may object to the filing of the petition. These objections typically question the municipality's right to file. A hearing is then held to determine if the petition will be dismissed. If it is not dismissed, the judge orders an automatic stay to protect the municipality from

creditors' attempts to collect. Generally, at this time the municipality provides a list of creditors to the court. However, a delay may be granted if time is needed to gather information (United States Bankruptcy Code, 2020). Due to the public nature of municipal bankruptcy cases, the court is required to inform the public of the petition, any relief from creditors, and the dismissal of a Chapter 9 case (Wiggins, 2017).

The municipality is responsible for presenting a plan to restructure debt. There are several ways that this may be accomplished. Maturity dates may be extended, the principal amounts may be reduced, the interest rates may be reduced, or the debts may be repaid through new debt. The plan will designate which debts are to be restructured. Debt that is specifically secured by a particular revenue stream is usually not restructured. The court's role in Chapter 9 cases is limited to the approval of the petition and the confirmation and execution of the debt restructuring plan (Governmental Accounting Standards Board, 2009; United States Courts, 2020).

Advantages and Disadvantages of filing for Chapter 9 Relief.

Advantages. As discussed above, the primary advantage of filing Chapter 9 is the time gained to formulate a workable financial plan while receiving legal protection from creditors. In addition, some states offer services only after the bankruptcy has been filed (Spiotto et al., 2016). These services may include legal, administrative, or financial assistance.

Disadvantages. In addition to the increased costs of borrowing, other disadvantages to filing for Chapter 9 relief may include a reduction of services, loss of residents and businesses, reluctance of voters to approve tax increases, and loss of image (Gramlich, 2011; MacKay, 2017). Overlapping and surrounding municipalities may also experience an increase in the likelihood of financial stress (Chaudhury et al., 2019). The significance of these results is

magnified because they build on each other. For example, a reduction of services may lead to the loss of residents and businesses, which then leads to a loss of image. Once this cycle has begun, it takes a great deal of effort and time to turn it around (Jackson & Leary, 2016).

GASB Statement No. 58. The Governmental Accounting Standards Board (GASB) is the standard setting body for accounting practices in state and local entities in the United States. Among the many published standards by GASB, Statement No. 58 provides guidance regarding the accounting and financial reporting requirements for municipalities that have filed for Chapter 9 relief. Its purpose is to provide consistent financial measurement and reporting for these entities (Governmental Accounting Standards Board, 2009).

GASB requires an adjustment to any liabilities that were included in the payment-restructuring plan at the time of confirmation by the court. The adjustments may require gains to be reported in instances where debt principal has been reduced. Those debts that still exist should reflect the new balances and terms. Of particular interest to pensioners, pension plan obligations are eligible to be adjusted (Dick, 2018). GASB No. 58 also describes required disclosures. The entity must describe the main reasons the bankruptcy occurred, the expected effect on the major groups of creditors, and the way the changes will be applied (Governmental Accounting Standards Board, 2009).

Comparison of Chapter 9 to Chapter 11. Chapter 9 of the Bankruptcy Code deals exclusively with the bankruptcy of municipalities. The more well-known Chapter 11 deals with the bankruptcy of commercial businesses. The many differences in these two chapters stem primarily from the conceptual differences between a municipality and a commercial business (Governmental Accounting Standards Board, 2017; Wiggins, 2017).

A commercial business has owners and operates to earn a profit. It owns assets and can borrow and lend money. Revenues are typically earned through exchange transactions with customers and are impacted by competition in the market. Owners often evaluate success by continued profits (Patton et al., 2019).

On the other hand, municipalities generate revenue primarily through non-exchange transactions such as property taxes. Although the taxpayers do receive some benefit from their taxes, the benefits received are not in proportion to the amount paid. Residents and businesses expect the municipality to operate within the published budget. (Patton et al., 2019; Wiggins, 2017).

Differences in the Petition and Restructure Plan. Only the municipality may initiate a Chapter 9 petition or file a debt restructure plan. This is different from a Chapter 11 plan where creditors may file both. The Chapter 9 plan may reorganize or adjust debt. However, the municipality may not be liquidated. The Chapter 11 plan may reorganize the debt or it may liquidate the entity (Spiotto et al., 2016; United States Courts, 2020).

Differences in Limitations and Restrictions. With Chapter 9 filings, the bankruptcy court is subject to any state laws regarding the municipality. The court may not interfere with the day-to-day operations of the municipality due to the 10th Amendment of the U.S. Constitution. Thus, a municipality that has filed for Chapter 9 protection may still incur debt and sell or lease property. The Chapter 11 court has more control and must approve a wide variety of actions (Spiotto et al., 2016; Wiggins, 2017).

Theoretical Framework

As mentioned earlier, three theoretical frameworks provide the foundation of this research. They include the agency theory, the accountability framework, and the financial ratio

theory. The agency theory explores the responsibilities and challenges that occur when one party is working on behalf of another party (Pepper, 2019). The accountability framework addresses the transparency obligations inherent in government reporting (Bovens & Wille, 2020). Lastly, the financial ratio theory demonstrates a connection between financial ratios derived from financial statements with the fiscal condition of an entity (Succurro et al., 2019).

Agency Theory. An agency exists when one party (principal) contracts with another party (agent) to act on the principal's behalf (Pepper, 2019). In the context of commercial businesses, shareholders hire managers to handle the day-to-day operations of the business. In relation to local government, taxpayers elect government officials to run the business of their state or community. This arrangement is often necessary to acquire the skills and talents needed to manage the organization.

This principal-agent relationship may be a source of costs. Agency costs may arise when agents within an organization have conflicting interests from those of the principals (Pepper, 2019). Some of the factors that can cause the conflicts are self-interest, differences in risk tolerance, and inconsistency in available information (Panda & Leepsa, 2017).

Agency theory is the study of this problem and the possible resolutions that may minimize these costs (Baker, 2019). One of the first writers to discuss agency costs and theory was Smith in *The Wealth of Nations* (Smith, 1776/2019). Smith postulated that owners and employees may have different goals and employees may work for their own interests instead of the owners' interest (Panda & Leepsa, 2017). Since then, agency theory has been applied to many areas including accounting, economics, political science, management, social psychology, and human resource development (Baker, 2019).

A common research goal having to do with the agency problem is to discover solutions that will minimize agency costs. One of the primary proposed solutions is monitoring the work of the agent. This is discussed further in the section on accountability framework. Other possible solutions include strengthening the bond between principal and agent, installing independent committees, sharing more information with the agent, and creating compensation packages for the agent that would encourage the actions of the agent to agree with the desires of the principal (Panda & Leepsa, 2017; Pepper, 2019).

Accountability Framework. The term accountability has various meanings, depending on the context in which it is used. In a general sense, accountability conveys an obligation to give an account for one's actions and an acceptance that those actions may be regulated by others (Hall et al., 2017). Bovens (2007) notes that accountability involves "the obligation to explain and justify conduct" (p. 450). Dillard and Vinnari (2019) build on this by stating that accountability is the distribution of information regarding one's actions and the willingness to accept the consequences for those actions. Each of these definitions involves a relationship between a party that performs the actions and a party that may question and judge those actions (Bovens & Wille, 2020).

One of the earliest uses of the word dates back to the reign of King William I of England. To get an accounting of the property owned by property holders in his realm, King William authorized a census, which was recorded in the Domesday Books. This count totaled over 29,000 separate pieces of property belonging to approximately 1,800 people (Baxter & Lewis, 2017; Bovens, 2007). In this case, accountability is a bookkeeping term in which property owners were accountable to the King.

More recently, accountability has been associated with good management or governance, transparency, responsibility, equity, and integrity (Bovens, 2007). Generally, the government or the corporation is now accountable to the stakeholders. In the United States, financial statements are prepared in accordance with Generally Accepted Accounting Principles (GAAP) to inform stakeholders of the actions of management. Stakeholders have the right to question management about these actions and invoke consequences if they disapprove of those actions (Dillard & Vinnari, 2019; Governmental Accounting Standards Board, 2017).

Stakeholder disapproval in corporations may be expressed by efforts to replace management or by the sale of shares. In municipalities, stakeholder disapproval may take the form of political actions to remove government leaders. In extreme cases, residents and businesses may leave the municipality. This lowers the tax base and potentially hurts the reputation of the community (Dillard & Vinnari, 2019; Jackson & Leary, 2016).

Accountability is complicated due to the fact that there is not a consensus among stakeholders about what actions make one accountable. Three views of accountability are communicative, phenomenological, and consequentialist (Carroll & Olegario, 2020). Each of these views differs as to what is required to be accountable.

The communicative view holds that the disclosure of relevant information fulfills the requirements of accountability (Carroll & Olegario, 2020). This view equates accountability with transparency. Transparency involves making information available to stakeholders (Daniels et al., 2020). In a government setting, the stakeholders would include residents, local businesses, creditors, charities, auditors, courts, special interest groups, and the public at large.

The phenomenological view goes a step further than the previous view. Those who hold this view consider transparency as a first step only in accountability. They require the actor to

disclose information and to fulfill stakeholders' expectations regarding the management of the entity (Carroll & Olegario, 2020). This view is more complex because the stakeholders may not all have the same expectations. Individual relationships between the actor and the forum may bias the perception of accountability (Busuioc & Lodge, 2017). For example, a creditor may have a different perspective regarding the municipality's accountability than a taxpayer.

The consequentialist view is an outcomes-based view (Carroll & Olegario, 2020). This is also referred to as results-based management (Han, 2020). In addition to the requirements of transparency and meeting expectations, holders of this view want consequences for the actor's outcomes. Consequences may be negative such as a penalty or a sanction for not meeting a deadline or standard. Consequences may also be positive, such as a bonus for early completion of a project (Han, 2020).

An interesting insight into the consequentialist view is the reaction by an actor when there are no negative consequences of an action. If the stakeholders do not have the authority to impose significant penalties, there is little motivation for the actor to correct unpopular actions. As an example, Carroll and Olegario (2020) refer to Volkswagen's 2017 healthy sales numbers, after receiving fines and negative public media coverage regarding cheating on emissions reports. This lack of impact on sales provided no reason for the company to conform to emissions standards.

In all of these views, the effectiveness of accountability is limited by the understandability and timeliness of the information. Buhmann et al. (2020) found that algorithms used to communicate financial information are often opaque. Therefore, they should be accompanied by significant engagement and clear communication. Information should be disclosed in a way that the average stakeholder will be able to understand and use. GASB

Statement 34 addressed this issue in state and municipal financial statements by requiring additional explanatory information (Yusuf & Jordan, 2017). However, many still believe that governmental financial statements are unclear to the average reader (Bergman & Weinberg, 2018).

The nature and relevance of the information disclosed also impacts the perception of accountability. As the priorities of society evolve, the requirements to provide information evolve as well. For example, GASB has prescribed the required data and format of state and local government external reporting. The minimum requirements include a management's discussion and analysis, government-wide and fund financial statements, notes to financial statements, and other supplementary information (Patton et al., 2019). However, some stakeholders feel that sustainability and social issues information should be included (Dillard & Vinnari, 2019). Responses to these requests for additional information affect the perception of accountability of these entities.

One way that municipalities attempt to achieve accountability is through the creation of an annual operating budget. While these budgets may have similarities to a corporate budget, there are several key differences. Unlike commercial entities, the budgets of municipalities have the force of law. That is, the municipalities are required by law to follow the budget (Governmental Accounting Standards Board, 2017). Many governments are required to balance their budgets. Generally, this means that they may not spend more than they have. Lastly, the operating budget of a municipality is available to the public. Therefore, the public can hold the government leaders accountable to follow the budget (Governmental Accounting Standards Board, 2017; Patton et al., 2019).

A second instrument used to demonstrate accountability by state and local governments is the preparation of a Comprehensive Annual Financial Report. This report includes all of the minimum reporting requirements set forth by GASB plus other information that adds to the depth and understanding of the fiscal position of the government (Patton et al., 2019). In addition to the basic financial statements, elements included in the Comprehensive Annual Financial Report are an introduction, an auditor's report, management's discussion and analysis, other required supplementary information, combining statements, and statistical information (Patton et al., 2019; Wiggins, 2017).

The preparation of this annual report is not mandated universally; however, it is required by some states such as Texas (Texas Comptroller of Public Accounts, 2021). To encourage municipalities to prepare this report, the Government Finance Officers Association (GFOA) recognizes municipalities each year that have prepared Comprehensive Annual Financial Reports that show compliance to GAAP and a high degree of transparency. Some of the 2020 winners are East Bay Municipal Utility District, California; Mecklenburg County, North Carolina; and City of Redmond, Washington (Government Finance Officers Association of the United States and Canada, 2021).

Financial Ratio Theory.

Early Recognition of Financial Ratio Theory. As early as the 1930's, individuals and organizations were looking for ways to predict the financial failure of organizations. The Bureau of Business Research (BBR) was one of the pioneers in this effort. It compared certain financial ratios of organizations that had failed to the average ratios of all companies in order to isolate financial predictors of failure (Bellovary et al., 2007).

Others followed the BBR's work with ratio comparisons through the next decades. During these years, the research centered on financial ratios that measured liquidity such as working capital and current assets (Bellovary et al. 2007). In addition, many studies considered predictors for specific industries or specific geographic areas. Examples include Pettway and Sinkey (1980) who studied bank failures and Barreda et al. (2017) who studied failures in the hospitality industry. It was discovered that financial predictors may predict more accurately within a particular industry than they do across industries (Bellovary et al., 2007).

In the 1960's Beaver used univariate analysis to measure the predictability of financial ratios (Succurro et al., 2019). Beaver based this work on the belief that financial ratios are a representation of an organization's financial statements; therefore, they can be relied upon to predict financial success or failure (Beaver, 1966; Horrigan, 1965). This study compared 30 financial ratios between bankrupt companies and non-bankrupt companies. Results showed that Net Income to Total Debt had the best predictive ability (Beaver, 1966; Bellovary et al., 2007).

Building on Beaver's research, in 1968 Altman performed a multivariate analysis to further measure the prediction accuracy of financial ratios (Acosta-Gonzalez et al., 2019; Succurro et al., 2019). This methodology used a five-factor model and was considered an improvement upon univariate analysis (Succurro et al., 2019). Results showed a 95% accuracy in bankruptcy prediction one year prior to bankruptcy (Altman, 1968; Bellovary et al., 2007). Since Altman's research, multivariate analysis became a primary method used to evaluate financial ratio predictability (Succurro et al., 2019).

Development of Financial Ratios as Predictors. In the following years, additional statistical models gained popularity. Ohlson used logistic regression in the 1970s to predict organizational failure (Barboza et al., 2017; Ohlson, 1980). Logit analysis and probit analysis

became popular in the 1980's and 1990's (Barreda et al., 2017; Jabeur, 2017). One of the drawbacks of the multiple discriminant analysis (MDA) model is the assumption that all the variables are normally distributed. The logit analysis model did not require normally distributed variables (Barreda et al., 2017). Through the last decades of the 20th century, research showed mixed results regarding which methodology yielded better results.

More recently, researchers have begun to use artificial intelligence systems (AIS). These are also known as intelligent techniques (Ravi Kumar & Ravi, 2007). Various types of AIS include neural networks, rough sets models, decision trees, and new age machine learning models (Acosta-Gonzalez et al., 2019; Barboza et al., 2017; Jones et al., 2017; Sigaud, & Stulp, 2019).

Artificial neural networks are computer systems that mimic the neurons in the brain. Programmers of these systems attempt to train the network to “acquire, refine, and transfer knowledge over sustained periods of time” (Parisi et al., 2019, p. 55). While these systems have been successful in prediction studies, challenges remain. When new information is introduced into the network, previous learning may be compromised (Parisi et al., 2019).

New age machine learning models such as bagging, boosting, and random forests have also been used in prediction studies (Jones et al., 2017). Bagging and boosting systems re-classify data with various weights in order to reduce bias. Random forests are systems based on a decision tree model. It is similar to bagging and boosting; however, it allows for outliers and noise (Barboza et al., 2017).

Opinions vary as to which methods are more successful (Alaminos et al., 2016; Barboza et al., 2017). Even when results show one method outperforming other methods, the costs of a

particular method must be considered (Jones et al., 2017). Most studies generally agree that some type of combination of methods would yield the most dependable results.

Concerns about the Accuracy of Financial Ratio Theory. Notwithstanding the successful results obtained through financial ratio prediction, recent research has suggested that prediction accuracy is improved when non-financial data are considered as well. Liang et al., (2016) support the addition of corporate governance indicators such as board structure. Acosta-Gonzalez et al. (2019) support the addition of current macro-economic data. Leary and Jackson (2017) show how the culture of the organization can affect financial success or failure. Proponents of adding non-financial data to financial ratio analysis argue that the resulting data are more complete and thus a better predictor of bankruptcy or financial stress (Acosta-Gonzalez et al., 2019; Liang et al., 2016).

Variables as Predictors of Bankruptcy and Fiscal Stress

Accounting Based Prediction Variables.

Grouping of Variables. Throughout the history of bankruptcy prediction, researchers have selected relevant financial ratios computed from financial statements to test for predictive ability. The ratios generally fall into one of several groups or types. A conservative approach would be to analyze ratios from each of the primary groups (Chapman, 2021).

One example of grouping is liquidity, solvency, and profitability (Warren et al., 2020). Liquidity deals with an organization's cash management strategy and the ability to pay its short-term debt (Iskandar et al., 2018). Solvency also deals with cash management and reflects the company's ability to pay its long-term debt. Lastly, profitability ratios reveal the company's ability to earn a profit (Warren et al., 2020).

Others group the variables in slightly different combinations. For example, Acosta-Gonzalez et al. (2019) group variables as follows: liquidity/solvency, profitability, activity, indebtedness, equilibrium, cash flow, and asset structure. Trussel and Patrick (2018) group variables by operating measures, debt measures, capital structure measures, liquidity measures, employee measures, and tax measures. Other groups included by researchers are efficiency (Alaminos et al., 2016), leverage (Barreda et al., 2017), growth/change variables (Liang et al., 2016), and investment in capital expenditure to total assets (Jones et al., 2017). Stone et al. (2015) included a group of financial ratios indicating service solvency for government organizations.

A set of commonly used variables in the liquidity area has to do with working capital. *Working capital* is computed as current assets, those assets expected to be liquidated within a year, minus current liabilities, those liabilities expected to be paid within the year (Warren et al., 2020). A healthy working capital reflects the ability to pay short-term obligations. Three ratios that reflect on working capital are *working capital/total assets*, *current assets/total assets*, and the *current ratio* (current assets/current liabilities) (Acosta-Gonzalez et al., 2019; Bellovary, 2007).

In the category of solvency, a commonly used ratio is *total debt to total assets*. This ratio reflects the portion of total assets funded through debt (Alaminos et al., 2016). While some businesses increase the debt level to gain financial leverage, it also increases the risk of insolvency.

Two of the most common ratios used to predict bankruptcy in commercial companies are *net income/total assets* and *sales/total assets* (Acosta-Gonzalez et al., 2019; Barboza et al., 2017). These two ratios are part of the profitability group and show how effectively a company

can generate income using the assets it owns. The first of these ratios has the added benefit of considering the expenses that are necessary to earn the income (Warren et al., 2020).

Another popular group of financial ratios is cash flow. The Statement of Cash Flows is one of the four basic financial statements. The purpose of this statement is to measure the cash inflows and outflows in three areas: operating, investing, and financing (Wahlen et al., 2020). This information can inform the reader if the general operations of the company are generating sufficient cash to sustain those operations. The net change in cash from the three areas combined speak to the liquidity of the company. Related ratios that may be used to predict bankruptcy also include *cash flow from operations/sales* and *cash flow from operations/current liabilities* (Acosta-Gonzalez et al., 2019).

Once ratios are selected, they may be evaluated in different ways. An evaluation of each ratio over time may reveal positive or negative trends (Patton et al., 2019). In addition, benchmarks may be established. Benchmarks are goals that can reveal certain levels of fiscal distress or the lack thereof. The PEW Charitable Trusts recommends benchmarks for use by states in the evaluation of local governments' financial condition (Chapman, 2021).

Commonly Selected Variables. The five variables selected by Altman in the seminal work from 1966 are shown below. These five selections inform the reader regarding liquidity, solvency, and profitability. MDA using these five variables correctly predicted bankruptcy in 95% of the cases.

- $x_1 = \text{Working capital/Total assets}$
- $x_2 = \text{Retained Earnings/Total assets}$
- $x_3 = \text{Earnings before interest and taxes/Total assets}$
- $x_4 = \text{Market value equity/Book value of total debt}$

- $x_5 = \text{Sales/Total assets}$ (Altman, 1968, p. 594)

Altman's choice of variables has been used in multiple studies since Altman's work to predict bankruptcy or financial stress (Barboza et al., 2017). Some researchers have modified these slightly, while others have simply included additional variables in their study (Alaminos et al., 2016; Barreda et al., 2017; Jones et al., 2017). While there is no single combination of variables that most accurately predicts bankruptcy in all cases, there is a general agreement that Altman's five selections provide information that is helpful in predicting corporate bankruptcy (Bellovary et al., 2007).

Number of Variables. In the quest to predict bankruptcy, another difference found in research is the number of financial ratios examined. The number of ratios considered ranged from one to 57 (Bellovary et al., 2007). There were many differing views regarding which ratio had the highest predictive abilities. However, as long as the major groups were covered, results showed similar results using few or many variables.

Non-Accounting Based Prediction Variables. Although accounting-based models are the primary means used to predict bankruptcy, other models exist that consider non-accounting based information. These developed for several reasons. First, reliance on data taken from backward-looking financial statements may be considered outdated or may reflect an uncharacteristic year (Charalambous et al., 2020; Succurro et al., 2019). Second, assets are reflected at book values in the financial statements, which may or may not equal market value (Káčer et al., 2019). Third, financial statements are prepared using the going-concern principle (Li & Faff, 2019). This is an accounting principle that states that financial statements should be prepared under the assumption that the organization will "continue to operate into the foreseeable future" (Wahlen et al., 2020, p. 18). Next, there may be internal governance factors

that affect the likelihood of bankruptcy (Cohen et al., 2017; Liang et al., 2016). Finally, external economic factors may influence the ability of an organization to avoid bankruptcy (Acosta-Gonzalez et al., 2019; Káčer et al., 2019).

Market-based Models. One of the first non-accounting-based models replaced the book value of assets and debt, taken from the financial statements, with their market values. Merton introduced this seminal work using market-based models in 1974 (Charalambous et al., 2020; Li & Faff, 2019; Succurro et al., 2019). Proponents of market-based models argued that market data are more current than data taken from financial statements and is therefore a better predictor of financial condition (Káčer et al., 2019).

Governance Variables. In recent years, researchers have begun to question the effect that governance indicators might have on the likelihood of bankruptcy. Liang et al. (2016) included governance factors, such as board and ownership structure and key personnel retention, along with the accounting based financial indicators. This research showed the addition of governance indicators to financial indicators did not improve the ability to predict corporate bankruptcy (Liang et al., 2016). However, other research shows that certain governance characteristics such as a high level of board independence or managerial ownership can improve the accuracy of financial indicators as bankruptcy predictors (Almaskati et al., 2021).

It should be noted that these studies did not evaluate governance indicators alone. Rather, they were added to generally accepted financial measures to test for an improvement in predictability. The results have been mixed. Studies have also found that any additional predictive benefit achieved through the addition of governance indicators diminishes in favor of financial indicators as bankruptcy gets closer (Almaskati et al., 2021).

Macroeconomic Variables. The consideration of only internal financial and governance data reflects the opinion that these are the primary predictors of bankruptcy. An additional school of thought is that macroeconomic events may affect organizations in different ways and may therefore provide insight into the likelihood of bankruptcy. As with governance indicators, macroeconomic variables have often been combined with financial ratios to determine the predictability of bankruptcy (Káčer et al., 2019). Some of the macroeconomic factors that have been considered are interest rates, stability/volatility of the stock markets, inflation rate, unemployment rate, lagged gross domestic product, and money supply (Acosta-Gonzalez et al., 2019; Káčer et al., 2019).

As with the governance variables, there are conflicting results regarding the ability of macroeconomic variables to improve the predictability of bankruptcy. Káčer et al. (2019) determined that consideration of the annual average interest rate and the short-term employment expectation did not improve the accuracy of financial ratios in predicting bankruptcy for small and medium sized entities (SMEs) in Slovakia. On the other hand, the research of Acosta-Gonzalez et al. (2019) illustrates that macroeconomic variables involving credit fluctuations were statistically significant in predicting the bankruptcy of construction companies in Spain.

Variables Used in Municipal Fiscal Stress Prediction.

Financial Ratios for Municipalities. Due to the fundamental differences between business and governments, some of the financial ratios that predict bankruptcy in business will not be applicable to municipalities (Governmental Accounting Standards Board, 2017). For example, return on assets is based on the net income of a business. Municipalities do not have a net income calculation. Sales in relation to total assets would not apply since governments do not have sales in the traditional sense. In addition, other ratios such as pension funding and

infrastructure funding may have added relevance to municipalities. However, predictors for bankruptcy are just as necessary for municipalities as they are for corporations.

There has been very little research regarding predictors of bankruptcy in municipalities. Most of the related research is focused on the prediction of fiscal or financial distress, which is often a precursor to bankruptcy (Cohen et al., 2017; Kasdan, 2016; Y. Kim et al., 2020; Leiser & Mills, 2019; Stone et al., 2015). Therefore, one of the primary issues in municipal research has been to define fiscal distress. A generally accepted definition has been elusive. The following descriptions have been used to refer to local governments in danger of default: municipalities experiencing fiscal or financial distress, fiscal or financial risk, challenges in paying financial obligations, or a decrease in services provided (Almaskati et al., 2021; Gorina et al., 2018; Succurro et al., 2019). Trussel and Patrick (2018) identify a financially distressed government as “one that experiences a significant and persistent imbalance between revenues and expenditures” (p. 83). Gorina et al. (2018) consider financial condition as a continuum ranging from the ability to meet financial and service obligations to the inability to meet those obligations in the same manner. Fiscal or financial distress results as municipalities cease to meet those obligations. The ultimate fiscal distress is the filing of bankruptcy (Barreda et al., 2017).

Early efforts to identify predictors of municipal financial stress included a series of research efforts by the Advisory Commission on Intergovernmental Relations (ACIR) during the 1970s and 1980s (Gorina et al., 2018). The findings of this research showed that financial distress in local governments was often caused by a combination of external factors, such as the economy, citizens’ wealth or resources, essential services expected to be provided by the local government, and local infrastructure needs (Trussel & Patrick, 2009). The significance of this

finding is that these causes are generally not controllable by local government administrators (Trussel & Patrick, 2009).

The International City/County Management Association (ICMA) created the Financial Trend Monitoring System, which proposed 29 categories of indicators taken from fund financial statements and environmental data (Y. Kim et al., 2020; McDonald, 2018). This system contained several ways of grouping data. The first grouping isolated data into environmental, organizational, and financial (Gorina et al., 2018). This distinction helped to isolate those influences that could be controlled from those that could not be controlled. Another distinction was drawn between four types of solvency: cash, budget, service, and long-term (Gorina et al., 2018; Stone et al., 2015). Variables were selected and grouped into these four types to analyze each area of solvency. Flexibility was encouraged, emphasizing the fact that there is a wide variety of local government entities (Gorina et al., 2018). Updated in the 1990s, this system has become a popular and accepted tool to measure fiscal distress in municipalities (Trussel & Patrick, 2018).

Brown published a 10-point test in 1993, which identified financial indicators that could be used to compare the financial health of a municipality to other municipalities tested (Leiser & Mills, 2019; Trussel & Patrick, 2018). Brown's test measured 10 financial ratios that represented five categories: revenues, expenditures, operating position, debt, and unfunded pension costs. This test became popular due to the ready accessibility of the data and ease of use (McDonald, 2018).

GASB Statement No. 34 (1999) introduced a significant change to municipal financial statement preparation. In addition to the fund financial statements that were already required, GASB Statement No. 34 added government-wide financial statements. These new statements

consist of a Statement of Activities and a Statement of Net Position, formerly known as The Statement of Net Assets (Gorina et al., 2018; Governmental Accounting Standards Board, 1999; Stone et al., 2015). Unlike most fund financial statements, these statements are prepared using the accrual basis of accounting and measuring all economic resources, current and non-current (Patton et al., 2019; Wang et al., 2007). The intention of the additional statements was to provide greater accountability and transparency to the public, to aid in the comparison of governments, and to identify trends within a single government (Stone et al., 2015; Yusuf & Jordan, 2017).

The addition of government-wide statements opened up new possibilities for financial ratio analysis. Prior research had primarily utilized ratios from the general fund; although some included a measure of long-term debt (Maher et al., 2020). The general fund only measured current financial resources; thus, capital assets and long-term liabilities were not included. Incorporating financial ratios from the government-wide statements, Wang et al. (2007) created a test to measure the solvency of a municipality. In this test, eleven indicators represented the four primary areas of solvency that were defined in the Financial Trend Monitoring System: cash (short-term), budget (annual), long-term, and service (McDonald, 2018). Since they were using ratios from the newly required statements, they were able to measure the effects of capital acquisitions, depreciation, and long-term debts (Wang et al., 2007).

In recent years, many combinations of variables have been analyzed to locate financial distress predictors. Ratios have been taken from either the government-wide statements or a combination of government-wide and general fund statements. Maher and Nollenberger implemented a modified version of Brown's 10-point test. Their modification included the addition of enterprise fund data and pension data (Maher et al., 2020). Callahan and Pisano (2014) compared financial, organizational, and economic/environmental factors of the city of

San Bernardino, California, with those of the county of San Bernardino. Stone et al. (2015) performed a case study on the bankruptcy of Detroit, Michigan. These studies and others support the conclusion that there is little agreement on how to measure or predict fiscal distress in local government entities (Gorina et al., 2018; Maher et al., 2020).

In an effort to prevent fiscal distress and eventual bankruptcy in their local governments, 25 states have developed monitoring systems to identify early signs of fiscal stress. Nine of these also have early warning systems in place (The PEW Charitable Trusts, 2017).

While each state may develop its own system, the systems have several commonalities. First, local governments submit financial data to the state on a prescribed basis. Secondly, states identify financial indicators, which may predict financial stress. Common indicators include revenue to expenditures ratios, overall or unfunded debt, and trends such as population or property values (Gorina et al., 2018; Maher et al., 2020). Thirdly, the indicators are compared to the local data to identify at risk governments. Fourthly, contact is initiated with at risk local governments to begin appropriate corrective action (Maher et al., 2020).

The early detection of financial problems may provide enough time to correct the situation (Chapman & Timmerhoff, 2020). States may intervene with direct financial assistance or pledges to secure local debt (Murphy & Lu, 2017). They may appoint an emergency manager as in the case of Detroit, Michigan (Leary & Jackson, 2017). Other benefits associated with state monitoring of local governments are improved accountability, improved credit ratings, and less opportunity for corruption at the local level (Nakhmurina, 2020; The PEW Charitable Trusts, 2017).

Special Considerations for Municipalities.

Pension Funding. Select municipalities began to offer pension plans to employees in the mid 1800's. Early beneficiaries were police officers, firefighters, and teachers (Flesher et al., 2019). Corporations followed this example by offering pensions to employees as early as 1875 (Flesher et al., 2019; Foltin, 2018; Marino & Melcher, 2018). Early accounting of these costs varied. Some employers considered payments to pension plans as a distribution of net profits and therefore not an expense. When corporations began paying income tax to the federal government, there was an incentive to expense pension costs since this would allow them to be deducted from income (Flesher et al., 2019).

Pension plans are categorized as defined contribution plans or defined benefit plans. A defined contribution plan defines the contribution that the employer must contribute each year for the employee's benefit. As long as the employer makes this contribution, no further funding obligation exists. Control of the fund and any market risk belongs to the employee (Foltin, 2018; Wahlen et al., 2020). Alternatively, a defined benefit plan defines the benefit the employee will receive after retirement. The employer must fund an amount each period that will produce those benefits. Market risk belongs to the employer (Davidyan & Waymire, 2018). If the market value drops, the employer must make this amount up in additional contributions (Wahlen et al., 2020).

One of the major differences between businesses and municipalities is the handling of pensions. Since the 1970's, businesses have largely moved from offering defined benefit plans for their employees to offering defined contribution plans (Jeppson et al., 2018). This move has transferred the risk of underfunding the plans from the business to the employee. On the other hand, states and municipalities still primarily offer defined benefit plans to employees (Barth et al., 2018; Chen, 2018; Wang & Peng, 2018).

In spite of the \$4.5 trillion in assets these plans have (Public Plans Data, 2020), many of these municipal pension plans are largely underfunded (Foltin, 2018). The average funding rate held above 80% until the Great Recession of 2008. Since that time, the average rate has continually declined to the 2020 level of 71.5% (Public Plans Data, 2020). While the common threshold of sustainability for funding is 80%, some municipalities have funding ratios as low as 15% - 25% (Barth et al., 2018; Davidyan & Waymire, 2018; Foltin, 2018; Public Plans Data, 2020).

There were two significant effects of the Great Recession on pension funding. First, the recession caused a decrease in the rate of return on the plan assets. Secondly, the financial situation created by the recession caused many employers to decrease annual contributions to the plans. In some cases, employers skipped annual payments completely. Together, these are the primary reasons for the funding drop since 2008 (Gorina, 2018).

When plans are underfunded, they lose the interest that could have been gained by having adequately funded pension plan assets. Municipalities may increase contributions to the pension fund to make up for the lost interest. To compensate for this increase in pension cost, municipalities often cut back in other areas such as reduced funding of infrastructure, reduced public services, and lower current salaries (Jeppson et al., 2018). These reductions can cause additional problems (Leary & Jackson, 2017).

In addition, a severely underfunded pension plan may increase risk for municipal bondholders (Jeppson et al., 2018). If a municipality proceeds to bankruptcy, there are usually two large classes of stakeholders: bondholders and pensioners. Legally, pensioners do not have any more protection from debt adjustment than bondholders do. However, in several recent cases such as San Bernardino, Stockton, and Detroit, pensioners received a much more favorable

settlement in the Chapter 9 bankruptcy than bondholders (Dick, 2018). This trend could cause interest rates for municipal bonds to rise.

Pension plan underfunding has been responsible for a downgrade in credit ratings. This downgrade may result in a higher cost of borrowing, putting a further strain on the budget (Davidyan & Waymire, 2018; Jeppson et al., 2018). Government officials may also be tempted to make higher risk investments in an attempt to earn more interest (Jeppson et al., 2018).

To address problems associated with pension plan underfunding, the GASB has issued several statements. In 2012, GASB issued two statements regarding pensions: Statement No. 67 “Financial Reporting for Pension Plans – An Amendment of GASB Statement No. 25” and Statement No. 68 “Accounting and Financial Reporting for Pensions” (Governmental Accounting Standards Board, 2012a; Governmental Accounting Standards Board, 2012b). These statements added a level of transparency to government pension funding by requiring that the government-wide Statement of Net Position reveal the unfunded pension liability (Davidyan & Waymire, 2018; Flesher et al., 2019). In 2015, GASB issued Statement No. 73 “Accounting and Financial Reporting for Pensions and Related Assets That Are Not within the Scope of GASB Statement 68 and Amendments to Certain Provisions of GASB Statements 67 and 68.” This statement broadened the application of Statement 68 (Governmental Accounting Standards Board, 2015). Lastly, GASB published Statement No 82 in 2016: “Pension Issues an Amendment of GASB Statements No. 67, No. 68, and No. 73.” This statement specifically addresses the presentation of payroll measures and the classification of employer payments to pension plans (Governmental Accounting Standards Board, 2016). When taken together, these four GASB statements have called attention to the funding levels of defined benefit plans (Foltin, 2018).

State and local governments have begun to respond to the increased interest in pension funding levels. Considering the increased level of transparency, a common reaction has been to increase the discount rate of interest used in the calculation of the pension liability. It is estimated that an increase in this rate of 1% will lower the overall liability by 14% - 16% (Marino & Melcher, 2018; Stalebrink & Donatella, 2020). Many view this as a problem since this rate can be manipulated by the municipality. Foltin (2018) suggests that a “generally accepted variable discount rate should be agreed to” (p. 96).

One solution has been to move from defined benefit plans to defined contribution plans (Davidyan & Waymire, 2018; Foltin, 2018; Wang & Peng, 2018). Some states, such as Oklahoma have achieved a total conversion, others such as Tennessee, have partially converted to defined contribution plans (Foltin, 2018). This switch will limit the employer risk. However, it will not immediately correct underfunding.

Other efforts to correct the underfunding problem have been structural in nature. Some governments, such as Detroit, Michigan, have reduced the future pension benefits and curtailed the cost of future living adjustments. Others have eliminated non-pension retirement benefits such as health care (Dick, 2018). Lastly, current employees may be required to increase the amounts that they contribute to the plan while they are employed (Davidyan & Waymire, 2018). These methods may reduce the underfunding overtime, but they are long-term corrections that have little effect on short-term balances.

State Monitoring and Intervention. Due to the 10th Amendment to the U.S. Constitution, the federal government is denied the authority over bankruptcy decisions by the municipalities. This right is reserved for the states (Spiotto et al., 2016; Yang, 2019a). States may unconditionally authorize, conditionally authorize, or prohibit the municipalities within their

borders to file for Chapter 9 bankruptcy. Since 1994, the law requires that specific authorization is required by a state for a municipality to file Chapter 9. Therefore, any states that do not grant this authorization (either unconditionally or conditionally) effectively disallow Chapter 9 bankruptcy for their municipalities (Spiotto, 2012).

In addition to the authority to authorize Chapter 9 bankruptcy proceedings, many states have added monitoring and intervention procedures. The goal of the monitoring and intervention of municipalities is to prevent or correct fiscal distress and thus eliminate the need for a Chapter 9 filing (Spiotto, 2012; The PEW Charitable Trusts, 2020). While the states' legal responsibilities for assisting municipalities in distress varies, it is clear that a fiscally distressed municipality can adversely affect the state. As local services decrease and taxes increase, citizens and businesses often move out of the locality. They may move out of the state, which decreases the state's revenues as well. Some believe that a municipal bankruptcy can adversely affect or spill over into other communities in the surrounding area as well. This is known as the contagion effect (Yang, 2019b).

Currently, 25 states have established procedures for monitoring the fiscal condition of the municipalities within their borders (A. Lu, personal communication, April 27, 2021; The PEW Charitable Trusts, 2017). Most of these states allow for the conditional authorization of Chapter 9 filing. However, some states that do not specifically authorize Chapter 9 filing, such as Tennessee, Nevada, and Iowa, do take an active interest in their municipalities to help prevent fiscal stress. The states that formally monitor the fiscal condition of municipalities within their borders include:

- California
- Colorado

- Connecticut
- Florida
- Iowa
- Kentucky
- Louisiana
- Maryland
- Massachusetts
- Michigan
- Minnesota
- Nevada
- New Hampshire
- New Jersey
- New Mexico
- New York
- North Carolina
- Ohio
- Oregon
- Pennsylvania
- Rhode Island
- South Dakota
- Tennessee
- Virginia

- Washington (A. Lu, personal communication, April 27, 2021; The PEW Charitable Trusts, 2017)

Monitoring procedures may take many forms. A common strategy is for states to track specific financial ratios and increase reporting requirements if the ratios fall out of a safe range (Pellegrin, 2020). Another strategy, used by Rhode Island, requires that municipalities submit their budgets for state approval before publishing. Pennsylvania requires regular budgeted to actual comparisons along with a five-year financial plan (Hincken, 2020). South Dakota utilizes the talents of auditors in periodic audits to look for signs of distress. Sometimes, state officials learn of municipal distress from media reports, such as when the state of Colorado realized the city of Olathe was in distress through a media report stating that an annual festival had been cancelled (The PEW Charitable Trusts, 2016).

State monitoring of municipalities has shown to be beneficial. Nakhmurina (2020) found that regular monitoring improved various financial indicators as well as the quality of reporting. Kim and Matkin (2020) support state monitoring as a means to minimize municipal financial problems. Municipalities in North Carolina have successfully managed unemployment challenges largely as a result of the state monitoring system (The PEW Charitable Trusts, 2013). In general, the transparency gained through the monitoring process has improved reporting and provided states with more time to react to a potential fiscal problem.

In addition to monitoring, some states have developed intervention programs. These programs may range from advice from state level representatives to the appointment of emergency managers who are given authority in local decision-making (Leary & Jackson, 2017; Yang, 2019a). These steps and levels of engagement are often prompted using information obtained from monitoring.

Prior to the 1970's, state intervention in municipal fiscal stress was individualized and varied from case to case. Since then, states have begun to pass laws to standardize the responses within each state. This has helped to ensure that even small or special purpose municipalities are not overlooked. In addition, local officials know what type of assistance and intervention they can expect from state officials (Yang, 2019a).

After state authorities identify fiscally distressed municipalities, the next step involves plans to correct the problem. Typically, this begins with communication between officials at the state and local levels to understand the issues that are causing the problem. Local autonomy may be partially reduced as state officials help make decisions. In some cases, states may appoint an emergency manager and give this person complete authority with regard to certain financial decisions (Jackson & Leary, 2017; Yang, 2019a).

The idea of state intervention in a local government is a controversial one. One side of the argument comes from the Cooley Doctrine. This philosophy supports the rights of the local governments to rule themselves and not be subordinate to a state government (Kasdan, 2016; Sellers & Scharff, 2020; Spiotto, 2012).

The other side of the argument evolves from Dillon's Rule. This perspective, which was upheld by the Supreme Court, views the local governments as subordinate to their respective state governments. It also gives states the power to intervene in the affairs of local governments (Kasdan, 2016; Sellers & Scharff, 2020; Spiotto, 2012).

State intervention may take many forms. The least invasive forms include advice, training, and assistance in processes and the preparation of required reporting. These may include a recommendation to update accounting or grant writing software systems. Governance

processes may be reviewed for inefficiencies. Assistance and training may be offered for the preparation of budgets and financial statements (The PEW Charitable Trusts, 2020).

States may require slightly more invasive intervention through compliance with provisions similar to those set out in the Sarbanes-Oxley Act. While primarily aimed at publicly traded companies, this act contains provisions that, if acted upon, can strengthen the quality of financial reporting and add a layer of protection to municipal stakeholders (Sarbanes-Oxley Act, 2002; Zender & Deal, 2016). These provisions include the addition of an audit committee, whistle blower protection, and verification of auditor independence (Sarbanes-Oxley Act, 2002; Zender & Deal, 2016).

Some forms of intervention are more aggressive. Many states set limits on the amount of debt that municipalities may issue. For example, Pennsylvania sets debt limits based on the prior ten-year average of assessed taxable property (Spiotto, 2012). States may also provide legal assistance in the renegotiation of contracts. They may provide loans and grants, approve the consolidation with other municipalities, and provide specific approval for the filing of Chapter 9 of the Bankruptcy Code (Nickels, 2016).

There are several benefits of state intervention into the financial and governance affairs of a financially distressed local government. When investors and lenders know that a state can and will intervene, if necessary, there is more confidence that a default will not occur (Murphy, 2018). This generally keeps interest rates from rising significantly. Another advantage is the addition of a set of internal controls. If there has been corruption, gross negligence, or ineffective leadership at the local level, an independent examination by state officials may discover this (Nakhmurina, 2020).

There are also disadvantages to state intervention. Local citizens may feel that state officials have different priorities than they have and therefore resist giving up control to state officials (Kasdan, 2016). In addition, the knowledge that the state has had to intervene may damage the municipality's reputation with potential investors. Finally, there is a risk that municipalities that know the state will come to their aid may take on excessive risk that they would not have incurred without the state to bail them out (Yang, 2019a). In spite of these disadvantages, an increasing number of state leaders are choosing to respond to local government distress with monitoring and/or intervention.

Summary of the Literature Review

Since the United States became a nation, local governments have been expected to honor their obligations and provide reasonable services to citizens. Occasionally however, unfavorable circumstances have caused some municipalities to experience financial distress. Chapter 9 of the United States Bankruptcy Code addresses the bankruptcy of municipalities and provides an option for these municipalities.

Chapter 9 was written to address the particular needs of local governments. The bankruptcy laws for businesses were not applicable due to the difference in structure of a business and a municipality. If a business cannot reorganize successfully, liquidation is an option. However, liquidation of a local government is not a possibility. Therefore, Chapter 9 exists to provide time for municipal leaders to prepare a plan to correct the financial stress. There are restrictions on which governments may file including: insolvency, permission from the state to file, desiring a plan to adjust debt and working to gain approval from creditors (United States Courts, 2020).

The filing of Chapter 9 is expensive and should be considered as a last resort (Spiotto, 2012). Therefore, the identification of indicators that can predict conditions common to bankrupt municipalities would be a value to municipal leaders. While research in this area is increasing, there is still no definitive set of indicators that serve this purpose. In addition to various financial ratios, current research includes governance, environmental, and political issues (Y. Kim et al., 2020; McDonald, 2018).

Pension funding and state responses to municipal fiscal distress can also affect the likelihood of municipal bankruptcy. Pension plan underfunding has become a significant issue for many municipalities since the Great Recession of 2008. The refusal or inability to address this issue has allowed the pension plans of many municipalities to become seriously underfunded. Increasingly, states have begun to respond to municipalities that exhibit fiscal distress. These responses, both monitoring and intervention, have as a goal the correction of problems that cause the crises and hopefully the avoidance of bankruptcy (Spiotto, 2012; The PEW Charitable Trusts, 2020).

Summary of Section 1 and Transition

The Chapter 9 provision for municipal bankruptcy meets an important need by providing time for municipal leaders to draft a sustainable and workable plan for the future. However, the costs are significant, and bankruptcy should be considered as a last resort (Spiotto, 2012). Early indicators that can alert leaders to impending financial stress would allow more time to address the situation and possibly avoid bankruptcy. This study attempted to identify those indicators through quantitative non-experimental research. The literature review contributed by outlining the municipal bankruptcy process, identifying those ratios commonly used in business and municipalities, and by explaining the need for the current research. Additional factors such as

pension funding and state intervention were also explored. Section 2 discusses the details of the project, including the research method and design, population and sampling method, and data collection and analysis.

Section 2: The Project

Over 300 municipalities have filed for Chapter 9 bankruptcy since 1980 (Spiotto, 2018). Events such as natural disasters, demographic changes, pandemics, investment losses, plant closures, and mismanagement will likely continue to contribute to severe financial stress and the need to file for bankruptcy in the future for some municipalities (Dzigbede et al., 2020; Hendrick & Degnan, 2020; Maher et al., 2020; Zender & Deal, 2016). Because of fundamental differences in purpose and reporting, bankruptcy prediction tools used in the for-profit sector are not applicable for municipalities (Governmental Accounting Standards Board, 2017).

Current research addresses predictors for municipal financial stress (Cohen et al., 2017; Kasdan, 2016; Y. Kim et al., 2020; Leiser & Mills, 2019; Stone et al., 2015). This study was designed to add to current research by seeking to find predictors for those municipalities that proceed to the ultimate step of financial stress which is the filing for Chapter 9 bankruptcy. This section is organized as follows: (a) purpose statement, (b) role of the researcher, (c) research methodology, (d) participants, (e) population and sampling, (f) data collection and organization, (g) data analysis, and (h) reliability and validity.

Purpose Statement

The purpose of this non-experimental quantitative study was to examine the relationship between the financial indicators of those government entities that have declared bankruptcy as compared to financial indicators from similar government entities that have not declared bankruptcy in order to identify predictors of bankruptcy. Prior research has evaluated various

financial indicators and models for predicting bankruptcy in corporations (Acosta-Gonzalez et al., 2019; Alaminos et al., 2016; Barboza et al., 2017; Bateni & Asghari, 2020). This research adds to the body of knowledge through the identification of financial indicators that can predict the likelihood of financial distress and probable bankruptcy in local governments. Since 1980, there have been 311 Chapter 9 bankruptcy filings (Spiotto, 2018). Although rare compared to the number of corporate bankruptcies, Chapter 9 bankruptcy cases may involve the re-negotiation of millions of dollars of municipal debt and adversely affect the residents of these local governmental entities (United States Courts, 2020).

This research provides local government leaders with additional tools to predict and possibly preempt bankruptcy. In addition, potential investors can use these tools when considering investments in municipal bonds. Lastly, those considering future employment with municipalities may utilize these tools to help make employment decisions.

Role of the Researcher

The researcher collected financial data from publicly available Comprehensive Annual Financial Reports. In cases where these reports were not available, the published audited annual financial statements were used. The level of state involvement regarding the filing of Chapter 9 by municipalities was retrieved from The PEW Charitable Trusts Research and verified through individual state websites. Since this information is available to the public, no surveys were used in this study. The data were collected into Excel, uploaded into SPSS 27 software where it was analyzed with respect to the hypotheses, and retained by the researcher.

Research Methodology

This section covers the selection of research design and method for this study. Both the design and method were selected based on the most appropriate way to address the problem

statement and the hypotheses. For this study, the design and method should address the measurement of numerical information, facilitate an unbiased approach, and use statistical procedures (Creswell, 2014).

Discussion of Fixed Quantitative Design

A fixed quantitative design was selected for this project. This design is suitable for an objective search for relationships between variables. This objectivity is often expressed in terms of numbers and closed-ended questions as opposed to words and open-ended questions which are used in the qualitative design (Creswell, 2014). This design was appropriate for this study which considered the relationship of numeric financial ratios to the likelihood of bankruptcy. In addition, it is a commonly used design used in both studies of corporate bankruptcy prediction and of municipal financial distress prediction (Bellovary et al., 2007; McDonald, 2018).

A flexible qualitative design is appropriate when themes and patterns are identified and interpreted. Open-ended questions are used to collect personal insights and opinions. Research using a flexible qualitative design often attempts to explain how or why (Creswell, 2014; Stake, 2010). This design was not appropriate for this study because personal insights and interpretations were not collected. The purpose of the study was to identify correlations between the independent variables and the dependent variable rather than how or why the dependent variable exists.

Discussion of Correlational Method

The method chosen for this research was a non-experimental correlational approach. This method was used to examine the relationship between variables without an intervention (Creswell, 2014). This method was appropriate for this study because the purpose of the study

was to examine the relationship between the independent variables, selected financial indicators, and the dependent variable, likelihood of bankruptcy.

An experimental method is commonly used to determine a cause-and-effect relationship (Warner, 2013). This method was not selected since there was no intervention performed and this research did not seek to identify this type of relationship. All data were retrieved from historical data without intervention.

The type of correlational approach used was logistic regression. This type of correlational analysis provides a “way of mathematically understanding the relationships and interactions between the variables in a study” (Limberg et al., 2021, p. 147). It is appropriate when there is more than one independent variable and one dependent dichotomous variable (Morgan et al., 2013). One dependent variable and eight independent variables were examined for this study and are shown in Table 2.

The dependent variable in this study was the existence of Chapter 9 bankruptcy filing or the lack of Chapter 9 bankruptcy filing. Data were collected from the Public Access to Court Electronic Records (PACER) and the PEW Charitable Trusts to determine those municipalities that have filed for Chapter 9 bankruptcy. These results were analyzed in relation to the selected independent variables to determine those that had predictive value in relation to the dependent variable.

There were eight independent variables. Each of the first seven provide financial information regarding at least one of the four areas of solvency: cash, budgetary, long-term, and service. All financial data were retrieved from the government-wide financial statements: the Statement of Activities and the Statement of Net Position for the primary government, not including component units.

Table 2*Variable Descriptions*

Variable Name	Variable Type	Data Type	Dimension	Range
Bankruptcy Filed	Dependent	Dichotomous		Yes or No
Current Ratio	Independent	Scale	Cash Solvency	$0 \leq x \leq \infty$
Operating Ratio	Independent	Scale	Budgetary Solvency	$0 \leq x \leq \infty$
Operating Ratio for Business Type Activities	Independent	Scale	Budgetary Solvency	$0 \leq x \leq \infty$
Net Asset Ratio	Independent	Scale	Long-Term Solvency	$-\infty \leq x \leq \infty$
Long Term Liability Ratio	Independent	Scale	Long-Term Solvency	$0 \leq x \leq \infty$
Pension Debt Funded Ratio	Independent	Scale	Long-Term Solvency	$0 \leq x \leq \infty$
Tax Per Capita	Independent	Scale	Service Solvency	$0 \leq x \leq \infty$
State Involvement	Independent	Nominal		No monitoring or intervention; Monitoring only; Monitoring and Intervention

The current ratio represents the current assets divided by the current liabilities of the primary government. The net asset ratio reflects the total net assets less those invested in capital, divided by total assets. The long-term liability ratio is calculated by non-current liabilities divided by total assets. The data for these three variables were gathered from the government-wide Statement of Net Position.

Data for two of the variables came from the government-wide Statement of Activities. They are the operating ratio and the operating ratio for business type activities (BTA). The operating ratio divides total revenue by total expenses. The operating ratio for BTA reflects BTA charges for services (revenues) divided by BTA expenses.

When available, data for the tax per capita were retrieved from two places. The tax revenue data were taken from the Statement of Activities. The population of each municipality was retrieved from the demographic and economic statistics section of the Comprehensive Annual Financial Report. However, this information was only available for the general-purpose entities.

The pension debt funded ratio was also retrieved from a separate page in the Comprehensive Annual Financial Report: The Schedule of Changes in Net Pension Liability. If this report was unavailable, an alternative source was the audited financial reports. As with the tax per capita variable, only general-purpose entities provided this information.

The final variable addresses state responses to municipal financial reporting. Of the states that allow a municipality to file for Chapter 9 bankruptcy, some formally monitor the financial reporting of municipalities but do not intervene. Other states monitor and intervene if certain benchmarks are surpassed. Finally, other states neither monitor nor intervene with municipal financial affairs. This information was collected from The PEW Charitable Trusts.

The analysis of any relationships between the independent variables and the dependent variable was designed to address the hypothesis of this study in order to determine if the null hypothesis should be rejected. The null hypothesis assumed there is not a statistically significant relationship between selected financial indicators and the likelihood of bankruptcy by a local government entity.

Summary of Research Methodology

This project was implemented using a fixed quantitative design. This design is appropriate for this type of objective search for relationships between variables (Creswell, 2014). The method used was logistic regression. This was a non-experimental correlational approach. This approach was selected since the project does not require an intervention. Logistic regression was suitable for this project since it had multiple independent variables and one dependent dichotomous variable (Morgan et al., 2013).

Participants

Participants were not used in this study. Rather the hypotheses were addressed by analyzing archival data that is available to the public. The data were collected from Comprehensive Annual Financial Reports and published annual financial reports. No confidential information was collected. This archival data were selected because they contain the necessary information and have been audited by independent auditors.

Population and Sampling

This study was designed to identify predictors of local government entity bankruptcy in states that specifically allow local governments to select this option. This section addresses the eligible population used for this study. The purposive and random sampling methods and the selected sample size are also addressed.

Discussion of Population

The eligible population was identified through the U.S. Census Bureau. This resource was selected because it has a current listing of all local government entities listed by state. As of the 2017 U.S. Census, there are 90,075 local government entities in the United States (see Figure 2). The filing of Chapter 9 bankruptcy requires specific state approval. Therefore, the eligible

population of this research excluded any local governments that are in states that have not specifically allowed this option. This exclusion was necessary since without state approval, Chapter 9 bankruptcy would not occur. There are currently 27 states that provide specific approval for their municipalities to file for Chapter 9 bankruptcy (The PEW Charitable Trusts, 2020). These states have a total of 63,148 municipalities (United States Census Bureau, 2020).

A further reduction was made because some states allow Chapter 9 filing for only certain types of entities. For example, Montana allows the filing of Chapter 9 for all types of entities except its 54 counties. Therefore, Montana counties were excluded from the eligible population. These state limitations reduced the eligible population to 55,671 (United States Census Bureau, 2020).

Discussion of Sampling

The sample was selected using purposive and random sampling methods. Purposive sampling methods are useful when the research goal is enhanced by the selection of participants with key attributes, such as the filing of Chapter 9 bankruptcy or type of municipality (Campbell et al., 2020; Jackson, 2017). This method was used to ensure that the sample contained general-purpose and special-purpose bankrupt municipalities. The sample entities were matched to ensure the comparability regarding entity purpose, general or special. In addition, matched samples were selected from the same year to reduce the effect of economic factors. A random sample was taken from the total population of eligible municipalities using the random function generator in Excel.

The total sample consisted of 44 eligible general-purpose and special-purpose municipalities that filed for Chapter 9 bankruptcy between 2003 and 2020. This list of bankrupt municipalities was collected through the Public Access to Court Electronic Records (PACER).

Appendix A provides the listing of these municipalities. This amount excludes Chapter 9 filings from the Puerto Rico Bankruptcy Court. In addition, 44 municipalities that did not file for Chapter 9 bankruptcy in that period were included in the sample. Appendix B provides a listing of the matched non-bankrupt entities. The total sample size included 88 local government entities.

The 44 bankrupt entities were matched with the 44 non-bankrupt entities according to two parameters. The first parameter is entity type. The bankrupt entities were identified as either general-purpose or special-purpose. The second parameter is year. Raw data were selected from each bankrupt entity one year prior to the filing of Chapter 9. Each bankrupt sample was matched with a non-bankrupt sample according to type and year.

Summary of Population and Sampling

For this study, a matched sampling method was used to identify relationships between bankrupt municipalities and paired non-bankrupt municipalities. The 44 bankrupt entities selected were matched with 44 non-bankrupt entities for a total sample size of 88. They were matched according to type and year and cover an 18-year period between 2003 and 2020.

Data Collection & Organization

This section provides a description of the data collection and data organization procedures used for this study. The data collected, along with the source of this data are discussed. The organizational techniques for the raw data are examined, including the type of software systems used.

Data Collection Plan

The collected data consists of financial data and the level of state involvement from each eligible bankrupt municipality. In addition, for every bankrupt municipality, data were collected

from the same year and entity type from a municipality that has not filed for Chapter 9. This information was accessed through Comprehensive Annual Financial Reports when available. If not available, the audited financial statements were accessed directly. Information regarding the state involvement in municipal bankruptcies was taken from data gathered by The Pew Charitable Trusts. This collection plan is appropriate for this study because it compared solvency and state involvement data from bankrupt municipalities with the corresponding data from non-bankrupt municipalities (Creswell, 2014).

Instruments

No instruments were used to gather information for this study. The financial information was collected from publicly available archived financial statements; therefore, no specific permission to use this information was necessary. Data regarding state involvement was also collected from publicly available information. Since bankruptcy is largely impacted by insolvency in one or more areas (Liang et al., 2016; McDonald, 2018; Succurro et al., 2019), this data addressed the research question by analyzing solvency issues. In addition, the extent to which a state provides financial assistance to municipalities which are considering bankruptcy may impact the need to file for Chapter 9 (The PEW Charitable Trusts, 2017; The PEW Charitable Trusts, 2020). Therefore, state involvement data addressed the research question by analyzing levels of state involvement.

Data Organization Plan

Raw data were entered into Microsoft Excel to be sorted, coded, and calculated. Relevant financial information from each of the bankrupt and non-bankrupt municipalities was recorded and organized to calculate the needed financial ratios. In addition, the type of state involvement was recorded for each municipality. Organized data were then exported into IBM SPSS 27 for

statistical analysis. All data were saved on the researcher's computer hard drive with a secondary back-up to a flash drive.

Working papers for all bankrupt municipalities were retained. These papers reflect additional details of the bankrupt municipalities. If an entity was not selected for the study, those details offer information for the reason they were excluded (Stake, 2010).

Summary of Data Collection & Organization

For this study, data were collected from three primary sources. Comprehensive Annual Financial Reports were used where they were available. If unavailable, published financial statements were used to gather financial data. Research from The PEW Charitable Trusts was the source of the state involvement information.

Raw data from all entities were organized into Excel software. After organization and sorting, the data were exported into SPSS 27 for analysis. Working papers with additional data were retained.

Data Analysis

For each municipality in the study, the following raw data were retrieved and analyzed: current assets, current liabilities, total net assets, net assets invested in capital, total assets, non-current liabilities, total revenues, total expenses, total business type activities (BTA) revenues, total BTA expenses, total revenue from taxes, total population, pension debt funding ratio, and the level of state involvement in Chapter 9 filings. This information was used to calculate the financial ratios that serve as independent variables. Data from bankrupt entities were taken from the year prior to the filing of Chapter 9. Data from a matched non-bankrupt entity were gathered from the same year as each bankrupt municipality.

Descriptive statistics were calculated through SPSS 27. These statistics summarize the data and provide a means to look for errors and omissions. Each variable was examined to address the hypothesis.

The Variables

One dependent variable and eight independent variables were used in this study. These variables were selected for the purpose of developing a model that may be used to predict the filing of Chapter 9 bankruptcy. The variables described below are listed in the Table 3.

Dependent Variable. The dependent variable is the filing or lack of filing of Chapter 9 bankruptcy. This information was retrieved from the listing of all Chapter 9 bankruptcies filed per the Public Access to Court Electronic Records (PACER). This dichotomous variable was coded with a “1” to represent the filing of Chapter 9 and a “0” to represent the absence of filing of Chapter 9.

Independent Variable 1. Independent variable 1 is the current ratio. This scale/normal variable is calculated by dividing the current assets by the current liabilities of the primary government. This information is located on the government-wide Statement of Net Position.

Independent Variable 2. Independent variable 2 is the operating ratio and is also a scale data type. This ratio is calculated by dividing total revenue by total expenses. The source of this data is the government-wide Statement of Activities.

Independent Variable 3. Independent variable 3 is the operating ratio for business type activities (BTA). The data type is scale. The calculation involves the total revenues for BTA divided by the total expenses of BTA. The source of this data is also the government-wide Statement of Activities.

Independent Variable 4. Independent variable 4 is the net asset ratio. This ratio reflects the total net assets less those invested in capital, divided by total assets. Data for this scale variable is located on the government-wide Statement of Net Position.

Independent Variable 5. Independent variable 5 is the long-term liability ratio. The calculation for this variable is the non-current liabilities divided by total assets. Data for this variable is also located on the government-wide Statement of Net Position.

Independent Variable 6. Independent variable 6 is the pension debt funded ratio. This scale data may be found on the schedule of changes in net pension liability on the Comprehensive Annual Financial Report. If this report is unavailable, this ratio may be calculated by dividing the ending plan fiduciary net position by the total ending pension liability. The notes to the financial statements contain this data.

Independent Variable 7. Independent variable 7 is the tax per capita and is also scale type data. The tax data are listed on the government-side Statement of Activities. The population for each municipality may be found in the government and economic statistics section of the Comprehensive Annual Financial Report. If this report is unavailable, the population can be found in the management's discussion and analysis report which accompanies the published financial reports.

Independent Variable 8. Independent variable 8 is the level of state involvement. This nominal data are divided into three distinct categories. The categories are no involvement, formal monitoring only, and monitoring and intervention. This information was collected from The PEW Charitable Trusts research.

Table 3*Variable Names, Types, Data Types, and Range*

Variable Name	Variable Type	Data Type	Range
Bankruptcy Filed	Dependent	Dichotomous	Yes or No
Current Ratio	Independent	Scale	$0 \leq x \leq \infty$
Operating Ratio	Independent	Scale	$0 \leq x \leq \infty$
Operating Ratio for Business Type Activities	Independent	Scale	$0 \leq x \leq \infty$
Net Asset Ratio	Independent	Scale	$-\infty \leq x \leq \infty$
Long Term Liability Ratio	Independent	Scale	$0 \leq x \leq \infty$
Pension Debt Funded Ratio	Independent	Scale	$0 \leq x \leq \infty$
Tax Per Capita	Independent	Scale	$0 \leq x \leq \infty$
State Involvement	Independent	Nominal	No monitoring or intervention. Monitoring only; Monitoring and Intervention

Quantitative Data Analysis

Seven of the eight independent variables contain scale data. Accordingly, the following descriptive statistics were performed on these variables: number of municipalities, range, minimum, maximum, mean, standard deviation, variance, and skewness. These statistics were evaluated for reasonableness, errors, missing data, and outliers. To test for normal distribution, a histogram was created for the independent variables (Morgan et al., 2013).

The eighth independent variable contains nominal data. Descriptive statistics performed for this variable include the number of municipalities and mode. A frequency distribution table was created to illustrate the data regarding this variable (Morgan et al., 2013).

The hypothesis seeks to determine if a statistically significant relationship exists between selected financial indicators and the likelihood of bankruptcy by a local government entity. To test this hypothesis, the dependent variable and all eight independent variables were measured and analyzed.

Summary of Data Analysis

Raw data necessary to calculate the variables were organized and analyzed. This was used to calculate financial ratios. The dichotomous dependent variable addresses the filing or lack of filing of Chapter 9 bankruptcy. The first seven independent variables are financial indicators calculated from audited financial statement raw data. The final independent variable is a measure of state involvement regarding the fiscal condition of distressed local governments.

Descriptive statistics were calculated and evaluated to check for errors and to provide a summary of the sample data. Appropriate statistics were calculated for the scale and the nominal variables (Morgan et al., 2013). All variables were examined to address the hypothesis.

Reliability and Validity

Reliability and validity are attributes of research that add to the overall integrity of the results. Reliable data represent consistent and accurate information that may be replicated by future efforts. Validity addresses the meaningfulness of the data relative to the research question. The following sections address these qualities and the means for mitigating threats to each.

Reliability

In a quantitative study, reliability refers to the consistency and accuracy of collected data and to the test-retest reliability. Consistency and accuracy address the lack of measurement error, including bias. Test-retest reliability refers to the likelihood that others may reproduce the study and get similar results. While total assurance of reliability is not possible, integrating steps to strengthen reliability of data provides a degree of confidence in the accuracy of the data (Creswell, 2014; Morgan et al., 2013).

No instruments were used for this study. The financial data for this study were retrieved from publicly available financial statements. These statements were prepared in accordance with Generally Accepted Accounting Principles (GAAP) and Governmental Accounting Standards Board (GASB), which define the measurement and location within the financial statements of the raw data. Additionally in each case, the data were audited by an independent CPA firm to ensure compliance with GAAP and GASB. This assurance of compliance to GAAP and GASB increases the likelihood of reliability as to consistency and the test-retest ability. Data regarding the final independent variable, state involvement, was retrieved from The PEW Charitable Trusts research. This was verified using individual state websites.

Validity

According to Creswell (2014), validity in quantitative research enhances “the ability to draw meaningful and useful inferences” from research results (p. 160). As with reliability, complete validity is not possible to guarantee. However, steps may be taken to increase the likelihood of validity. Three aspects of validity are content, predictive, and construct (Creswell, 2014; Morgan et al., 2013).

Content validity addresses the data that is measured and if it is the correct data to address the research question (Creswell, 2014). Variables measured in this study are representative of those variables consistently found to predict bankruptcy in commercial firms or financial stress in local governments (Acosta-González et al., 2019; Bellovary, 2007; McDonald, 2018; Succurro et al., 2019). This is appropriate since the filing of Chapter 9 bankruptcy is often preceded by financial stress.

Predictive validity concerns the ability to infer a specific conclusion from the results of the study. The sample of 88 municipalities includes 44 bankrupt and 44 non-bankrupt entities. Seven of the eight independent variables directly measure at least one of the four areas of municipal solvency. The eighth independent variable measures the level of state involvement. While the final variable is a more recent development, research has shown that states are increasingly taking a more proactive approach to municipal bankruptcy (The PEW Charitable Trusts, 2017; The PEW Charitable Trusts, 2020).

Construct validity addresses the usefulness of the research results (Creswell, 2014). This area of validity was considered early in the design of this study. The ability to predict the bankruptcy of a local government entity can be valuable to local leaders as well as to potential investors.

Summary of Reliability and Validity

The usefulness of research results is impacted by the reliability and validity of the research. Reliability refers to consistency and accuracy. These are strengthened in this study using data which has been audited to comply with GAAP and GASB. Validity refers to the meaning and usefulness of the results. Validity was addressed by using financial measures shown

to be predictive of financial stress. In addition, there is a direct application of these results to municipal leadership and potential investors.

Summary of Section 2 and Transition

This quantitative non-experimental study examined the relationships between financial indicators of municipalities that have filed for Chapter 9 bankruptcy and those eligible municipalities that have not filed for Chapter 9 bankruptcy. This research adds to the body of knowledge by providing predictors of the likelihood of municipal bankruptcy. This will be helpful to many types of municipal stakeholders, such as officials, potential lenders, and potential employees.

A fixed quantitative design was selected to address the objective search of relationships between numeric variables. The correlational approach selected was logistic regression. This method is appropriate due to the inclusion of multiple independent variables and one dependent dichotomous variable.

The eligible population consisted of all general-purpose and special-purpose local government entities in the United States that are eligible to file Chapter 9. A matched sample of these was compared to the 44 eligible entities that have filed for Chapter 9 in the last 18 years. The total sample size was 88 entities.

Data to address the hypothesis was collected from archival data. The financial data were retrieved from audited financial reports. The audit by independent third parties adds to the reliability of the data. Validity is strengthened by the selection of key variables shown to be useful in predicting financial stress in previous studies.

Section 3 will provide the findings of the analysis. These findings will be discussed in relation to the research question, the theoretical framework, the literature, and the research

problem. An application to professional practice section will include application strategies. Lastly, recommendations for further study, and an application to personal and professional growth will be addressed.

Section 3: Application to Professional Practice

This study was completed to locate possible financial indicators that would predict the likelihood of filing Chapter 9 bankruptcy by a local government entity. Section 3 provides an overview of this study. Details of the quantitative research study and subsequent results are presented. The relationship of the research findings to the research question, theoretical framework, and literature are evaluated. This section also includes the application of the study to professional practice and recommendations for further study. Lastly, reflections by the researcher are included which evaluate the study in light of personal, professional, and biblical perspectives.

Overview of the Study

The purpose of this study was to locate possible predictors of bankruptcy in local government entities. A review of the existing literature was conducted to investigate current predictors of bankruptcy in commercial enterprises as well as current predictors of financial stress in LGEs. The research question for this study was developed to determine to what extent financial indicators can predict the bankruptcy of a local government entity.

Archival data were collected from 44 bankrupt entities and 44 matching non-bankrupt entities. It was prepared and entered into SPSS software for analysis. The methodology selected for this study was logistic regression.

Originally, eight independent variables were selected for the study. Due to missing data and multicollinearity between two of the variables, five of the variables were excluded. Of the

three remaining variables, the operating ratio and the net asset ratio were found to predict Chapter 9 bankruptcy in LGEs.

Presentation of the Findings

This research was designed to detect possible indicators of bankruptcy in local government entities (LGE). A quantitative logistic regression method was utilized to analyze financial ratios taken from the financial statements of LGEs. The financial ratios were representative of the financial statements as a whole (Beaver, 1966; Liang et al., 2016).

The presentation of the findings section provides the descriptives performed in this research, as well as the results. Hypothesis testing is explained, including the appropriateness of the data and the method. Results are shown in tables and interpreted. Research findings are discussed relative to the research question, the theoretical framework, the existing literature, and the problem statement.

Descriptive Statistics

This section describes the data that were used to address the research question. Archival data were collected for 46 bankrupt entities identified from the Public Access to Court Electronic Records (PACER). Data were also collected for 46 non-bankrupt entities, which were matched for year and type of entity to the bankrupt entities. The beginning time period was 2003 and the ending time period was 2020. However, when reviewing the completeness and consistency of the data, one bankrupt entity reported unaudited financial statements. Another bankrupt entity did not provide complete records. The decision was made to exclude these two cases and the corresponding non-bankrupt entities, resulting in a total of 88 cases.

Of the 141 entities which had filed for Chapter 9 protection, 121 met the requirements outlined in the purpose statement. These were government entities in the states that allowed

bankruptcy protection. For these entities, research was conducted to locate financial statements in the year prior to bankruptcy filing. When unable to locate this information, emails were sent to the entities and to the state departments of revenue in which they were located asking for the financial statements. Audited financial statements were reviewed for 44 bankrupt entities. Of the 44, 13 were general-purpose entities and 31 were special-purpose entities. These entities are listed in Appendix A.

In addition, financial information for 44 matching entities which had not filed for Chapter 9 bankruptcy was attained. They were matched by year, type, and state. This included 13 general-purpose and 31 special-purpose entities. Table 4 shows the distribution of filing status and entity types. A complete listing of these entities is found in Appendix B.

Table 4

Distribution of Local Government Entities

	General-purpose	Special-purpose	Total
Bankrupt	13	31	44
Non-bankrupt	13	31	44
Total	26	62	88

For this study, eight independent variables were considered. These eight variables were evaluated for use in the logistic regression analysis. The following pages examine the descriptive statistics for each variable, as well as the ability for each to be used in the analysis.

Independent Variable 1. Independent variable 1 is the current ratio. It is calculated by dividing the current assets by the current liabilities. The mean for independent variable 1 was 5.805, and the standard deviation was 10.386. Four extreme outliers were found for this variable. These were adjusted to 0.5 units above ± 3 standard deviations from the mean (Warner, 2013).

Skewness and kurtosis were still large, but logistic regression does not require normality and significant outliers have been addressed. Further influence of outliers was completed in the model analysis.

After adjustments, this variable had data that met the requirements for logistic regression analysis and was included in the model. Table 5 provides additional descriptive statistics for this variable.

Table 5

Descriptive Statistics for Independent Variable 1 – Current Ratio

	<i>N</i>	Mean	<i>SD</i>	Min	Max	Skewness	Kurtosis
All Entities	88	5.805	10.386	0.080	47.635	3.190	10.170
Bankrupt	44	2.925	7.348	0.080	47.635	5.553	33.546
Non-bankrupt	44	8.686	12.136	0.100	47.635	2.437	5.507

Figure 3

Histogram for Independent Variable 1 – Current Ratio

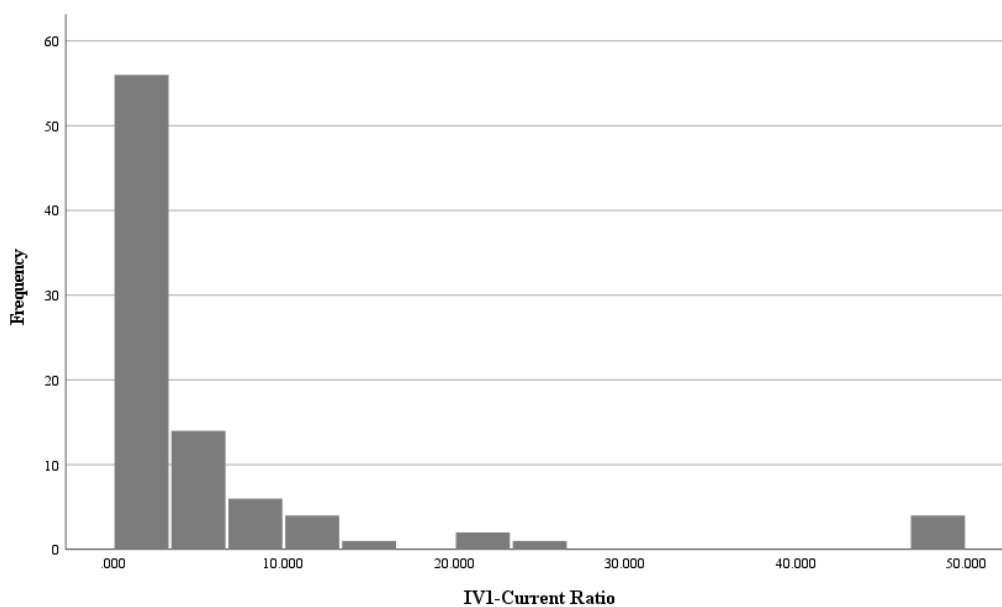
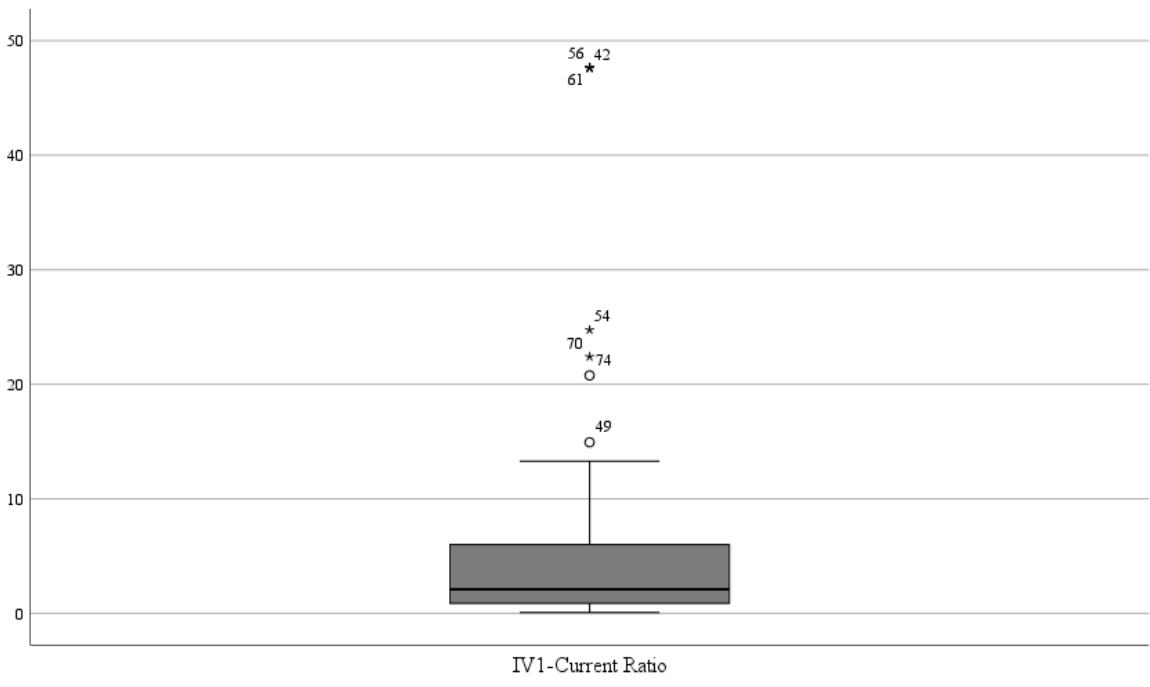


Figure 4

Box and Whiskers for Independent Variable 1 – Current Ratio



Independent Variable 2. Independent variable 2 is the operating ratio. This ratio is calculated by dividing total revenue by total expenses. Independent variable 2 had a mean of 1.026 and a standard deviation of 0.343. This variable had data that met the requirements for logistic regression analysis and was included in the model. Table 6 provides additional descriptive statistics for this variable.

Table 6*Descriptive Statistics for Independent Variable 2 – Operating Ratio*

	<i>N</i>	Mean	<i>SD</i>	Min	Max	Skewness	Kurtosis
All Entities	88	1.026	0.343	0.360	3.430	4.299	28.120
Bankrupt	44	0.911	0.147	0.580	1.350	0.025	1.871
Non-bankrupt	44	1.140	0.435	0.360	3.430	3.624	18.127

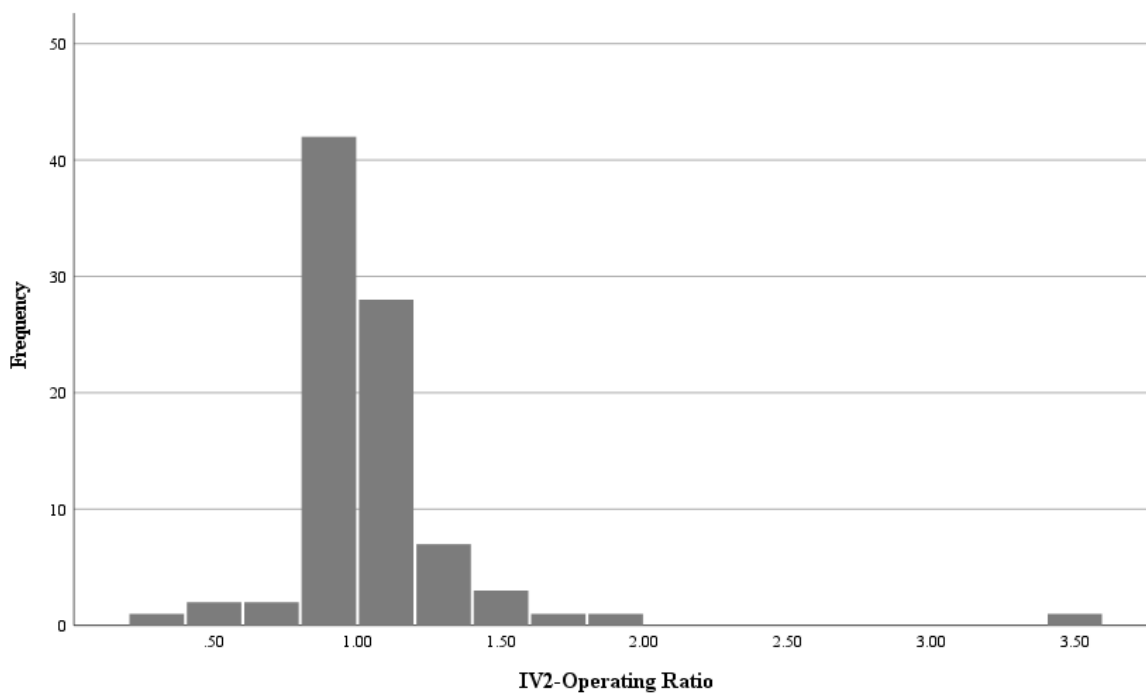
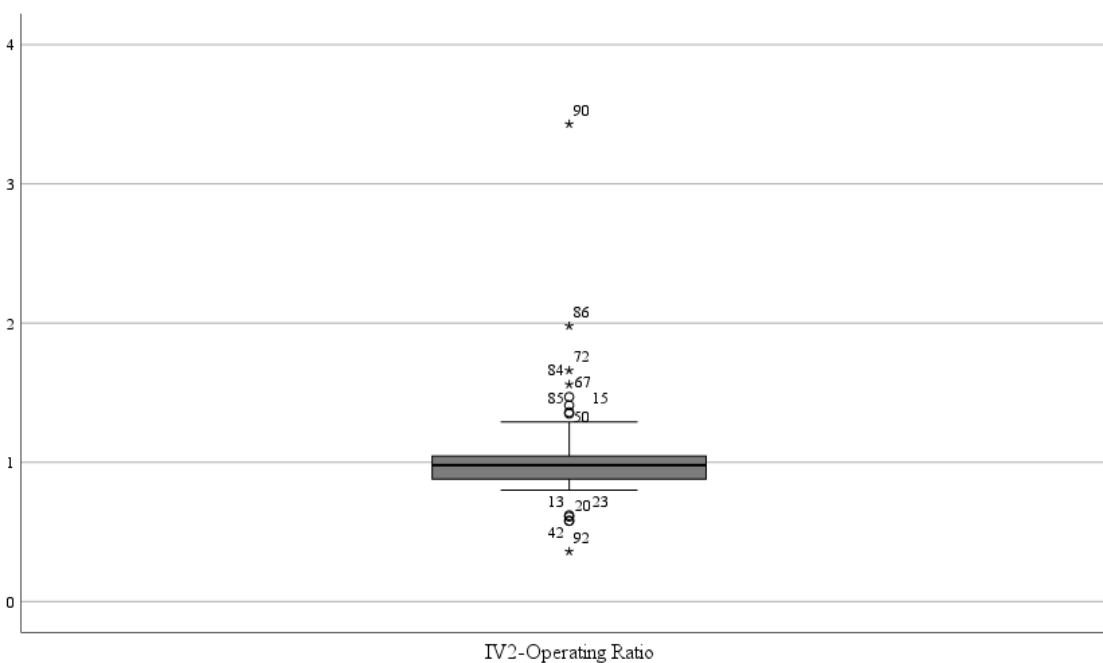
Figure 5*Histogram for Independent Variable 2 – Operating Ratio*

Figure 6

Box and Whiskers for Independent Variable 2 – Operating Ratio



Independent Variable 3. Independent variable 3 is the operating ratio for business type activities (BTA). The calculation involves the total revenues for BTA divided by the total expenses of BTA. This variable was found to only be appropriate for general-purpose entities and served no relevancy for special-purpose entities. In addition, this measure was captured within the operating ratio which was analyzed through independent variable 2. Since there were only 13 general-purpose entities and this information was included in another measure, the operating ratio for BTA was excluded from the analysis.

Table 7

Descriptive Statistics for Independent Variable 3 – Operating Ratio for BTA

	<i>N</i>	Mean	<i>SD</i>	Min	Max	Skewness	Kurtosis
IV3 – Operating Ratio for BTA	88	0.863	0.385	0.000	2.040	0.163	1.713

Independent Variable 4. Independent variable 4 is the net asset ratio. This ratio reflects the total net assets less those invested in capital, divided by total assets. Independent variable 4 had a mean of -0.0002 and a standard deviation of 0.586. This variable had data that met the requirements for logistic regression analysis and was included in the model. Table 8 provides additional descriptive statistics for this variable.

Table 8

Descriptive Statistics for Independent Variable 4 – Net Asset Ratio

	<i>N</i>	Mean	<i>SD</i>	Min	Max	Skewness	Kurtosis
All Entities	88	-0.0002	0.586	-2.960	0.790	-2.734	10.659
Bankrupt	44	-0.248	0.704	-2.960	0.630	-2.339	6.438
Non-bankrupt	44	0.247	0.272	-0.420	0.790	0.149	-0.084

Figure 7

Histogram for Independent Variable 4 – Net Asset Ratio

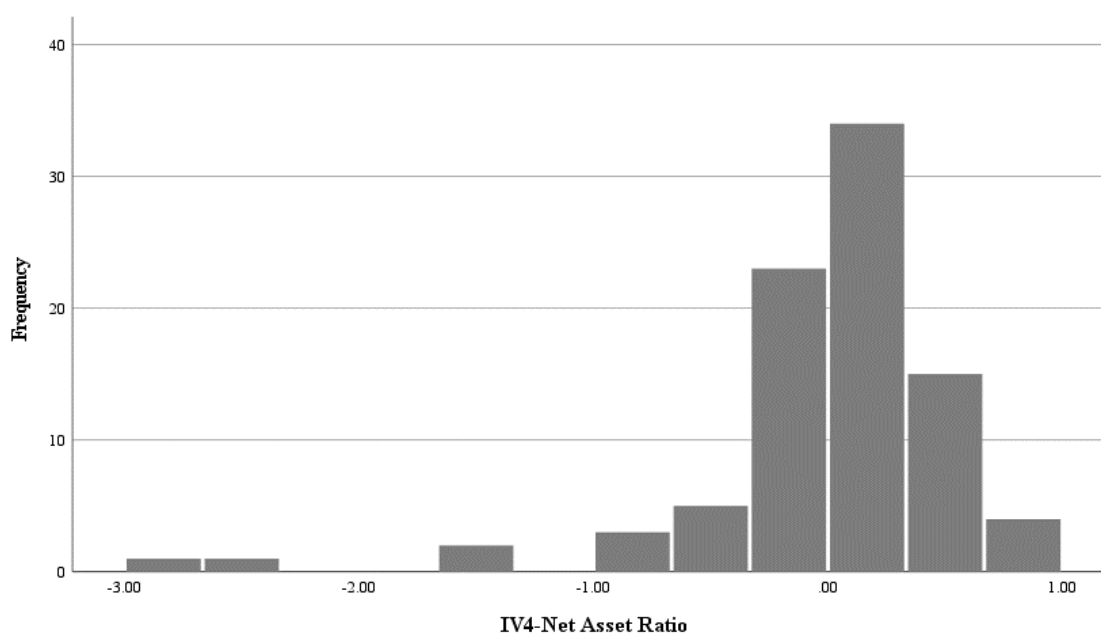
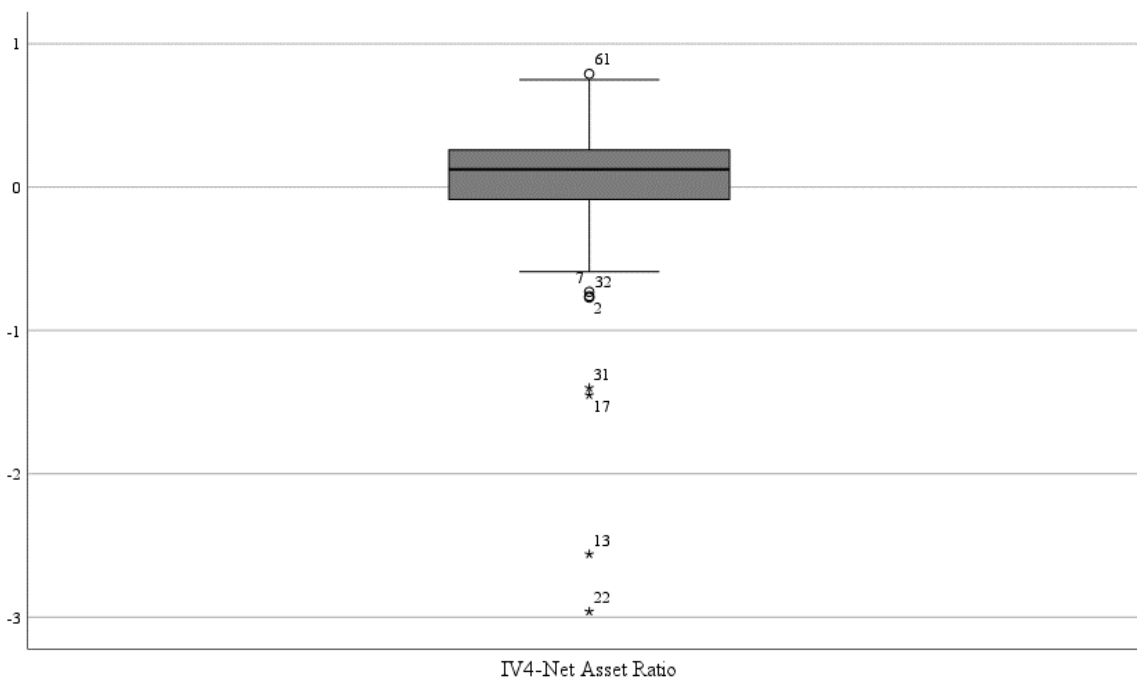


Figure 8

Box and Whiskers for Independent Variable 4 – Net Asset Ratio



Independent Variable 5. Independent variable 5 is the long-term liability ratio. This ratio is calculated as the long-term liabilities divided by the total assets. However, in many of the bankrupt entities, there were no long-term liabilities because they had all been moved to current liabilities. Therefore, the long-term liability ratio did not accurately reflect the financial health of the entity. As such, an equally common metric was substituted to demonstrate the relationship of liabilities to assets within the entity: total liabilities divided by total assets.

Table 9*Descriptive Statistics for Alternative Independent Variable 5 – Liability Ratio*

	<i>N</i>	Mean	<i>SD</i>	Min	Max	Skewness	Kurtosis
All Entities	88	0.754	0.726	0.000	4.340	2.366	7.701
Bankrupt	44	1.088	0.864	0.080	4.340	1.822	4.178
Non-bankrupt	44	0.420	0.303	0.000	1.080	0.497	-0.566

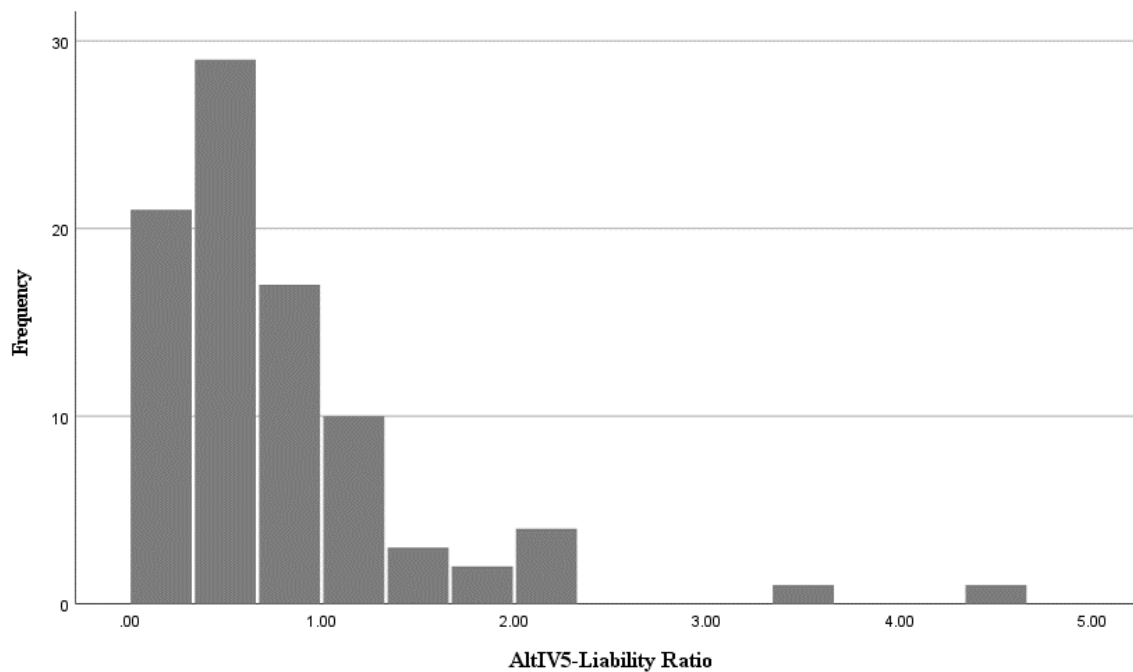
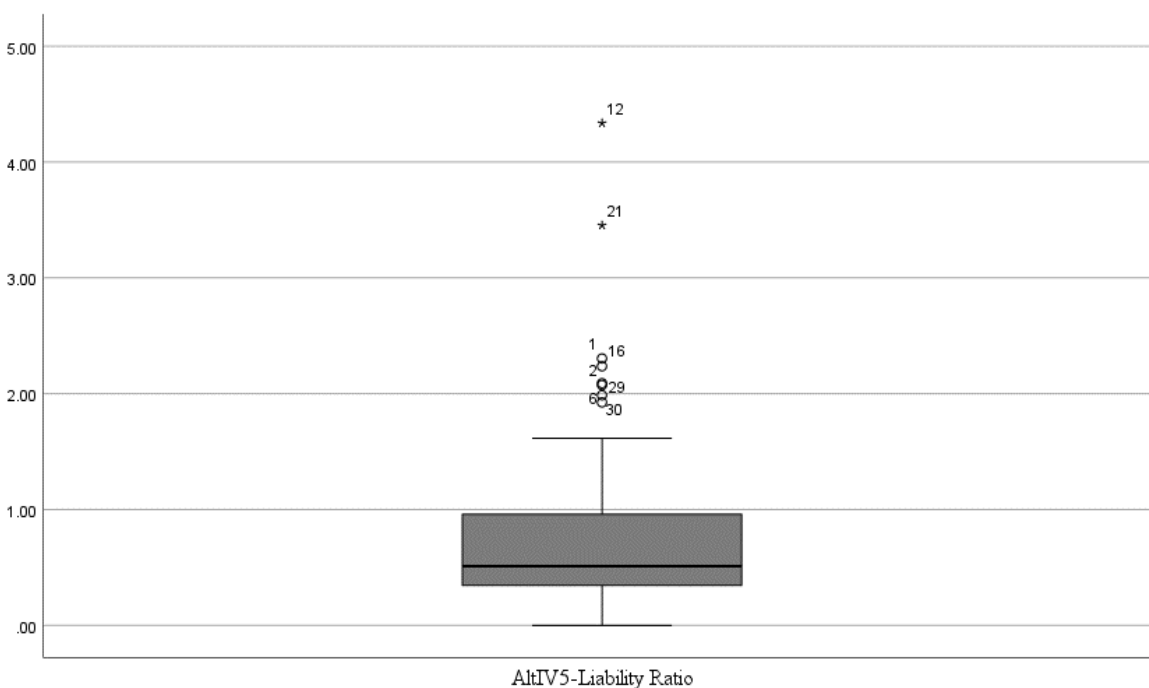
Figure 9*Histogram for Alternative Independent Variable 5 – Liability Ratio*

Figure 10

Box and Whiskers for Alternative Independent Variable 5 – Liability Ratio



Independent Variable 6. Independent variable 6 is the pension debt funded ratio. This ratio was calculated by dividing the ending plan fiduciary net position by the total ending pension liability. Only 44 entities provided pension funding information. Of the 44 without consistent pension information: 18 had no pension plan, 18 had defined contribution plans, two entities reported only the net pension liability, and six did not provide pension information. In addition, the unfunded pension debt is part of the total liabilities included in the ratio for independent variable 5. In multivariate analysis, missing data of over 10% must be addressed by correcting, adjusting, or removing the variable (Warner, 2013). Due to the large portion of missing data and the inclusion of the measure within total liabilities, the pension debt funded ratio did not provide independent of sufficient information to merit inclusion in the model.

Of those with pension funding provided, 23 of the 44 met the generally accepted benchmark which indicates a safe level of funding. This benchmark of 80% funding is considered the funding level needed for public pension plans to remain sustainable (Barth et al., 2018). Although there was not enough information on Pension Debt Funded Ratio to include in the model, Table 10 provides data regarding which entities met the generally accepted benchmark.

Table 10

Distribution of Local Government Entities that Met the Sustainability Benchmark Measure

	Benchmark Met ($\geq 80\%$ funded)	Benchmark Not Met	Total
Bankrupt	10	9	19
Non-bankrupt	13	12	25
Total	23	21	44

Independent Variable 7. Independent variable 7 is the tax per capita. This is calculated by dividing the tax burden by the population. The population was available only for 26 general-purpose entities and 3 special-purpose entities. Therefore, this variable was excluded from the model. As Table 11 demonstrates, there was not enough data in order to use the multivariate analysis with $n = 29$. Similar to BTA, the limitation to only general-purpose entities prevented the inclusion in this model but warrants further examination in future studies.

Table 11*Descriptive Statistics for Independent Variable 7 – Tax per Capita*

	<i>N</i>	Mean	<i>SD</i>	Min	Max	Skewness	Kurtosis
IV7 – Tax per capita	29	321.207	260.271	4.000	1029.000	0.549	0.168

Independent Variable 8. Independent variable 8 is state involvement. Dummy variables were used to analyze this variable. A 0 represents no monitoring or intervention, a 1 represents formal monitoring only, and a 2 represents monitoring and intervention. Forty of the 88 entities were from one state. Thus, the variable lacked sufficient variation across states to contribute meaningfully. This caused independent variable 8 to have issues with generalizability to the population. The model was not able to determine whether the findings were due to the variable outcome (monitoring only) or the state (California). Table 12 further demonstrates how the abundance of information from one state created an issue for this variable. Therefore, state involvement was excluded from the model. Appendix C provides a list of all states that allow bankruptcy and their level of involvement.

Summary of Descriptive Statistics. Tables providing the mean, standard deviation, minimum, maximum, skewness, and kurtosis were prepared for all scale independent variables. Histograms, box and whiskers, and distribution charts were used to clarify and present the descriptive statistics of the data. The eighth independent variable was nominal. Therefore, alternative descriptive data were prepared for this variable.

Table 12*Number of Entities per State Represented in the Study*

State	Number of Bankrupt	Number of Non-Bankrupt	Total	Percent of <i>N</i> = 88
Alabama	3	3	6	6.8%
Arkansas	1	1	2	2.3%
California	20	19	39	44.3%
Colorado	1	1	2	2.3%
Florida	1	2	3	3.4%
Idaho	2	2	4	4.5%
Illinois	1	1	2	2.3%
Kentucky	2	1	3	3.4%
Michigan	1	2	3	3.4%
Missouri	2	2	4	4.5%
Oklahoma	3	3	6	6.8%
Pennsylvania	1	1	2	2.3%
Rhode Island	2	2	4	4.5%
Texas	2	2	4	4.5%
Washington	2	2	4	4.5%
Total	44	44	88	100%

Based on the data extracted from this analysis, independent variables 1 (current ratio), 2 (operating ratio), 4 (net asset ratio), and 5 (long-term liability ratio) remained as potential predictors of bankruptcy. Independent variable 3 (operating ratio for BTA) was excluded because this information was not applicable for the special-purpose entities. Independent variable

6 (pension debt funded ratio) was excluded due to the large portion of missing data. Independent variable 7 (tax per capita) was excluded as this information was only available for the general-purpose entities. Lastly, independent variable 10 (state involvement) was excluded from the study due to a lack of variation across states. Table 13 summarizes the descriptive statistics for the independent variables that remained as potential predictors of bankruptcy.

Table 13

Summary of Descriptive Statistics for Remaining Independent Variables

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
						Statistic	Std. Error	Statistic	Std. Error
IV1_CurRT	88	.080	47.635	5.80511	10.386473	3.190	.257	10.170	.508
IV2_OpRT	88	.36	3.43	1.0256	.34264	4.299	.257	28.120	.508
IV4_NtRT	88	-2.96	.79	-.0002	.58584	-2.734	.257	10.659	.508
IV5_LiRT	88	.00	4.34	.7539	.72648	2.366	.257	7.701	.508
Valid N (listwise)	88								

Hypothesis Testing

IBM SPSS 27 was used to analyze the collected data. The dependent variable in this study was dichotomous and measured as yes or no. The original independent variables included some normal variables and one nominal variable. A discriminant analysis was not selected since this method requires normality of all the independent variables. Rather, a binomial logistic regression analysis was selected as the most appropriate method to analyze this data (Easter & Hemming, 2021; Mood et al., 2019; Morgan et al. 2013).

For logistic regression, six assumptions must be evaluated prior to its use. These include a binary or dichotomous variable, independent observations, a sufficiently large sample size, no

extreme outliers, the absence of multicollinearity among variables, and a linear relationship (Leung, 2021; Warner, 2013). If these assumptions are met, a logistic regression analysis can be appropriately performed.

For the first assumption, logistic regression requires the dependent variable to be dichotomous (Morgan et al., 2013). The dependent variable for this study was the presence or absence of bankruptcy filing for local government entities. As such, this variable was dichotomous and meets the assumption requirement.

Another assumption requires that observations be independent (Stoltzfus, 2011). No repeated measures were used in this study. There were three entities that filed for bankruptcy twice. In these three cases, the span of time between filings was significant: Coalinga Regional Medical Center 14 years, West Contra Costa Healthcare District 11 years, and Palm Drive Health Care District 7 years. In each case the significant time span between filings indicates a considerable difference in economic and financial conditions. This fact was confirmed using their respective financial statements. In addition, each bankrupt entity was matched with an independent entity that did not file for bankruptcy. Therefore, the assumption of independence was met.

Sufficient sample size is another assumption that must be met for logistic regression analysis. In order to determine an acceptable sample size, a widely accepted guideline for the minimum number of cases to include is $n = 10 k / p$ (Babyak, 2004; Stoltzfus, 2011). After evaluating each assumption, three independent variables were included. The probability of the least frequent outcome is 0.50 since there are only two available outcomes, bankrupt or non-bankrupt. Therefore, the minimum number of cases required is $n = 10 \times 3 / 0.50 = 60$. While a

sample size of 100 is ideal, this goodness of fit statistic was used. The sample size of 88 was therefore sufficient to meet the required $n = 60$.

While normality is not required for logistic regression, the presence of extreme outliers can influence the model (Leung, 2021; Warner, 2013). As such, the presence of outliers was evaluated for individual variables and adjusted to 0.5 units above ± 3 standard deviations from the mean. This allows the data to retain descriptive properties without significantly skewing the model (Warner, 2013). In independent variable 1, four outliers were adjusted. The values on all other variables were within ± 3 standard deviations from the mean. Therefore, no additional adjustments were required.

In addition to a dichotomous dependent variable and independence of observations, logistic regression assumes the independent variables contribute uniquely to the regression model or are absent of multicollinearity. When evaluating Pearson's r , multicollinearity is considered acceptable if $r < \pm 0.900$ (Warner, 2013). Table 14 provides the correlations between the independent variables. The correlation between independent variable 4 and the alternate independent variable 5 is found to be $r = -0.889$. As this is near the multicollinearity measure and with a small n (88), independent variable 5 did not provide a unique contribution to the model and was excluded. After removing independent variable 5, the remaining variables were tested again for multicollinearity. As Table 15 demonstrates, the correlation between each variable falls below this guideline.

Table 14*Correlations between Independent Variables for Multicollinearity Considerations*

		IV1	IV2	IV4	AltIV5
IV1	Pearson Correlation	--			
Current Ratio	<i>N</i>	88			
IV2	Pearson Correlation	0.067	--		
Operating Ratio	Sig. (2-tailed)	0.536			
	<i>N</i>	88	88		
IV4	Pearson Correlation	0.363	0.191	--	
Net Asset Ratio	Sig. (2-tailed)	0.001	0.075		
	<i>N</i>	88	88	88	
Alt IV5	Pearson Correlation	-0.375	-0.214	-0.889	--
L-T Liability Ratio	Sig. (2-tailed)	0.000	0.046	0.000	
	<i>N</i>	88	88	88	88

Table 15*Correlations between Independent Variables for Multicollinearity Assumption*

		IV1	IV2	IV4
IV1	Pearson Correlation	1	0.067	0.363
Current Ratio	Sig. (2-tailed)		0.536	0.001
	<i>N</i>	88	88	88
IV2	Pearson Correlation	0.067	1	0.191
Operating Ratio	Sig. (2-tailed)	0.536		0.075
	<i>N</i>	88	88	88
IV4	Pearson Correlation	0.363	0.191	1
Net Asset Ratio	Sig. (2-tailed)	0.001	0.075	
	<i>N</i>	88	88	88

The final assumption is that there is a linear relationship between the independent variables to the logit of the dependent variable. To ensure this linearity, a Box-Tidwell test was performed. This test requires that all variables have positive values; therefore, a constant was added to independent variable 4 so that there were no negative values. The test created the natural log of the independent variables and examined the relationship of those variables and

their interactions to the dependent variable. No significant values are desired in the test (Zeng, 2020). As noted in Table 16, no significant values were found ($p \leq 0.05$). Therefore, linearity was confirmed.

Table 16

Box-Tidwell Test for Linearity

		<i>B</i>	<i>SE</i>	Wald	<i>df</i>	Sig.	Exp(<i>B</i>)	95% C.I. for EXP(<i>B</i>)	
								Lower	Upper
Step	IV1_CurRT	-.553	.285	3.760	1	.052	.575	.329	1.006
1 ^a	IV2_OpRT	8.965	7.178	1.560	1	.212	7822.239	.006	10068837259.643
	IV4_NtRT	-5.234	11.236	.217	1	.641	.005	.000	19527449.344
	IV1_CurRT by LNIV1	.136	.073	3.522	1	.061	1.146	.994	1.322
	IV2_OpRT by LNIV2	-12.891	7.961	2.622	1	.105	.000	.000	15.079
	IV4_NtRT by LNIV4	2.395	7.948	.091	1	.763	10.971	.000	63896973.732
	Constant	-7.633	6.973	1.198	1	.274	.000		

a. Variable(s) entered on step 1: IV1_CurRT, IV2_OpRT, IV4_NtRT, IV1_CurRT * LNIV1, IV2_OpRT * LNIV2, IV4_NtRT * LNIV4.

Hypothesis 1. Hypothesis 1 focuses on the relationship between the selected financial indicators and the likelihood of bankruptcy in a local government entity.

H₀1: There is not a statistically significant relationship between selected financial indicators and the likelihood of bankruptcy by a local government entity.

H₁1: There is a statistically significant relationship between selected financial indicators and the likelihood of bankruptcy by a local government entity.

The hypothesis for the relationship between the three independent variables and the dependent variable was measured using logistic regression. The independent variables included the current ratio (IV1), operating ratio (IV2), and Net Asset Ratio (IV4). The dependent variable was the likelihood of the local government entity filing for bankruptcy. The logistic regression model was statistically significant, $X^2 = 34.968$, $p < 0.001$. The model explained 43.7% (Nagelkerke R^2) of the variance in the filing of bankruptcy. The results of the *pseudo R*² values are demonstrated in Table 17.

Table 17

Results of Logistic Regression Model using Nagelkerke R²

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	87.026 ^a	.328	.437

a. Estimation terminated at iteration number 6 because parameter estimates changed by less than .001.

The model correctly classified 72.7% of the cases. Sensitivity was 71.7%, and specificity was 73.8%. The positive predictive value was found to be 75.0%, and the negative predictive value was 70.5%. Table 18 provides the classification table for the correctly and incorrectly predicted outcomes.

Table 18*Classification Table*

		Observed	Predicted		Percentage Correct
			Bankrupt	Non-Bankrupt	
Step 1	Outcome Bankrupt		33	11	75.0
	Non-Bankrupt		13	31	70.5
Overall Percentage					72.7

a. The cut value is .500

The Wald test for the three independent variables is displayed in Table 19. The operating ratio and net asset ratios are both significant. The current ratio is not significant. The odds of going bankrupt are 41.667 times greater for each unit reduction in the operating ratio and 14.286 times greater for each unit reduction in the net asset ratio. Using this analysis, the formula for predicting bankruptcy would be $\text{Bankruptcy} = -0.031(\text{IV1}) - 3.738(\text{IV2}) - 2.665(\text{IV4}) + 4.066$. Since the results are statistically significant, the null hypothesis is rejected.

Table 19*Logistic Regression Predicting Likelihood of Filing of Bankruptcy based on Financial Indicators*

							95% C.I. for EXP(B)		
		B	SE	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1 ^a	IV1_CurRT	-.031	.036	.712	1	.399	.970	.903	1.041
	IV2_OpRT	-3.738	1.675	4.978	1	.026	.024	.001	.635
	IV4_NtRT	-2.665	1.060	6.319	1	.012	.070	.009	.556
	Constant	4.066	1.681	5.847	1	.016	58.301		

a. Variable(s) entered on step 1: IV1_CurRT, IV2_OpRT, IV4_NtRT.

A significant value on the Hosmer-Lemeshow goodness of fit test indicates a poor fit; however, a large p-value > 0.90 can also be problematic especially when the sample is small, suggesting an overfitted model. A $p = 0.41$ indicates no evidence of poor fit nor does it suggest model overfitting. Table 20 portrays the results of this test for goodness of fit.

Table 20

Results of Goodness of Fit Testing

Hosmer and Lemeshow Test			
Step	Chi-square	<i>df</i>	Sig.
1	8.267	8	.408

The presence of extreme outliers or influential observations was determined by examining the studentized residuals with Cook's *d*. There were two cases whose residual distance was slightly greater than ± 2.0 : Eden Township Healthcare District and Ozark Solid Waste Management. Upon further investigation into the entities, the decision was made to include these cases in the model to avoid overfitting. The unique circumstances of each case and the model's ability to identify these cases is seen as a strength.

From the Casewise list shown in Table 21, this model had two discrepancies. Ozark Solid Waste Management, a special-purpose government in Arkansas, filed for Chapter 9 bankruptcy protection. However, the model predicted it would not. Eden Township Healthcare District, a special-purpose entity from California, did not file for bankruptcy. The model predicted that it would.

Table 21*Casewise List for Studentized Residuals Over 2*

Case	Selected Status ^a	Observed Outcome	Predicted	Predicted Group	Temporary Variable		
					Resid	ZResid	SResid
21	S	B**	.102	N	.898	2.967	2.184
92	S	N**	.896	B	-.896	-2.941	-2.277

a. S = Selected, U = Unselected cases, and ** = Misclassified cases.

b. Cases with studentized residuals greater than 2.000 are listed.

The model predicted Eden Township Healthcare District (in California) would be bankrupt; however, Eden did not file for bankruptcy. For the year ended June 30,2009, the operating ratio of Eden Township Healthcare District was only 0.36. Expenses exceeded revenues by almost \$8.5 million. This issue was caused by a one-time grant to St. Rose Hospital and to the purchase of the Dublin Gateway Medical Center (DGMC). In addition, current liabilities were 10 times the amount of current assets. At that time, there were not enough current assets available to make the upcoming note payable on the purchase of DGMC. To address this situation, management engaged the help of financial consultants and got new more favorable financing arrangements (Macias Gini & O'Connell LLP, 2009).

The model predicted would Ozark Solid Waste Management would not file for bankruptcy; however, Ozark did file for bankruptcy. This prediction was based on the financial ratios from the published financial statements for 2013. However, there is evidence from the Arkansas Department of Environmental Quality that calls into question the legitimacy of these financial statements. In a published letter dated October 28, 2013, the inspector for the state cited that all operations ceased in mid-2010. According to the environmental reports, there were numerous violations and no annual reports had been filed since 2009. Considering this

information, the accuracy of the financial statements is in question (Arkansas Department of Environmental Quality, 2013).

When examining these two extreme outliers, Eden looks more like a bankrupt entity while Ozark mirrors a non-bankrupt entity. As explained above, there were extenuating circumstances that caused this result. Table 22 demonstrates the results of these two entities compared to what the model predicted.

Table 22

Results of Eden and Ozark as Compared to their Predicted Outcomes

	Non-Bankrupt Mean	Eden	Bankrupt Mean	Ozark
IV1_CurRT	8.68557	0.10	2.92466	1.26
IV2_OpRT	1.1402	0.36	0.9109	1.21
IV4_NtRT	0.2473	0.21	-0.2477	0.63

Summary of Hypothesis Testing. The hypothesis was tested using the logistic regression method of analysis. To ensure that this was the appropriate method to use, six assumptions were tested and met. These assumptions are a binary or dichotomous variable, independent observations, a sufficiently large sample size, no extreme outliers, the absence of multicollinearity among variables, and a linear relationship (Leung, 2021; Warner, 2013). During assumption testing, independent variable 5 was excluded due to multicollinearity with independent variable 4. Therefore, three independent variables were considered for the logistic regression.

The Hosmer and Lemeshow Test was utilized to determine the goodness of fit. The results of this test did not indicate a poor fit. In addition, a high p value would indicate

overfitting of the model. However, $p = 0.41$ suggested proper fitting of the model. Two extreme outliers were identified. The actual results for these two entities were compared to their predicted outcomes in Table 22. The reasons for the discrepancies were described.

There were two independent variables found to predict bankruptcy in local government entities with statistical significance. These were independent variable 2 (operating ratio) and independent variable 4 (net assets ratio). Independent variable 1 (current ratio) was used in the model but did not have statistical significance in predicting bankruptcy. These findings indicate that decreases in the local government entity's operating ratio and net asset ratio would increase the likelihood of the filing of bankruptcy under Chapter 9.

Relationship of the Findings

Relationship of the Findings to the Research Question. The research question for this study was developed to determine to what extent financial indicators can predict the bankruptcy of a local government entity. The corresponding null hypothesis proposes that there is not a statistically significant relationship between selected financial indicators and the likelihood of bankruptcy by a local government entity. This null hypothesis was analyzed using a logistic regression model that sought to evaluate the relationship between eight independent variables and the likelihood of bankruptcy. Due to missing data and multicollinearity between two of the variables, five of the variables were excluded. The results are shown in Table 19. The results from the Wald test for net assets ratio and operating ratio and related p-values were shown to be statistically significant at the 95% confidence level. The results for the current ratio and related p-values were not statistically significant at the 95% confidence level. This indicates that two financial ratios, net assets ratio and operating ratio, were predictors of bankruptcy in local government entities.

Relationship of the Findings to the Theoretical Framework. Three theories were used to frame this study on predicting bankruptcy for local government entities. These theories included agency theory, accountability framework, and financial ratio theory. The rationale for how governmental accounting differs from corporate for-profit accounting is addressed with the first two theories (Governmental Accounting Standards Board, 2017; Mohr, 2017). The financial ratio theory describes how accounting data from financial statements has predictive value regarding an entity's financial position. Financial ratios taken from that data may be used to predict the likelihood of financial distress or failure (Altman, 1968; Beaver, 1966).

Agency theory addresses how government leaders may have conflicting interests from those they represent. In governmental accounting, there are three primary groups of stakeholders who would suffer the most harm if the entity filed for bankruptcy. These stakeholders include taxpayers, lenders, and employees (Pepper, 2019). Therefore, locating possible indicators can provide for a level of protection for those stakeholders. The impact of the findings of this study could potentially present measures that local governments or stakeholders could evaluate for early detection and possible prevention of bankruptcy. Stakeholders could also use this information to determine their potential level of financial involvement with the entity.

The accountability framework explains how accountability is the primary goal and focus in governmental accounting. Accountability includes transparency and the responsibility to meet publicly mandated and other legal obligations (Carroll & Olegario, 2020). The findings of this study provide an opportunity for stakeholders to obtain additional insights above and beyond the financial statements and required reporting. Providing this information could increase transparency and opportunities for greater accountability.

The financial ratio theory describes how outcomes can be predicted through data available in financial statements delivered through financial ratios (Bellovary et al., 2007). While a current trend is to consider adding non-financial data to an analysis, many still agree that financial ratios are the best single predictors (Acosta-Gonzalez et al., 2019; Liang et al., 2016). Therefore, evaluating financial ratios for government entities can serve as a primary source of bankruptcy prediction. This study considered various financial ratios that were relevant to local government entities to determine which ones might predict bankruptcy. Two ratios were found to have predictive value for this purpose.

Relationship of the Findings to the Literature. The literature was reviewed to consider the existing research regarding predictive financial ratios in two areas: corporate bankruptcies and financial stress in local government entities. Corporate bankruptcy prediction has a long history and is applicable to this study in many ways. Government entity financial distress prediction is a more recent area of study and highly correlates with the likelihood of Chapter 9 bankruptcy prediction. This section compares the findings of this study to each of these two categories.

The findings of this study confirmed the work of Acosta-Gonzalez et al. (2019), which showed that solvency ratios have predictive value regarding possible bankruptcy. Acosta-Gonzalez et al. (2019) found that the ratios that most commonly predicted corporate bankruptcy in the construction sector were those in the solvency and indebtedness categories. The findings of the study showed that the net asset ratio has predictive value in predicting Chapter 9 bankruptcy filing. This ratio yields information regarding the solvency of an entity.

Barboza et al. (2017) compared common financial ratios using logistic regression with machine learning techniques. Their study found that the logistic regression model was 69%

predictive. This predictive power is substantiated through this study with logistic regression analysis of two financial ratios providing 72.7% predictability.

Bellovary et al. (2007) performed a review of bankruptcy prediction studies from 1930 to 2007. They concluded that accuracy was not necessarily improved by adding more independent variables. In fact, some of the highest prediction rates were found with only two variables. After eliminating variables due to missing data or multicollinearity, three independent variables remained to be analyzed for predictive capacity in this study.

Charalambous et al. (2020) found that corporations were more likely to declare bankruptcy when they are less profitable and have a more constrained liquidity. This study confirmed the finding on profitability through independent variable 2, operating ratio. However, this study was unable to verify the finding regarding liquidity. Independent variable 1, current ratio, was not shown to have predictive ability.

An earlier study by Ohlson (1980) concluded that financial ratios have predictive powers when measuring four areas: size, solvency, profitability, and liquidity. Solvency and profitability ratios were confirmed to have predictive ability in this study. The current assets to current liabilities ratio, which is in the liquidity area, was not. While this study was originally designed to consider the size of the entity, this was excluded since this information was only available for general-purpose entities which made up approximately 30% of the entities.

A 2015 study by Stone et al., showed that a decrease in the operating ratio and the net asset ratio were consistent with a local government entity in financial decline. The findings of this study substantiated these findings. Stone et al. (2015) also showed that the current ratio did not predict an impending crisis. This also, was confirmed by the results of this study.

Gorina et al. (2018) predicted that cash solvency (liquidity), long-term solvency, and the revenue structure of government entities have predictive value regarding financial stress. As previously stated, solvency ratios were confirmed to have predictive value in this study. Liquidity was not confirmed with statistical significance. While the current study did not include ratios regarding the composition of revenues, it did show that revenues less expenditures can predict bankruptcy filing.

Relationship of the Findings to the Problem. The problem addressed by this study was the lack of potential financial indicators available to stakeholders for the filing of bankruptcy of local government entities. Without early indication, stakeholders are at risk. For example, services could be cut to local citizens, employers could lose part of their pensions, and repayment of bond debt could be reduced. When bankruptcy is not evident to stakeholders before the filing of Chapter 9, there is little time to remediate any potential issues. Therefore, this study sought to provide financial indicators that could be evaluated prior to the actual filing of bankruptcy.

Summary of the Findings

In summary, the findings of this study address the research question and the problem by identifying two bankruptcy predictors for local government entities. These two predictors are the net asset ratio and the operating ratio. Both are taken from published and audited financial information. The prediction accuracy is 72.7%.

In addition, the findings are aligned with the three theories used as a theoretical framework for this study: agency theory, accountability framework, and financial ratio theory. The need for transparent and reliable information to be used by government entity stakeholders is central to the first two theories (Carroll & Olegario, 2020; Pepper, 2019). The financial ratio

theory establishes financial ratios taken from financial statements as primary indicators of financial condition (Bellovary et al., 2007).

Finally, the findings of this study generally support the findings of predictors in both corporate bankruptcy and local government entity financial stress. While non-financial data are used by some researchers to improve the predictability of financial ratios; it is generally accepted that financial ratios are the best single source (Bellovary et al., 2007). In addition, most of the studies in the literature considered some combination of variables that represented liquidity, solvency, and profitability. This study supported the earlier findings that solvency and profitability ratios have predictive value. It did not support the earlier findings that liquidity ratios have predictive value.

Application to Professional Practice

This research was designed to add to the body of knowledge regarding the early detection of bankruptcy in local government entities (LGE). A quantitative logistic regression method was utilized to analyze financial ratios taken from the financial statements of LGEs in order to identify possible predictors of bankruptcy. Previous research has shown that financial indicators are relevant in the prediction of bankruptcy in corporations (Acosta-Gonzalez et al., 2019; Alaminos et al., 2016; Bellovary et al., 2007; Jones et al., 2017; Liang et al., 2016). This research project tested whether financial indicators would also be applicable to bankruptcy prediction in local government entities.

Improving General Business Practice

Decisions made at the local government level impact almost every person in the United States. Citizens are affected by services provided, laws enacted, and taxes levied. The efficiency and stability of a local government can impact the lifestyle of its citizens. While Chapter 9

bankruptcies are not common, when they do occur, they can interrupt business as usual for many stakeholders.

Early indicators that a bankruptcy may be likely could provide the time needed for local government officials to address problems. This study indicates that two financial ratios, taken directly from recent financial statements, predict the filing of Chapter 9 bankruptcy with statistical significance. They are the operating ratio and the net asset ratio. The odds of going bankrupt are 41.667 times greater for each unit reduction in the operating ratio and 14.286 times greater for each unit reduction in the net asset ratio. Therefore, these two ratios should be monitored, and significant reductions should be addressed.

With the additional time provided by early indicators, government officials may make changes that would negate the need for Chapter 9 filing. For general-purpose entities, some examples of changes would be increasing taxes, increasing non-tax revenues, reducing or eliminating certain services, or increasing efficiency within the government. Additional taxes could be raised by increasing the rate of tax or by increasing the tax base. Some LGEs have achieved this through the annexation of additional property (Chaudhury et al., 2019). An increase in non-tax revenues for general-purpose governments might include an increase in service charges for services such as trash pick-up or public transportation. Local services may be reduced for a temporary period until the needed savings may be achieved or they may be eliminated permanently. Efficiency may be achieved voluntarily by current officials taking an introspective look at operations. If not done voluntarily, these officials may be replaced by the citizens at election time.

Special-purpose entities may also benefit from an early indicator that bankruptcy is likely. Primarily, special-purpose revenues are from services such as medical facilities, utilities,

or public housing. Charges for these services might be increased. Sometimes taxes are assessed for these entities and these taxes might be increased. As with general-purpose entities, certain services might be reduced or eliminated. The operations of special-purpose entities may also be subject to public scrutiny, thus encouraging efficiency (Patton et al., 2019).

For both general-purpose and special-purpose entities, borrowing is often an option. This may take several forms. The primary way for LGEs to borrow is through the issuance of bonds. While this can provide large amounts of cash, the LGE is obligated to pay annual interest to the bondholders and repay the principal at the end of the bond term. Government officials should be confident that this added debt would not be too much for the LGE to manage. Another way for an LGE to borrow is to request temporary funds from the state. This usually comes with strings attached that detail exactly how the funds are to be spent. LGEs must be sure that they will benefit from this type of spending and that the debt can be repaid in the agreed upon term (Adelino et al., 2017).

This study was originally designed to aid local government officials. However, the results can also be used by potential investors. LGEs often borrow money through the issuance of bonds. Investors in those bonds should consider the solvency of the entity before investing to be confident of repayment. The operating ratio and the net asset ratio may provide insights into that solvency and thus the likelihood of repayment of bond issuances.

Potential Application Strategies

While this study is intended to show predictors at one year prior to filing Chapter 9 bankruptcy, LGE officials could use this information to start trending the operating ratio and the net asset ratio. Drops in either of these ratios could prompt strategic discussions of potential changes.

For example, many general-purpose entities have business type activities (BTA). The BTA operations are incorporated into the overall operating ratio of the entity. If the overall operating ratio is dropping, one application might be to address the profitability of each BTA or possibly even add or eliminate a BTA altogether. It should be noted that eliminating BTAs might not be advantageous even if they are unprofitable. While the elimination of an unprofitable municipal golf course may not cause a hardship of the citizens, the elimination of a utility district or a school district certainly could. In those cases, a better option might be to increase revenue or efficiency in that BTA.

Regarding the net asset ratio, LGEs should strive for a comfortable level of debt versus net assets. Leverage may be achieved through proper borrowing. However, sometimes short-term borrowing is necessary to bridge the gap before taxes are received. This can create an issue since too much borrowing lowers the net assets to total assets ratio in the short-term. This limits flexibility when making good business decisions for the LGE.

Another application of this research is to compare these two ratios to the same ratios for other similar entities. Since the financial statements for LGEs are made available to the public, local government officials might benefit from comparing their operating and net asset ratios to those in other similar LGEs, particularly in the same state.

This comparison may have several benefits. If the ratios of the LGE are lower than those of the similar entities, a study of the similar entities' financial statements may provide insight into why they are performing better. This may suggest a change in course of action. For example, other entities in the same state may have applied for state grant funding that was available or they may have recruited multiple new businesses to their area.

Alternatively, a close look at entities in the same state with lower ratios, may provide insights into mistakes that could be avoided. Examples of this would include a drastic increase in taxes or the elimination of essential services. Both of these situations may cause businesses and residents to relocate, thus making the financial situation even worse.

A third application of this research is for states to consider these ratios. Of the 27 states that allow Chapter 9 bankruptcy, only 12 have a formal monitoring process and also provide some type of intervention when needed. Six states have a formal monitoring process but do not routinely intervene (see Appendix C). Admittedly, there may be some rivalry between the state and local officials. However, quarterly monitoring and offers of assistance and advice from state officials may be what the LGE needs to turn a negative situation around and thus avoid Chapter 9 bankruptcy.

Summary of Application of Professional Practice

As with corporations, financial ratios retrieved from audited financial statements of LGEs can be a good source of information, regarding the solvency and profitability of an entity. This study has shown that the operating and net asset ratios can predict the likelihood that an LGE will file for Chapter 9 bankruptcy. These ratios may be used by local government officials as early indicators of potential problems. In addition, potential lenders may use these ratios to help measure the solvency and stability of LGEs. Lastly, the ratios may be used by citizens to better understand and become involved in local government decision making.

Recommendations for Further Study

A legally separate organization for which a primary government is financially responsible is considered a component unit of that primary entity (Patton et al., 2019). Examples of component units are municipal libraries, school boards, and utility boards. Often these

component units are reported in the audited financial statements in a separate column to the right of the primary general-purpose government. Since these component units are often run by different leadership, this study did not incorporate the financial data from the component units. However, since they are the financial responsibility of the primary governments, subsequent studies could consider if the addition of financial data from the component units would make a material difference in the likelihood of Chapter 9 bankruptcy.

From an accounting point of view, solvency refers to the ability to pay long-term debt (Warren et al., 2020). Insolvency, as demonstrated by an unfavorable net asset ratio, can be a precursor to bankruptcy. However, service insolvency can often be another factor (Chaudhury et al., 2019). Some LGEs strive to maintain financial equilibrium, to the detriment of the services they offer. As experienced in Detroit, Michigan, the result of a decrease in the services offered was a decline in residents and businesses (Leary & Jackson, 2017). This further reduced the city's revenues. Additional research could consider the extent to which services could be reduced without causing residents and businesses to leave.

Out of the 32 special-purpose entities considered in this study that declared Chapter 9 bankruptcy, 20 were in the healthcare field. The remaining 12 were from various areas including housing, transportation, and waste management. Further research could investigate those healthcare special-purpose entities and possible reasons for the relatively high number of bankruptcy cases.

Reflections

Consistency is emphasized in the field of accounting. Accountants are encouraged to prepare and report financial data according to the guidelines of the appropriate ruling organization such as the FASB, GASB, or SEC. While still valuing consistency, this research

project focused on differences in local government entities and how those differences might predict bankruptcy. This study promoted independent, bias-free thinking and challenged the researcher to ask questions regarding the content and implications of financial data. While consistency is important, researching for deeper understanding can promote the discovery of new information.

Personal & Professional Growth

The topic of this research was selected due to an interest in state and local government accounting. As a professor of various accounting topics, the researcher realized the need to clearly differentiate between corporate accounting practices and government accounting practices. One of the areas that seemed to vary the most was bankruptcy.

In addition to the knowledge of local government bankruptcies gained from this project, other qualities were learned that can be carried into the classroom. Accountants must recognize the large spectrum of entity types such as for-profit companies, governments, and not-for-profits; and accept the differences in accounting practices for each. Accountants should be critical thinkers and not be afraid to ask questions. Lastly, when answers are not quickly found, research and persistence are required.

Aside from the application to the classroom, new connections in the world of government accounting were made. At the beginning of the study, there was an assumption that all the archival public data needed would be readily available. That did not prove to be the case, however. Much of the data from entities that had declared Chapter 9 bankruptcy was missing, extremely difficult to locate, or states refused to share it. The search for this data led to others who had realized this problem and gathered much of this information from their previous

research. Access to their collections saved time and provided new relationships with others who were also interested in the topic.

The completion of this research provided increased confidence in the research topic and also in research methodology. Logistic regression was the methodology used to analyze the data through SPSS software. Personal experience with these tools provided a context and understanding that can be used in the future for other accounting projects as well as to help accounting students.

Biblical Perspective

The two primary frameworks used in this study are accountability and agency. The accountability framework addresses the transparency obligations inherent in government reporting (Bovens & Wille, 2020). The agency theory explores the responsibilities and challenges that occur when one party is working on behalf of another party (Pepper, 2019). These issues are often addressed in the Bible as stewardship.

Stewardship is illustrated in the parable of the talents. Entrusted with the gold of their master, three servants reacted in various ways. Two servants doubled the gold they were given by investing. The other servant buried the gold in the ground and thus earned no additional gold. Upon return, the master called upon them to account for their actions. The two who had invested wisely were rewarded. The servant who had buried gold in the ground was penalized by having to give it to one of the wise servants (Matthew 25:14-28, NIV).

Accountability Framework. In the context of local governments, elected officials are usually held accountable to the citizens who elected them. An expectation exists that the officials will be transparent regarding their actions on behalf of the government. This transparency often takes place through the published financial statements of the entity. Through these statements,

the public can become aware of how public funds were raised and spent. It can also be seen how closely the actual spending aligned with the approved budget.

As with the parable of the talents, local government officials are often rewarded for excellent performance. Rewards may be in the form of re-election or bonuses. In addition, they may be penalized for poor performance. Penalties may be in the form of not being re-elected or financial penalties. As the Bible teaches through this parable, government officials should expect to account for their actions to the public who gave them authority.

Agency Framework. An agency exists when one party contracts with another party to act on the behalf of the first party (Pepper, 2019). This relationship occurs when local government officials are elected. They are expected to act in a manner that is in the best interests of the public. Agency costs arise when a government official acts only in his or her own interests.

This framework is also demonstrated in the Bible. In the story of Jonah, God sent Jonah as His representative to preach to the people of Nineveh. However, Jonah did not care for the people of this city and chose to disobey God. He went instead in the other direction towards Tarshish. During this trip a storm arose that caused the sailors to fear shipwreck. To calm the storm, they threw Jonah into the sea. A fish swallowed Jonah and kept him three days and nights. During this time, Jonah prayed and determined that he would do as he had vowed to God and go to Nineveh to deliver God's message (Jonah 1:1-2:9, NIV).

As with the story of Jonah, local government officials have been given the authority by others to represent them. Public trust has been placed in the hands of the officials. It is a matter of honor and responsibility that this expectation is fulfilled.

Summary of Reflections

This research project provided both personal and professional growth. Personal growth was seen in the form of increased knowledge of the topic and research methodology. Professional growth was achieved through new acquaintances that are knowledgeable and respected in the area of Chapter 9 bankruptcies. In addition, performing the research from a Christian world view perspective has helped to visualize the practical workings of local government in light of God's Word.

Summary of Section 3

Section 3 provided a discussion of the study findings and the application to professional practice. This section began with an overview of the study. Next, a detailed discussion of the presentation of the findings was analyzed. These findings were examined in light of the research question, theoretical framework, literature, and research problem. An application to professional practice for the study was discussed to provide improvements for general business practices. Recommendations for further study were evaluated. Reflections of how the study impacted the researcher personally and professionally was included. Finally, a Biblical perspective was considered in light of the study.

Summary and Conclusion

The filing of Chapter 9 bankruptcy by a local government entity can be disruptive and extremely costly to many stakeholders. Scholarly literature on bankruptcy prediction focuses primarily on corporate bankruptcies. Therefore, research was needed to locate possible predictors specific to municipal bankruptcies.

This non-experimental quantitative study examined the relationship between the financial indicators of those government entities that have declared bankruptcy as compared to financial

indicators from similar government entities that have not declared bankruptcy in order to identify possible predictors of bankruptcy. The logistic regression method of analysis established that two financial ratios were successful as predictors for bankruptcy. These two ratios are the net asset ratio and the operating ratio. The identification of these predictors provides measures that local governments or stakeholders may evaluate for early detection and possible prevention of bankruptcy. In addition, stakeholders may use this information to determine their potential level of financial involvement with the entity.

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Appendix A

Local Government Entities that Filed for Bankruptcy Included in the Study

Local Government Entity	State	Type of Entity	Date Bankruptcy Filed
Texas Student Housing Authority	Texas	Special-Purpose	8/31/2020
City of Fairfield	Alabama	General-Purpose	9/30/2017
Targhee Regional Public Transportation Authority	Idaho	Special-Purpose	9/30/2018
Clearwater Cay Community Development District	Florida	Special-Purpose	9/30/2018
Coalinga Regional Medical Center	California	Special-Purpose	6/30/2017
Iron County Hospital District	Missouri	Special-Purpose	6/30/2017
Surprise Valley Health Care District	California	Special-Purpose	6/30/2017
Tulare Local Healthcare District	California	Special-Purpose	6/30/2016
Kennewick Public Hospital District	Washington	Special-Purpose	12/31/2015
Gainesville Hospital District	Texas	Special-Purpose	9/30/2016
Atoka County Healthcare Authority	Oklahoma	Special-Purpose	6/30/2016
West Contra Costa Healthcare District	California	Special-Purpose	12/31/2015
Southern Inyo Healthcare District	California	Special-Purpose	6/30/2015
City of Hillview, Kentucky	Kentucky	General-Purpose	6/30/2015
Craig County Hospital Authority	Oklahoma	Special-Purpose	12/31/2013
Central Coventry Fire District	Rhode Island	Special-Purpose	8/31/2014
Lakeside 370 Levee District	Missouri	Special-Purpose	6/30/2011
Palm Drive Health Care District	California	Special-Purpose	6/30/2013
Ravenna Metropolitan District	Colorado	Special-Purpose	12/31/2013

Local Government Entity	State	Type of Entity	Date Bankruptcy Filed
Ozark Mountain Solid Waste District	Arkansas	Special-Purpose	6/30/2013
Adair County Hospital District	Kentucky	Special-Purpose	6/30/2012
City of Detroit, Michigan	Michigan	General-Purpose	6/30/2013
Mendocino Coast Health Care District	California	Special-Purpose	6/30/2012
City of San Bernardino, California	California	General-Purpose	6/30/2012
Town of Mammoth Lakes, California	California	General-Purpose	6/30/2012
City of Stockton, California	California	General-Purpose	6/30/2012
Rural Water District No. 1, Cherokee County	Oklahoma	Special-Purpose	12/31/2011
Mendocino Coast Recreation and Park District	California	Special-Purpose	6/30/2011
Jefferson County, Alabama	Alabama	General-Purpose	9/30/2011
City of Harrisburg	Pennsylvania	General-Purpose	12/31/2010
The City of Central Falls, Rhode Island	Rhode Island	General-Purpose	6/30/2011
Boise County	Idaho	General-Purpose	9/30/2010
City of Prichard, Alabama	Alabama	General-Purpose	9/30/2009
Sierra Kings Health Care District	California	Special-Purpose	6/30/2009
Village of Washington Park	Illinois	General-Purpose	4/30/2009
Pierce County Housing Authority	Washington	Special-Purpose	12/31/2007
City of Vallejo, California	California	General-Purpose	6/30/2007
Valley Health System and Metropolitan Life Insurance Company	California	Special-Purpose	6/30/2007
Palm Drive Health Care District (CA)	California	Special-Purpose	6/30/2006

Local Government Entity	State	Type of Entity	Date Bankruptcy Filed
West Contra Costa Healthcare District (CA)	California	Special-Purpose	12/31/2006
Los Osos Community Services District (CA)	California	Special-Purpose	12/31/2005
Tri-City Mental Health Center	California	Special-Purpose	6/30/2003
Indian Valley Health Care District	California	Special-Purpose	6/30/2003
Coalinga Regional Medical Center	California	Special-Purpose	6/30/2003

Appendix B

Local Government Entities that did not File for Bankruptcy Included in the Study

Local Government Entity	State	Type of Entity	Date of Financial Statements Used
Greenville Housing Authority	Texas	Special-Purpose	3/31/2020
Cullman, Alabama	Alabama	General-Purpose	9/30/2017
Mountain Rides Transportation Authority	Idaho	Special-Purpose	9/30/2018
Indigo East Community Development District	Florida	Special-Purpose	9/30/2018
San Benito Health Care District	California	Special-Purpose	6/30/2017
Ozarks Community Health Center	Missouri	Special-Purpose	5/31/2017
Morongo Basin Healthcare District	California	Special-Purpose	6/30/2017
Marin Healthcare District	California	Special-Purpose	12/31/2016
Adams County Public Hospital District No. 3	Washington	Special-Purpose	12/31/2015
Matagorda County Hospital District	Texas	Special-Purpose	9/30/2016
Tahlequah Hospital Authority	Oklahoma	Special-Purpose	6/30/2016
El Camino Healthcare District	California	Special-Purpose	6/30/2015
Tahoe Forest Hospital District	California	Special-Purpose	6/30/2015
Burbon County KY	Kentucky	General-Purpose	6/30/2015
Grady Memorial Hospital Authority	Oklahoma	Special-Purpose	12/31/2013
Town of Johnston Housing Authority	Rhode Island	Special-Purpose	12/31/2014
Boone County Regional Sewer District	Missouri	Special-Purpose	12/31/2014
Antelope Valley Healthcare District	California	Special-Purpose	6/30/2013
Housing Authority of the City of Englewood	Colorado	Special-Purpose	12/31/2014

Local Government Entity	State	Type of Entity	Date of Financial Statements Used
City of Foreman, AR Water and Sewer Fund	Arkansas	Special-Purpose	12/31/2014
Halifax Hospital Medical Center	Florida	Special-Purpose	9/30/2012
Grand Rapids Michigan	Michigan	General-Purpose	6/30/2013
Beach Cities Health District	California	Special-Purpose	6/30/2012
City of Pasadena CA	California	General-Purpose	6/30/2012
Portola CA	California	General-Purpose	6/30/2012
Riverside County CA	California	General-Purpose	6/30/2012
Vivian County Rural Water District #6	Oklahoma	Special-Purpose	12/31/2011
Kaweah Delta Health Care District	California	Special-Purpose	6/30/2011
Mobile Alabama	Alabama	General-Purpose	9/30/2011
Wilkes Barre, PA	Pennsylvania	General-Purpose	12/31/2010
City of Woonsocket, RI	Rhode Island	General-Purpose	6/30/2011
City of Post Falls ID	Idaho	General-Purpose	9/30/2010
Muscle Shoals, AL	Alabama	General-Purpose	9/30/2009
Eden Township Healthcare District	California	Special-Purpose	6/30/2009
City of Morrison	Illinois	General-Purpose	4/30/2009
Housing Authority of Grays Harbor County	Washington	Special-Purpose	12/31/2007
Fullerton City CA	California	General-Purpose	6/30/2007
Camarillo Health Care District	California	Special-Purpose	6/30/2007
Peninsula Healthcare District	California	Special-Purpose	6/30/2006
Palo Verde Healthcare District	California	Special-Purpose	6/30/2006

Local Government Entity	State	Type of Entity	Date of Financial Statements Used
City of Traverse and Charter Township of Farfield	Michigan	Special-Purpose	6/30/2005
Marin Healthcare District	California	Special-Purpose	6/30/2003
Moreno Valley Community Hospital District	California	Special-Purpose	6/30/2003
Los Medanos Community Healthcare District	California	Special-Purpose	6/30/2003

Appendix C

Level of State Involvement in States That Allow Chapter 9 Bankruptcy

	Neither Formally Monitor nor Intervene	Formally Monitor Only	Formally Monitor and Intervene
Alabama	X		
Arizona	X		
Arkansas	X		
California		X	
Colorado		X	
Connecticut			X
Florida			X
Idaho	X		
Illinois			X
Kentucky		X	
Louisiana		X	
Michigan			X
Minnesota		X	
Missouri	X		
Montana	X		
Nebraska	X		
New Jersey			X
New York			X
North Carolina			X
Ohio			X
Oklahoma	X		
Oregon			X
Pennsylvania			X
Rhode Island			X
South Carolina	X		

	Neither Formally Monitor nor Intervene	Formally Monitor Only	Formally Monitor and Intervene
Texas			X
Washington		X	