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Fiscal Health Analysis Of Texas And Its Municipalities

Mary Fischer
The University of Texas at Tyler

Treba Marsh
Stephen F. Austin State University, tmarsh@sfasu.edu

Esther Bunn
Stephen F Austin State University, estherbunn@sfasu.edu

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Mary Fischer, University of Texas at Tyler, USA
Treba Marsh, Stephen F. Austin State University, USA
Esther Bunn, Stephen F. Austin State University, USA

ABSTRACT

Recently insolvent municipalities have declared bankruptcy when they are unable to meet their bond debt or pay their outstanding liability obligations. This analysis looks at the fiscal health of Texas municipalities who have issued debt in the past two years to identify those suffering financial stress that would possibly result in the municipality seeking bankruptcy to resolve its fiscal issues.

This investigation analyzes the State of Texas and local municipalities' fiscal health using the revised Altman Z-Score with the government's annual financial report data. Additional analysis relating the Z-score to entities' bond rating is reported. These findings provide an effective mechanism for investors and interested citizens to evaluate and identify distressed governmental entities with a possible bankruptcy risk.

Keywords: Altman Z-Score; Municipal Fiscal Issues; Municipal Bankruptcy; Bond Ratings

BACKGROUND

*M*unicipal bonds are debt securities issued by state and local governments or other municipalities to raise capital for governmental purposes. Over 80,000 municipalities issue two types of municipal bonds in the United States, e.g., general obligation and revenue bonds (Johnston, 2013). A general obligation bond has full faith and credit backing of an issuer, which is generally obligated to repay the debt, mainly through taxation. A revenue bond relies on specific or designated revenues for repayment rather than taxation.

There is growing concern over the substantial increase in the municipal bond market during the last decade. In 2001, the total amount of municipal debt outstanding was $1.6 trillion. By 2011, the amount of debt outstanding had grown by a substantial 133.8% increase - to $3.74 trillion (Johnston, 2013). Bond ratings for any type of bond based on a rating agency's opinion of the creditworthiness of an issuer are extremely important for investors who are trying to evaluate risk and make investment decisions.

This exploratory study analyzes Texas and Texas local governments using a revised Altman (2000) bankruptcy prediction model to ascertain existing fiscal distress. A comparison of bond ratings with the distress analysis is made to determine whether meaningful correlations exist.

Municipal Bankruptcy

Corporations and individuals have been filing for bankruptcy since the 1800's. However, there was no option for municipalities to file for bankruptcy until the 1930's, when Congress enacted municipal bankruptcy legislation in response to lawsuits against municipalities that had become unable to repay their debt obligations (United States Courts, 2013). Chapter 9 bankruptcy can be filed by a municipality when it has been determined that a municipality has become insolvent and is unable to satisfy their debt obligations as they mature.

Historically, filings for Chapter 9 bankruptcies have been extremely rare, with only 600 filings since 1937 (Spiotto, 2008). However in 2011, there were 13 filings for Chapter 9 bankruptcy which more than doubled the six that were filed in 2010 (Wozniacka, 2012). According to *Governing* (2013), there have been 38 municipal bankruptcies filed since 2010, eight of which were local government bankruptcies. Detroit, Michigan, filed for bankruptcy on July 13, 2013, which is the largest municipal bankruptcy filing in U.S. history, with approximately $18-20 billion of unfunded debt (Fletcher, 2013).

The major factor in the growing number of local governmental bankruptcies is the amount of underfunded pension and other post-employment benefits accrued by local governments. According to The Pew Charitable Trusts (2013) report of cities with a population of 500,000 or more, those municipalities have $385 billion in pension liabilities, of which 26% ($99 billion) is unfunded and $126.2 billion in other post-employment benefit (OPEB) liabilities, of which 94% ($118 billion) is unfunded. Thus, there is growing concern about municipalities' ability to repay their long-term debt obligations and unfunded employee benefit liabilities. Consequently, there is a growing risk for investing in these municipal bonds creating a new dynamic in the world of municipal investing.

Fiscal Health Determinates

Analyzing fiscal health and predicting bankruptcy in firms has long been a hot topic and research area of interest. Since the 1930's, there has been a number of bankruptcy prediction models (Beaver, 1966; Ohlson, 1980; Mossman et al., 1998; Grice and Dugan, 2001; Bellovary et al., 2007). In 1968, Altman published a multivariate discriminate analysis (MDA) bankruptcy prediction model to determine the simultaneous effect that multiple independent variables have on a qualitative dependent variable. Altman's 1968 original discriminate function model is:

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.06X_4 + 1.0X_5$$

where

X_1 = Working capital/ Total Assets
X_2 = Retained Earnings/ Total Assets
X_3 = Earnings before interest and taxes/ Total Assets
X_4 = Market value equity/ Book value of total debt
X_5 = Sales/ Total Assets

Altman's original study of 66 publically-traded manufacturing firms was 95% accurate in predicting bankruptcy one year prior to the firm's failure. The accuracy decreased to 72% two years out and to 52% three years prior to insolvency (Altman, 1968; Anjum, 2012). Altman revised the Z score model in 2000 and 2002 to address service firms and emerging markets. The revised "Z" model only has four variables (omitting X_5) that can be applied to service and nonpublicly-traded firms as well as organizations outside of the U.S. (Altman, 2002, p. 17). The revised model is $Z = 6.56 (X_1) + 3.26 (X_2) + 6.72 (X_3) + 1.05 (X_4)$ which finds that Z-Scores of 1.10 or less indicate a distressed condition, while scores of 3.0 and above indicate a safe condition. Z scores above 1.10 through 2.9 are in a gray zone that warrants monitoring. Bond rating equivalents of these scores in the model are provided to assist entity fiscal analysis (Altman, 2002, p. 19).

Municipalities are comparable to service organizations as they do not produce goods but rather provide services, safety health and welfare benefits to a prescribed service population. Although Altman's 2002 bankruptcy prediction model has only been applied to various for-profit entities, this study uses the 2002 model to predict fiscal distress in Texas state and local governments. This study calculates the Z-Scores for Texas State and local governments and compares the Z-score with bond ratings issued for the same entities. This not only provides insight into the potential financial trouble of Texas municipalities, it also enables municipal bond investors to better analyze potential "safe" investments.

Municipalities In The Study

Texas has 254 counties and 1,209 municipalities within its borders. Since this study compares the bond rating to the Z-Scores, only Texas municipalities that issued bonds in 2011 and 2012 are included in the study to narrow the sample size. Texas State and local municipal bond issuance data were obtained from Morning Star Direct and Reuters databases. Obtaining financial information for the entities included in the sample became an issue as a few of the entities did not have published or available financial report information. As a result, the municipalities without available financial data or missing data are deleted from the study, resulting in a sample of 85 state and local municipal entities.

Financial Data Collection

A Comprehensive Annual Financial Report (CAFR) for the State of Texas and the 84 local governments in the study is used to gather financial information necessary to calculate each of the Z-Score model ratios. Each CAFR was analyzed line-by-line to collect the appropriate data. The data for each entity included total current assets, total current liabilities, total assets (including any deferred outflows), unrestricted net assets together with net capital assets, net asset change, total liabilities, total net assets, total revenue, transfers, gains and losses. The collected data with the information needed to calculate the Z-Scores was audited by the third author. An audit error of less than 2% was found primarily due to typos and transposed numbers.

Based on perception, the authors hypothesize that the Z-Score analysis will find very few, if any, Texas state and local municipalities in the "gray" zone and few, if any, in the distress zone. This expectation is drawn from the perception that Texas has managed its money and budgets well and the various municipalities have managed their fiscal affairs in the same way.

Government Financial Data Conversion To Z-Scores

A conversion of government financial data is necessary to apply the Altman's 2002 Z-Score Model analysis. For-profit entities base their financial reporting on full accrual accounting standards set by the Financial Accounting Standards Board (FASB). To obtain comparable information for government entities, this study uses the full accrual information reported in the 2012 governmental-wide financial reports for governmental activities whose reporting standards are set by the Governmental Accounting Standards Board (GASB). These differences warranted little manipulation to convert certain elements of governmental reporting to make them compatible with Altman's model.

- X_1 variable is computed as (current assets-current liabilities)/total assets. In order to convert the government reported data to match for-profit model, deferred outflows (formerly reported as an asset) reported in the statement of net assets is added to total assets. None of the municipalities in this study report deferred outflow recognition (GASB, 2010; GASB, 2012), so the adjustment to total assets was not necessary.
- X_2 variable is computed as retained earnings/total assets. This study uses unrestricted net assets as a proxy for retained earnings. Capital assets net of related debt (capital asset equity) is added to unrestricted net assets as for-profits' capital asset equity is included in their retained earnings.
- X_3 variable is computed as earnings before interest and taxes/total assets. Change in unrestricted net assets serves as a proxy for earnings for governmental entities.
- X_4 variable is computed as book value of equity/total liabilities. Total net assets is used as the book value of equity as governments do not yet record fair value, and deferred inflows (GASB, 2010; GASB, 2012) is added to total liabilities. None of the municipalities in the study report deferred inflow, so no adjustment was made to the total liabilities balance.

STUDY FINDINGS AND RESULTS

Z-scores using the 2002 Altman model and governmental financial data were calculated. A correlation analysis of the four ratio variables in the model was performed to ensure no violation of the assumption of

normality, linearity and homoscedasticity. No significant correlation greater than r=.44 was found.

The result of the Z-Scores calculation is quite interesting. The sample includes the state of Texas and 84 various Texas counties and municipalities. The Z-Scores for the 85 entities produce entities in each Zone, as shown in Table 1.

Table 1: Z-Scores And Bond Rating For Texas And Texas Municipalities

Texas Entity	Z-Score	Bond Rating	Altman Z-Score* Bond Rating Conversion	Texas Entity	Z-Score	Bond Rating	Altman Z-Score* Bond Rating Conversion
Sealy	0.627	N/R		Travis County	4.540	A1	3.60
Irving	1.185	Aaa	4.90	Vidor	4.557	N/R	
Royse City	1.465	N/R		Lake Worth	4.589	N/R	
San Antonio	1.601	Aaa	4.90	Del Rio	4.648	AA-	3.75
Melissa	1.815	A1	3.60	Brenham	4.654	N/R	
Denton County	2.149	Aaa	4.90	Texas	4.665	Aaa	4.90
Elgin	2.280	A1	3.60	Nederland	4.673	N/R	
Shenandoah	2.386	N/R		San Patricio	4.768	N/R	
Austin	2.754	AAA	4.90	Bay City	4.786	N/R	
Dallas	2.841	Aaa	4.90	Kingsville	4.794	N/R	
New Braunfels	2.897	N/R		Carrollton	4.833	Aa2	4.05
Bryan	3.017	N/R		Taylor	4.878	N/R	
Randall County	3.027	N/R		Jacksonville	5.003	N/R	
Robinson	3.144	A+	3.60	Seguin	5.244	A2	3.40
Bastrop	3.156	AA-	3.75	Portland	5.255	A+	3.60
Hays County	3.159	AA	4.05	Grayson County	5.264	AA-	3.75
Tarrant County	3.165	N/R		Caldwell County	5.290	N/R	
Leander	3.221	Aa3	4.05	Corsicana	5.301	A2	3.40
Killeen	3.249	AA	4.05	Round Rock	5.363	A+	3.60
Harker Heights	3.345	A+	3.60	Harris County	5.515	AAA	4.90
Hidalgo County	3.390	AA-	3.75	Mont Belvieu	5.566	N/R	
Roanoke	3.394	A2	3.40	Sherman	5.614	N/R	
Sanger	3.416	N/R		Mount Pleasant	5.799	N/R	
Temple	3.468	N/R		Euless	5.854	Aa2	4.05
Copperas Cove	3.532	AA-	3.75	Hudson Oaks	5.869	N/R	
McLennan County	3.589	N/R		Wichita Falls	6.016	A1	3.60
Fort Bend County	3.589	A2	3.40	Plano	6.104	AAA	4.90
Bastrop County	3.601	AA-	3.75	The Colony	6.141	N/R	
Bexar County	3.604	Aaa	4.90	Vernon	6.160	N/R	
San Marcos	3.618	N/R		Oak Ridge North	6.436	N/R	
Victoria	3.743	AA	4.05	Hopkins County	6.498	Ba3	1.50
Jefferson County	3.805	N/R		Saginaw	6.690	Aa3	4.05
Wharton	3.805	A2	3.40	Hill County	6.729	N/R	
Palmer	3.824	N/R		Midlothian	7.108	AA-	3.75
Bunker Hill Village	3.933	AAA	4.90	Allen	7.405	AAA	4.90
Hewitt	3.937	AA-	3.75	Trophy Club	7.473	N/R	
Pflugerville	4.060	AA-	3.75	Nacogdoches	7.584	AA-	3.75
Keller	4.102	AA	4.05	Shavano Park	9.024	N/R	
Bell County	4.128	N/R		Balcones Heights	9.312	N/R	
Gilmer	4.130	A+	3.60	Coleman	11.115	N/R	
Missouri City	4.180	N/R		Snyder	19.820	N/R	
Hillsboro	4.357	A	3.40	Sweetwater	22.658	AA-	3.75
Laredo	4.472	AA	4.05		*(Altman 2002, p 19)		

The results of the Z-Scores are interesting as only one entity in the sample is considered to be *distressed* and 87% (n=74) of the entities are considered safe or low risk for bankruptcy (see Table 2). As expected, the state of Texas has a Z-Score (4.665) considered in the safe zone. However, the capitol, Austin (2.754), along with the major cities of Dallas (2.841) and San Antonio (1.601), are in the gray zone. Sealy, Texas is the one entity found to be distressed (0.627).

Table 2: Texas Entities In Each Zone

Zone	Number Of Entities
Safe	74
Gray	10
Distressed/High Probability For Bankruptcy	1

Sealy is a small city with a population of 6,000 and is located 50 miles west of downtown Houston. Wal-Mart is the City's major employer employing 15.4 % of the population. The average household income is $72,009. The area has several manufacturing and industrial facilities that add to the relative stability of the local 6.3% unemployment rate, which is less than the state 6.9% rate. Sealy currently enjoys a favorable economic environment and local indicators point to continued stability. However, the financial picture of the City is not as favorable.

The city's 2012 CAFR reports current assets of $1.53 million and current liabilities of $2.05 current liabilities. Thus, the city's current ratio is only 75, which is not favorable as the city does not have short-term solvency to meet its current obligations. A measure that is reasonably favorable is the city's debt ratio. In 2012, total liabilities of $11.8 million are 67 % of the $17.6 total assets, indicating the city has quite a bit of debt and may find that obtaining additional financing could come with a high rate of interest. An alarming measure is the city's total liabilities of $11.8 million to net assets of only $5.7 million, resulting in a ratio of 2.07 %, which is less than a favorable degree of risk that is influenced by a $-5.04 million unrestricted net asset balance. Unfortunately, Sealy's 2012 general bond obligation issuance was not rated by Moody's, S&P or Fitch.

A component of this investigation is a comparison of the Z-Score findings with the credit ratings of the 85 entities in the study. A "triple A" rating (AAA or Aaa) is the highest rating that can be assigned to an issuer; it indicates the highest possible creditworthiness an issuer can be assigned. Naturally, it would be assumed that issuers with a Z-Score in the safe zone would likely be assigned a triple A rating and issuers with a Z-Score in the distress zone would be assigned a much lower rating. However, rating agencies have access to information as to whether the municipality has a letter of credit or bond insurance that impacts the rating decision that is not available to financial statement users. Interestingly enough, there is not a comparison between the Z-Score and bond ratings. The correlation was -0.152 (α=.01). The Z-Scores of those entities in the safe and distress zones were compared with their assigned credit ratings. Table 3 displays the entities in the distressed and gray zones, together with their Z-Score and bond credit rating, which are significantly different (α=.001).

Table 3: Texas Entities In The Distressed And Gray Zones

Zone	Entity	Z-Score	Bond Rating
Distressed	Sealy	0.6268	N/R
Gray	Irving	1.1850	Aaa
	Royse City	1.4653	N/R
	San Antonio	1.6009	Aaa
	Melissa	1.8150	A1
	Denton County	2.1494	Aaa
	Elgin	2.2799	A1
	Shenandoah	2.3864	N/R
	Austin	2.7515	AAA
	Dallas	2.8409	Aaa
	New Braunfels	2.8968	N/R

It is interesting to note that of the ten gray zone municipalities, five have a triple A credit rating, which is the highest bond rating possible. This is surprising as this group of entities is expected to hold an average or lower than an A1 bond rating. Out of the 74 entities that were in the safe zone, only seven (less than 10%) hold the highest

credit ratings available AAA/Aaa (see Table 1). Sweetwater, with the highest calculated Z-Scores in the safe zone, only has a bond rating of AA-. Yet, Hopkins County only holds a bond rating of Ba3, which is a speculative grade bond rating. The municipalities in the safe zone were expected to hold a triple A bond rating or at least an A- or greater.

CONCLUSION

The Altman Z-Score remains popular despite a host of criticisms. The score is easy to use and compare organizations, and the prediction is right more often than it is wrong. While Altman's original model (1968) may be somewhat out of date, simple adjustments (Altman, 2002) have made the model applicable to a wider industry application providing a means for analysis by those concerned with the fiscal health of an entity to calculate a meaningful measure.

This study provides further insight into the financial condition of the state of Texas and its local municipalities. As anticipated, only one local Texas municipality is in the Distressed Zone and at fiscal risk. More analysis is needed to determine if Sealy, Texas has the fiscal capacity to sustain itself. A majority of the ten municipalities that are in the Gray Zone are large municipalities with diverse constraints and concerns. Future analysis is warranted to ascertain if these municipalities remain fiscally stable or inch into decline.

An interesting aspect of the financial information in this study is the fact that current government GAAP does not require the governments' pension and OPEB liabilities to be reported. These obligations are considerably underfunded (Pew, 2013) and the current Z-score ratios and computations do not include these obligations, which have been a major obligation in the recent municipal bankruptcy filings. However, representatives of the rating agencies (Jacob, 2014; Blake, 2014) claim pension and OPEB liabilities have been incorporated in their rating analysis for the past few years which could lead to the lack of correlation between bond ratings and the distress analysis. Although municipal bonds have always been considered a source of extremely safe and very low-risk investments, this study finds that this may not be the case in the future.

AUTHOR INFORMATION

Mary Fischer, Ph.D., Professor, College of Business & Technology, The University of Texas at Tyler, Texas. Her research interest includes financial accounting, nonprofit and government organizations, auditing and accounting education. E-mail: mfischer@uttyler.edu. (Corresponding Author)

Treba Marsh, DBA, Professor, Gerald W. Schlief School of Accountancy, Stephen F. Austin State University, Nacogdoches, Texas. Her research interest includes state and local public finance, financial accounting, internal controls, and public budgeting. E-mail: tmarsh@sfasu.edu.

Esther Bunn, MPA, Lecturer, Gerald W. Schlief School of Accountancy, Stephen F. Austin State University, Nacogdoches, Texas. Her research interests include accounting education and financial accounting. E-mail: estherbunn@sfasu.edu.

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