The Implementation of Data Analytics in the Governmental and Not-for-Profit

Sector

By

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ABSTRACT OF THE DISSERTATION

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Applying data analytics techniques in the governmental and not-for-profit sector can transform facts and figures into strategic insights that deliver intelligence and support decision making. The objective of this research is to undertake data analytic techniques that will provide empirical evidence and improve transparency and accountability. The analytical methods used in this study include text mining, artificial neural networks, and the predictive modeling.

In order to improve the quality of state and local government financial reporting, the Governmental Accounting Standards Board (GASB) publishes standards and guidelines. One of the GASB's 2014 research agendas was to collect broad user opinions about the governmental standards and their implementation. In support of this objective, one section of this study measures public sentiment by using textual analysis.

Text mining provides an alternative approach to the more conventional public data collection methods, such as surveys or questionnaires. This method measures user sentiment from public websites and ascertains opinions regarding specific GASB standards and exposure drafts. Such research can serve to improve the development of government financial standards and provide better insights regarding their implementation. Text mining capabilities can be used for analyses of internet based media such as online news or social

media therefore the applicability of this method is quite extensive. This method is also able to evaluate sentiment from different types of documents such as financial reports or comment letters.

With the growth in the amount of municipal bond investments, the implementation of an analytical model that can provide a better understanding of financial performance evaluation is paramount. One source of investor information is obtained from credit rating agencies. These agencies provide their assessments of local governments' creditworthiness through the issuance of credit ratings. In presenting their assessments in the form of credit ratings, these agencies have never clearly revealed either the variables or weights assigned on each of the variables on their models.

One of the chapters in this study explores the composition of credit ratings by incorporating budgetary, financial, and demographic information into an Artificial Neural Networks model. The study is expected to identify the impact that the different factors have on municipal credit ratings. The main contribution provided by this chapter is the development of a model that will explain to users the composition of the variables or factors that influence the municipal bond credit ratings.

The purpose of an entity audit is to provide an opinion as to whether management's financial statements are prepared in accordance with applicable accounting standards. This objective is achieved by independent auditors undertaking appropriate audit procedures. However, audit findings and conclusions can be insufficient or inadequate due to limited audit information or management efforts to avoid a qualified audit opinion. One strategy management can use to avoid a qualified audit opinion is to switch auditors. This is known as opinion shopping. One chapter in this study provides empirical evidence of the

association between switching auditors and the issuance of a qualified audit opinion for a Non-Federal Entity (NFE).

Overall this study will contribute in three areas to the government and not-for-profit accounting literature. Text mining analysis will be able to provide insights into public opinion on the implementation of standards. Next, predictive modeling will detect the irregularities of opinion shopping. Finally, the Artificial Neural Networks will provide an inferential analysis that can provide information to users of municipal bond credit ratings to improve future decision making.

For future studies additional data sources can be included, for example: incorporating non-financial variable to indicate the occurrence of opinion shopping, adding more states data to the neural networks prediction model, and including the GASB's comment letters for text mining analysis.

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Chapter 1. Introduction

1.1 Research Background

The Government Accounting Standard Board (GASB) is an independent organization whose mission is to establish and improve standards of accounting and financial reporting for U.S. state and local governments (GASB, 2016). Before the GASB issues a standard, there are several activities that must happen. The first phase is the initial research, which is performed to identify the scope issues that need to be addressed in the project. Based on the initial research, knowledgeable individuals are consulted on the issues. The due process is started after the board is agree on the project. Due process provides an open forum for comments or suggestions from the public as well as a rigorous examination of the standards (GASB, 2016).

GASB standards affect the current and future practice of governmental financial reporting. Therefore, there is a strong desire to obtain public opinion regarding the implementation of standards. The substantial number of government entities[1] and recurrent updates of financial statement standards produce volumes of information for the public. This causes difficulty for users to understand the meaning of the information presented. As a result, there is a need for the media to facilitate communication between policy makers and the public instead of the more conventional methods of opinion collection, such as an interview or questionnaire. With the current advancements in technology, the GASB can

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[1] Based on the recent census, in the United States, there are 89,476 local governments. From these local governments, 22% are municipalities and 18% are towns and townships. In addition to that number there are 50 state governments and numerous tribal governments which include ten thousands of local governments-counties, cities, districts, mosquito abatement districts, and special districts for myriad other purposes (Mead, 2011).

utilize the flexibility of social media or Internet-based sources to collect public responses and opinions regarding the GASB exposure drafts or standards.

Public opinion can be collected through public websites and social networks, such as online news resources and Twitter. This process is known as sentiment analysis or opinion mining[2]. This is a popular modern method of opinion collection which is able to transform collected textual data into more useful information. One section in this study will focus on collecting public sentiments regarding statements and exposure drafts that are issued by the GASB utilizing text-mining procedures.

For funds, local government entities can issue municipal bonds. This type of investment can vary depending on the bond type, interest rate, tax term, maturity term, or the purpose of the fund. A multitude of information is required to make good investment decisions or even prevent bad investment choices. One of the distinctive features of municipal bond trading believed to be reflective of an issuer's credit worthiness is credit rating. Therefore, the credit rating of municipal bonds is capable of influencing market decisions regarding the issuer and marketability of bonds in the market (Ammarz, Duncombe, Hou, Jump, & Wright, 2001).

Credit ratings are issued by a credit rating agency (CRA). A CRA is a company that provides services in publishing credit ratings by assessing the debt instruments (bonds and other securities) that are issued by corporations or government entities. Credit rating assessment is based on the possibility that the debt will be repaid (Rom, 2009). Although a CRA publishes valuable information to the investor, these agencies are not transparent in

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[2] Sentiment and opinion analysis will be used interchangeable in this study.

term of definitions and compositions of variables in their credit rating models. This problem can cause the perception of opacity in the credit rating issuance process.

One chapter in this study will explore credit rating bonds from local governments (hereafter referred to as municipal bonds) based on three main categories: financial, budgetary, and demographic information. The study is not supposed to reproduce the credit ratings provided by major agencies such as Moody's, S&P or Fitch but instead aims to determine the characteristics and categories of source information that influence a change in municipal bond credit ratings. The results of this study are expected to assist local government entities in understanding more about credit rating models and to improve public trust regarding the objectivity of credit ratings.

The current economic conditions faced by government and not-for-profit entities reinforces the need to supervise the usage of federal funds. Auditing is "a formal, systematic, and disciplined approach designed to evaluate and improve the effectiveness of process and related controls" (Weatherford & Ruppert, 2015). Based on an independent examination, auditing obtains evidence as to ascertain whether the validity of the management assertions can be supported. To establish accountability, auditors need a clear picture of who the decision maker is and who will implements the decision. It is also important for the auditor to understand what the basis for decision is and whether there are functional relationship between any achievement and specific organizational actions (Halachmi, 2002). The concept of accountability, especially for a Non-Federal Entity (NFE)[3] that use public funding, is very important. Based on the GASB Concepts Statement

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[3] In this study Non-federal Entity consist of local governments, states, not-for-profit organizations, tribes, or local territories that have received federal funding

No. 1, accountability[4] is an important factor for the success of the governing process. Management and government officials entrusted with public resources are responsible for providing public functions that are efficient, effective, economical, and ethical.

Auditors can be changed due to several factors such as audit fee structure, disagreements, service-related reasons, and uninformed reasons (Hackenbrack & Hogan, 2002). One reason that has become an ongoing concern of policy makers is opinion shopping. Opinion shopping refers to the practice by which audit clients seek alternative auditors who are more likely to give a clean audit opinion when the incumbent auditor is likely to issue an unclean opinion (Chen et al. 2016).

Chapter two provides empirical evidence as to whether the NFE is engaging in audit opinion shopping activities. The developed model will not only be able to identify the occurrence of opinion shopping but also estimate the probability of an entity receiving a qualified or unqualified audit opinion after a switch or no switch. The model will be based on several indicators from an available data source such as the IRS filing reports and the Federal Audit Clearinghouse[5].

The overall expectation of this study is to provide a better understanding of the practice and implementation of accounting and auditing guidelines for local governments and nonprofit entities for the purpose of public transparency. Moreover, the analytical model in this research aims to improve the quality of empirical evidence and serve as feedback for policymakers.

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[4] From the GASB *Concepts Statement No. 1,* "Objectives of Financial Reporting," it is states that *"**Accountability** is the cornerstone of all financial reporting in government…Accountability requires governments to answer to the citizenry— to justify the raising of public resources and the purposes for which they are used."*

[5] Federal Audit Clearinghouse: an organization that operates on behalf of the Office Management and Budget (OMB) with primary function to distribute single audit reporting packages and maintain a public database of completed audit reports.

This study consists of five parts. Following the introductory section, there are three main essays. The first essay will provide empirical evidence regarding opinion shopping in the local government and nonprofit sector. The second essay assesses whether information from the financial statements and non-financial information is able to influence the municipal bond credit ratings. The third essay focuses on public sentiment regarding the standards and exposure drafts issued by the GASB. This chapter will implement a textual analysis utilizing online news for selected GASB statements and exposure drafts. The last chapter of this study consists of discussion of future research and a conclusion.

1.2 The History of the GASB

The Government Accounting Standards Board (GASB) was created in 1984 to establish generally accepted accounting principles (GAAP) for state and local government entities. The history of standard setting for local and state governments has been influenced by significant fiscal crises. For example, the 1975 New York City fiscal crisis created the demand for more comprehensive financial disclosures and a standardized body to regulate.

Corporate financial reports were becoming the subject of federal regulation when the Securities and Exchange Committee (SEC) was formed in 1930 (Benson, Marks, & Raman, 1991). This condition led to the requirement that corporations prepare their financial statements in accordance with Generally Accepted Accounting Principles (GAAP). In general, auditors should not express their opinion if the statements are not presented in accordance with GAAP standards and when the management cannot explain the variation in applied accounting method.

In contrast to corporate organizations, state and local governments were not subject to the SEC's requirement. A formal authority was created when the National Committee

on Municipal Accounting (NCMA) was formed in 1934. The NCMA was established to respond various issues regarding municipal accounting and reporting. Six landmark publications were published by the NCMA during the 1930s and 1940s, as listed in Table 1 (Roybark, Coffman, & Previts, 2012).

Table 1 NCMA Landmark Bulletins

Bulletin	Year	Tittle
No. 1	1934	Principles of Municipal Accounting
No. 2	1934	Suggested Procedure for a Detailed Municipal Audit
No. 3	1934	A Bibliography of Municipal Accounting
No. 4	1935	Municipal Accounting Terminology for State, Municipal, and Other Local Governments
No. 5	1935	Municipal Funds and Their Balance Sheets
No. 6	1936	Municipal Accounting Statements

The NCMA was in existence until 1941 and was replaced by the National Committee on Governmental Accounting (NCGA), which operated from 1948 until 1973. NCGA issued Municipal Accounting and Auditing in 1951 and Classification of Municipal Accounts in 1953. However, similar to the NCMA, the NCGA was deactivated after the standards issuance and revision tasks. After the NCGA, the Governmental Accounting Standards Board (GASB) was formed in 1984 (Reck, Lowensohn, & Wilson, 2012).

Since 1984, the GASB has been the only authoritative body to establish Generally Accepted Accounting Principles (GAAP) for state and local governments[6]. These principles are the fundamental guidelines for the creation of financial reports (Reck, Lowensohn, & Wilson, 2012). However, the nature of GASB's standards are not similar to

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[6] Some states and cities are not complying the GAAP but the implementation of GAAP is the signal for good corporate governance.

federal laws or regulations hence it does not have the authority to enforce their use. Nevertheless, compliance with the GASB standards is required under many states laws and credit rating agencies that take into consideration if the standards are being followed.

1.3 Overview of Financial Information

The concept and practice of financial reporting of government entities differ from those of corporate and business organizations. The main reason for the marked differences lies in the objective of financial reporting. Governmental accounting provides accountability to the public and does not focus solely on business purposes. GASB *Concepts Statement No. 1,* "Objectives of Financial Reporting" states that *"Accountability is the cornerstone of all financial reporting in government…Accountability requires governments to answer to the citizenry—to justify the raising of public resources and the purposes for which they are used."* From this statement it can be inferred that the objectives of financial reporting are to assist the public in gathering information and evaluate government financial activities for accountability purposes.

Current governmental financial reporting procedures have received criticism. The format and publication time of governmental reports are the first source of disapproval. Typically, financial reports are in pdf format. This requires additional effort by users to analyze the reports. Numerical data from CAFR for example are not so easy to analyze in the available format (pdf). The best way to prepare financial data for analysis is to transfer/convert it into a spreadsheets program such as Excel or Stata. Furthermore, the largest local governments take about 6 months to release their reports after year-end (Mead, 2011). In contrast, the SEC requires that public companies release reports within 60 days for 10-K and 40 days for 10-Q of year-end SEC, 2009).

The second issue relates to the lack of standardization of the financial statements. There is no standardized chart of accounts for reporting. Therefore, it is difficult to perform a comparative study across entities. Moreover, without requiring the standardization of financial statements, it is difficult to have all entities adhere to a uniform method of preparing financial reports.

Local and state financial reports not only capture the most fundamental information about the financial condition of a government, they also detail the different types of governmental activities. In general, government activities can be classified as *governmental*, *business*, and *fiduciary* (Reck, Lowensohn, & Wilson, 2012). Governmental-activities include general-purpose services such as police and fire protection and the construction of roads and bridges. These services are usually provided by states, counties, municipalities (cities, towns, and villages), and townships. Business type activities relate to special purpose services. They provide only a single function or a limited number of functions such as drainage and flood control, irrigation, and water supply maintenance. Business activities are funded by special purpose government entities that have the power to levy and collect taxes. In addition, these entities are able finance their operations by raising revenue from various sources as provided by the state level laws. Fiduciary activities grant the government the power to act as an agent or trustee for outside parties. For example, the government may act as a trustee for employee pension plan.

After the implementation of GASB Statement no. 34 (GASB 34), state and local governments are required to provide more comprehensive information regarding their various funds and activities (Plummer, Hutchison, & Patton, 2007). States and local governments provide a more comprehensive report called the Comprehensive Annual

Financial Report (CAFR). The format of the CAFR (Figure 1) should contain the following three broad sections: introduction, financial, and statistical (GASB, 2010).

The introductory section usually includes items such as title page, table of content, description of the governmental entity, legal letter of transmittal[7], financial report awards, list of principal officials, organizational chart, and audit committee letter.

The financial section includes five components. The first component is the auditor's report, which will vary from state to state. Some states have laws requiring that all state agencies and local governments be audited by an audit agency of the state or an independent public accounting firm. Other states mandate that the audit process be conducted by a state audit agency and an independent public accounting firm. Despite these variations, the auditor's opinion should be imbedded in the CAFR.

The next three parts of the CAFR's financial section provide the minimum requirement for general purpose external financial reporting. The first part is the Required Supplementary Information (RSI). The RSI presents the basic financial statements and current financial position of the entity in a narrative format. The RSI is intended to deliver financial information in a form that is easy to understand by the reader. The second part presents the basic financial statements. There are two types of basic financial statements known as the governmental-wide statement and the fund financial statement (Appendix A). The third part provides the notes to the basic financial statements.

The last part of CAFR's financial section is supplementary information. The information includes a consolidation between statements and various schedules. In summary, the financial section provides sufficient information to fully disclose and fairly

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[7] Which is typically a message from the controller to the executive of the government and includes other information that management belief is necessary

present the financial position and operations of the entity during the fiscal year. It also includes additional information relevant to the financial condition of the entity such as agreements with creditors and other constraints over its financial position.

The statistical section of the CAFR presents financial trends, revenue capacity, debt capacity, and demographic, economic and operating information. This information is presented in the form of tables and graphs. Financial trends show components of the financial statements from the past ten years. Revenue capacity presents the most significant sources of revenue. Debt capacity contains information regarding the government's outstanding obligations, especially with regard to long-term debt. Demographic and economic information include statistics regarding population size, personal income, and the unemployment rate. Operating information includes details about the government resources necessary to conduct operations. This includes information such as a list of employees by function and program and the amount of capital assets.

Figure 1 the Structure of CAFR

The budget (Appendix B) is another source of information regarding municipal financial performance. In general, municipal budget reports are issued by local government entities annually. This report is the reflection of government vision, strategy, and priorities therefore, managing the budget process is a challenging process that must be engaged by many different stakeholders under tight deadlines for the purpose of transparency.

The detailed explanation of budget preparation procedures for local government entities can be found in the cities or towns website. These budget procedures do not vary differently across the entities with certain exception of large population (more than 300,000 in population) cities or towns (MRSC, 2016). Budget for local government can be in the form of line-item budgets, program budgets, performance budget, or zero-based budget.

Line item-budget is the most common type of budget for local government entities. This approach describes every item required for producing government services. Program budgets show the fund allocation to major program activities rather than item by item. Performance budgets approach reflect the allocation of budget amount based on the organization structure. And for the zero-based budget, the expenditures budget can be set below the current level of expenditures (Schick & Hatry, 1982; Lauth, 2014).

The budget report consists of revenues and appropriations for the next fiscal year. The budget documents depict important details regarding anticipated revenues and the expected use of these revenues. However, these documents are generally published in pdf format[8] making it difficult to undertake further analysis.

Financial information can be collected from form 990 for nonprofit organizations. The title of this form is "Return of Organizations Exempt from Income Tax". As a result,

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[8] Some of the local government entities provide excel format of budget form, for example: Ohio and NJ (From 2015)

form 990 must be filed by organizations that are exempt from federal income taxes under section 501 of the Internal Revenue Code. Organizations that must file form 990 under section 501 are those that have either annual gross receipts of $200,000 or more or end of year total assets of $500,000 or more. For the calendar year 2015 or for filers whose fiscal year starts in 2015, the gross receipt limit is $750,000 and total assets must be less than $1,250,000. For the filer that does not have gross receipts and total assets between these ranges form 990-EZ can be filed. This is a shorter and simpler version of form 990.

The form 990 consists of several parts. The first until seventh part of the form must be completed by all filing organizations. These parts require information regarding activities, finance, governance, compliance, and compensation paid to certain persons. Additional schedules are also required to be completed depending on the activities and type of the organization.

1.4 Financial Data Source

Various sources can be utilized to gather government and not-for-profit financial data. This section will summarize several data source that related to the topic in this study. The first data source is the Electronic Municipal Market Access (EMMA) site from the Municipal Securities Rulemaking Board (MSRB). EMMA can be considered as one of the more substantial enhancements to occur in the municipal bonds trading function. This site provides a repository database, free of charge for accessing individual bond data, which is an improvement from the previous manner of accessing trading data.

In general, the information that can be collected from the EMMA database consists of two parts (Table 2). First is the information that is required when the issuer initiates bond issues or related primary market disclosures. This information can include official

statements, refunding statements, continuing disclosures, or other related documents. The second type of information is more relevant to the secondary market, and captures information such as trading price, rate, and other historical trading data.

Table 2 EMMA Database

The Electronic Municipal Market Access System (EMMA)	
Address	http://emma.msrb.org/aboutemma/overview.aspx
Objectives	The EMMA website was established to increase public access to disclosure and transparency information in the municipal securities market. EMMA provides investors, state and local governments and other market participants with key information about municipal securities, free of charge.
Data	- Offering documents, called official statements, for most new offerings of municipal bonds, notes, 529 college savings plans and other municipal securities issued since 1990 - Advance refunding documents, which detail arrangements made when new bonds are issued to establish escrows to pay-off existing bonds (usually to refinance the old debt at a lower interest rate) - Continuing disclosure documents that describe material information throughout the life of a bond and must be provided by municipal bond issuers. - Additional disclosures that are voluntarily provided by issuers may be available for some bonds. - Market transparency data, which includes real-time prices and yields at which bonds and notes are bought and sold, for most trades occurring on or after January 31, 2005. - Interest rates for municipal securities, including those for auction rate securities and variable rate demand obligations - Municipal market-wide trends and data are also available in the market statistics section.

The MSRB requires that municipal securities dealers report their most recent transactions to the MSRB within minutes of the time of trade so that this information is available on the EMMA website in close to real-time reporting. This improvement in MSRB reporting has greatly increased information availability and transparency. However, the disclosures or reports that are collected on the EMMA site are still filed in PDF format,

thereby making it difficult for users to perform comparative analyses of the information, and consequently limiting its usability and usefulness.

Many governments have tried to provide increased openness and transparency with respect to their operations, and the adoption of Information Systems technologies, which are considered vital for cost-efficiency and convenience, have spurred much of this change. The concept of e-government or e-reporting is quite popular in the public administration and is seen as progress towards an improved transparency (Wong & Welch, 2004). Furthermore, communication transparency and the freedom to access government information are regarded as an integral democratic right, for example: without the ability to access information, citizens are not able to hold the government they elected accountable or not able to assess the efficacy of administration actions and make demand about the public services (Harrison, Guerrero, & Burke, 2012) and it is essential for the public officer to protect public's right of access toward the government information (McDermott, 2010).

With the advances in technology that enable the reengineering of governmental financial reporting systems, electronic disclosure capabilities are an integral part of many governmental projects. In general, the public can obtain CAFR, budget data, or organization information from the web site of a government entity. Moreover, requests for the specific information can also be submitted to the entity to gather further information. Some states and local governmental entities have implemented the Public Record Act (PRA). From the PRA, the public can request all records maintained by state and local governmental agencies, with only very narrow statutory exemptions (MRSC, 2016). However, sometimes the process can take several days and the user may have to pay for printing and copying costs.

A Non-Federal Entity (NFE) is an organization that receives federal funding and based on the circular A-133 this entity is required to submit their audit report. As one form of an NFE, not-for-profit organization can be divided by the subsection of the United States Internal Revenue Code 501 (c) (Figure 5). Not-for-profit organizations contributed around 5.3% of GDP in 2014 and accounted 9.2% of all wages and salaries paid in United States for the year 2010 (NCSS, 2016). These types of organizations include everything from neighborhood associations that have no large assets to a large institution with billions of dollars in assets.

The Federal government operates the Federal Audit Clearinghouse (FAC) to provide online information regarding the audit data of NFE. The primary objectives of this site are to disclose single audit reporting packages, promote the Office of Management and Budget (OMB) oversight and assessment toward federal award audit, facilitate a public database for completed audit report, and assist auditors and auditees in minimizing the reporting burden in related to the requirement of circular A-133.

The US Census Bureau also provides different categories of information for public. The information that can be collected from this site is more focused on the social and demographic information such as: population, median income, tax rate, housing, or job information. With the FactFinder tool, researcher can obtain supporting information from different areas in The United States.

The following figure provides a screen shot of factfinder from US Census (http://factfinder.census.gov/faces/nav/jsf/pages/download_center.xhtml). The dataset is divided into two parts: prepackaged or customized. The prepackaged data shows the tables and figures that are already prepared based on the several survey programs such as:

American Community Survey or American Housing Survey. The customized section provides data based on the user selection and query, such as: the survey program or geography/region.

Figure 2 US Census FactFinder

Financial data also can be collected in an efficient and accurate manner from subscription-based information services such as Bloomberg or Mergent. Bloomberg provides various forms of data and substantial support in the form of customer services that can assist users in the data collection process. Bloomberg provides real-time and historical financial market data and economic data, covering all sectors worldwide. It also features analytics, company financials, news, and customizable charting. The following table is summary of several Bloomberg Database functions.

Table 3 Bloomberg Database

Function	Data
Searching	Historical Stock Prices, Company Description, Company Financial, M&A, Company News, Future Contract, Spot, Forward Rates, and Exchange Rates.
Data Wizard	- Market, Reference, Analytical, Data Sets: the most recent data (from 500+ fields), including analytics, real time prices, and various fundamentals information. - Historical End of Day: time series data for a specified time period in increments of days, weeks, months, quarters, or years - Historic Intraday Bars: intra-day data for various market parameters for up-to 50 days with an interval down to one minute - Historical Intraday Ticks: Intraday market ticks for time increments, based on big, ask, or trade events
Bloomberg Formulas	This function allows user to use Bloomberg formulas for the purpose to populate data in spreadsheet. Below is the most used formula: - BDP (Bloomberg Data Point): Returns data to a single cell in your Excel spreadsheet. This formula contains only one ticker and only one field. Formula syntax: =BDP(Security,Field) - BDH (Bloomberg Data History): Returns the historical data for a security. Formula syntax: =BDP(Security,Field,Start Date,End Date) - BDS (Bloomberg Data Set): Returns multi-cell descriptive data to spreadsheet. Formula syntax: =BDS (Security,Field)
Fundamental Analysis wizard	There are two main functions in this section: - Fundamental Data: Use the Fundamental Wizard to select templates for securities and retrieve end-of-day data for a specified period of time in increments of days, weeks, months, quarters, or years. - Earnings Estimates: Use the Earning Estimates wizard to display earnings projections, for a specific equity or group of equities, so you can quickly gauge market expectations.

While Bloomberg has a variety of information, Mergent database provides in depth
data that focuses more on the credit rating information and various municipal bonds data.

The information that can be collected from this service consist of: issuer description, state, project name, obligor, agents, coupon type, offering price, offering yield, offering amount, total outstanding amount, maturity date, tax status, and credit rating.

With a mission to protect investors, issuers, and the greater public interest, many local governmental entities are promoting fair, efficient, regulated, and engaging active disclosure. Several local governmental entities reflect grand initiatives to develop free online sources that includes information such as governmental disclosures, market transparency data, and educational materials. OhioCheckbook.com[9] is one examples of an online source of governmental data (Figure 3). OhioCheckbook.com was launched on December 2, 2014, marking the first time in Ohio history when citizens could actually see every expenditure in state government. Since its launch, OhioCheckbook.com has received overwhelming support from newspapers and groups across the state[10].

This site is a modern transparency website type that can serve the public with information about the flow of tax funds and budgeting process. The objective of this project is to provide detailed information about the decision-making process on state spending and the true costs of government.

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[9] http://ohiotreasurer.gov/Transparency/Ohios-Online-Checkbook
[10] The list of local government entities that included in the OhioCheckbook.com is on Appendix C

Figure 3 Ohio Checkbook

The interactive dashboard allows users to access the financial information with various type of queries such as department, expense type, period/fiscal year, or program type. The public is also able to collect transactional information from this site. Ohiocheckbook.com includes spending data from every state agency and elected office dating back to the 2007-08 fiscal year. Users can explore the database through a variety of methods including a search engine style search bar.

This transparency website is making progress with more than 200 cities, villages, townships, counties, school districts, and special districts data are available on the state's website. The table below is the summary of entities that included on the OhioCheckbook.com. Participation is increasing because there is essentially no cost for a local government to join the state's existing online platform.

Table 4 Ohio Checkbook List of Entity

Entity	
Cities and Villages	97
Townships	74
Schools	69
Counties	14
Special Districts	14
Total	**268**

The existence of the state checkbook improves the transparency of governmental activities. Before, data updates took longer than six months, but now data will be updated monthly with 45- to 60- day lag. And for local governments that previously updated their checkbooks data annually, they can now update it at least quarterly or semi-annually.

Another example is the New York City's checkbook[11]. This site provides interactive dashboards that provide up-to-date financial information of the city. Not only supporting government transparency this online source has also become a new tool for subcontractors and the public by providing spending and contract information.

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[11] http://www.checkbooknyc.com/spending_landing/yeartype/B/year/117

Figure 4 NYC Checkbook
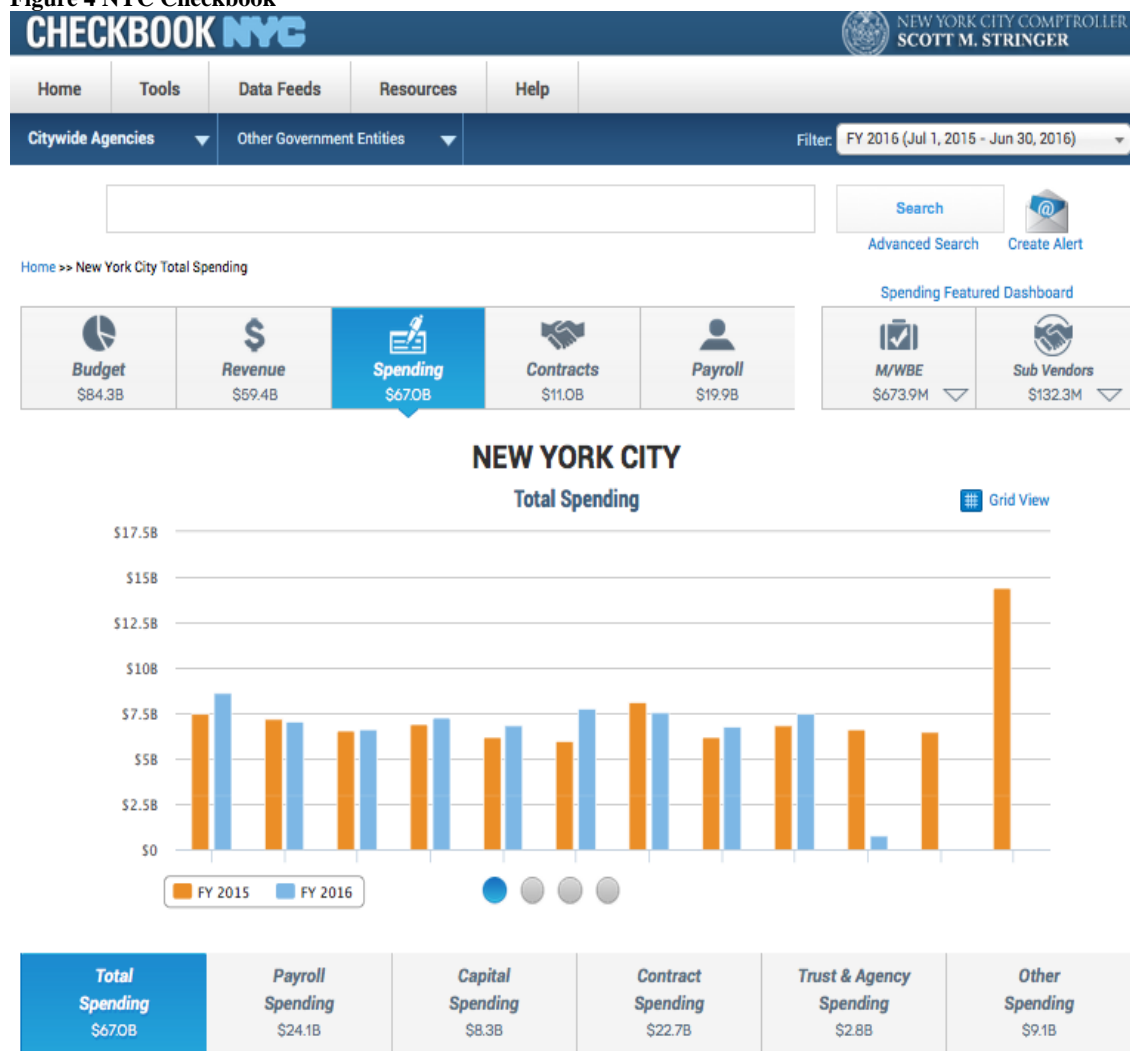
Checkbook NYC's data consists of budget, revenue, spending, contracts and payroll information. Below is the summary of the information that can be obtained from this site (http://www.checkbooknyc.com/spending_landing/yeartype/B/year/117).

Table 5 NYC Checkbook Data Summary

Category	Information
Budget	▪ Committed Expense Budget: the scope of the budget includes all of the city government's expenditures. This is a blueprint for the type of activities that are funded in a particular year and at what level. ▪ Budget Variance: the difference between the budgeted or baseline amount of expense or revenue, and the actual amount ▪ Expense Categories: This section provides information about the expenses based on the citywide agency, expense category, budget code, or the type of programs.
Revenue	Provides information regarding the source of revenues, such as state grants, federal grants, charges for services, or fines and forfeitures.
Spending	Provides information regarding the spending activities. There are five spending categories: payroll spending, capital spending, contract spending, trust & agency spending, and other spending.
Contract	Contract information that consist of registered contract (have been registered with the city controller), active contract, and pending contract.
Payroll	Payroll data per agency, overtime data, and annual payroll data.

The initiative of online data sources gives residents a means for holding their community's public officials accountable for spending tax dollars wisely. For data seekers that previously spent countless hours combing through websites to find information or wait for information requests to be filled, they can now easily search, download and explore expenditures in user-friendly formats. Using interactive charts and graphs they can also quickly compare spending in their community to other municipalities. Local governments might also find that easier access to this information can help them see how they measure up to other communities. They can now use data from around the state to make better departmental decisions that reduce waste and improve services. The next table provides a summary of several governmental open data websites.

Table 6 Online Access Government Data

State/Local Gov. Entity	Description
Colorado	In January 2015, Colorado re-launched (the initial project is the Transparency Online Project in 2009) its transparency portal with a new, more user friendly interface. The website features advanced search and browse-by-category functionality, and the new data viewer also incorporates a one-click drill-down feature and "back" arrow allowing for simple navigation between varying levels of detail (Appendix D). URL: https://www.colorado.gov/apps/oit/transparency/index.html
Montana	This site provides information about unaudited, non-confidential, payment information to the public. It is also including information regarding spending of tax credits, exemptions, grants and loans intended to bolster the state's economy by incentivizing job creation, training or capital investment. URL: http://transparency.mt.gov/
Kansas	Kansas's kanview (The Kansas Transparency Program) provides online facility for public to view or download about government financial activity (spending and income). Prior to the current version, kanview was not able to serve the bulk download and provide no clear definition about the data. URL: http://kanview.ks.gov/
Nevada	Nevada's transparent government website provides information regarding the budget expenditure for the entire State of Nevada. User can select to have more disaggregate information based on the government function or programs. Furthermore, this site provide link to the tax expenditure report that can provide information about tax revenues, tax credits, exemptions, and deductions. URL: http://open.nv.gov/
North Dakota	There are three main categories of information in this site: spending by agency/university, spending by category, and payment to vendors. Spending by agency/university provides information about what types of goods/services are purchased and the suppliers related to these transactions. Spending by category shows information regarding all agencies

State/Local Gov. Entity	Description
	expenditures based on the budget code and category. Payment to vendors will provide report regarding whose being paid by the State, how much, and by which state agency or university. URL: http://data.share.nd.gov/pr/Pages/checkbook.aspx

1.5 The Auditing Process

Based on Generally Accepted Government Auditing Standards (GAGAS), auditors for government or non-profit entities may use Government Auditing Standards in conjunction with professional guidelines, such as those from the PCAOB or the International Auditing and Assurance Standards (GAO, 2007). For the government and not-for-profit entity, there are several types of audits that may be performed including performance audits, compliance audit and financial audits.

A performance audit examines the efficiency and effectiveness of the programs and operations of a government or non-profit entity. Benefit of performance audit in the public and private sectors are generally similar although for corporation is focusing more on the profit maximization and value to the shareholders. Performance audits can provide benefits for the public sector in several directions. First it can assist the problem identification process. By identify the problem areas, government agency can find solution immediately and reduce inefficiencies. Second benefit from performance audit sis that the audit report can help citizens obtain insight into the management of government programs and activities. And finally, performance audits are providing the evaluation of individuals or departments in the organization.

Performance audit in public sector can improve the effectivity of policies, procedures, and structure of organization. However, the implementation of this type of audits rise several issues, such as the difficulty to identify and measure the outcomes especially in the short term, budgetary constraints that can withheld the programs or activities implementation, or lack of expertise to thoroughly conduct performance audits.

Compliance audit is a service provided by a CPA firm, which issues an examination, review, and agreed-upon procedures report. This type of audit is performed by assessing whether activities, financial transactions, and disclosure are in compliance with the authorities which govern the auditee. The authorities can include rules, laws, budget, policy, codes, or established term and principles (ISSAI, 2013).

Financial audits provide an independent assessment on the entity's financial information. The primary objective is to present an audit opinion on whether the entity's financial statements are presented fairly based on the financial reporting frameworks. Moreover, this opinion reports on the internal controls of the entity based on compliance with laws, regulations, contracts, and grant agreements that have material influence on the financial reports.

Comparing with the private sectors, the legal risk for the public sector appointed auditor is lower. This could be because the manager of public bodies is less likely to use public funds to pursue lengthy legal battles at the expense of taxpayer money.

Public sector auditing strengthens public governance by providing for accountability and protecting the core values of the public sector entity, ensuring managers and officials conduct the public's business transparently, fairly, and honestly, as well as with equity and integrity. Elected and appointed officials at all levels of the

public sector need to support effective audit activities by establishing independent audit functions that meet all of the key elements. Furthermore, the government leaders need to embrace the advance of technology by providing online data sources to the public. The "OpenGov" platform makes government entity more transparent and enables citizens to be better informed.

1.6 Single Audit

Every year, the Federal Government provides more than $400 billion of grants to the Non-Federal Entity (NFE) (OMB, 2015). NFE consists of state, local and tribal governments, colleges, universities and other non-profit organizations. The Single Audit Act of 1984 (with amendment in 1996) and OMB Circular A-133 (Audits of State, Local Governments, and Non-Profit Organizations) provides the audit requirements for ensuring that these funds are expended properly.

The Office of Management and Budget (OMB)[12] issues guidance for the recipients of federal awards. This guidance consists of eight circulars[13] that manage the requirements of federal funds (AICPA, 2014). The focus of this study is on circular A-133 regarding the audit process of states, local governments, and non-profit organizations (Figure 5). Based on circular no. A-133, non-federal entities[14] that spend $500,000 ($300,000 for fiscal year before December 31, 2003) or more in one year in federal awards must have a single audit conducted for that year. The auditee requirement for receiving federal grants is to prepare

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[12] On December 26, 2013, OMB issued an update of the circular A-133 guidelines.

[13] Namely: A21 Cost Principles for Educational Institutions, A87 Cost Principles for state, local and Indian Tribal Governments, A89 Federal Domestic Assistance Program Information, A102 Grants and Cooperative Agreement with State and Local Governments, A110 Uniform Administrative Requirements for Grants and Other Agreements with Institutions of higher Education, Hospital and Other Non-Profit Organizations, A122 Cost Principles for Non-Profit Organizations and A133 Audit of States, Local Governments, and Non-Profit Organizations.

[14] Non-Federal Entities in this study consist of state, local government, Indian tribe, institution of higher education, not-for-profit organizations that receive federal awards.

financial statements that at minimum consist of a schedule of expenditures of the awards and notes that describe the significant accounting policies.

Non-federal entities that expend less than the cut-off are exempt from the audit requirement for that year but all the documentation must be available for review or audit by the appropriate officials that are appointed by the General Accounting Office (GAO). If the non-federal entities fail to implement an audit, there are sanctions by the federal government including withholding a percentage of the award, suspending the award, or even terminating the award until the audit is complete (GAO, 2012).

Appointed auditors are responsible for performing audits of government entities based on Generally Accepted Government Auditing Standards (GAGAS) and Circular A-133. Both standards emphasize risk assessment procedures for all aspects of the audit. The AICPA has established professional standards for the financial audits and attestation engagements of nonprofit entities. These standards are a mix of GAGAS and the AICPA standards.

The procedures performed should allow the auditor to obtain sufficient evidence to understand the internal controls and confirm the compliance requirement of the entity. With a mission to provide reliability and integrity of the financial statements, the auditors' independence remains of paramount importance in today's society. This is especially due to the nature and purpose of NFE, which deems the audit report as one of the most important accountability sources for public (Krishnan & Schauer, 2000). Figure 5 lists various forms of not-for-profit organizations.

Figure 5 US Not-for-Profit Organization (NCSS, 2016)
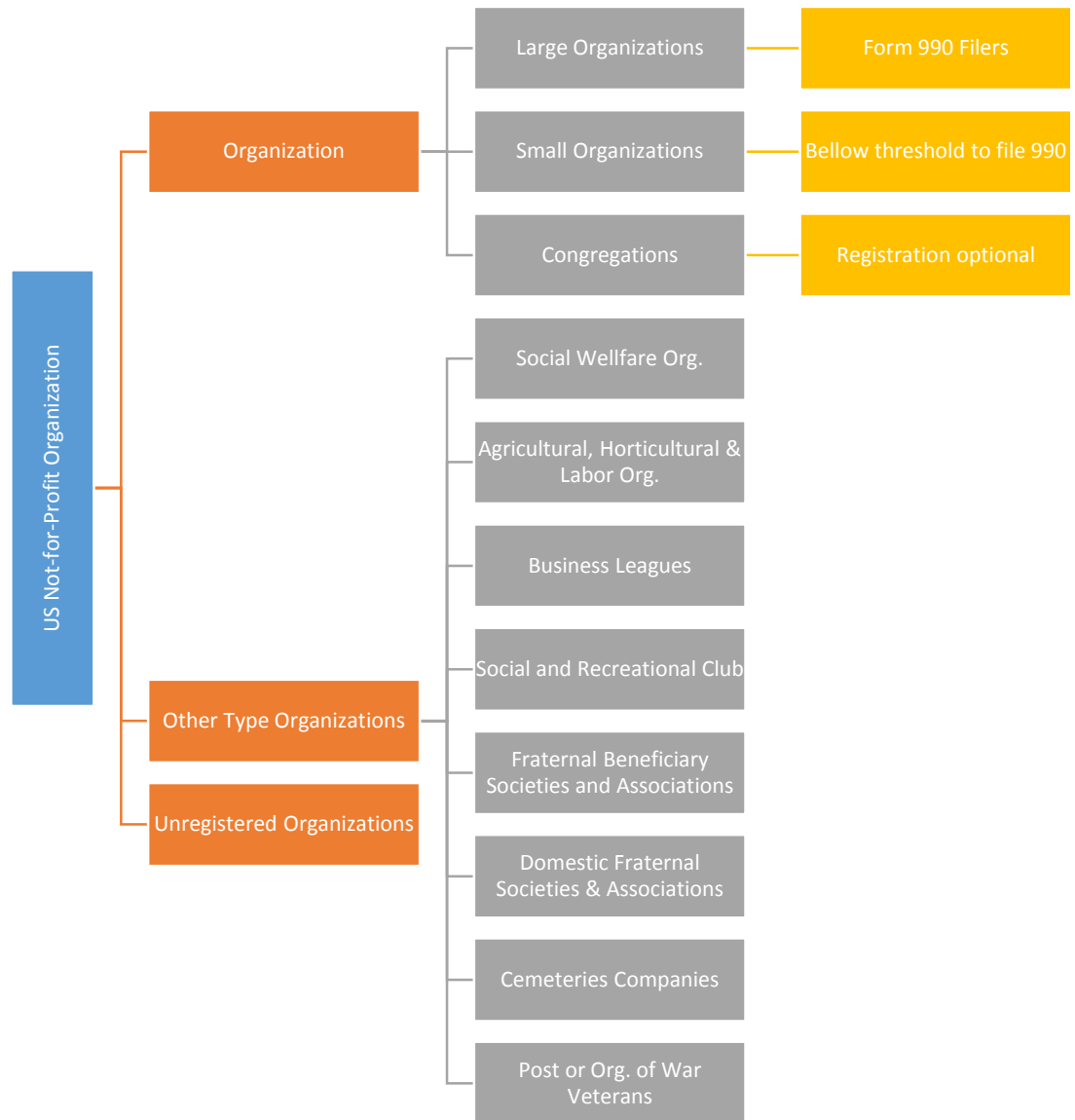
1.7 Summary

As technology has increased, the availability of various open data sources for governmental and not-for-profit organization has grown significantly. This Open government data initiative facilitates citizenry in analyzing large quantities of data to embrace transparency and accountability. One example of an online data repository is the Federal Audit Clearinghouse (FAC) from the Federal Government. FAC provides online information regarding the audit data of state and local government entities and not-for-

profit organizations that have received federal grants. The primary objective of this site is to disclose single audit reporting packages, promote the Office of Management and Budget (OMB) oversight and assessment toward federal award audit, facilitate a public database for completed audit reports, and assist auditors and auditee in minimizing the reporting burden in related to the requirement of circular A-133. From this database, users can analyze the audit process and identify the NFE efficiency, programs, possible waste or fraud, and productivity. Chapter two benefit from this data source and provide empirical evidence regarding opinion shopping in the local government and nonprofit sector.

With the rapid growth of open data initiatives, it is now possible for public to access an abundance of information from the state or local government entity. However, the amplified information limit the effectiveness of any searches due to information overload. This condition requires a data analytic tool that can assist user to select appropriate information. The use of artificial neural networks analysis can determine the type of variable that significantly influence the municipal credit rating. Chapter 3 identify the sources of information that support municipal credit rating.

With the objective to establish and improves accounting and reporting standards, the GASB is the official source of generally accepted accounting principles for state and local government. However, the nature of GASB's standards are not similar to federal laws or regulations hence it does not have the power to enforce their use.

Since its inception in 1984, the GASB has strived to meet the needs of the users of governmental financial reports by publishing standards that reflect their particular concerns and the unique features of the governmental environment. Although the GASB has

established a substantial body of standards, the need to develop and improve accounting and financial reporting standards for governments still exists.

To improve the standards implementation, the GASB is actively inviting public participation in the standard due process activity. The GASB due process activities are designed to encourage broad public participation by incorporating questionnaires or interviews. These type of data collection methods are perceived as cost intensive and time consuming (D. de Leeuw, 2005). The rapid growth of computer technology has caused the next important change in data collection. Chapter four implements a textual analysis methodology utilizing online news for selected GASB statements and exposure drafts.

This dissertation consists of five parts. Following the introductory section, there are three main essays. Chapter two provides empirical evidence regarding opinion shopping in the local government and nonprofit sector. Chapter three assesses whether information from the financial statements and non-financial information support municipal bond credit ratings. Chapter four uses text mining method is measuring the public sentiment of GASB statements and exposure drafts. The final chapter of this study consists of discussion of future research and a conclusion.

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Chapter 2. Audit Opinion Shopping: Evidence from Non-Federal Entities

2.1 Research Background

Given the current economic challenges faced by governments and non-profit entities, the need to supervise the utilization of federal funds is very crucial. Audits provide essential accountability and transparency that oversee these federal funds. Audit reports serve as an important resource in providing the accountability and transparency over an organization's programs and operations.

The concept of accountability, especially for Non-Federal Entity (NFE)[15] that use public funding is very important. Based on the GASB Concepts Statement No. 1, accountability is an important factor for the success of the governing process. Management and government officials entrusted with public resources are responsible for providing to the public supporting functions in an efficient, effective, economical, and ethical manner.

Choosing an audit firm is a critical decision because the role of an auditor is to provide an organization with assurance of compliance with Generally Accepted Accounting Principles (GAAP). Auditors can be changed for several reasons, including audit fee motives, disagreements, and service-related issues (Hackenbrack & Hogan, 2002). One reason that has become an ongoing concern of policy makers is opinion shopping. The study from Chen et al. provides definition of opinion shopping: "*the practice by which audit clients seek alternative auditors willing to give a clean audit opinion when the incumbent auditor is likely to issue an unclean opinion*" (Chen et al. 2016). When the audit opinion becomes a commodity, it can impair the quality of audit reporting (Knapp & Elikai, 1988).

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[15] In this study Non-federal Entity consist of local governments, states, not-for-profit organizations, tribes, or local territories that have received federal funding

The contribution of this study is to analyze the likelihood of opinion shopping in the Non-Federal Entity (NFE) setting. Although there have been several opinion shopping studies in the corporate world, their finding are not perfectly suitable with the NFE setting. Several factors differentiate the NFE and corporate sector. The effect of a qualified audit opinion on the corporate sector impacts the market value of their stocks or management compensation, but for NFE the effect will not only impact the NFE's ability to raise money for capital development through bonds but also on the government's funding decisions for the NFE.

This research is important is because it can provide a new perspective on opinion shopping not in the private or corporate world but for governmental and not-for-profit entities that are different nature and objective. NFE often trying to tackle society's long term problem hence sometimes it is difficult to measure the performance of a program or activity. NFE's performance measurement is not solely based on financial indicators. Qualitative based measurement such as the mission of organization, leadership, or the consistency of the activities can be considered as or more informative as quantitative measurement (Penley, 2012). Moreover, in various cases, the cost of measuring performance is greater than the usefulness of the information it generates (Rooney, 2011).

Private sector auditing has a smaller scope and the primary objective is to provide a true and fair opinion on the company's financial reports. Whereas, for NFE, the audit process must include not only an opinion on the financial statement but also over the aspects of governance with respect to the entity's ability to fulfill its mission and programs. Therefore, it is imperative to examine empirical evidence interpreting whether there is an

indication of opinion shopping is engaged by a Non-Federal Entity to support the transparency and accountability of the NFE (ACCA, 2010).

2.2 Theoretical Framework

In the process of auditing financial statements, one of the auditor's primary objectives is to issue a written report that expresses a professional opinion regarding the fairness of the financial statements based on the applicable accounting standards (Hackenbrack & Hogan, 2002; Arens, Elder, & Beasley, 2012). The auditor must be technically capable and independent in providing their opinion (Citron & Taffler , 1992).

There are several reasons for replacing or keeping an auditor. When such a decision is motivated by the ability to receive a better audit opinion, the strategy is known as *opinion shopping* (Gomez-Aguilar & Ruiz-Barbadillo, 2003). Opinion shopping has been the primary focus of many prior studies because it not only involves the reliability of the audit report, but also affects the overall audit process (Lu, 2006).

An audit opinion is very important because it can influence the success or failure of the organization in the future (Citron & Taffler , 1992). For example, a clean audit opinion for listed firms can affect the market value of stocks or management compensation (Chow & Rice, 1982). There have been a number of prior studies that provide conjectures of the existing of opinion shopping in corporate organizations. Management may select a lower quality auditor to increase the chance of obtaining a clean report for the following year (Gomez-Aguilar & Ruiz-Barbadillo, 2003). Some studies also indicate that by selecting local audit firms they receive more favorable results. (Chan , Lin , & Wang , 2012). By selecting a local auditor, management is able to put more pressure on that auditor for a favorable audit opinion (Chan, Lin, & Mo, 2006). Selecting a smaller audit firm also

provides the opportunity for a company to mask a weak corporate governance structure (Lin & Liu, 2009).

Although several studies provide an indication that opinion shopping exists, the strategy of selecting an auditor for a favorable audit opinion does not always provide a positive outcome for the entity. If there exist material weaknesses the new auditor may issue a qualified opinion in order to minimize the potential risk the auditors faces from lawsuits or damage to their reputation. This will prevent the new auditors from compromising their opinion (Knapp & Elikai, 1988). In some cases, client pressure and tight competition may provide different results (Chan, Lin, & Mo, 2006).

For NFE that issue debt investment products, receiving a qualified audit opinion may cause the market to react poorly on the issuance of new bonds or require a higher interest rate on those bonds (Samson, 2003).Furthermore, there is a greater possibility that it will impact future federal funding to the NFE (Krishnan & Stephens, 1995; Feng , 2014).

However, a study from Trussel and Parson (Trussel & Parsons, 2008) shows that there is a possibility that donors, grantors, board members, and other stakeholders focus on aspects other than financial performance. Another example that illustrates a different point of view towards the NFE donor is that of a 1999 study by Gordon and Khumawala, which reveals that individual donors for charitable organizations are primarily influenced by the mission of the charity rather than the accounting reports (Gordon & Khumawala, 1999).

Because of the inherent differences between NFEs and corporate organizations, it is very interesting to explore whether there is an indication of opinion shopping in the NFE sector. Furthermore, distinct characteristics can also be examined from a performance

evaluation. Not-for-profit organizations commonly measure their performance based on specific projects and not on the entire organization's performance.

In order to provide empirical evidence of audit opinion shopping in a non-federal entity, this study will make a comparative analysis between switched (replaced auditor) and non-switched groups. Furthermore, this study will proceed with a subsequent analysis to detect the affectivity of opinion shopping by developing a predictive model. The lack of information regarding the reason for an auditor change is part of the study's limitation. It is possible that the auditor is change not because of opinion shopping but because the incumbent auditor lost out on the bidding process for audit services.

2.3 Research Methodology

This study examines the association between audit opinion and auditor switch for organizations that receive federal grants. The cost of receiving a qualified audit opinion includes additional auditing costs due to additional audit hours (Houghton & Jubb, 1999) as well as a decrease in the amount of future federal funds (Feng , 2014). Given the cost associated with a qualified audit opinion, managements tends to react in order to prevent similar situation from happening (Firth, 2002). There are numerous ways to avoid the costs associated with receiving a qualified opinion. For example, management may attempt to negotiate with the auditor for a clean opinion or if an agreement cannot be reached, managers may often decide to switch auditors.

The strategy to switch auditors in order to receive a better audit opinion is examined in the first part of the study. There are two main research questions:

- Are firms more likely to switch auditors after receiving a qualified opinion rather than after receiving a clean opinion?

▪ When firms switch auditors after receiving a qualified opinion, are they more likely to receive a clean opinion the following year?

A positive answer to these research questions would imply that a firm's management may pressure current auditors into issuing a clean opinion by threatening to switch auditors in the future.

2.3.1 Hypothesis I

The decision to switch auditors in order to achieve a better audit opinion can diminish user confidence in audited financial statements. This strategy will not only influence public opinion regarding the financial statements of the switching firm but also the whole audit structure and procedure. Schwartz and Menon show that failing firms have a tendency to change their auditors when compared to the healthy firms (Schwartz & Menon, 1985).

In the NFE setting, management's motivation to engage in opinion shopping is not clear. On the one hand, NFEs aim to receive a clean audit opinion in order to receive federal funding from the government. On the other hand, changing auditors in order to get a clean opinion will result in several consequences. For example there are some states that required approval for municipalities and regional school district that want to change their auditor, such as Rhode Island (Auditor General State of Rhode Island, 2011) or The State of Utah (Office of the Utah State Auditor, 2016). There is also the time spent for search and the adjustment period for hiring a new auditor (Larcker, 2011). These factors can also be combined with the fact that an NFE donor not only focuses on the audit report but also on non-financial factors such as the purpose and mission of organization in question.

Growing concern regarding the possibility of opinion shopping comes from not only the regulator such as PCAOB (PCAOB, 2011) but also from the public accountant firm[16] itself (Zeff, 2003). This concern warrants a study that will provide empirical evidence regarding opinion shopping. A comparative analysis between matched groups of qualified and unqualified audit opinions will be able to detect whether the NFE that receives a qualified opinion is more likely to switch their auditors in the following period.

- Hypothesis 1. The NFE is more likely to switch their auditors after receiving a qualified opinion.

2.3.2. Hypothesis II

Following the organization's decision to change auditors, the second hypothesis finding must answer the following question: will switching auditors result in a more favorable audit opinion for the organization. A positive answer for this research question will mean that opinion shopping is implemented successfully by switching from the incumbent auditor.

Previous studies of for-profit organization that decided to switch auditors (Chow & Rice, 1982; Krishnan, Krishnan, & Stephens, 1996; Chan , Lin , & Wang , 2012) show mixed results for the entities. Some of the literature suggests that post-switch opinions are not more favorable than pre-switch opinions. It is believed that other external factors, such as financial condition (Chow & Rice, 1982) or the threat to auditor reputation (Knapp & Elikai, 1988) can influence the effectiveness of opinion shopping.

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[16] The comment from Leonard M. Savoie, a former research and education partner (PW): "*competition to obtain a client for the lowest fee or to obtain or retain a client at the expense of technical standards is debilitating. It will weaken and, if unchecked, destroy the profession*" (Zeff, 2003).

On the other hand, another group of prior studies shows that companies that did not switch auditors were more likely to receive an unfavorable audit opinion than companies that had made the decision to switch (Lennox, 2000). The tight competition of the audit market as well as the risk of losing the client is the cause of such a result (Chan, Lin, & Mo, 2006).

By utilizing a subsequent analysis of the post-switch decision, this study will provide empirical evidence regarding the possibility of successful opinion shopping after the change of auditor. This study also contributes to existing research in the area of governmental and not-for-profit accounting.

- Hypothesis 2. The NFE that switches auditors after receiving a qualified opinion will be more likely to receive a clean opinion the following year.

2.4 Data and Sample

The collected data in this study consists of audit reports from the local government entities and not-for-profit organizations. The data was collected from the Federal Audit Clearinghouse (FAC). This entity operates on behalf of the Office of Management and Budget (OMB) in order to provide audit report packages to federal agencies. The FAC assists the OMB in oversight, assesses compliance with federal award audit requirements, minimizes the reporting burden of circular A-133 audit requirements, and maintains a public database of completed audits.

The initial sample contains 697,281 audit reports from the years 1997 to 2014. The data set consists of several types of organizations such as local governments, states, not-for-profit organizations, tribes, and local territories.

- Local government: This data set consists of local governments within a state, including a county, borough, municipality, city, town, township, parish, local public authority, special district, school district, intrastate district, council of governments, and any other instrumentality of local government.

- Not-for-profit organization: This sector includes any corporation, trust, association, cooperative, or other organization that operates for the purpose of science, education, service, charity, or similar objective. The types of not-for-profit organizations that are included in this dataset are airports, hospitals, housing organizations, and institutions for higher education, schools, transit organizations, utilities, and social services

The entities included in the sample are required to have either an unqualified or qualified audit opinion, no missing values in the variable audit year, auditor's name, type of entity, location and amount received from Federal government. Since this paper focuses on first time qualified opinions and their influence on an auditor switch in the following three years, it is also required that the previous year's audit opinion is clean and that all entities have at least 5 consecutive years of audit opinion. As a result of the above criteria, 187,679 entity-year sample are further analyzed.

The sample data is divided into two subsamples based on the first year (year 1) audit opinion: qualified (group 1) and unqualified (group 2). There are 185,548 entity-year samples in group 2, while 2,131 in group 1. The next step is to find matched samples between group 1 and 2 to make comparative analysis between these two groups. The matching process is based on the similarity of variables (audit year, entity location and type

of entity) and the smallest difference between amounts received from federal government. Furthermore, the observations that have no matches are deleted. The final sample consists of 9,504 pairs. Table 7 illustrates the classification of the sample based on the entity type.

Table 7 Sample Distribution

Type Code	Type of Entity	Frequency
0	State	48
10	County	464
20	Municipality	424
30	Township	120
40	Independent Special District	384
50	Independent Education Agency	4448
60	Indian Tribe/Alaskan Native Village Dependent	160
90	Not-for-Profit	3456
Total		9,504

2.5 Results and Analysis

This section presents the results of the analysis conducted for the two research questions. The first question will be addressed by comparing auditor-switch ratios between the NFEs that received unqualified and qualified audit opinions. The second research question will be addressed with a follow-up analysis, which will provide information on whether the decision to switch auditors after a qualified opinion will likely change the audit opinion for the following year.

The percentage of auditor change between group 1 and group 2 is shown on the following table. In the first year, 12.54% of entities changed auditors from group 1 sample, while only 8.08% of entities changed their auditors from group 2 sample. In the second and third years, the accumulated auditor switch ratio is 8.75% (7.58%) and 7.49% (8.59%) respectively for group 1 and group 2. Overall, group 1 has a higher percentage of change of auditor. As expected, because many other factors can influence, the incentive for

switching auditors due to a qualified opinion decreases over the time from year one to year three.

Based on Chi-square testing, the auditor switch ratios between group 1 and group 2 are different and statistically significant in year 2 of the study (the second year after the benchmark year). The p-value of the Chi-square testing is significant at the 1% level in the first year (year 2), but the difference is not significant in the second (year 3) and third years (year 4).

This finding is also consistent with the prior study, which revealed that switch ratios between unqualified and qualified matching samples are typically significant different within one year of the qualified opinion (benchmark year). Chow and Rice (1982) suggest that an auditor switch within one year of the qualified opinion is assumed to be associated with the qualified opinion because of the time requirement to proceed with the search for a new audit team for the following year (Chow & Rice, 1982). Beyond this period there may be other factors that can intervene (Citron & Taffler , 1992).

Table 8 Auditor Change Ratio

Year	2	3	4
Group 1	12.54%	8.75%	7.49%
Group 2	8.08%	7.58%	8.59%
Difference	4.46%	1.17%	1.10%
Test			
Pearson Chi2(1)	12.784	1.100	0.962
P-Value	0.000*	0.294	0.327

The second research question focuses on the group 1 sample (qualified). This analysis addresses whether observation in group 1 that have switched their auditor are more likely to receive a clean opinion in the following years. The next table presents the ratio

between the number of observation in group 1 that have received qualified audit opinion and unqualified audit opinion for each of sub categories (switched and not switched).

The results show that qualified audit opinion ratios decrease in the subsequent three years for both subgroups of samples (switched and not switched). However, entities that changed auditors have much lower qualified auditor opinion ratios. Chi-square testing shows that the difference between ratios across the two types of entities (switched and not switched) is significant at the 1% level for all three years. This result shows qualified opinion NFE that switched their auditor will be more likely to receive a clean opinion compare to the qualified NFE that do not replace their auditor.

Table 9 Qualified Audit Opinion Ratio

Year	2	3	4
Auditor change	21.48%	16.24%	13.92%
Non-Auditor change	44.56%	32.49%	26.96%
Difference	23.08%	16.25%	13.04%
Test			
Pearson Chi2(1)	28.5733	23.9729	21.603
P-Value	0.000*	0.000*	0.000*

2.6 Further Analysis

This study also conducts a follow up analysis regarding the probability of success for a NFE that has engaged in opinion shopping. The prior analysis demonstrates that there is a possibility of opinion shopping based on the new audit opinion after the auditor switch. However, the indication of opinion shopping based on the switch decision is not enough. The opinion shopping can go both directions. There is the possibility that management keep the current auditor because the incumbent auditor is more likely to give favorable audit opinion compare to hiring a new auditor. This type of opinion shopping schema

cannot be detected only by analyzing the switching process. Records regarding the level of auditor turnover are not necessarily an indication that opinion shopping existed or even increased in this type of opinion shopping (Knapp & Elikai, 1988).

The predictive model will be able to reveal the probability of the success of opinion shopping even without an actual switch so that it can also include detecting the NFE that purposely do not switch their auditor to receive a more favorable audit opinion. The following figure is the simplified scenario of that can be captured in this study. When the current auditor provides a more favorable audit opinion for NFE there are two possibilities whether to replace their auditor or keep the incumbent auditor. Group A shows that NFE will change their auditor if the current auditor is not favorable to them. This type of opinion shopping can be detected from the prior analysis. Group B and C are not included in the analysis because the NFE decision can be driven by audit rotation or a goal to obtain a more objective audit process. Group D has an indication of opinion shopping but this category is impossible to detect if the analysis is only based on the switching decision. In order to detect this type of opinion shopping schema, this section will analyze whether NFE would more likely receive an unfavorable opinion under different auditor switch decisions.

Figure 6 Opinion Shopping Schema
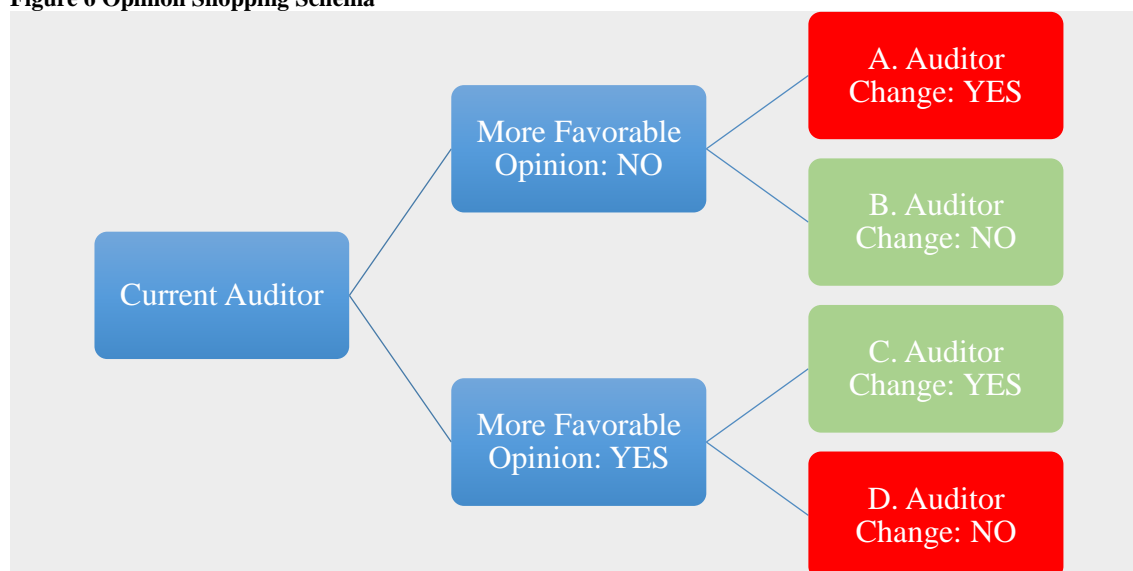
If the empirical evidence supports this hypothesis, then it suggests that NFEs do successfully engage in opinion shopping. This predictive model includes prior audit opinions, switching decisions, and other organization factors such as entity size, expenses, and revenues. To provide for a similarity of entity characteristics, the predictive analysis only include not-for-profit organization types as the sample.

- Hypothesis: NFE would more likely receive an unfavorable opinion under the alternate switch decisions.

Data and Sample

Similar to the previous analysis, the audit opinion data is collected from the Federal Audit Clearinghouse (FAC). However, the entities that are included in this part of the study are limited to not-for-profit organizations because of their significant dependence on public funding[17] and data availability from the IRS Form 990. With the title "Return of

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[17] From National Center for Charitable Statistics (NCCS) over 1,6 million charities in the United States and the number is growing

Organization Exempt from Income Tax" Form 990 is a report that must be filed by organizations that are exempt from federal income taxes under section 501 of the Internal Revenue Code. The organizations under section 501 that have to report Form 990 are the ones that have either annual gross receipt of $200,000 or more or end of year total assets of $500,000 or more. For the calendar year 2015 or for the filer whose fiscal year starts in 2015, the gross receipt limit is $750,000 and total assets must be less than $1,250,000. The filer that does not have gross receipts and total assets between these ranges can file form 990-EZ, which is a shorter and simpler version of Form 990.

Not all not-for-profit organizations are exempt from income taxes. In general, only organizations that pursue charitable, educational, or religious purposes are exempt. Form 990 is not an income tax return (because of tax-exempt status) but a report that provides information to the public regarding the use of funds under the privilege of tax-exempt status. This form also provides substantial financial information that reveals the organization's financial condition. This yearly filing is submitted to the Internal Revenue Service (IRS) and consists of several pieces of information that can be divided into three categories including basic facts about the filer, financial information, and possible abuses. With the financial information from Form 990, the predictive model is supported by several variables that represent the financial condition of the entity. Below is the summary of the variables.

Table 10 the Explanatory Variables (NFE Characteristics)

Category	Variable	Description
Organization	BOA	The size of voting boards
Organization	EMP	The number of employees
Organization	VOL	The number of volunteers
Financial	ROA	Return on Assets: Net Income/Total Assets
Financial	AGR	Assets Growth Rate: Total Assets (Current-Prior)/Total Assets Prior
Financial	LEV	Leverage: Total Liabilities/Total Assets
Financial	EFF	Efficiency Ratio: Total Expenses/Total Revenues

Result and Analysis

There are 457 observations that are included in the analysis. The analysis starts with the financial variables and organization size as the initial NFE characteristics. The following table shows the probability of qualified audit opinion ($Opinion_t$) given prior audit opinion ($Opinion_{t-1}$), the decision to change the auditor ($Switch_t$) and the NFE characteristics (ROA, AGR, LEV, EFF, and Size).

$$Opinion_t = \beta_0 + \beta_1 Switch_t + \beta_2 Opinion_{t-1} + \beta_3 Switch_t * Opinion_{t-1} + \beta_4 X_4 + \varepsilon_t$$

Table 11 Audit Reporting Model

Variables	Coefficients	z-statistic
$Switch_t$	1.297***	3.38
$Opinion_{t-1}$	3.916***	12.23
$Switch_t * Opinion_{t-1}$	-3.511***	-6.27
ROA	-0.062	-0.21
AGR	0.369	0.77
LEV	-0.125	-0.53
EFF	0.084	0.88
Size	-0.280	-1.27
Constant	-2.483**	-3.36
Year	Controlled	
N	457	
Pseudo R-sq	0.717	

* p<0.1, ** p<0.05, *** p<0.01

The next table shows auditor switching model. On this model, the $Shop_t$ variable is calculated from the audit reporting model by controlling the switch variable.

$$\text{Pr}\left(Opinion_t^1 = 1\right) = \text{Pr}(Opinion_t = 1 \mid Opinion_{t-1}, Switch_t = 1, X_t)$$

$$\text{Pr}\left(Opinion_t^0 = 1\right) = \text{Pr}(Opinion_t = 1 \mid Opinion_{t-1}, Switch_t = 0, X_t)$$

$$Shop_t = \text{Pr}\left(Opinion_t^1 = 1\right) - \text{Pr}\left(Opinion_t^0 = 1\right)$$

The significant coefficient (Shop=-0.936***) indicates that entities would have received a qualified audit opinion more frequently if they had made the alternative (opposite) switch decisions. This model suggests that the NFEs are successfully engaging in opinion shopping. While the other financial indicators have insignificant effects on switching. The NFE's ROA shows a negative influence on the tendency to switch auditors. This is consistent with the Lennox study that suggests that companies with financial difficulty will more likely change their auditors (Lennox, 2000).

Table 12 Auditor Switching Model

Variables	Coefficients	z-statistic
Shop	-0.936***	-4.13
ROA	-2.01**	-2.07
AGR	0.631	1.57
LEV	0.002	0.01
EFF	-0.673	-0.97
Size	0.214	1.24
Constant	-1.019	-1.09
Year	Controlled	
N	457	
Pseudo R-sq	0.189	

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

From the following figure, panel 1 describes the probability for each of the condition when the prior opinion is qualified. The sample size in panel 1 is 123. For panel 2, the sample consists of entities that have a prior clean opinion and sample size is 334.

If the entity is changing their auditor the switch dummy is equal to one and if not the switch dummy is equal to zero. The probability depends on the prior opinion, the switch decision and other company characteristics.

In Panel 1, with probability 92.53% entity that does not change their auditor and with the probability of 34.52% the entity that change their auditor will receive qualified audit opinion in the year t. For panel 2, the probability of entity to receive qualified audit opinion in year t is 2.83% for the entity that does not change their auditor and 22.23% for the entity that does change their auditor.

Panel 1: Prior Opinion is modified
#=123

Q$_{it-1}$=1
S=0 → Mean $P_r(Q_{it}^{10} = 1) = 92.53\%$
S=1 → Mean $P_r(Q_{it}^{11} = 1) = 34.52\%$
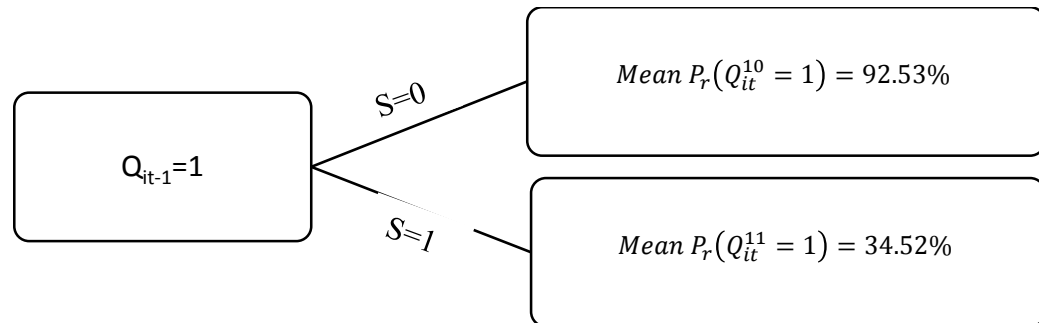
Panel 2: Prior Opinion is clean
#=334

Q$_{it-1}$=0
S=0 → Mean $P_r(Q_{it}^{00} = 1) = 2.83\%$
S=1 → Mean $P_r(Q_{it}^{01} = 1) = 22.23\%$
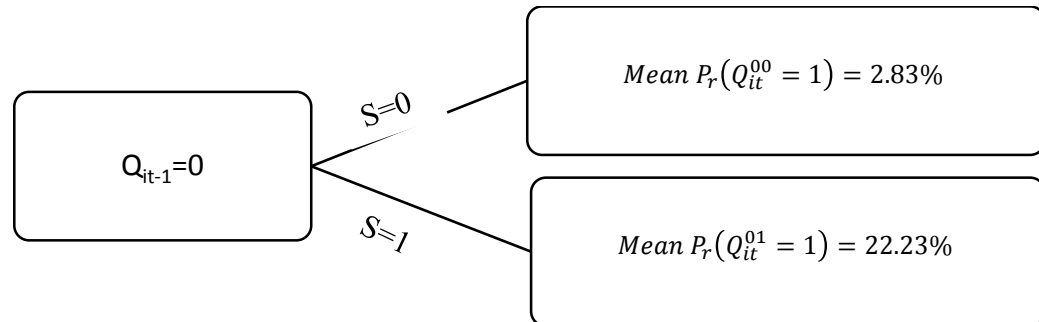
If entity engages in opinion shopping, the entity will use the switch decision to minimize the probability of receiving a qualified audit opinion. Panel A shows that after entity receive a qualified report, this entity switches auditor and engages in opinion shopping if $Mean\ P_r(Q_{it}^{10} = 1) > Mean\ P_r(Q_{it}^{11} = 1)$. For panel B, after receiving a clean opinion, the entity does not switch auditor and engage in opinion shopping if $Mean\ P_r(Q_{it}^{01} = 1) > Mean\ P_r(Q_{it}^{00} = 1)$. This result shows that by switching their auditor, the entity will likely to increase the probability to change their audit opinion. It is also implying that the company will likely to receive more frequent qualified opinion under opposite switch decision.

Table 13 Model Summary

Panel A $Mean\ P_r(Q_{it}^{10} = 1) > Mean\ P_r(Q_{it}^{11} = 1)$	After entity receive a qualified report, this entity switches auditor and engages in opinion shopping
Panel B $Mean\ P_r(Q_{it}^{01} = 1) > Mean\ P_r(Q_{it}^{00} = 1)$	After receiving a clean opinion, the entity does not switch auditor and engage in opinion shopping

2.7 Summary

Regulatory authorities are concerned about opinion shopping because it can diminish user confidence in audited financial statements. This extends beyond the financial statements of the switching firm. The first analysis provides a comparison between unqualified and matched qualified groups. This analysis shows that the entities that received qualified audit opinions have a higher probability to switch auditors only in the following year. The second test implies that entities that switch their auditors after receiving a qualified opinion are more likely to receive clean opinions in the following year.

Additional analysis reveals that based on various factors, the NFE entities are successfully implementing opinion shopping. If they engaged in different switching strategies, the number of modified audit reports is likely to be much higher. Furthermore, the model also shows that Return on Assets is one of the fundamental indicators influencing an NFE to make a switching decision.

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Chapter 3. ANN Analysis to Explore the Credit Rating on Municipal Bonds

3.1 Research Background

With the primary objective of seeking high returns and safe investments, investors focus their investment activities not only on corporate investment products but also on the debt market of states, cities, and government-related entities. The popularity of local government based investment products is supported by the fact that in general this type of investment is backed by public tax revenue or is tax exempt. Furthermore, the data from 2014 shows that the municipal bonds provide returns of 8.32% on the average, which is higher than corporate debt (6.68%) and the Dow Jones Industrial average (6.86%) (Kuriloff, 2014).

The process of issuing municipal bonds is started with an announcement from the local governments. The process is followed by bids from underwriters (the primary market). Appointed banks generally are responsible for the bids. The winner is selected based on the lowest net interest cost for the local government entity. After the underwriter has been selected, the public offering will begin (the secondary market). Similar to corporate bonds, municipal bonds are types of loans that require the issuer to be paid back at a specified time (maturity date) and such bonds pay a specified rate of interest (coupon rate). The maturity period for municipal bonds is typically from 1 to 30 years with some cases up to 100 years.

In municipal bond transactions, credit ratings issued by the credit rating agency (CRA) are one of the primary sources of information for the investors. The CRA is a type of organization that provides services in publishing credit rating by assessing the debt instruments (bonds and other securities) issued by a corporation or government. A credit

rating assessment is based on the possibility that the debt will be repaid (Rom, 2009).The credit rating can also influence the city or local government's management and economic condition. For example in the late 1960s, New York City's controller claimed that the city's credit rating caused additional interest costs (Liu & Thakor, 1984). A more recent example is from the state of Illinois. Moody's downgraded Illinois credit rating in October 2015 and became the first state that receive below single A rate (Dietrich, 2015). The downgraded credit rating influences the state's capability to pay the overdue bills or make its future pension payments (Dietrich, 2015).

Although the CRA publishes valuable information for the investor, there is an interesting paradox. These agencies provide their assessment of a local government's creditworthiness. However, there are several challenges faced by the agency in order to maintain its priority position as the source of information for the investor (Partnoy, 1999). One major problem is the unclear definition of the factors that determine the credit rating. The CRA has never clearly revealed the variables or weight assigned to each of the variables on their models. For example, the description regarding debt repayment capability is described widely without specifying which characteristics of the borrower matter most when measuring the ability to make a repayment (Ammarz et al., 2001). This policy that appeared to adopt the black box approach received criticism in the mid-70s, especially in areas of New York, as it overrated bonds that contributed to the fiscal crisis problems.

Unclear descriptions or lack of information about the credit rating model can trigger uncertainty for investors or bond issuers. The case of Chicago's credit rating between the year 2002 and 2012 is shown as an example (Farmer, Do Credit Rating Matter Anymore?,

2015). During this period, the city's pension debt had increased to eight times of its operating revenue. While Moody's and Fitch downgraded the city's credit rating, Standard & Poor has kept the rating locked at A+ which is not a minor difference (over the same period). In fact, because of these CRAs differing decisions, Chicago's credit rating now spread across the possible rating levels for the bond investment product type. From this example, several questions can be raised such as how come these CRAs have disparate result over the same debt issuer can be raised or is there any indication of rating shopping. The rating shopping is when an issuer only selecting the CRA that give the most favorable credit rating (Farmer, 2014). The indication of rating shopping is also under scrutiny from regulators because lack of objectivity in assessing investment product, such as municipal bond or asset-backed-securities can stimulate bigger financial problem.

In order to assist state and local government entities, this study aims to develop a model that can explain the composition variables or factors that influence municipal bond credit ratings. This information will be beneficial for the municipal bond issuers because it will allow them to focus more on the most crucial factors that will maintain or improve their credit score. Further observing the credit rating model assists in clarifying the credit rating process that can support the objectivity of the process with the objective to minimize the negative opinion regarding the conflict of interest that exists between the entity and issuer-paid rating agency or eliminate the stigma of rating shopping.

Various studies have shown that Artificial Intelligence (AI) methods provide better performance than traditional statistical methods (Fisher & Lenz, 1996). One of the methods that is included in the AI category is Artificial Neural Networks (ANN). This study uses ANN methods instead of more conventional statistical methods such as regression because

of the data type and the flexibility of the model. The dependent variable on this study is an ordinal variable, a type of data that has ordered observations even though the exact values are unknown, and as such the use of linear regression would need a few steps to accommodate these non-linear relationship and the results are not guaranteed to produce better prediction (Shmueli, 2012) . The regression analysis would predict the value of the Y variable for each value of the X variable (McDonald, 2015). Previous finance studies also show that regression analysis is not suitable for research related to ordinal variables. Bond rating is an ordinal rather than an interval variable. Therefore, there is significant difficulty in using regular regression for interpreting the result of the analysis (Wallace, 1981).

The example of ANN's flexibility is its capability to capture non-linear relationships in the model (Shiffman , 2012). Furthermore, one of the key elements of ANN is its ability to learn and adapt to a complex system. With supervised learning[18] of the neural networks method, this study explores credit rating bonds from local governments (hereafter referred to as municipal bonds) based on three main categories: financial, budgetary, and demographic information. This study does not propose to reproduce the credit ratings from major agencies such as Moody's, S&P or Fitch. Instead, the goal of this study is to determine the characteristics and information sources that are important enough to influence changes in municipal bond credit ratings from two different CRA.

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[18] Under general classification, ANN method can be divided into two categories (Beckmw, 2013). First is unsupervised learning which is can be used for pattern recognition. Unsupervised learning can be incorporated as the method for the detecting the compliance pattern of local government entities toward standards/regulations or general/common practice. The second category of neural network is a supervised learning. This type of neural network is generally used for prediction.

3.2 Theoretical Framework

In determining and evaluating financial performance, the investor not only relies on financial statements but also on other types of information. One of the primary sources of information is the credit rating. Published credit ratings are able to influence municipal borrowing costs and investor yields (Rubinfeld, 1973). Furthermore, this credit rating is able to drive market demand in investments (Copeland & Ingram, 1982) and influence the marketability of bonds (Ammarz, Duncombe, Hou, Jump, & Wright, 2001).

Despite the level of importance of credit ratings, the information that is provided by the CRA is not comprehensive enough to determine the observed factors that are responsible for changing credit rating (Ammarz, Duncombe, Hou, Jump, & Wright, 2001). For example, Fitch's official website (Staffa & Zibit , 2014) shows several broad categories of credit rating determinants, such as assets, legal issues, or fund sufficiency. Asset is considered as the primary factor in Fitch's rating driver. Assets are measured from size or its use restriction. Regarding legal issues, Fitch will examine the supporting document that can inform about the legal obligation of the issuer. Fund sufficiency is measured by the amount, frequency and timing of the bond payment. These categories are designed to protect investor from the bankruptcy risk and in the same time support the issuer financing process.

The process to understand the factors that influence credit rating is an integral part of learning economic lessons (Griffin & Tang, 2012). This issue is quite significant and can be observed in several prior studies. The study from Ammarz et al. provides four factors that contribute to municipal credit rating. These factors include economic growth,

taxpayer wealth, city composition, and city's diversification (Ammarz, Duncombe, Hou, Jump, & Wright, 2001).

While Ammarz et al focus on financial position and performance, the study from Simonsen, Robbins, and Helgerson (Simonsen, Robbins, & Helgerson, 2001) argues that small communities typically have fewer resources to handle their financial management and tend to be less sophisticated. This means that size and population can also be considered a proxy to measure economic diversification and can limit the potential markets where they can release bonds. Other research also supports this hypothesis by arguing that the rate of population growth represents an increased public service demand and a taxation base (Rubinfeld, 1973).

Municipal bond payments are to be made over several, possibly numerous periods in the future. Therefore, there is a need to estimate future ability to pay. One of the characteristics that determine this capability is budgetary information. High budget flexibility indicates an ability to sufficiently fund improvements in the future such as to support the quality of life and support public services such as health and education. With better quality of life and a more educated population, a local government is likely to maintain and increase the stability of its income and resources in the future (Hastie, 1972).

Although prior research already provides scientific evidence of the determining factors in municipal bond credit ratings, there is a literature gap. No research has explored the categories or composition of credit ratings from a different dimension. This study explores municipal bond credit ratings based on three different categories: financial, budgetary, and demographic. The model will be developed utilizing Artificial Neural Networks in order to address the data type.

3.3 Municipal Bonds Credit Rating

The following table shows the summary of three main credit rating agencies that cover municipal bond credit ratings. These rating agencies include Standard & Poor's (S&P), Fitch Ratings, and Moody's Investors Service, Inc. (Moody's). Moody's began in 1909 when John Moody published the first available bond credit rating focusing on the railroad industry. Standard and Poor's began in 1922 followed by Fitch in 1924 (White, 2010). The following section will show a comparison summary between the three major rating agencies.

3.3.1 Moody Rating

Moody's gives an Aaa rating for issuers that demonstrate the best creditworthiness relative to other municipal or tax-exempt issuers. The second best rating is Aa, followed by A and Baa. Bonds within the category Aa, A, or Baa are also assigned to sub categories which are 1, 2, or 3. The smaller the number of the sub categories, the strongest creditworthiness of this issuer.

3.3.2 S&P Rating

Similar to Moody's, S&P credit rating agency assigns their rating based on credit worthiness, which includes the possibility of credit quality adverse change (S&P, 2014). Credit ratings issued by S&P can be either long-term or short-term. Municipal bonds usually fall into the latter category since the maturity period is more than one year.

3.3.3 Fitch Rating

The ratings from Fitch can be divided into two parts: investment grade and speculative grade. Investment grade is the category for low to moderate credit risk

investment. Similar to S&P, Fitch describes these ratings by starting with AAA and ending with BBB. Speculative grade indicates relatively high credit risk and can identify investments already claimed for financial default. Some bonds that are not rated by Fitch are denoted as Not Rated (NR).

Table 14 the Credit Rating Summary

Classification	Moody's	S&P	Fitch
Best Quality	Aaa	AAA	AAA
High Quality	Aa1	AA+	AA+
	Aa2	AA	AA
	Aa3	AA-	AA-
Upper Medium Grade	A1	A+	A+
	A2	A	A
	A3	A-	A-
Medium Grade	Baa1	BBB+	BBB+
	Baa2	BBB	BBB
	Baa3	BBB-	BBB-

3.4 Artificial Neural Networks

Computer scientists have long been inspired by the human brain. In 1943, Warren S. McCulloch, a neuroscientist, and Walter Pitts, a logician, developed the first conceptual model of an artificial neural network. In their paper, "A logical calculus of the ideas imminent in nervous activity," they describe the concept of a neuron, a single cell living in a network of cells that receives inputs, processes those inputs, and generates an output.

Artificial Neural Networks (ANN) mimic the structure of biological neural network, which are based on the process and physiology of the nervous system. ANN attempt to produce the learning and decision making of the brain (Lucchini & Pisati, 2005).

ANN is *a type of model that can be used to predict outputs or to classify the observations* (Klein & Rossin, 1997). It resembles the brain function in two respects: acquiring knowledge through a learning process and storing the knowledge inside the neurons.

Some applications of ANN are similar to the linear traditional regression model. Regression is also able to store the knowledge from the least-square method in the regression coefficient. In this sense, it is a neural network (IBM, 2012). However, the ANN model require a less rigid model structure and assumption that are imposed before learning process is implemented. Furthermore, the relationship between variables are not necessary to be known before the analysis because the form of the relationship will be determined during the learning process (Shiffman , 2012). If a linear relationship between the dependent and independent variables is detected, the results of the ANN should closely approximate those of the linear regression model. If a nonlinear relationship is more appropriate, the neural network will automatically approximate the "correct" model structure (IBM, 2012).

The structure of ANN is composed of three layers: input layer, hidden layer, and output layer. The first layer consists of inputs and variables. Following this layer is a hidden layer, where every input will be multiplied by certain weights that refer to the variables' strength. The result of the hidden layer calculation will be shown in the last layer, which is the output layer.

With these mathematical calculations, ANN are able to make predictions based on variable input. The network in ANN refers to the pattern that connects the input, nodes (on the hidden layer), and outputs (Garson, 2014). Similar to the other prediction models, a training set is essential to generate a relationship between input and output results. The process that produces the predictive model based on the training set is called the learning process. The learning process aims to minimize prediction error. After the network model is created, it can be used to make predictions using the testing set.

Multilayer perceptron (MLP) is a procedure in ANN architecture that aims to minimize the prediction error of the output (Memarian & Balasundram, 2012). MLP is chosen in this study because of the well-known predictive function of this method in various fields (Garson, 2014). MLP is a procedure that produces a predictive model for one or multiple outcome variables based on the value of the predictor variables. The structure of MLP is known as feed forward[19] because the connection of the network starts with the input layer and moves to the output layer without any feedback loops.

For the MLP, the dependent variables can be: nominal, ordinal, or scale. Nominal is a variable type that its values represent categories with no intrinsic ranking. For example zip code, state, or religious affiliation. Ordinal variable represents categories with some intrinsic ranking, such as: credit rating or customer satisfaction. The scale variable is the type of variable that represent ordered categories with a meaningful metric so that distance differences between values are appropriate such as age, income (dollars), or weight.

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[19] Input layer consists of the predictors or variables. The hidden layer contains unobservable nodes or units. The value of these units is in part function of the predictor, the network characteristic, or user specifications. The output layer provides the responses, similar with the hidden layer, the value depends on the various weights and functions.

Compared to more conventional statistical methods such as regression, ANN provides several advantages. The first advantage is the capability to estimate almost any nonlinear function (Fanning & Cogger, 1998). ANN delivers robust results by ignoring irrelevant inputs and noise (Cortez, 2014). ANN is also more effective than the regression method for the pattern recognition function (Coakley & Brown , 1993).

Although ANN is a superior method of prediction and detection when compared to linear time series models (Kim & Mayer, 2010), there is one main criticism of this method. ANN is known to use mathematic calculations for weights, based on the complexity of hidden layer, and produce the outcome on the next layer. Some opponents of ANN believe that this method is subject to various adjustments and it is difficult to explain an underlying process for the relationship. However, supporters believe that the black box is user oriented, especially for those that do not have in-depth knowledge of the function modeled.

3.5 Research Methodology

The design of this study is based on the Copeland and Ingram methodology (Copeland & Ingram, 1982). However, it is different in several aspects. First, this study implements a machine learning technique, Artificial Neural Networks (ANN), instead of regression. With the ANN method, various types of variables can be included and non-linear analyses can be achieved. The second difference is that this research focuses on the impact of financial and non-financial attributes on the change of credit rating and not vice versa. Finally, deviation with the previous research is due to the sample selection. This study is attempting to capture subsets of municipal or local government entities within the state of New Jersey to achieve similar accounting practices in the sample.

The bonds in this study are general obligation bonds (GO bonds). The reason for this selection is because GO bonds are not issued for a specific purpose so there is no deviation from one issuance to another (Ingram, Brooks, & Copeland, 1983). Moreover when state and local government entity issues GO bonds, this means that the issuer will guarantee the repayment of this instrument hence make tax as the majority of the source of fund (Pylypczak-Wasylyszyn, 2015). Unlike the GO bonds, Revenue Bond rely on the specific type of fund sources, such as transportation systems, hospital, power systems, or water systems.

Determinant Categories

The input variables (Appendix E) can be categorized into three main groups: financial, budgetary, and demographic. The financial type variables attempt to capture the financial conditions of the local government. This information can be collected from the CAFR[20] or external sources such as Bloomberg.

Budgetary information[21] is separated from the financial group due to the nature of budgets, which look forward instead of representing historical data. The first item of information that can be collected from the municipal budget form is anticipated revenue. This account shows the anticipated revenues from multiple sources to finance the local government's annual budgets. Anticipated revenues are non-tax sources of funds, which are almost guaranteed to be paid. This variable is a good indicator of future cash inflow for the municipalities. This account can be classified into several sub accounts, namely local revenue, state aid, federal and state grants, and interlocal service agreements. Local

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[20] There are 36 items that are collected from CAFR
[21] Budget data is collected from the municipal data sheet

revenue is revenue that is generated locally while state aid is the revenues of municipalities that originated from the State of New Jersey. Federal and state grants are various grants that are distributed by the federal and state governments. Lastly, interlocal service agreement shows income from the shared service paid by other local governments.

In contrast to the revenue accounts, the expenditures will show appropriations in the format of line-by-line items in the municipal budget data sheets. In addition to the operating expenses, there are major expenditure accounts such as capital improvement, municipal debt services, and reserve for uncollected taxes that need to be analyzed. Operating expenses included various expenses to finance the operating activities of the local government. Capital improvement is an account to record expenses that relate to the projects that are currently financed by the municipal budgets. Municipal debt services will include all expenses that relate to the issuance and payment of municipal debts. Finally, reserve for uncollected tax represents the number that backs up the uncollected tax for the payment of various expenses such as school expenditures or municipal obligations. The majority of a local government's revenue is from tax. Therefore, incorporating uncollected tax in the model will provide a potential resource for the government to fulfill its bond obligations at maturity.

The non-financial variables are obtained from the US Census Bureau or local government websites. This category consists of demographic information such as population rate or household median income. Household median income is the income of the residents[22] and all other individuals above the age of 15 years old that live in the

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[22] We use household median income instead of family because based on the US Census description family media income is the income of a family that consists of two or more people (one of whom is the householder) related by birth, marriage, or adoption residing in the same housing unit. And analysts often use median household income to indicate what is typical.

household, whether they are related to the homeowner or not. Because many households consist of individuals who are unrelated (via marriage, adoption or birth), this variable is a more accurate representation of the income. Median household income[23] can be a reasonable variable to predict future cash flow for offsetting outstanding debt or taxation income.

3.6 Data and Sample

The data and samples for this study are collected from several sources. The rating data are collected from the Electronic Municipal Market Access (EMMA)[24]. However, due to data limitations, the CRA in this study only consists of two major agencies: Moody's and S&P. Financial data are mainly collected from the basic financial information of the CAFR or through direct request of the municipalities. The budgetary information is obtained by using the guidelines of the Flexible Chart of Accounts (FCOA) from the Department of Community Affairs. Non-financial data are collected from various sources including the notes to financial statements as well as from external data sources, such as U.S. Bureau Statistic and Bloomberg.

The sample was obtained from cities or municipalities in the state of New Jersey that issue bonds and financial statements within the period of 2008 to 2014. The types of municipal bonds only include General Obligation Bonds (GO) and excludes other types of bonds such as revenue bonds or housing authority bonds. These types of bonds require substantially different factors to determine their credit ratings.

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[23] B19013 Source: http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t

[24] Starting on November 2011, Municipal Securities Rulemaking Board (MSRB) provides publicly display for municipal credit rating through EMMA.

The initial data set is 8,260 observations. From this data set, the final sample is developed based on observations that have no missing attributes, such as: credit rating agency, cusip number, population and median income data, municipal budget form, and bonds type. The final sample of the analysis consist of 318 observations for S&P and 316 for Moody's.

The dependent variable is reclassified into 3 groups of ratings. The following table is the summary of dependent variable for each dataset. The dataset will be divided into two parts including a training set and a test set. The training set is used to compute the weight of every input toward the output. After the weight and model are set, the test set will be used as the cross-validation for the result of the training set.

Table 15 Dataset Classification

CRA	Group 1 Best Quality	Group 2 High Quality	Group 3 Upper Medium	Total
S&P	50	237	31	318
Moody's	9	160	147	316

3.7 Results and Analysis

The statistical software to be used in this chapter is IBM SPSS Statistics. Under neural networks analysis, multilayer perceptron is the selected method. The S&P data set is divided into two parts: 66% training and 34% to validate the model. The results show that this model is capable of predicting the credit rating with more than 70% accuracy (for training dataset 75.2% and for testing dataset is 73.1%).

A high percentage of accuracy is provide by the model to predict the observations in group 2. However, with 24.5% incorrect predictions this model has weaknesses to predict the credit rating in group 1 and 3. It is possible that the sample size is not well distributed and most of the input variable is related more to the group 2 credit rating.

Table 16 S&P Classification

Sample	Observed	Predicted			
		1	2	3	Percent Correct
Training	1	0	35	0	0.0%
	2	0	158	0	100.0%
	3	0	17	0	0.0%
	Overall Percent	0.0%	100.0%	0.0%	75.2%
Testing	1	0	15	0	0.0%
	2	0	79	0	100.0%
	3	0	14	0	0.0%
	Overall Percent	0.0%	100.0%	0.0%	**73.1%**

Dependent Variable: Sim_Credit Rating

Independent variable importance is important because it is a measure of how much the network model predictive value changes for different values that the independent variables (IBM, 2012). The S&P credit rating is derived mostly from the CAFR (Financial Report) data. As is demonstrated in the following table, the top ten of most significant variables in the model are from the CAFR.

Table 17 S&P Results

No.	Sources	Description
1	CAFR	Salaries and Employee Benefits
2	CAFR	Unreserved General Fund
3	CAFR	Total Assets
4	CAFR	Accounts Payable
5	Budget	Public and Private Revenue
6	Budget	Taxes for Municipal Budget
7	CAFR	Property Tax Revenue
8	CAFR	Other Program Expenses
9	CAFR	Capital Outlay
10	CAFR	Operating Expenses

From the case processing summary results, the model divided the data set into 74% for training and 26% for testing. Moody's dataset shows a lower prediction capability when compared to the previous data set. The classification table shows that the model classifies correctly 72.6% to group two and 54.1% to group 3 for training dataset. The overall classification, the model is able to classify 61.5% (training) and 63.4% (testing) of the cases.

Table 18 Moody's Classification

		Predicted			
Sample	Observed	1	2	3	Percent Correct
Training	1	0	6	2	0.0%
	2	0	85	32	72.6%
	3	0	50	59	54.1%
	Overall Percent	0.0%	60.3%	39.7%	61.5%
Testing	1	0	2	0	0.0%
	2	0	32	10	76.2%
	3	0	18	20	52.6%
	Overall Percent	0.0%	63.4%	36.6%	63.4%

Based on the level of significance of the independent variables, it is evident that the top ten most significant variables in the model are of a different composition than those for S&P. Information from budget reports and demographics is also included in the top ten with some of the CAFR variables.

Table 19 Moody's Results

No.	Sources	Description
1	Budget	Anticipated Revenue-Additional
2	Demographic	Median Household Income Rate
3	Budget	Anticipated General Revenue Rate
4	CAFR	Operating Expenses Rate
5	CAFR	Property Tax Revenue
6	CAFR	Cash and Near Cash
7	Demographic	Population Change Rate
8	Budget	Anticipated Revenue-Local
9	Budget	Anticipated Revenue-Assigned
10	CAFR	Accounts Payable

Based on this model, it is possible to observe the differences between the two major credit rating agencies. S&P credit rating places more emphasis on the financial statement information and Moody's credit rating is influenced by several factors including budgetary information, demographic data, and some parts of the CAFR variables.

Both Moody's (63.4%) and S&P (73.1%) models show quite a low percentage of overall predictive capability. It is possible that there is an error in variable selection or the need to increase the sample size.

3.8 Summary

This study aims to provide empirical evidence on the significance level of financial and non-financial factors on the change in municipal bond ratings. Moreover, the results enable users to understand which government financial and non-financial information are most significant in influencing credit rating. Based on the ANN model, the different between S&P and Moody's credit rating is revealed. S&P provides more emphasis on financial information (CAFR elements) and Moody's depends on other factors, such as budget and demographic information.

The results of this study are expected to provide users with fundamental information regarding municipal bond credit ratings. By understanding the process and method of credit rating agencies, the user can trace back any discrepancies in the past or predict the future municipal bond credit ratings. It also provides additional insight into the accounting and non-accounting information that are considered part of CRA assessments. Creditors and investors need this predictive information because the yield on their investment depends on the change in credit ratings.

The limitation of this model is that the observation is only focused on the New Jersey cities and towns hence the sample size is small. For a future study, additional states can be included in the analysis to produce cross-sectional analysis.

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Chapter 4. Public Review and Input Regarding Governmental Financial Guidelines: Text Mining analysis of Online News

4.1 Research Background

The State Budget Crisis Task Force released its final report regarding the fiscal condition of state and local governments in the United States. This task force, which was formed about three years ago and co-chaired by former Federal Reserve Chairman Paul Volcker and former New York State lieutenant governor Richard Ravitch, expressed alarm regarding the unsustainable financial conditions of most state and local governments (Cohn, 2014). Among the suggested remedies to address this crisis condition was the recommendation that state or local financial reports be disclosed in a clear, concise, timely, and more understandable manner.

The starting point of the format or structure of governmental financial report is government financial report standards or guidelines. For states and local governments, it is primarily the Governmental Accounting Standards Board (GASB) that issues the guidelines of financial accounting and reporting. This organization provides recommendations in the form of standards, drafts, or research articles.

While there are clearly positive impacts from standards or statements issued by the GASB, the public sentiments regarding these issuances are difficult to measure. Therefore, one of the topics on the GASB's 2014 research agenda is to collect user opinions about GASB drafts and standards. This research agenda is the motivation for this study, which aims to obtain public sentiments by using a text mining method and analyze the public opinion regarding these guidelines.

Public opinion can be mined through public websites and social networks, such as online news resources and Twitter. This process is known as sentiment analysis or opinion mining[25], which is a widespread modern method due to advances in technology and the tremendous use of the Internet and social media to transform collected textual data into more useful information.

The implementation of opinion analysis on text regarding certain topics can generate a summary of sentiment orientation (Pang & Lee, 2008). By analyzing the user opinions or sentiment about GASB drafts or statements, government leaders and public managers will be able to gain in-depth information that will allow them to identify any major or overarching issues that have arisen due to the GASB statements that have been implemented or drafts of standards that will be implemented in future. For citizens and municipal bond potential investors, this research will reveal public consensus regarding GASB standards that can be used in investment decision-making.

Furthermore, there is a need to improve the development of standards and provide better literature regarding the governmental accounting field. This study attempts to fill this gap by deciphering user opinion regarding procedures, standards, and principles of government accounting with the purpose of determining the affectivity and difficulty in their implementation or practice.

4.2 Theoretical Framework

There is mainstream research regarding the need to collect diverse opinions. The exposure to diverse viewpoints is proven to assist interested users in understanding different perspectives. Such understanding leads to greater acceptance and tolerance (Kim,

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[25] Sentiment and opinion analysis will be used interchangeable in this study.

Hsu, & de Zuniiga, 2013). Opinion is a significant measure for many human activities and the driving force of behavior. There is a tendency for people to seek out others opinions in order to make an informed decision (Liu B. , 2012).

With the modernization of means of communication, there is a trend to use online public spheres for individuals to share their opinions or inadvertently expose themselves to differing opinions (Brundidge, 2010). As social beings, humans need to share, be heard, and feel a sense of worth and importance. Moreover, there is a sense of curiosity regarding the world around us (Bargh & McKenna, 2004). These human characteristics indirectly support social networks platforms such as Twitter and Facebook, which have gained substantial popularity (Correa, Hinsley, & De Zúñiga, 2010)

By definition, sentiment analysis or opinion mining is a field that studies people's opinions, sentiments, evaluations, attitudes, appraisals, and emotions toward certain products, services, issues, events, individuals, or topics (Liu B. , 2012). Since the beginning of 2000, this method has become more popular in various research areas. It has not only been used for academic purposes but has also become popular in the business community (Berry & Castellanos, 2007). Online product reviews such as on Amazon or CNET are one of alternatives to mine public opinion regarding certain products (Somprasertsri & Lalitrojwong, 2010). By extracting, classifying, and analyzing the information, a company can become informed of their product position in the market (Dave et al., 2003). Moreover, sentiment analysis can also be implemented in other languages (Pak & Paroubek, 2010). With this method, the collection and analysis of public opinion or sentiment can be achieved in a convenient way.

In contrast to the conventional route, opinion mining method is capable of accessing vast responses in a timely matter (even real-time). This can be achieved quite inexpensively when compared to surveys or questionnaires (Hoppe et al., 2000). Data sources for opinion mining are quite large. This is due to the extensive advances in Internet connection and new paradigms of online users. The high popularity of social media outlets such as Twitter and Facebook have allowed these networks to become data sources for opinion mining. These micro blogs are rich with public sentiments toward various topics.

Focusing on the online news, the percentage of Americans that prefer online news or articles has doubled from 9% to 19% since 2010. Among adults younger than the age of 30, the percentages regarding preferred new sources are as follows: television news (34%), online news (33%), and newspaper (13%) (PEW Research Center-News Consumption, 1991-2012). This phenomenon supports the possibility of the researcher having a vast selection of opinion mining data sources.

For the online news and articles, opinion mining can serve multiple objectives. For example, it can classify articles into categories based on the topics such as sports, entertainment, or world news (Gasanova at al., 2014). In addition, it can analyze the features of the articles to determine polarity or sentiment. This can be done based on the paragraph or overall sentiment of the article (Pang & Lee, 2008).

In general, there are three levels of classification for sentiment analysis (Pang & Lee, 2008). The first level is involves examining overall opinion from an entire document. The second level is assessing the sentiment of sentences. And finally the third level observes the opinion itself. This is the finer-grained analysis when compared with the

previous two methods. This level tries to discover sentiment regarding the entities and/or their features that are mentioned in the opinion.

Social media and Internet based information, such as online news provide an online space for sharing information and opinions with regard to public policy such as GASB standards and drafts and their implementation. These outlets are increasing the users' capability not only to obtain news or information but also to upload their thoughts and opinions (Kim, Hsu, & de Zuniiga, 2013). The use of Internet based media is not only limited to personal relationships and entertainment. It can be used for sharing information, discovering opportunities, generating discussion, and engaging in communication with a great number of users with different experiences, backgrounds, and opinions.

4.3 GASB Drafts and Statements

The Governmental Accounting Standards Board (GASB) is a non-governmental organization that sets accounting standards for state and local government entities, including cities, counties, school districts, and the trust funds that they establish. In response to public concern, the GASB issued several new exposure drafts and has engaged in continuous improvement of the issued standards.

Due process is an important practice that rigorously improves the quality and potential of new standards. The GASB is encouraging the public to comment on proposed standards, encouraging the users to note the aspects with which they agree or disagree. However, the process to collect public comments and opinions is not an easy task. Round table discussions, questionnaires, and surveys are appropriate methods to collect public opinion but these methods are time and cost consuming (Hoppe et al., 2000).

This study is aiming to provide an alternative method to obtain users sentiments utilizing Information Technology. This summary of opinion can also inform policy makers of the implementation success of the current standards and serve as indicator of future implementation problems. The resources and efforts to improve governmental disclosures by redefining reporting practices depend largely on how users understand and implement those standards. If the standards are poorly understood and improperly implemented, then the follow up modification produces no significant improvement toward financial statements (Ingram & Copeland, 1981).

Selected GASB statements[26], such as GASB Statement No. 45 and GASB Statement No. 70, and GASB drafts of leases and fair value are included in the analysis. These drafts and standards are selected based on the GASB research agenda. Moreover, this study also focuses on the specific topics that relate to the governmental financial models such as GASB No. 34 or GASB No. 55. These topics are included because of their influence on the current model of governmental financial reporting.

4.3.1 GASB Exposure Drafts

The GASB has added several projects onto its agenda to improve the quality of their standards for the transparency of state and local government finances. Before officially announcing a standard or statement publicly, the GASB follows several steps for due process purposes (GASB, 2014).

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[26] GASB Statement is standard or guideline that issued by GASB

Figure 7 GASB Due Process

The first step in the due process system is to appoint an advisory task force as an expert team. Then a literature study regarding subjects that relate to the proposed standard is completed. The process is concluded with an introduction and distribution of the standard (exposure drafts) to the public during a public hearing. There is also an open comment and discussion event to determine potential issues in implementation and suggest possible solutions. This part can be supported by the result of this study.

4.3.1.1 Fair Value Measurement and Application

In May 2014, an exposure draft from the GASB regarding new accounting and financial reporting standards that related to fair value was completed. This proposal consisted of methods to measure fair value and contained a discussion of the disclosures that should be provided. The fair value definition presented by the GASB is as follows: the received price at the measurement date, for selling assets or paying liabilities in transactions between market participants (GASB, 2014).

The expected result of this exposure draft was to guide fair value measurement and provide proper information regarding the disclosure practice for government entities. The consistent definition and accepted valuation techniques would enhance comparability of financial statements among governments by requiring measurement of certain assets and liabilities at fair value. The proposed statement would also improve the overall information regarding government's financial position to financial statement users.

There are three main methods proposed in this draft relating to the fair value valuation technique. First is the market approach, which uses prices and other relevant information from the market relating to identical or comparable assets and groups of assets or liabilities and groups of liabilities. The second technique is the cost approach. This method reflects the cost that would be needed to replace the service provided by an asset. The third alternative is the income approach. The income approach calculates the present value of all cash flows, income, and expenses (GASB, 2014). These valuation techniques should be applied consistently, through a change may be appropriate in certain circumstance.

Table 20 the Summary of Fair Value Approach (GASB, 2014)

The Summary of Fair Value Approach
Market Approach • Uses prices and other relevant information generated by market transactions involving identical or similar assets, liabilities, or a group of assets and liabilities. • Using quoted market prices is a technique that is consistent with the market approach. Valuation techniques consistent with the market approach often use market multiples derived from a set of identical or similar assets, liabilities, or a group of assets and liabilities. • For example: the fair value of an investment in a company could be determined based on the price/earnings ratios of similar companies. Similar companies may trade at different ratios; therefore, the selection of the appropriate ratio within the range of price/earnings ratios requires professional judgment, considering qualitative and quantitative factors specific to the measurement.
Cost Approach • Uses the amount that would be required currently to replace the present service capacity of an asset. • From the perspective of a market participant seller, the price that would be received for the asset is based on the cost to a market participant buyer to acquire or construct a substitute asset of comparable utility, adjusted for obsolescence. • Obsolescence encompasses physical deterioration, functional (technological) obsolescence, and economic (external) obsolescence.
Income Approach • Uses future amounts (for example, cash flows or income and expenses) to a single current amount (such as discounted present value). • When the income approach is used, the fair value measurement reflects current market expectations about those future amounts. • Valuation techniques consistent with the income approach include (a) present value, (b) option pricing models, such as the Black–Scholes–Merton formula, and (c) the multi-period excess earnings method

4.3.1.2 Major Issues Related to Leases

Many government entities use leasing to finance certain necessary items such as vehicles, heavy equipment, or building. Leasing enables government entity to utilize assets without actually purchase the items. Some of the government organizations also serve as lessor by leasing assets to other entities.

According to the GASB (GASB, 2014), leases are a contract that conveys the right to use a nonfinancial asset (the underlying asset) for a certain period of time with the exchange of assets or a like transaction. For the state and local government transactions, if

a lease contains a purchase option, it would not be accounted for under the leases guidance. The lease liability is measured by calculation the present value of the payments that are to be made over the lease period.

The proposed statement would also result in fundamental changes in the distinction between capital leases and operating leases in favor of treating all leases (except short-term leases) as financings. Drafts on lease standards are written to improve their existing guidance by reexamining the accounting and financial reporting for leases. Specifically, the GASB is trying to determine whether the current standard is sufficient enough to meet essential user needs for decision -making regarding governmental leases. If it is not sufficient, it must determine what other requirements are necessary.

Table 21 Reporting Summary of Lease Accounting (GASB, 2014)

Initial Reporting of the Lease		
	Assets	Liability
Lessee	Value of lease liability plus prepayments and initial direct costs that are ancillary to place asset in use	Present value of future lease payments including fixed payments, variable payments based on index or rate, probably residual guarantees
Lessor	Lease receivable Continue to report leased asset	N/A
Subsequent Reporting of the Lease		
	Assets	Liability
Lessee	Amortize over shorter of useful life or lease term	Reduce by lease payments (less amount of interest expense)
Lessor	Depreciate leased asset (unless indefinite life or required to be returned in its original or enhanced condition Reduce receivable by lease payments (less payment needed to cover accrued interest)	N/A

4.3.2   GASB Standards

The Governmental Accounting Standards Boards (GASB) and the Financial Accounting Standards Board (FASB) have several similarities such as both of the GASB and FASB are ensuring that the practice of accounting and financial reporting are accurate, reliable, and beneficial to the user (Whitehead, 2015). However, the GASB and the FASB are considerably different in relation to the scope and focus of the standards. The scope of the GASB's standards is including the state, local government, and not-for-profit entity. While for the FASB, the scope is the United States public companies (Marsh & Fischer, 2011).

One of the differences between FASB and GASB is the focus of the standard. The FASB is primarily focusing on providing useful information so that the decision maker can making decision in scarce resource allocation. The GASB's focus is also supporting decision making process but also maintaining the accountability as the cornerstone of the public organization financial reporting (Fischer, Gordon, & Kraut, 2010).

The standards that are issued by the GASB do not have the legal authority to require compliance; however, some state and local governments mandate compliance. Most of the accounting profession as well as investors view standard implementation as part of the baseline for proper accounting. Therefore, standard GASB statement implementation can be an indication for good governance practice (Chan J. L., 2001).

4.3.2.1 GASB Statement No. 34

The GASB spends a substantial amount of time and resources on increasing the quality of the governmental financial reporting model. The effort was culminated with the issuance of GASB Statement No. 34 in 1999. This statement has become the center of

contemporary government financial reporting in the United States (Patton & Hutchison, 2013). This standard heavily influences the reporting approach of state and local government entities. Therefore, there is a need to study the effectiveness of the standard implementation.

Although the implementation of GASB Statement No. 34 began in 2001, the GASB board still believes that improvements can be made. In August 2013, the board decided to begin pre-agenda research in examining the effectiveness of current financial reporting models. The project is aiming to make improvement to the existing financial reporting model to enhance the effectiveness of the model in providing information essential for decision making and assessing government accountability.

Under GASB Statement No. 34, local governments are required to report historical cost and depreciation for capital assets. The reporting process is divided into three phases: phase 1 after June 15, 2001 for governmental entities with revenues greater than $100 million, phase 2 after June 15, 2002 for the medium-size governmental entities with revenues greater than $10 million, and phase 3 after June 15, 2003 for the smaller-sized governmental entities with revenue less than $10 million.

From the GASB website (GASB, 2015), we can see the potential areas of improvement for GASB 34. The improvement will include several features in the reporting model, such as: MD&A, Government wide financial statements, major funds, governmental fund financial statements, proprietary fund financial statements, and budgetary information.

4.3.2.2 GASB Statement No. 55

The current GAAP hierarchy is set forth in the American Institute of Certified Public Accountants (AICPA) Statement on Auditing Standards No. 69. This practice is not under the authoritative literature of GASB as the organization responsible for establishing GAAP for state and local governments. With the GASB No. 55 the hierarchy of GAAP for state and local government will be include in the GASB authoritative literature. This uniformity will able to enhance the conformity of financial statements of state and local government entities.

The title of the GASB 55 is *The Hierarchy of Generally Accepted Accounting Principles for State and Local Governments.* This standard establishes the priority of pronouncements and sources on government financial statements. In addition, it is expected to improve financial statements by providing category guidance in the Generally Accepted Accounting Principles (GAAP) hierarchy, emphasizing authoritative literature when the accounting treatment is not specified in GAAP, and referring to the GASB Concept Statements when specific accounting treatments are not specified in non-authoritative literature (GASB, 2013).

The requirement of the GASB 55 will enhance the financial reporting by contributing to the codification of all GAAP for state and local government so that they able to derive from the same source. This statement is also expected to assist preparers of state and local government to identify and apply all relevant guidance.

4.3.2.3 GASB Statement No. 45 and No. 68

Besides salaries, government employees also receive several types of benefits as part of their compensation. One of the most common types of post-employment compensation is pension. State and local government employees will receive a pension

when their employment with the government ends through retirement or other reasons for separation. GASB Statement No. 68[27] regulates the accounting procedures for pension benefit plans. Its purpose is to assist government entities in providing information regarding pensions (Vermeer, Styles, & Patton, 2012).

In addition to pensions, employees also receive other postemployment benefits such as healthcare or legal service benefits. These types of compensation are well known as Other Postemployment Benefits (OPEB), which are postemployment benefits other than pensions. All post-employment benefits (OPEB and pensions) will be recorded and reported under an accrual basis. In determining the annual pension and OPEB costs for one period, government entities need to estimate their cash outflows for these benefits and make discounted projections based on the present value to be allocated.

Most governments do not disclose the full cost of the OPEB in the financial statement annually. Usually they report only the cost when cash is spent. Furthermore, the disclosed information lacks a description of the nature and size of the OPEB. Consequently, this leads to incomplete information for the financial statement reader (GASB, 2014). The main standard that is issued to address the OPEB problem is GASB Statement No. 45. This standard is purposely created to correct the shortcomings in the reporting and accounting procedures of the OPEB for state and local government entities.

Under the implementation of the OPEB standard, state and local government employers that provide postemployment benefits other than pension should disclose information pertaining to four main categories. The first category requires disclosure of the benefits provided and the employee or participant that will receive the benefits. The second

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[27] An Amendment of GASB Statement No. 27 issued on Nov 1994

category relates to a description of the statutory, contractual, or other authority under which benefit provision and obligation to contribute are established. The next category is the disclosure of the accounting and financing of those benefits. The last category is the recording or recognition of the benefit during the period and related information.

4.3.2.4 GASB Statement No. 70

On April 30, 2013 the GASB issued a standard to provide final guidance on Accounting and Financial Reporting for non-exchange Financial Guarantee Transactions. Under non-exchange financial guarantee, the government entity that guaranteeing the debt or as the guarantor agrees to make payments to the debt holder if the entity that issued the debt or the issuer is unable to fulfil its obligation independently.

GASB Statement No. 70 (GASB No. 70) is believed to assist with the recognition and disclosure of financial guarantees for creditor claims. For example, this statement would be useful for the potential investors when a school district receives a financial guarantee from the state government for the district bonds issuance. It is expected that the standard will provide investors with better quality disclosures, especially regarding the probability of debt default by the government.

GASB 70 will assist government entity to recognize a liability when qualitative factors indicate the probability that payment is needed as a result of the guarantee agreement. These qualitative factor can be in the form of event such as when the issuer experiencing the loss of a major revenue source or initiating the bankruptcy protection proceedings. The liability should be recorded based on the best estimate of the cost expected to be incurred expressed at present value. When a best estimate cannot be

determinate, the government entity can use a range of estimation (liability should be recorded based on the minimum amount within the range).

Although other relevant accounting and financial reporting guidance for non-exchange financial guarantees already exist within GASB literature, the GASB 70 will become the only source for guidance. As the guidance for the implementation, GASB 70 will able to minimize uncertainty or inconsistency in the application that can enhance the comparability of the reported information.

In summary, the objective of the GASB 70 as the single source of recognition and disclosure guidance is to provide users with the essential information to recognize and understand the risks and potential claims on a guarantor government's resources based on qualitative factors. This statement is needed because in many situations no money changes is detected under a non-exchange financial guarantee transactions hence in many cases the disclosure of type of transaction is not exist in the financial statements.

Table 22 GASB Exposure Drafts and Statements

Draft & Statement	Title	Issued
Fair Value	Exposure Draft: Fair Value Measurement and Application	Draft
Leases	Exposure Draft: Major Issues Related to Leases	Draft
34	Basic Financial Statements and Management's Discussion and Analysis for State and Local Governments	June 1999
45	Accounting And Financial Reporting By Employers For Postemployment Benefits Other Than Pensions	June 2004
55	The Hierarchy Of Generally Accepted Accounting Principles For State And Local Governments	March 2009
68	Accounting And Financial Reporting For Pensions	June 2012
70	Accounting And Financial Reporting For Non-exchange Financial Guarantees	April 2013

4.4 Research Methodology

The data collection in this study started with the search of online articles that discuss selected GASB standards and drafts. The search used the Google and Yahoo search engines and the results eliminate the articles that only mention the announcement or just describe the definition of the GASB standards and drafts. The elimination of announcement and definition makes the sample size quite small, which is also part of the study limitation from the collected samples, Python[28] is used to remove the article from the advertisement

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[28] The text mining software that is used in this study (https://www.python.org)

or unnecessary link. This open source software is also capable of removing stop words such as "a", "about", "an", or "off" (Russell, 2014). After the stop words are removed, the article is converted into a list of words. From the list of words, the sentiment analysis can be performed.

The sentiment analysis is adopting Bag-of-Words method. This method assumes that each of document is a bag of words therefore the word order has no significance (Kosala & Blockeel, 2000). From this method, there are three types of sentiment that can be detected from the document: positive, negative, and neutral. The process starts with determining the neutral sentiments then follows with the sentiment polarity (positive and negative) only if the text is not neutral. Positive means that the text expresses a positive sentiment. In contrast, if the result shows negative, it means that the text shows negative sentiment. For a neutral opinion, there could be almost similar mixture of positive and negative language or there can be an association with a signature word such as "mediocre" (Pang & Lee, 2008).

Polarity is measured by the frequency of positive minus negative sentiment words divided by these two categories. Words such as "good", "wonderful", and "amazing" are the example of positive sentiments. Words such as "abandon", "bad", and "difficult" are included in the negative sentiment. The list of sentiment words is taken from the dictionary (http://www3.nd.edu/~mcdonald/Word_Lists.html). From this dictionary we can calculate the overall sentiment or polarity of the news[29]. This dictionary is selected because the applicability to finance and accounting domain. The selection of dictionary should relevant to the domain or able to create problem, for example words such as crude

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[29] We can also create our own dictionary, but in this study we follow the dictionary from Bill McDonald Notre dame University

(oil) or tax may have negative connotation in different domain but not in earning report (O'Connor, 2011).

4.5 Results and Analysis

The data is collected from the google and yahoo search engine. The results only included the article that discuss about the GASB standards and draft and eliminate the articles that only mention the announcement. The data collection is limited between the years 2000 until 2014. The analysis is not developed based on the timeline because not enough data is available to make this type of analysis. But for the future analysis, timeline based analysis can be performed by incorporating more data sources.

The results are displayed based on three types of opinion: positive, negative, and neutral. Each of the categories is calculated based on the article that represent the sentiment. There is almost an equal number of neutral and positive opinions for the fair value draft (Figure 8). This mixed result is explainable because the public seems to believe that this potential standard[30] can be a solution for the valuation problem in governmental accounting. However, the complexity of the standard might hinder the potential benefit for its successful implementation.

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[30] Currently still in the form of draft while this study is being written

Figure 8 GASB Fair Value Draft Sentiment Score
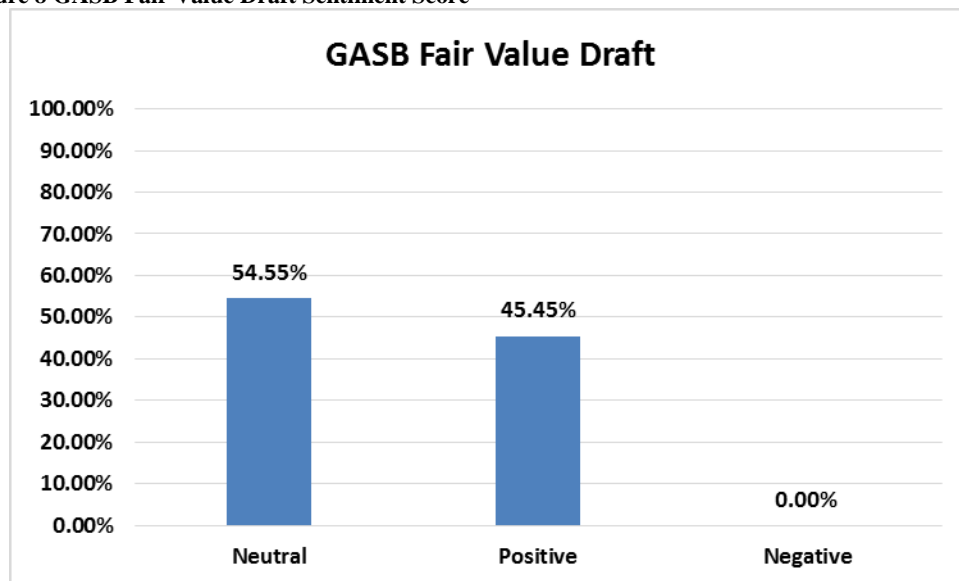
The exposure draft for leases shows positive sentiment, with more than 60% of online news articles generating favorable opinions. The online articles regarding this draft provide positive views regarding the future implementation of the standard. It is believed that the GASB lease standard is less complex for practitioners and would deliver greater comparability for in the accounting for leases.

Table 23 Summaries of GASB Draft Sentiment Score

GASB Draft	Title	Sentiment Score
Fair Value	Exposure Draft: Major Issues Related to Fair Value	Positive: 45.45% Negative: 0.00% **Neutral: 54.55%**
Leases	Exposure Draft: Major Issues Related to Leases	**Positive: 63.64%** Negative: 27.27% Neutral: 9.09%

The first standard focused on in this study is GASB Statement No. 34. From Figure 9 it is evident that the sentiment score from all published articles regarding this standard is mostly neutral with a small number of articles showing positive or negative sentiment. The strong results for a neutral opinion is probably driven by the fact that this standard was

issued seven years ago and there have been no major changes since the issuance. The board is scheduled to begin the project to re-examine the GASB 34 in October 2015 and anticipates issuing an initial due process document for public comment by the end of 2016 (GASB, 2015).

Figure 9 GASB Statement No. 34 Sentiment Score
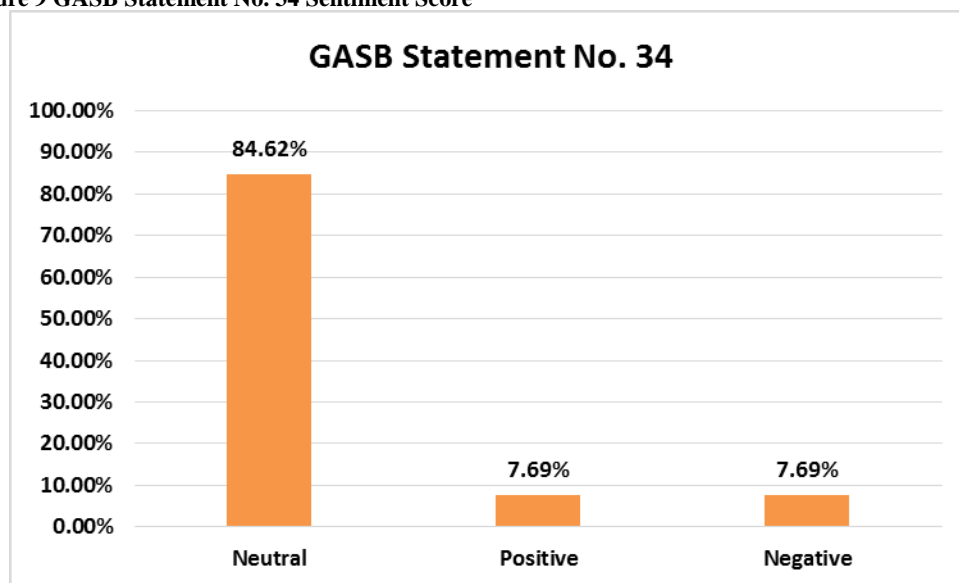
For the other standards, it is evident that GASB Statement No. 55 is accepted well by the public. About 75% of the articles pertaining to this statement show positive sentiment. It is possible that the lack of hierarchy will lead to problems in implementation. This is especially true because the GASB statements are not mandatory.

For GASB Statement No. 70, the articles are mostly neutral. This may be because the articles show equality in positive and negative sentiment or do not show enough sentiment to be captured by the algorithm.

There seems to be a higher negative sentiment with regard to post-employment benefits other than pensions. It is possible that the negative opinion is a product of the difficulty in measuring and reporting this account. Negative sentiment is also present for

GASB Statement No. 68 regarding pension plans. These results can be an indication to policy makers that there is a need for improvements in these standards.

Table 24 Summaries of GASB Statement Sentiment Score

GASB Statement	Title	Sentiment Score
34	Basic Financial Statements and RSI for States and Local Governments	Positive: 7.69% Negative: 7.69% Neutral: 84.62%
25/27/68	Accounting and Financial Reporting for Defines Benefit Pension Plans and Note Disclosures for Defined Contribution Plans	Positive: 29% Negative: 57% Neutral: 14%
12[31]/43/45	Accounting And Financial Reporting By Employers For Postemployment Benefits Other Than Pensions	Positive: 20% Negative: 60% Neutral: 20%
55	The Hierarchy Of Generally Accepted Accounting Principles For State And Local Governments	Positive: 75% Negative: 25% Neutral: 0%
70	Accounting And Financial Reporting For Non-exchange Financial Guarantees	Positive: 0% Negative: 33.33% Neutral: 66.67%

4.6 Summary

Because of the emerging need to improve the practice of governmental financial reporting, this study attempts to understand user opinion regarding procedures, standards, and principles of governmental accounting with the purpose of obtaining the affectivity and difficulty in their implementation and practice. Several standards and two drafts from the GASB have been selected in order to measure public sentiment. The selection of the GASB Statements and Exposure Drafts are based on the GASB's research agenda.

The analysis shows that Pension and OPEB standards received show negative sentiments based on an analysis of published online articles or news reports. However, GASB Statement No. 55 and the lease draft show positive sentiment from the public. From

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[31] Superseded by GASB No. 45

these results, information can be provided to policy makers regarding the public acceptance of these standards and suggestions can be made to improve future standards.

The use of text mining can be an alternative method for GASB in collecting public opinion without spending at the levels required for conventional method such as interviews or questionnaires. Text mining is able to incorporate the popular use of internet based media such as online news or social media so the coverage of this method is quite vast. This method can also be employed in evaluating sentiment from different type of documents such as documents or comment letters.

At the next stage of this study, the results can be used to develop further analysis by making associations with other non-financial reporting data such as geographical and demographic statistics. More complex machine learning algorithms can be implemented for the future study, for example algorithm that able to detect negation or extent of the sentiment. Furthermore, other data sources can also be included in the analysis. These may include public sentiments from Twitter or Facebook. This would eliminate the small sample limitation in this study.

Although various analyses can be achieved using textual analysis, the object of this research is opinion-related Therefore, there is still subjectivity in the result. This subjectivity is compounded by the sentiment words that are chosen for this specific analysis. To minimize this weakness, an expert in governmental accounting can design a specific dictionary[32] to improve the accuracy of the sentiment evaluation.

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[32] This study used the dictionary that commonly used by the researcher in the finance and accounting field.

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Chapter 5. Conclusions and Future Research

5.1 Conclusions

This study will provide a better understanding of the practices and implementation of governmental and not-for-profit accounting and auditing. The empirical evidence presented is expected to provide information for the purpose of improving transparency and accountability. By implementing a data analytics research methodology, this study contributes to the governmental and not-for-profit accounting literature regarding the level of success with the implementation of accounting and reporting standards and serve as feedback for policy makers to improve future decision-making.

The format of and publication time required for governmental reports draws much criticism. This is because government financial reports are typically presented in pdf format which requires additional effort by users to analyze the data in the reports. Numerical data from the CAFR for example is not easy to analyze in the available format (pdf). The preferred way to provide financial data for analysis is to transfer/convert it into a spreadsheets program such as Excel or Stata. Regarding the time required to publish financial reports, local governments take a longer time to release their reports as compared to the public companies.

To improve the quality of government financial reports, many governmental entities and not-for-profit organizations provide open source data. The first chapter describes several data sources that can be accessed by the public. The data sources are categorized into: financial and budgetary data, demographic data, and audit data sources.

Municipal trading data can be accessed from the Electronic Municipal Market Access website (EMMA), which was developed by the Municipal Securities Rulemaking

Board (MSRB). This site provides a repository database, free of charge, allowing access to individual bond data and disclosure information.

Financial data can be collected in an efficient and accurate manner from subscription-based information services such as Bloomberg or Mergent. Bloomberg provides both various types of data and a customer support service that can assist users in the data collection process. Bloomberg provides real-time and historical financial market data and economic data, covering all sectors worldwide. It also features analytics, company financials, news, and customizable charting.

While Bloomberg provides various types of information, the Mergent database provides in-depth data that focuses on credit rating information and municipal bonds data. The information that can be collected from this service consists of: issuer description, state, project name, obligor, agents, coupon type, offering price, offering yield, offering amount, total outstanding amount, maturity date, tax status, and credit rating.

Financial data is also provided by state and local governmental entities. The public can obtain CAFR, budget data, or organization information from the websites of government entities. Furthermore, many state and local governmental entities provide open data for the public. OhioCheckbook.com[33] is one of the examples of an online source of governmental data. OhioCheckbook.com facilitates public to access every expenditure and revenue of the State of Ohio. This site promotes transparency by providing the public with information about the flow of tax funds and the budgeting process. The objective of this project is to provide detailed information about the decision-making process on state spending and the true costs of government. Other example of state or local governments

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[33] http://ohiotreasurer.gov/Transparency/Ohios-Online-Checkbook

that provide their data online for the public are Colorado, Montana, Kansas, Nevada, North Dakota and New York City.

For demographic information, The US Census Bureau provides information such as: population, median income, tax rate, housing, or job information. With the FactFinder tool, a researcher can obtain supporting information for cross sectional analyses from different areas in The United States.

The Federal government operates the Federal Audit Clearinghouse (FAC) that provides online information regarding the audit data of NFE. The primary objective of this site is to disclose the single audit reporting packages, promote the Office of Management and Budget (OMB) oversight and assessment toward the federal award audit, facilitate a public database for completed audit reports, and assist auditors and auditees in addressing the reporting requirements of Circular A-133.

Many governmental entities and not-for-profit organizations have tried to provide increased openness and transparency with respect to their operations, and the adoption of Information Systems technologies, which is considered vital for cost-efficiency and convenience, has spurred much of this change. The concept of e-government or e-reporting is quite popular in public administration and is seen as progressing towards improved transparency. From these various data sources, much potential research in the government and not-for-profit area can be supported.

Chapter two utilizes audit report data from the Non-Federal Entity (NFE). The sample consists of local government, tribes, local territories and not-for-profit organization that have received federal funding. This chapter aims to provide empirical evidence in support of opinion shopping indication in the NFE setting. The final sample consists of

9,504 entity-year pairs. The matching process is based on the similarity of variables (audit year, entity location and type of entity) and the smallest differences between amounts received from the federal government. Furthermore, the observations that have no matches were deleted.

Based on the comparison analysis, the result shows that the qualified opinion group (group 1) sample reflect a higher percentage of change of auditor. The second analysis is focused on group 1 only. The analysis shows that the entities in group 1 that have switched their auditor are more likely to receive a clean opinion in the following years compared to the entities that have not changed their auditors.

Furthermore, the predictive model is designed to analyze the probability of successful implementation of opinion shopping by NFEs. The predictive model aims to provide information beyond the occurrence of opinion shopping and also measure the level of success of the NFEs in implementing opinion shopping. This predictive model includes prior audit opinions, switching decisions, and other organization factors such as entity size, expenses, and revenues. To maintain a similarity of characteristics, the predictive analysis will only include not-for-profit organization types as provided in the sample.

The result indicates that entities would have received a qualified audit opinion more frequently if they had made different (opposite) auditor switch decisions. The other financial indicators in the model have an insignificant effects on switching but the NFE's ROA shows a negative influence on the tendency to switch auditors. This is consistent with the Lennox study that suggests that companies with financial difficulty will more likely change their auditors (Lennox, 2000). From these analyses, there is an indication that NFEs do successfully engage in opinion shopping.

Credit worthiness of municipal bonds can be measured based on their credit rating. These ratings are issued by credit rating agencies (CRA) based on their assessments of the creditworthiness of local governments. In preparing for the assessment process, local government entities have to collect and deliver substantial financial and non-financial data to the CRA. This process is both time-consuming and costly and when considering the resultant credit ratings are arrived at by a black box method used by the CRA, lacking in transparency.

Chapter three applies Artificial Neural Networks to explore municipal bond credit ratings. The main contribution of this study is to develop a model that will enable users to explain the composition of the variables or factors that influence municipal bond credit ratings. The variables are divided into three different categories: financial, budgetary, and demographic. This information will be beneficial for the potential issuers of and investors in the local government debt market, as it will assist their investment decisions. The limitation of this model is that the observation only focuses on New Jersey cities and towns. Furthermore, the results are limited by the selection of variables included in the analysis. Therefore, including other variables may provide different results.

The model shows the differences between the two major credit rating agencies. S&P credit ratings place more emphasis on the financial statement information (CAFR) while Moody's credit ratings are influenced by several factors including budgetary information, demographic data, and some parts of the CAFR variables. In summary, this study will provide a better understanding of the practices and composition of municipal bond credit ratings.

In order to improve the quality of state and local government financial reporting, the Governmental Accounting Standards Board (GASB) provides standards and guidelines. The Government Accounting Standards Board (GASB) was created in 1984 to establish generally accepted accounting principles (GAAP) for state and local government entities. Since 1984, the GASB has been the only authoritative body to establish Generally Accepted Accounting Principles (GAAP) for state and local governments[34].

One of the GASB's 2014 research agendas was to collect broad user opinions about the standards and their implementation. In support of this objective, this study is undertaking to obtain public sentiment regarding GASB standards and implementation by using textual analysis. This method will identify user sentiment from public websites and measure that sentiment.

The results show the positive, negative, or neutral sentiments toward selected standards or exposure drafts. Two of the standards regarding pensions and OPEB received negative sentiments based on an analysis of published online articles or news reports. However, GASB Statement No. 55 and the lease draft show a positive sentiment from the public. From this types of analysis, information can be provided to policy makers regarding public acceptance of these standards and suggestions can be made to improve future standards. The contribution provided by such research is in its ability to improve the development of government financial standards and provide better insights regarding the implementation of these standards.

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[34] Some states and cities are not complying the GAAP but the implementation of GAAP is the signal for good corporate governance.

Figure 10 Overall Summary

Predictive Analysis	Artificial Neural Networks	Text Mining Analysis
• Opinion Shopping • Non-Federal Organization • IRS Form 990 • Stata	• Credit Rating Agency • The State of NJ • Financial, Budgetary, and Demographic Information • IBM SPSS	• Online News • GASB Statements • GASB Exposure drafts • Python

5.1 Limitation and Future Research

There are several limitations in this study. The opinion shopping data in the first essay is not able to distinguish organizations that change their auditor because of an auditor decision (client shopping). The second limitation is from the neural networks analysis. The focus of this study is limited to New Jersey. Therefore, the result might not comparable to other states. The next limitation is related to the text mining analysis. Because the research objective involves an opinion, there is the possibility of subjectivity in the result. Furthermore, the sample size in the study needs to be improved.

During the next stage of this study, the results will be used to develop further analyses by making associations with other non-financial reporting data such as geographical and demographic statistics. More complex machine learning algorithms can be implemented for the future study. For example, the study will use algorithms that are able to detect negation or the extent of the sentiment. Furthermore, other data sources can also be included in the analysis. This would eliminate the small sample size limitations of this study

Appendix A: The List of Government Financial Statements

Government Wide Statement	Fund Financial Statement
Statement of Net Position	Balance Sheets
Statement of Activities	Statement of Revenue

A. Statement of Net Position

This statement captures the position of assets, liabilities, and net assets, which is the difference between total assets and total liabilities. It is provides information regarding assets and liabilities at a certain point of time, usually at the last day of the fiscal year (Mead, 2011). The position displays the remaining resources after the liabilities have been settled off.

The equation of net position consists of assets, liabilities, and deferred accounts, and net assets. In general, assets and liabilities are displayed according their liquidity and maturity, respectively. Therefore, assets start with the one that easily converted into cash and liabilities begin with the liabilities that must be satisfied first. While deferred account is the account that shows transactions that are not immediately recognized as revenue or expense in the current period. This concept was introduced in GASB Concept Statement No. 4, Elements of Financial Statements in June 2007.
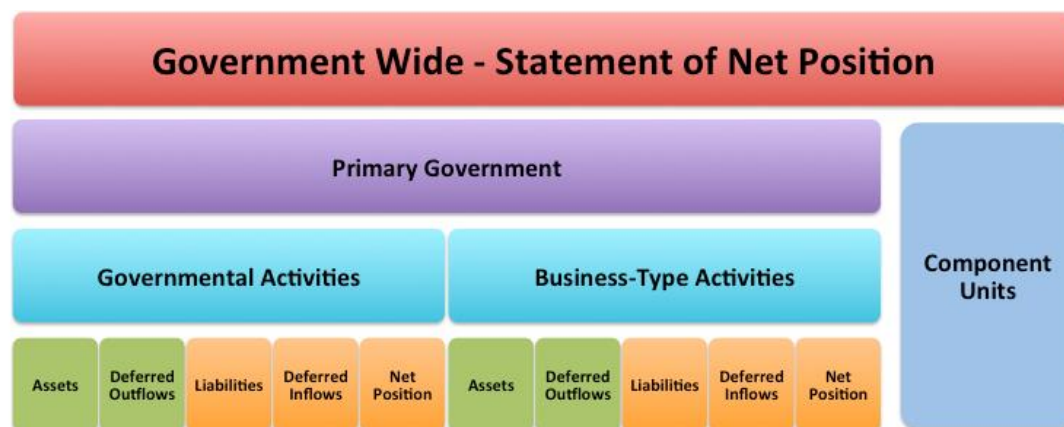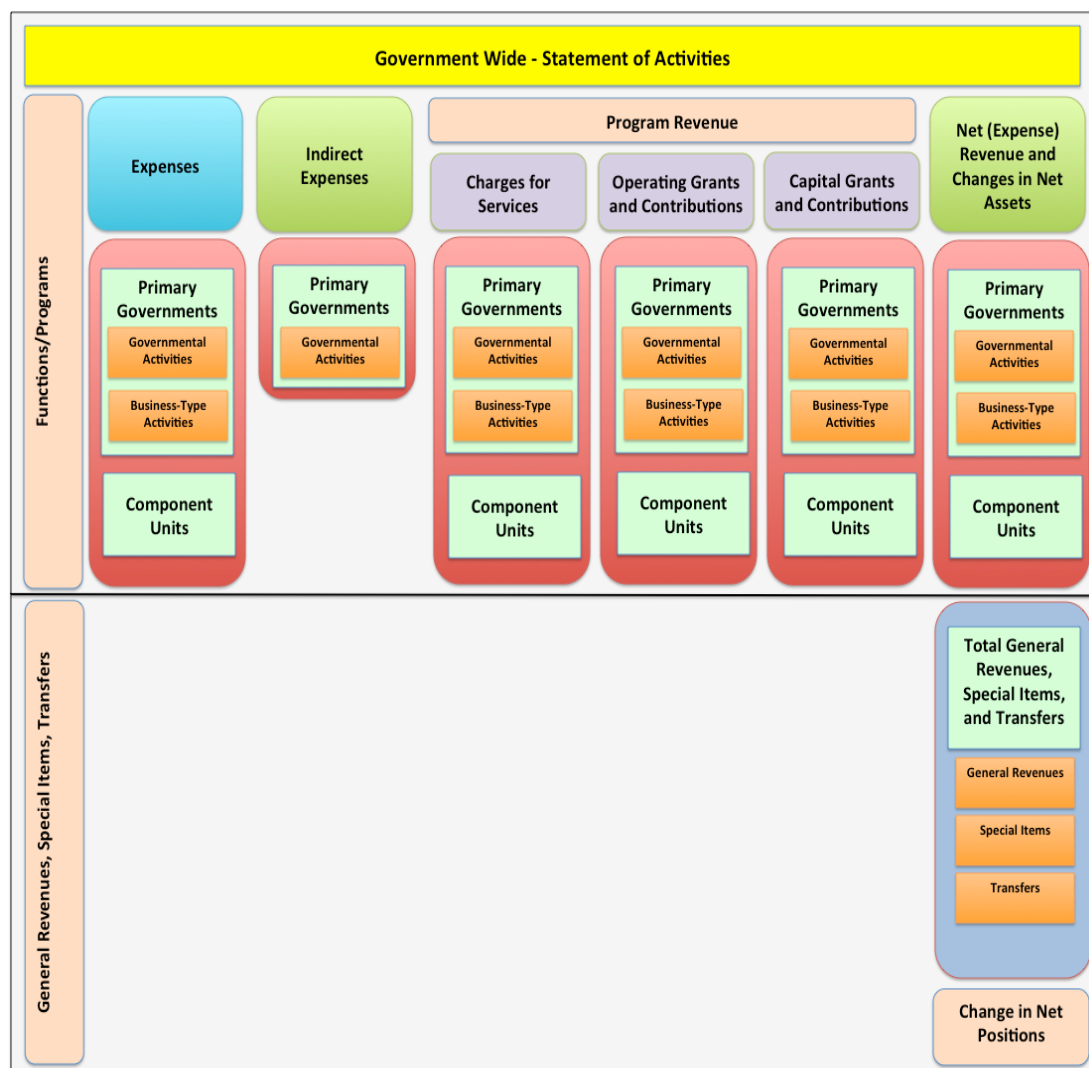
B. Statement of Activities

The statement of activities provides information regarding the revenues, expenses, and the transactions that affect increase or decrease of net position. The first column on the first part of this statement is the list of functions or programs that start with the primary government and end with component units. The second column is expense, which contains direct expenses that are attributable to the functions or programs.

The next column is the program revenue. These revenues are directly related to the functions or programs. There are two main types of program revenues, charges for services and grants and contributions. Charges for services are the revenues from the services or programs that are provided by the government, while, grants and contributions are the funds that the government received for certain types of purposes. Grant and contribution revenues have two types, operating and capital. While operating grants and contributions are fund to finance the annual operating activities of a government, capital grants and contributions are purposely to fund the acquisition, construction, or rehabilitation of capital assets.

The next column is the net revenue (expense), this column shows the net figure whether each of the programs is a contributor resource to the government or relies on general revenues (typically taxes and unrestricted aid).

The lower part of the statement basically provides information regarding the activities that drive the change of net positions. The statement presents general revenues that consist of fund sources to finance the net costs that are not funded by program revenue. This general revenue usually is taxes or unrestricted aid from other government. Moreover, this statement also captures general revenues such as from taxes and of all types and transfers between governmental and business-type activities, which is often reported in the lower part of the statement.

Government Wide - Statement of Activities

Functions/Programs

Expenses

Indirect Expenses

Program Revenue

Charges for Services

Operating Grants and Contributions

Capital Grants and Contributions

Net (Expense) Revenue and Changes in Net Assets

Primary Governments	Primary Governments	Primary Governments	Primary Governments	Primary Governments	Primary Governments
Governmental Activities	Governmental Activities	Governmental Activities	Governmental Activities	Governmental Activities	Governmental Activities
Business-Type Activities		Business-Type Activities	Business-Type Activities	Business-Type Activities	Business-Type Activities
Component Units		Component Units	Component Units	Component Units	Component Units

General Revenues, Special Items, Transfers

Total General Revenues, Special Items, and Transfers

General Revenues

Special Items

Transfers

Change in Net Positions

C. Balance Sheets

This report shows the financial position of government entity at certain point. In addition to the similarity of the function with the statement of net position, the balance sheet is also consists of assets and liabilities. However the balance sheets in the governmental financial report primarily consist only of current assets and short-term liabilities. The structure of the balance sheet is arranged into assets equal to liabilities and fund balances.

The end balance of balance sheet will be fund balance and usually is listed at the bottom of the statement. Based on the availability and constraint, there are five categories for fund balances: Non-spendable, Restricted, Committed, Assigned, and Unassigned.

Fund Balances Type	Descriptions
Non-spendable	▪ Cannot be used because the form (ex: inventories) or stipulated by the external party
Restricted	▪ Constrained by certain requirements from other governments or constitutional provisions
Committed	▪ Constrained by the government itself by implement decision making authority
Assigned	▪ Resources prepare for particular purposes
Unassigned	▪ The resources are not constrained in any way

D. Statement of Revenues

The statement of revenues, expenditure, and change in fund balance (hereafter will be called the statement of revenues) shows the flow of government resources that primarily focuses on the changes of cash and other current resources. The statement of revenue captures the difference between revenues and expenditures in the form of the change in fund balances.

The structure of this statement is almost similar with the balance sheet. The columns are consisted of general fund, special fund, and non-major fund but the rows instead of assets until fund balance, this statement list revenues and expenditures based on the nature or functions.

Appendix B: Budget Summary

Appendix B
BUDGET SUMMARY-REVENUES
1. Surplus Anticipated
2. Surplus Anticipated with Prior Written Consent of Director of Local Government Services
3. Miscellaneous Revenues:
   - Total Section A: Local Revenues
   - Total Section B: State Aid Without Offsetting Appropriations
   - Total Section C: Dedicated Uniform Construction Code Fees Offset with Appropriations
   - Total Section D: Special Items of General Revenue Anticipated with Prior Written Consent of Director of Local Government Service-Shared Services Agreements
   - Total Section E: Special Items of General Revenue Anticipated with Prior Written Consent of Director of Local Government Service-Additional Revenues
   - Total Section F: Special Items of General Revenue Anticipated with Prior Written Consent of Director of Local Government Service-Public and Private Revenues
   - Total Section G: Special Items of General Revenue Anticipated with Prior Written Consent of Director of Local Government Service-Other Special Items

   Total Miscellaneous Revenues
4. Receipts from Delinquent Taxes
5. Subtotal General Revenues (Items 1,2,3, and 4)
6. Amount to be Raised by Taxes for Support of Municipal Budget:
   - Local Tax for Municipal Purposes Including Reserve for Uncollected Taxes
   - Additional to Local District School Tax
   - Minimum Library Tax

   Total Amount to be raised by Taxes for Support of Municipal Budget
7. Total General Revenues

BUDGET SUMMARY-APPROPRIATIONS
1. Total General Appropriations for Municipal Purposes within CAPS
2. Operations-Excluded from CAPS
   - Other Operations
   - Uniform Construction Code
   - Shared Service Agreements
   - Additional Appropriations Offset by Revs.
   - Public & Private Program Offset by Revs.
   Total Operation-Excluded from CAPS
3. Capital Improvements
4. Municipal Debt Service
5. Total Deferred Charges
6. Judgments
7. Cash Deficit
8. Local District School Purposes
9. Transferred to Board of Education
10. Reserve for Uncollected Taxes
11. Total General Appropriations

Appendix C: OhioCheckbook Local Government and School

Appendix C
Cities and Villages (97 entities)

Alliance	Chardon	Jeffersonville	New Richmond	Shawnee Hills
Andover	Clayton	Johnstown	North Canton	Somerset
Ashland	Columbiana	Kettering	North Fairfield	St. Paris
Ashville	Columbus	Lakewood	North Royalton	Stow
Barberton	Cuyahoga Falls	Mansfield	North Star	Streetsboro
Beaver	DeGraff	Marble Cliff	Oak Hill	Sunbury
Beavercreek	Delaware	Marblehead	Octa	Tallmadge
Belle Center	East Palestine	Massillon	Pataskala	Thurston
Bellefontaine	Eastlake	McArthur	Piketon	Toledo
Belpre	Elmwood Place	Mechanicsburg	Plain City	Valley Hi
Bethel	Galena	Midland	Pleasant Hill	Wapakoneta
Bettsville	Grandview Heights	Milledgeville	Port Clinton	Waynesfield
Bexley	Green Springs	Millersburg	Quincy	Wellston
Bowersville	Greenhills	Montgomery	Republic	West Liberty
Brookville	Hamden	Mount Orab	Roseville	West Salem
Bucyrus	Hamilton	New Albany	Russells Point	Woodlawn
Burbank	Hillsboro	New Franklin	Salem	Worthington
Camden	Hubbard	New Holland	Salineville	
Canal Fulton	Huber Heights	New Lexington	Sandusky	
Catawba	Indian Hill	New Middletown	Sebring	

Townships (74)

Auglaize	Franklin (Adams)	Liberty (Jackson)	Prairie
Bainbridge	Franklin (Warren)	Liberty (Washington)	Ross (Butler)
Batavia	Goshen	Mad River	Russell
Bath	Hamilton	Madison (Clark)	Scioto
Beaver	Harrison	Madison (Jackson)	Scott (Adams)
Beavercreek	Hartsgrove	Madison (Richland)	Springfield (Clark)
Boardman	Huntington	Marlboro	Springfield (Mahoning)
Bratton (Adams)	Jackson (Mahoning)	Meigs (Adams)	Sugarcreek
Brown (Delaware)	Jackson (Franklin)	Miami	Violet
Byrd (Brown)	Jackson (Jackson)	Nimishillen	Washington
Caesarscreek	Jackson (Montgomery)	Orange	Weathersfield
Canton	Jackson (Stark)	Oxford	Whitewater
Catawba Island	Jefferson (Franklin)	Painesville	Williamsburg
Chester	Jefferson (Greene)	Paris	Winchester (Adams)
Clearcreek	Jefferson (Jackson)	Perry	
Colerain	Jefferson (Montgomery)	Pierce	
Danbury	Jefferson (Ross)	Plain (Franklin)	
Eagle (Brown)	Letart	Plain (Stark)	
East Union	Liberty (Butler)	Pleasant (Brown)	
Fairfield (Butler)	Liberty (Delaware)	Pleasant	

Schools (69)

Alexander Local	Lockland Local	Riverside Local
Beavercreek City	Lorain Educational Service Center	Sandusky City
Bucyrus City	Mad River Local	Shawnee Local
Caldwell Exempted Village	Massillon City	South Range Local
Clearview Local	Mathews Local	Southeastern Local
Clyde-Green Springs Exempted Village	Medina City	Southwest Licking Local
Columbia Local	Mentor Exempted Village	Southwest Local
Crestwood Local	Mohawk Local	Springboro Community City
Cuyahoga Heights Local	Mount Gilead Exempted Village	Talawanda City
Dayton Public	New Albany-Plain Local	Tecumseh Local
East Muskingum Local	New Philadelphia City	Toledo City
Fairport Harbor Exempted Village	New Riegel Local	Tuslaw Local
Finneytown Local	Newton Falls Exempted Village	Union Local
Franklin Monroe Local	North Royalton City	Upper Arlington City
Genoa Area Local	Northeastern Local	Wayne Local
Georgetown Exempted Village	Northwest Local	Wayne Trace Local
Greenon Local	Northwestern Local	Westlake City
Greenville City	OAK Leadership Institute	Worthington City
Hilliard City	Oregon City	Xenia Community City
Howland Local	Osnaburg Local	
Huntington Local	Perry Local	
Independence Local	Pickerington Local	
Jackson City	Reading Community City	
Leetonia Exempted Village	Ridgedale Local	
Lima City	Ripley Union Lewis Huntington Local	

Special Districts (14)	Counties (14)
Anderson Township Park	Butler
Boardman Township Park	Clermont
Bradford Public Library	Cuyahoga
Centerville Washington Park	Delaware
Delaware Soil & Water Conservation	Franklin
East Cleveland Public Library	Hamilton
Findlay Hancock County Public Library	Jackson
Joint Emergency Medical Service	Lorain
North Baltimore Public Library	Lucas
Perry Public Library	Mahoning
Salem Public Library	Stark
Southern Ohio Port Authority	Trumbull
Upper Arlington Public Library	Warren
West Central Ohio Port Authority	Wayne

Appendix D: State and Local Government Online Checkbook

Appendix D
Colorado

Montana

Kansas

Nevada

North Dakota

North Dakota | nd.gov Official Portal for North Dakota State Government | North Dakota LEGENDARY

North Dakota Transparency

OMB Home > North Dakota Transparency Home > Checkbook

Checkbook allows you to search the state check register, track state spending, and see where your tax dollars are spent. The **Spending by Agency / University** report will help you find out how much individual state agencies and universities spend, what types of goods / services are purchased, and who they're buying from. The **Spending by Category** report will allow you to see all agency expenditures across the State in broad spending categories, including budget category and account codes. The **Payments to Vendors** report will let you know who's being paid by the State, how much, and by which state agency or university.

Spending by Agency / University

Spending by Category

Payments to Vendors

Top 5 State Spending Categories	
Grants To School District	$845,785,129.17
Grants To Individuals	$626,501,451.85
Contractor Payments - Highways	$524,102,039.03
Tsfr To Highway Fund	$521,115,558.00
Higher Ed-General Fund Operati	$259,244,778.89

Appendix E: Variable Summary of ANN Model

Appendix E

Variable Number	Description	Formula
Financial Accounting-Information Source: CAFR		
V1	Operating Expenses	(Total Operating Expenses (t) - Total Operating Expenses (t-1))/ Total Operating Expenses (t-1)
V2	Cash & Near Cash	Cash & Near Cash (t)/ Total Assets (t)
V3	Total Assets	(Total Assets (t)- Total Assets (t-1))/ Total Assets (t-1)
V4	Accounts Payable	Accounts Payable (t)/ Total Liabilities (t)
V5	Reserved for Encumbrances	Reserved for Encumbrances (t)/ Total Fund Balances (t)
V6	Unreserved General Fund	Unreserved General Fund (t)/ Total Fund Balances (t)
V7	Property Tax Revenues	Property Tax Revenues (t)/ Total Revenues (t)
V8	General Government Expenses	General Government Expenses (t)/ Total Operating Expenses (t)
V9	Salaries and Employees Benefits	Salaries and Employees Benefits (t)/ Total Operating Expenses (t)
V10	Other Program Expenses	Other Program Expenses (t)/ Total Operating Expenses (t)
V11	Capital Outlay	Capital Outlay (t)/ Total Operating Expenses (t)
V12	Principal Debt Service	Principal Debt Service (t)/ Total Operating Expenses (t)
Budgetary Information Source: Municipal Data Sheet		
V13	Anticipated General Revenue	(Total Anticipated General Revenue (t) - Total Anticipated General Revenue (t-1))/ Total Anticipated General Revenue (t-1)
V14	Surplus Anticipated Revenues: A portion of Fund Balance (surplus) that utilized as revenue to support the current budget	Surplus Anticipated Revenues (t) / Total Anticipated General Revenue (t)
V15	Total Section A/Local Revenues: Revenues that generated locally	Local Revenues (t)/ Total Anticipated General Revenue (t)
V16	Total Section B/State Aid without Offsetting Appropriation: General aid and grants from the State of New Jersey	State Aid (t) / Total Anticipated General Revenue (t)

Variable Number	Description	Formula
V17	Total Section C/Dedicated Uniform Construction Code Fees Offset with Appropriations: Revenues that assigned to support the code enforcement budget to maintain the safety regulations and health standards are upheld.	Dedicated Uniform Construction Code Fees (t) / Total Anticipated General Revenue (t)
V18	Total Section D/Shared Services Agreements: Revenues that received for shared services paid by other localities.	Shared Services Revenue (t)/ Total Anticipated General Revenue (t)
V19	Total Section E/Additional Revenues	Additional Revenues (t)/ Total Anticipated General Revenue (t)
V20	Total Section F/Public and Private Revenues: Funds to be spent on specific purposes	Public and Private Revenues (t)/ Total Anticipated General Revenue (t)
V21	Total Section G/Other Special Items	Other Special Items Revenues (t)/ Total Anticipated General Revenue (t)
V22	Receipts from Delinquent Taxes: The sum of delinquent taxes anticipated as revenue in the current year budget	Receipts from Delinquent Taxes (t)/ Total Anticipated General Revenue (t)
V23	Amount to be Raised by Taxes for Support of Municipal Budget	Amount to be Raised by Taxes (t)/ Total Anticipated General Revenue (t)
Demographic Information Source: US Census		
V24	Population rate change	$(Pop\ (t-1) - Pop\ (t-2)) / Pop\ (t-2)$
V25	Median Household Income rate change	$Income\ (t) - Income\ (t-1)) / Income\ (t-1)$

Appendix F: Model Summary

1. S&P

		N	Percent
Sample	Training	210	66.0%
	Testing	108	34.0%
Valid		318	100.0%
Excluded		1	
Total		319	

Training	Cross Entropy Error	150.850
	Percent Incorrect Predictions	24.8%
	Stopping Rule Used	1 consecutive step(s) with no decrease in error[a]
	Training Time	0:00:00.14
Testing	Cross Entropy Error	82.580
	Percent Incorrect Predictions	26.9%

Dependent Variable: Sim_Credit Rating

a. Error computations are based on the testing sample.

2. Moody's

		N	Percent
Sample	Training	234	74.1%
	Testing	82	25.9%
Valid		316	100.0%
Excluded		1	
Total		317	

Training	Cross Entropy Error	176.657
	Percent Incorrect Predictions	38.5%
	Stopping Rule Used	1 consecutive step(s) with no decrease in error[a]
	Training Time	0:00:00.13
Testing	Cross Entropy Error	62.443
	Percent Incorrect Predictions	36.6%

Dependent Variable: Sim_Credit Rating

a. Error computations are based on the testing sample.

Appendix G: Correlation Table

Moody's

	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25
V1	1.00																								
V2	0.05	1.00																							
V3	0.33	0.04	1.00																						
V4	0.05	0.08	0.03	1.00																					
V5	0.06	0.04	0.00	0.11	1.00																				
V6	0.11	0.55	0.10	0.06	0.13	1.00																			
V7	0.11	0.09	0.08	0.01	0.04	0.00	1.00																		
V8	0.13	0.12	0.00	0.10	0.08	0.07	0.04	1.00																	
V9	0.00	0.16	0.00	0.03	0.02	0.04	0.02	0.43	1.00																
V10	0.09	0.10	0.03	0.13	0.04	0.05	0.07	0.59	0.24	1.00															
V11	0.02	0.11	0.00	0.06	0.07	0.03	0.03	0.13	0.11	0.03	1.00														
V12	0.03	0.07	0.06	0.01	0.08	0.16	0.09	0.26	0.29	0.19	0.04	1.00													
V13	0.02	0.01	0.03	0.15	0.05	0.06	0.19	0.03	0.03	0.01	0.06	0.03	1.00												
V14	0.11	0.38	0.07	0.01	0.17	0.37	0.04	0.03	0.10	0.05	0.04	0.01	0.03	1.00											
V15	0.04	0.01	0.20	0.05	0.10	0.06	0.29	0.03	0.02	0.01	0.02	0.02	0.07	0.10	1.00										
V16	0.10	0.18	0.09	0.02	0.05	0.08	0.31	0.04	0.00	0.01	0.10	0.07	0.08	0.07	0.07	1.00									
V17	0.03	0.15	0.03	0.05	0.08	0.10	0.12	0.01	0.04	0.04	0.03	0.01	0.02	0.13	0.11	0.04	1.00								
V18	0.02	0.02	0.05	0.00	0.02	0.04	0.05	0.01	0.08	0.07	0.01	0.02	0.02	0.13	0.04	0.02	1.00								
V19	0.02	0.00	0.02	0.07	0.01	0.04	0.05	0.03	0.02	0.03	0.00	0.07	0.04	0.04	0.03	0.08	0.01	0.04	1.00						
V20	0.04	0.25	0.02	0.07	0.09	0.10	0.17	0.02	0.04	0.02	0.14	0.07	0.21	0.07	0.05	0.12	0.07	0.04	0.01	1.00					
V21	0.14	0.20	0.27	0.15	0.07	0.17	0.19	0.03	0.05	0.09	0.05	0.17	0.13	0.21	0.05	0.01	0.02	0.12	0.11	0.11	1.00				
V22	0.10	0.04	0.07	0.06	0.06	0.04	0.10	0.05	0.11	0.05	0.07	0.10	0.04	0.05	0.13	0.28	0.07	0.01	0.07	0.01	0.07	1.00			
V23	0.06	0.11	0.03	0.04	0.05	0.03	0.32	0.03	0.02	0.10	0.06	0.05	0.03	0.04	0.11	0.18	0.11	0.04	0.01	0.11	0.17	0.04	1.00		
V24	0.03	0.03	0.04	0.11	0.11	0.02	0.04	0.04	0.10	0.03	0.11	0.03	0.07	0.07	0.01	0.10	0.13	0.02	0.03	0.02	0.02	0.04	0.06	1.00	
V25	0.02	0.35	0.03	0.03	0.10	0.24	0.16	0.10	0.16	0.06	0.00	0.05	0.01	0.23	0.12	0.12	0.36	0.04	0.00	0.16	0.01	0.10	0.12	0.06	1.00

S&P

	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18	V19	V20	V21	V22	V23	V24	V25
V1	1.00																								
V2	0.05	1.00																							
V3	0.33	0.04	1.00																						
V4	0.05	0.08	0.03	1.00																					
V5	0.06	0.04	0.00	0.11	1.00																				
V6	0.11	0.50	0.10	0.06	0.13	1.00																			
V7	0.12	0.09	0.08	0.01	0.04	0.01	1.00																		
V8	0.13	0.12	0.00	0.10	0.08	0.06	0.04	1.00																	
V9	0.00	0.16	0.00	0.03	0.02	0.04	0.01	0.43	1.00																
V10	0.09	0.09	0.03	0.12	0.05	0.05	0.07	0.50	0.24	1.00															
V11	0.02	0.11	0.00	0.06	0.07	0.03	0.02	0.13	0.11	0.02	1.00														
V12	0.02	0.07	0.06	0.01	0.07	0.16	0.08	0.27	0.30	0.19	0.04	1.00													
V13	0.02	0.01	0.03	0.15	0.05	0.06	0.19	0.03	0.03	0.01	0.06	0.03	1.00												
V14	0.11	0.39	0.07	0.01	0.18	0.38	0.05	0.04	0.10	0.05	0.05	0.01	0.03	1.00											
V15	0.04	0.00	0.20	0.05	0.10	0.06	0.29	0.03	0.02	0.01	0.01	0.02	0.07	0.10	1.00										
V16	0.10	0.17	0.09	0.02	0.05	0.08	0.31	0.04	0.00	0.01	0.10	0.08	0.08	0.08	0.07	1.00									
V17	0.03	0.15	0.03	0.05	0.08	0.10	0.12	0.01	0.04	0.03	0.03	0.01	0.03	0.13	0.11	0.04	1.00								
V18	0.02	0.02	0.05	0.00	0.02	0.04	0.07	0.01	0.09	0.07	0.14	0.01	0.02	0.03	0.13	0.04	0.02	1.00							
V19	0.11	0.39	0.07	0.01	0.18	0.38	0.05	0.04	0.10	0.05	0.05	0.01	0.03	1.00	0.10	0.08	0.13	0.03	1.00						
V20	0.04	0.25	0.02	0.07	0.09	0.10	0.17	0.02	0.04	0.02	0.14	0.06	0.21	0.07	0.05	0.12	0.08	0.04	0.07	1.00					
V21	0.14	0.19	0.27	0.16	0.07	0.16	0.20	0.03	0.05	0.08	0.05	0.17	0.13	0.21	0.05	0.01	0.02	0.12	0.21	0.10	1.00				
V22	0.10	0.04	0.07	0.06	0.06	0.04	0.10	0.05	0.11	0.05	0.07	0.11	0.04	0.05	0.13	0.28	0.08	0.01	0.05	0.01	0.07	1.00			
V23	0.06	0.11	0.03	0.04	0.05	0.03	0.32	0.03	0.02	0.10	0.06	0.05	0.03	0.04	0.11	0.18	0.11	0.03	0.04	0.11	0.17	0.04	1.00		
V24	0.03	0.03	0.04	0.11	0.10	0.02	0.04	0.04	0.09	0.05	0.11	0.03	0.07	0.07	0.01	0.10	0.13	0.02	0.07	0.02	0.01	0.04	0.06	1.00	
V25	0.02	0.34	0.03	0.03	0.10	0.23	0.16	0.10	0.16	0.06	0.00	0.05	0.01	0.24	0.12	0.12	0.36	0.04	0.24	0.16	0.01	0.10	0.12	0.06	1.00

Appendix H: Potential Areas of Improvement

Fair Value Draft

- Guidance for determining a fair value measurement for financial reporting purposes.
- Valuation techniques that are appropriate in the circumstances and for which sufficient data are available to measure fair value.
- The valuation techniques should be applied consistently, though a change may be appropriate in certain circumstances.
- Establish a hierarchy of inputs to valuation techniques used to measure fair value.
- This proposed statement would generally require investments to be measured at fair value.
- This proposed statement would require measurement at acquisition value for donated capital assets, donated works of art, historical treasures, and similar assets and capital assets received in a service concession arrangement.
- This proposed statement would require disclosures to be made about fair value measurements, valuation techniques, and inputs. It also would require additional disclosure information regarding investments in certain entities that calculate net asset value per share (or its equivalent)

Leases Draft

- Under the proposal, lessee governments would report the following in their financial statements for all leases except short-term leases (12 months or less):
  - An intangible asset that represents the government's right to use the leased asset
  - A corresponding liability for lease payments
  - Amortization expense related to the lease asset (recognizing the asset amount as an expense over the term of the lease)
  - Interest expense related to the lease liability
- Government lessors would report the following in their financial statements for all leases except short-term leases:
  - A receivable for the right to receive payments
  - A corresponding deferred inflow of resources to reflect resources related to future periods.
  - Lease revenue (and a corresponding reduction in the deferred inflow) systematically over the term of the lease
  - Interest revenue related to the receivable

GASB 34

The GASB Project for improving GASB 34 will consider enhancement to major features of the financial reporting model (GASB, 2015). The project will include:

- MD&A: Explore options for enhancing the financial statement analysis from the MD&A and clarify guidance for presenting currently known facts, decisions, or conditions expected to have a significant effect on financial position or results of operations.

- Government-Wide Financial Statements: Explore alternatives for the format of the statement of activities and assess whether the value of the information provided by a government-wide statement of cash flows would outweigh the costs of providing that information.

- Major funds: Explore options for providing additional information about debt service funds.

- Governmental Fund Financial Statements: Explore a conceptually consistent measurement focus and basis of accounting and develop a related presentation format for governmental fund financial statements.

- Proprietary Fund Financial Statements: Explore options for enhancing the consistency and usefulness of presenting operating and non-operating revenues and expenses.

- Budgetary Information: Explore option for enhancing the consistency of the presentation method and value of budgetary information.

GASB 55

- Reduce the GAAP hierarchy to two categories of authoritative GAAP from the four categories. The first category of authoritative GAAP would consist of GASB statements of Governmental Accounting Standards. The second category would consist of GASB Technical Bulletins and Implementation Guides, as well as guidance from the American Institute of CPAs that is specifically cleared by the GASB.

- Improve financial reporting for governments by clearly identifying the appropriate accounting guidance to apple

- Improve implementation guidance by elevating its authoritative status and, therefore, requiring that all implementation guidance be exposed for public comment.

GASB 45

- Recognize the cost of benefits in periods when the related services are received by the employer

- Provide information about the actuarial accrued liabilities for promised benefits associated with past services and whether and to what extent those benefits have been funded.

- Provide information useful in assessing potential demands on the employer's future cash flows.

GASB 68

- Establishes standards for measuring and recognizing liabilities, deferred outflows of resources, and deferred inflows of resources, and expense/expenditures.

- For defined benefit pensions, this statement identifies the methods and assumptions that should be used to project benefit payments, discount projected benefit payments to their actuarial present values, and attribute that present value to periods of employee service.

- Disclosure and required supplementary information requirements about pension also are addressed.

- Distinctions are made regarding the particular requirements for employers based on the number of employers whose employees are provided with pensions through the pension plan and whether pension obligations and pension plan assets are shared.

- This statement details the recognition and disclosure requirements for employers with liabilities (payables) to a defined benefit pension plan and for employers whose employees are provided with defined contribution pensions.

- This statement also addresses circumstances in which a non-employer entity has a legal requirement to make contributions directly to a pension plan.

GASB 70

- Recognize a liability when qualitative factors indicate that it is more likely than not that the government will actually be required to make a payment as a result of the guarantee agreement.

- Qualitative factors could include such events as the issuer experiencing a significant financial hardship, like the loss of major revenue source, breaching a debt contract, such as a failure to meet rate covenant, or initiating the process of entering into bankruptcy protection proceedings or a financial reorganization.

- The statement requires government to assess qualitative factors and historical data, if any, on frequency of default in relation to the group of guarantees rather than each individual guarantee.

- The amount of the liability reported by the guarantor should be the discounted present value of the best estimate of the costs expected to be incurred. When there is no best estimate, but a range of estimated costs can be established, the amount of the liability should be the minimum amount with the range.

- Government that received a non-exchange financial guarantee should continue to report a liability until legally released as an obligor if it is required to repay a guarantor for making a payment on a guaranteed obligation or for legally assuming the guaranteed obligation. In situations in which a government is released as an obligor, the government recognizes revenue as a result of being relieved of the obligation.

Appendix I: Artilcle Example

1. **GASB Fair Value Draft**

No.	Online Article		
	Tittle	Author/Affiliation	Link
1	GASB proposes measurement, fair value approaches	Ken Tysiac/Journal of Accountancy	http://www.journalofaccountancy.com/News/20138214
2	GASB Exposure Draft Tackles Fair Value	NACUBO	http://www.nacubo.org/Business_and_Policy_Areas/Accounting/Accounting_News/GASB_Exposure_Draft_Tackles_Fair_Value.html
3	GASB Endowments Rule Requires Fair Value Reporting	Melissa Hoffmann Lajara	http://www.nysscpa.org/trustedprof/1207a/tp7.htm
4	It's Beginning To Look A Lot Like FASB! Fair Value Measurement and Application	Michelle Watterworth	http://www.plantemoran.com/perspectives/articles/2013/Pages/fair-value-measurement-and-application.aspx
5	AICPA Supports GASB Preliminary Views on Fair Value Measurement	AICPA	http://www.aicpa.org/advocacy/cpaadvocate/2013/pages/aicpasupportsgasbpreliminaryviewsonfairvaluemeasurement.aspx
6	Government Fair-Value Rule Issued	Marie Leone	http://ww2.cfo.com/accounting-tax/2007/11/government-fair-value-rule-issued/
7	CBO: Change Public Pension Accounting to Fair-Value Method	Chief Investment Officer	http://www.ai-cio.com/channel/REGULATION,_LEGAL/CBO__Change_Public_Pension_Accounting_to_Fair-Value_Method.html
8	GASB finalizing new standard	Randy Finden	http://americancityandcounty.com/mag/government_gasb_finalizing_new

No.	Online Article		
	Tittle	**Author/Affiliation**	**Link**
9	AI Expresses Support for GASB Fair Value Exposure Draft	Appraisal Institute	http://www.myappraisalinstitute.org/ano/DisplayArticle/Default.aspx?volume=15&numbr=15/16&id=22297
10	GASB Issues Proposals on Concepts for Measurement of Assets and Liabilities and on the Measurement and Application of Fair Value	John Pappas	http://www.marketwatch.com/story/gasb-issues-proposals-on-concepts-for-measurement-of-assets-and-liabilities-and-on-the-measurement-and-application-of-fair-value-2013-06-20
11	GASB	Dan Crippen/National Governors Association	http://www.nga.org/cms/home/federal-relations/nga-letters/executive-committee-letters/col2-content/main-content-list/april-16-2012-letter---gasb.html

2. **GASB Statement No. 34**

No.	Online Article		
	Tittle	**Author/Affiliation**	**Link**
1	GASB Statement 34 Has Major Impact On Government Accounting	Don Frey/BUCS Fund Accounting Software	http://www.drfrey.com/gasb.html
2	How To Implement GASB no. 34	BRUCE W. CHASE AND LAURA B. TRIGGS/Journal of Accountancy	http://www.journalofaccountancy.com/issues/2001/nov/implementgasbno34.htm
3	Cities Find Unexpected Benefits From GASB 34 Compliance	Keri L. Samson/CartêGraph Systems, Inc	http://www.esri.com/news/arcuser/0103/gasb34.html
4	GASB Statement No. 34: THE DAWN of a New Governmental Financial Reporting Model	Laurence E. Johnson and David R. Bean/The CPA Journal	http://www.nysscpa.org/cpajournal/1999/1299/f141299a.html
5	All assets are not alike under GASB 34	Dennis H. Ross, P.E./APWA	http://www.apwa.net/Resources/Reporter/Articles/2001/9/All-assets-are-not-alike-under-GASB-34
6	What on Earth is GASB-34 and why should you care?New Accounting System Will Impact Small Systems	Patrick A. Taylor, P.E. and Linda Jordan/West Virginia Department of Health and Human Resources	http://www.nesc.wvu.edu/ndwc/articles/OT/SU01/OTsu01_GASB34.html
7	GASB Statement 34	The University of Tennessee	http://ctas-eli.ctas.tennessee.edu/reference/gasb-statement-34
8	GASB 34: We're on a Road to Nowhere (Because We're Depreciating Like It's 1999)	Ed Jones/Service Management 360	http://www.servicemanagement360.com/2013/04/22/gasb-34-linear-assets-depreciation/
9	GASB 34	Rumorcheck.org	http://www.rumorcheck.org/GASB34.html

No.	Online Article		
	Tittle	**Author/Affiliation**	**Link**
10	GASB 34 requirements	Jay Wickham/Public Works	http://www.pwmag.com/surveying/gasb-34-requirements.aspx
11	New Exposure Draft Amends Portions of GASB 34	AccountingWeb	http://www.accountingweb.com/topic/new-exposure-draft-amends-portions-gasb-34
12	Achieving the Potential of GASB 34	Rick Kermer	http://www.revenuecost.com/blog/budgeting/achieving-the-potential-of-gasb-34-251
13	The Great GASB….Evaluating GASB Statement 34	Heather Ricard	http://muniassnsc.blogspot.com/2014/02/the-great-gasb_20.html