

Is Management Performance a Factor in Municipal Bond Credit Ratings? The Case of Texas School Districts

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Municipal bond ratings are an important determinant of interest costs that a bond issuer must pay. The three major bond rating firms profess that economic and management factors are considered in assigning a bond rating. The management component is of particular interest to public administrators because they can exert more direct control over management factors. Management factors have not been studied empirically in the literature because management performance is generally difficult to quantify. However, the public education sector has seen advances in performance measures and at the same time has increasingly relied on municipal bonds to finance construction. **The ordered probit estimation provides support that management performance, as measured in the districts performance on standardized test scores and success in student college admission rates, does influence Texas school district bond credit ratings.**

INTRODUCTION

State and local governments have increasingly turned the municipal bond market to finance schools, parks, roads, and other capital projects. In the November 2006 election the public approved \$67.6 billion of municipal bond issues, an increase of more than \$20 billion since the 2002 elections.¹ State and local government administrators are obviously concerned about the interest costs associated with the financing of municipal bonds. A primary determinant of interest rates on a municipal bond issue is the bond credit rating.

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1. <http://www.ncsl.org/programs/fiscal/bonds06vote.htm>

A bond credit rating assigned by one (or more) of the three major rating firms—Fitch’s, Moody’s, and Standard & Poor’s—provides a ranking of the credit risk associated with a bond. The rating firms consider factors such as credit enhancements, collateral, revenue risk, current debt balances, economic factors, and tax burden in determining the credit rating.

The three major rating firms also indicate that management factors are considered in assessing the credit rating. Standard & Poor’s states “proper assessment of credit quality involves an evaluation of the basic underlying economic strength of the entity, as well as the effectiveness of the governing process to manage performance and address problems.”² The research on municipal credit risk has addressed the economic dimensions to credit risk analysis, but the management dimension to credit risk analysis is largely neglected. The management component is of particular interest to public administrators because they can exert some control over the management factors, while the economic factors are largely beyond their direct control. One reason that the management factors have not been studied is that management performance is often difficult to quantify. However, performance evaluation has received more attention over recent decades resulting in more quantitative measures of management performance.

Education is one example of a public sector that has seen advances in quantified performance measures such as standardized tests. At the same time, school districts have seen an increase in the use of municipal bonds to finance the construction and refurbishing of schools. Over the last decade, many school districts have struggled to balance operational requirements, capital improvement and educational objectives because of the growing population in some parts of the country and increased infrastructure needs. In addition, state aid, one of the major funding sources, has been reduced dramatically due to the negative impact of economic downturn. More and more local school districts across the country find it necessary to issue debt to meet their capital needs.

The objective of the research presented in this paper is to take advantage of bond finance data and performance measurement data available for Texas school districts to examine whether management factors are incorporated into the bond credit rating. It is important for public officials and administrators to know if management performance has an impact on their borrowing costs. Using the data from Texas independent school districts, a model is developed to estimate the bond credit rating that incorporates the effects of socio-economic factors, fiscal structure and strength of school performance on school bond ratings. Special attention is paid to empirically examine whether educational performance of school districts is reflected in its bond credit rating.

LITERATURE REVIEW

The default risk of tax-backed municipal bonds has generally been considered low risk, second to U.S. Government obligations. Although municipal bond defaults are relatively

2. Standard and Poor’s, *Public Finance Criteria* (New York: Standard & Poor’s, 2007): p. 7.

rare, the financial crisis of issuers like New York City, Orange County California, Philadelphia, and New Orleans have raised significant concerns about the default risk.

While the school district governments issue both general obligation bonds and revenue bonds, these two bonds do not have an equal share of education bond market. According to calculations from data reported in the *Bond Buyer Yearbook*, 72 percent of the bonds issued for education were general obligation bonds.³

The general rating criteria for GO bonds provided by S&P's look at the economic, financial, debt and management strength of an issuing body.⁴ The economic factor takes into account the issuer characteristics, demographic factors, tax base, and employment base. Financial indicators involve several areas: accounting and reporting procedures, which are consistent with GAAP; current account analysis; pensions and other long-term liabilities. Debt factors look at the type of pledged collateral, debt structure, current debt burden, and the future borrowing needs. Management factors focus on forecasting and planning, financial management, preparation of annual budget, capital improvement plan, property tax administration, and labor settlements and litigation. Other possible factors that may be considered are accounting and disclosure practices, internal controls, and staff turnover.⁵

Among the current literature on municipal bond ratings, a majority of articles investigate the factors that determine the GO bond ratings or alternatively, how these factors affect interest costs through the credit rating process.

In order to account for the ultimate effect of fiscal institutions on municipal borrowing costs, Johnson and Kriz⁶ examine how fiscal limits directly affect credit ratings. They look at the fiscal limits from revenue limits, spending limits, balanced budget requirements, debt limits, and popular vote requirements on GO debt issuance. A series of other variables, such as unemployment, which is a proxy for economic strength, personal income as wealth base of the state, own-source general revenue as tax burden, long-term debt and short-term debt measuring debt position, are taken as controls in the model. The findings suggest that own-source general revenue, spending limits, balanced budget rules, and debt restrictions have significant impacts on credit ratings.

Wilson⁷ studies the actual discriminating ability of the major variables that are employed in the credit analysis by Moody's Investors Service and Standard & Poor's Corp. The findings reveal that only the strength of the local economy is exerting a significant influence in determining a GO bond rating. He contends that there is no objective measure of credit ratings. The ratings are not likely to be completely quantified and the process of assigning a rating combines requires qualitative assessment. Alternatively, investors usually compare different bonds and the relative rankings among different

3. *Bond Buyer 2003 Yearbook* (New York: Thomson Financial, 2003).

4. Standard & Poor's, 2007.

5. Standard & Poor's, 2007: p 65.

6. Craig L. Johnson and Kenneth A. Kriz, "Fiscal Institutions, Credit Ratings, and Borrowing Costs," *Public Budgeting and Finance* 25, no. 1 (2005): 84–103.

7. Stephen R. Wilson, "Credit Ratings and General Obligation Bonds: A Statistical Alternative," *Government Finance Review* 12, no. 3 (1986): 19–22.

competing bond issuers. The rankings are based on unquantifiable perceptions of individual investors and are likely to account for the differentiated ratings. It conveys an important idea that the performance of an issuing body may have an effect on its credit rating.

Size of the jurisdiction or population, according to Simonsen, Robbins, and Helgersen,⁸ has an influence on the interest rates. The smaller jurisdictions may incur an interest cost penalty in the municipal bond market relative to larger ones. This finding emerged from their research on how management capacity influences the interest rates of municipal bonds. Simonsen and Robbins use population size as a proxy for financial management capacity because smaller communities usually have a lower level of financial-management capacity in terms of professional staff and other resources.⁹ More important, population can be a surrogate for economic base and diversity. Jurisdiction size is a determining factor for investment quality and it predicts the quality and appeal of a particular issue.¹⁰

However, Rubinfeld¹¹ in a much earlier study reports that population growth is likely to lead to a less favorable rating because of the impact of added demand for public services. This study also reveals that the rating process involves evaluation of the vector of community attributes, which leads to an ordinal ranking of communities. Two factors predicting the ratings are similar to those from other studies: ratio of the debt-to-actual assessed value and median household income. Other significant variables include percentage of taxes uncollected in the previous year and community location. Taxes uncollected measure the lack of ability and obstacles of short-term financial management for governments.

The difference between research on school debt-finance and those on general municipal security is that, besides the factors that are usually considered in the GO rating process, school finance literature also takes into account how the entity specific characteristics determine the credit quality of an issuer, namely, school district.

Bolten and Stansell,¹² using bonds issued by 50 Texas independent school districts, find a series of factors that are important in explaining bond quality variations: *demographic factor*: district size; *debt factor*: debt service coverage, total bond issues, debt capacity and floating debt; *revenue and tax factor*: reserve taxing power and funding, tax collection procedures, taxpayer income, special obligations and special funds balances, tax rate, and tax base.

8. Bill Simonsen, Mark D. Robbins, and Lee Helgersen, "The Influence of Jurisdiction Size and Sale Type on Municipal Bond Interest Rates: An Empirical Analysis," *Public Administration Review* 61, no. 6 (2001): 709–717.

9. Ibid. and Ehsan H. Feroz and Earl R. Wilson, "Market Segmentation and the Association between Municipal Financial Disclosure and Net Interest Costs," *Accounting Review* 67, no. 3 (1992): 480–495.

10. Willard T. Carleton and Eugene M. Lerner, "Statistical Credit Scoring of Municipal Bonds," *Journal of Money, Credit, and Banking* 1, no. 4 (1969): 750–764. Dale Morse and Cathy Deely, "Regional Differences in Municipal Bond Ratings," *Financial Analysts Journal* 39, no. 6 (1983): 54–59.

11. Daniel Rubinfeld, "Credit Ratings and the Market for General Obligation Municipal Bonds," *National Tax Journal* 26, no. 1 (1973): 17.

12. Steven E. Bolten and Stanley R. Stansell, "School Bond Ratings and the Cost of Capital," *RBER, Review of Business and Economic Research* 14, no. 2 (1978/1979): 54.

Several studies¹³ on school finance equality suggest that some socio-economic/demographic variables should be taken into account when we look at school districts. These variables include: district property value, district income, district unemployment, occupational structure of districts, average daily attendance, children of school age, population, and the percentage of blacks.

With the variables affecting school finance equality taken into account, Gist¹⁴ empirically analyzes variables that can explain net interest costs of Texas independent school districts. His study shows that average daily attendance, percentage of nonwhite students, property value per student and extended spending rate¹⁵ were significantly correlated with net interest costs.

Harris and Munley¹⁶ develop a model that reveals the school district bond rating process. A set of economic, demographic, and financial factors are hypothesized to play a role in the sequential decision process. The economic and demographic characteristics used by the study are median household income, student enrollment in the district, percentage of nonwhite students, and urban/rural districts. Financial variables include local tax efforts,¹⁷ year-end cash fund balance of the district, intergovernmental revenues, and gross debt. The results from the study suggest that the above factors influence the school district's decision about whether or not to acquire insurance and actual rating that an issue obtains.

The literature on credit ratings and education bond interest costs provide a foundation to build a model to predict credit ratings. However, some limitations have also emerged from the past research. As indicated by Wilson,¹⁸ the rating process is unlikely to be entirely quantified and it involves the subjective judgments, such as the comparative rankings defined over a set of community attributes.¹⁹ The subjective criteria are implicit and mainly contingent upon the perceptions of the key credit raters. These implicit factors have been nearly ignored by the past literature. Furthermore, as indicated in the S&P's rating criteria, the credit assessment process is not limited to the evaluation of economic strength and various financial measures, and it also considers "the effectiveness of the governing process to manage performance and address problems."²⁰ Therefore,

13. W. Norton Grubb and Jack W. Osman, "The Causes of School Finance Inequalities: Serrano and the Case of California," *Public Finance Quarterly* 5, no. 3 (1977): 373–392. Dean Popp and Walter Vogt, "Alternative Methods of School Finance: An Empirical Analysis of Cities in San Diego County," *American Journal of Economics and Sociology* 38, no. 4 (1979): 337–348.

14. Willie E. Gist, "The Market for School District Bonds: An Empirical Analysis of Texas Independent School Districts," *Southwest Journal of Business and Economics* 9, no. 1 (1992): 31.

15. Extended spending rate (ESR) is calculated with the following equation: $ESR = \text{total revenue} / (\text{operating expenditures} + \text{debt service costs} + \text{capital outlays})$.

16. M. H. Harris and V. G. Munley, "The Sequence of Decisions Facing School District Officials in the Bond Issuing Process: A Multistage Model," *Journal of Education Finance* 28, no. 1 (2002): 113–131.

17. Local tax effort in this analysis is defined as local tax revenue per student divided by median household income in the district.

18. Wilson, 1986.

19. Rubinfeld, 1973.

20. Standard & Poor's, *Public Finance Criteria*. (New York: Standard & Poor's, 2007).

performance of school districts in our case could correlate with the perceptions of the credit raters on a district's relative standing compared with the others.

RESEARCH MODEL

The main purpose of our study as previously stated is to examine whether management factors influence school bond ratings after controlling for economic, demographic, and financial characteristics identified in the literature. We specifically explore whether school district performance influences the credit ratings of school districts.

Performance Measures of Texas School Districts

In Texas, the Texas Education Agency (TEA) annually assigns accountability ratings to each public school and district based on their performance in Texas Assessment of Academic Skills (TAAS) and their dropout rates. Another variable widely used to assess school performance is the percentage of students admitted into college.²¹ Whether the accountability ratings and college admissions influence the bond rating assessment is one of the key questions in our study.

Also, new teacher turnover is an issue in educational practice and research because it has a negative impact on student achievement.²² More importantly for our study, teacher turnover incurs significant financial costs for the school system. The financial costs are usually from recruitment, training, mentoring, and benefits programs. Texas has a relatively high turnover rate; the estimated costs associated with teacher turnover were reported to be \$329 million for the 1999–2000 academic year according to the Texas State Board for Educator Certification (SBEC).²³ Therefore, we also want to know whether the teacher turnover of a school district may exert influence on its bond credit assignment.

Data Sources

Data used for the analyses draws from three sources: bond ratings provided by Standard & Poor's, district data from the 2002 National Center for Education Statistics (NCES), and a multiyear survey conducted by Meier and O'Toole²⁴ on public management and

21. Kenneth J. Meier and Laurence J. O'Toole, Jr. "Public Management and Organizational Performance: The Effect of Managerial Quality," *Journal of Policy Analysis and Management* 21, no. 4 (2002): 629–643.

22. E. A. Hanushek, J. F. Kain and S. G. Rivkin, "The Revolving Door: A Path-Breaking Study of Teachers in Texas Reveals That Working Conditions Matter More Than Salary," *Education Next* January 1 (2004): 77–82.

23. Texas Center for Educational Research, *The Cost of Teacher Turnover* (Austin, TX: TCEA, 2000).

24. Meier and O'Toole, 2002.

educational performance of Texas school districts. The fiscal data and school performance data for each district was available for the year 2002. The bond issue data were from years 2003 to 2005. Because most Texas school districts do not issue bonds annually, the data for the first bond issue following 2002 was matched to the fiscal and performance data from 2002 for each district. If the school district has more than one issue during the 2003–05 period, then the bond issues that follow the first issue are ignored.

Ninety-five percent of the bond issues were insured through the Texas Permanent School Fund which enhances the credit rating to AAA and, unfortunately, there were many bond issues where the Standard & Poor's underlying rating (SPUR) was not available. It is important to use the underlying credit rating in our investigation because the influence of the determinants of credit ratings would be concealed by the credit enhancement.²⁵ In addition, the analysis focuses on long-term bond issues because the credit risk of short-term debt is determined independently of long-term debt and utilizes a different rating metric. There were six districts with missing values in independent variables and these observations were omitted necessarily from the analysis. There are 247 complete observations for the analysis.

Model Specification

There are a series of commonly used variables drawn from past literature for measuring the economic, demographic, and financial characteristics of a particular school district that provide a good reference for our study. As discussed in the literature review, economic strength is generally measured by median household income, personal income and/or employment, and the value of the property tax base. **Demographic factors usually include population or population growth, average daily attendance, percentage of non-white students, and an urban/rural indicator.** Financial profiles are characterized by **tax revenue collected or uncollected, the tax rate, the cash fund balance, own-source revenue, intergovernmental transfers, the gross debt level including long-term debt, institutional restrictions, and other derived measures.** The management factors examined in our study include several indicators for school district performance: **state standardized test performance, dropout rate, college admission rate, and teacher turnover.** Therefore, a formal model of credit rating determinants is given by the following function:

$$\text{Rating} = f(E, D, F, P).$$

- *E*: Economic factors,
- *D*: Demographic factors,
- *F*: Financial factors,
- *P*: Performance factors.

25. It is also important to use SPUR as the dependent variable for econometric reasons because the 95 percent insured credit rating of AAA provides very little variance in the dependent variable. See Jun Peng, "Do Investors Look beyond Insured Triple-A Ratings," *Public Budgeting and Finance* 22, no. 4 (2002): 115–131, for a discussion of SPURs.

Dependent variable. The unit of analysis in our study is the individual bond ratings of individual Texas school districts. The underlying credit rating (SPUR) for each district's bond issue is used to create an ordinal variable ranging from 1 to 4 with a credit rating of AAA being equal to 1. The values 2, 3, and 4 of SPUR correspond to AA, A, BBB ratings. The values of SPUR in the data range from 2 to 4 because there are no bonds in the sample with a natural AAA rating.²⁶ As the dependent variable is ordinal in nature, an ordered probit maximum likelihood model is used to estimate the parameters.

Economic and Demographic Variables. The economic and demographic control variables we use are total enrollment (ENROLL), the percent of white students (PWSTUD), and the percent of low-income students (LOWINC). Total enrollment is used as a proxy for jurisdiction size of school districts. Past research shows that district size may be an advantage in the bond rating process,²⁷ so we predict that ENROLL is positively related to credit ratings. PWSTUD and LOWINC²⁸ measure the socio-economic condition of individual school districts. It is expected that PWSTUD positively affect bond ratings while LOWINC has the opposite effects.

Financial Variables. Financial measures include the percent of revenue from local sources (PCTLOC), the percent of the surplus funds balance to total expenditures (PFUNDBAL), property tax per pupil (TAXPUPIL), and debt burden measured by total debt divided by total tax base (DEBTBURD). PCTLOC describes the fiscal independence of the school district from state and federal funding. TAXPUPIL measures the ability of the district to afford debt. Districts with their own strong tax base are likely to have more stable tax revenues and be able to sustain more debt. However, an excessively high tax burden will decrease the tax base and potentially cause taxpayer revolt.²⁹ A higher surplus funds balance at the end of a year predicts an increased ability to pay for debt and is hypothesized to lift the credit ratings. DEBTBURD is the debt per tax base and measures the level of debt relative to the tax base. Excess debt relative to tax base may lead to a concern of the ability to repay debt, while an appropriate level of debt-finance may help to achieve the goals of capital projects, thus adding to fiscal health in the long run.

School District Performance Measures. The school district performance measure variables are of particular interest in our study. Four variables are utilized: the overall TAAS Exam pass rate (APASS), the four-year high school dropout rate (DROPOUT), the percentage of students admitted to college (COLPCT), and the teacher turnover percentage (TTURN). Accountability ratings are the general measurement for school district performance. It is important to note that these management performance measures are most important in comparison with other districts. For example the managerial effectiveness of a school district is not the drop out rate itself, but how the district's drop out rate compares with other districts. For this reason a district's drop out rate is compared with the average drop out rate of the sample. This produces a variable with a normal distribution around

26. A bond with a natural AAA rating is a bond that receives a AAA rating without the benefit of credit enhancement.

27. Simonsen et al., 2001; Harris and Munley, 2002.

28. This is measured the percent of students from families with incomes below the federal level to be eligible to receive free or reduced prices on school lunch.

29. Johnson and Kriz, 2005.

TABLE 1
Descriptive Statistics of Variables

Variable	Definition	Mean	SD	Min	Max
SPUR	S&P underlying rating	3.26	0.70	2.00	4.00
ENROLL	Total enrollment of school district (in thousand)	11.79	21.35	0.15	210.67
PWSTUD	Percentage of nonwhite students	52.57	29.57	0.00	99.00
LOWINC	Percentage of low-income students	45.36	23.05	0.00	96.60
PCTLOC	Percentage of revenue from local sources	49.81	24.77	7.00	99.00
TAXPUPIL	taxable property per pupil (in thousands)	237.61	247.64	26.173	2,929.03
DEBTBURD	Ratio of total debt to taxable property value	0.05	0.04	0.00	0.28
PFUNDBAL	Percentage of surplus funds balance	14.93	10.00	0.00	57.00
APASS	Deviation from average TAAS Exam pass rate	− 0.15	6.83	− 24.19	11.91
DROPOUT	Deviation from average four-year dropout rate	0.03	3.49	− 4.94	13.56
COLPCT	Deviation from average college admission percentage	0.07	12.24	− 23.36	46.44
TTURN	Deviation from average teacher turnover percentage	0.10	5.83	− 13.39	25.41

Note: Summary statistics are presented based on 247 observations that are used to estimate parameters in Tables 2 and 3.

ENROLL, total enrollment; PWSTUD, percent of white students; LOWINC, low-income students; PCTLOC, percent of revenue from local sources; TAXPUPIL, property tax per pupil; DEBTBURD, debt burden measured by total debt divided by total tax base; PFUNDBAL, percent of the surplus funds balance to total expenditures; APASS, overall TAAS Exam pass rate; DROPOUT, dropout rate; COLPCT, percentage of students admitted to college; TTURN, teacher turnover percentage.

zero with positive values representing districts above average and negative values for districts below average. This same technique is used to adjust the standardized test pass rates, the percent admitted to college, and the teacher turnover percent. APASS and COLPCT are expected to lead to higher bond ratings. Owing to the negative impact associated with teacher turnover,³⁰ TTURN should lead to a reduction in credit rating.

Table 1 provides a summary of statistics for the variables used in this study. All these variables capture a variety of factors that are expected to impact the perception of credit raters about the credit quality of a school district.

30. Hanushek et al., 2004; Texas Center for Educational Research, 2000.

RESEARCH FINDINGS

The maximum likelihood estimation for the ordered probit model is presented in Table 2. The overall model fit is statistically significant as identified by the chi-squared test. The variables of most interest are the management performance variables of APASS, DROP-OUT, COLPCT, and TTURN. All these variables demonstrate correlation in the expected direction. Note that SPUR is set up with better credit ratings being represented by lower numbers. Therefore, an increase in the SPUR variable corresponds to a decrease in credit quality. APASS and COLPCT are statistically significant at an α equal to, respectively, 5 and 10 percent. Thus a district that improves the percent of students passing the TAAS relative to the state average increases the probability that the district will get a better bond credit rating. The same interpretation applies to the percent of students in a district that go on to attend college. Districts that increase the percentage of students admitted to college relative to the state average will increase their probability of getting a better bond credit rating. The variables of DROPOUT and TTURN are not statistically significant.

The findings are also generally consistent with prior research on the economic, demographic, and financial determinants of bond credit ratings. First, the total enrollment (ENROLL) is positively associated with the likelihood of getting a better credit rating. The coefficient for the percentage of revenues coming from local sources (PCTLOC) is significant at the 0.1 level, indicating that a relative increase in local sources of funding for a particular school district is associated with a better bond credit rating. The

TABLE 2
Ordered Probit Maximum Likelihood Estimates (MLE)

SPUR_N	Coef.	Robust SE	Z	P > z
ENROLL	− 0.0001	0.0000	− 5.01	0.00
PWSTUD	0.0297	0.0072	4.15	0.00
LOWINC	0.0209	0.0099	2.11	0.04
PCTLOC	− 0.0297	0.0051	− 5.87	0.00
TAXPUPIL	− 0.0002	0.0003	− 0.60	0.55
DEBTBURD	− 1.9490	1.9952	− 0.98	0.33
PFUNDBAL	− 0.0121	0.0101	− 1.21	0.23
APASS	− 0.0452	0.0210	− 2.15	0.03
DROPOUT	− 0.0290	0.0297	− 0.98	0.33
COLPCT	− 0.0175	0.0093	− 1.88	0.06
TTURN	0.0004	0.0161	0.03	0.98

Number of obs = 247; Probability $> \chi^2 = 0.0000$; Wald $\chi^2(10) = 100.87$; Log pseudolikelihood = − 138.88454. ENROLL, total enrollment; PWSTUD, percent of white students; LOWINC, low-income students; PCTLOC, percent of revenue from local sources; TAXPUPIL, property tax per pupil; DEBTBURD, debt burden measured by total debt divided by total tax base; PFUNDBAL, percent of the surplus funds balance to total expenditures; APASS, overall TAAS Exam pass rate; DROPOUT, dropout rate; COLPCT, percentage of students admitted to college; TTURN, teacher turnover percentage.

TABLE 3
Marginal Effects of Explanatory Variables

	SPUR_N = 2 (AA)	SPUR_N = 3 (A)	SPUR_N = 4 (BBB)
ENROLL	0.0036	0.0171	− 0.0207
PWSTUD	− 0.0016	− 0.0078	0.0094
LOWINC	− 0.0012	− 0.0055	0.0067
PCTLOC	0.0016	0.0078	− 0.0094
TAXPUPIL	0.0000	0.0000	− 0.0001
DEBTBURD	0.1065	0.5069	− 0.6134
PFUNDBAL	0.0007	0.0032	− 0.0038
APASS	0.0025	0.0121	− 0.0147
DROPOUT	0.0018	0.0085	− 0.0103
COLPCT	0.0011	0.0051	− 0.0061
TTURN	0.0000	0.0000	0.0000

Note: None of the school districts had a natural AAA credit rating, therefore the value of the SPUR does not take the value of “1” for any district.

ENROLL, total enrollment; PWSTUD, percent of white students; LOWINC, low-income students; PCTLOC, percent of revenue from local sources; TAXPUPIL, property tax per pupil; DEBTBURD, debt burden measured by total debt divided by total tax base; PFUNDBAL, percent of the surplus funds balance to total expenditures; APASS, overall TAAS Exam pass rate; DROPOUT, dropout rate; COLPCT, percentage of students admitted to college; TTURN, teacher turnover percentage.

percentage of students receiving free lunch is also a statistically significant factor in determining the bond credit rating. Districts with more students in the free lunch program will have increase probability of getting lower bond credit ratings. It is unexpected that an increase in the percentage of white students (PWSTUD) significantly increases the likelihood of getting a lower credit rating, holding low-income pupils constant. The tax capacity (TAXPUPIL), debt burden (DEBTBURD), and the percentage of fund balance (PFUNDBAL) are not statistically significant in this model.

One drawback in the maximum likelihood estimation is the difficulty in interpreting its statistical results. Unlike the case in linear regression models, the magnitude of effects in ordered probit models cannot be viewed directly from the coefficients. Instead, we should interpret it in terms of marginal effect. The marginal effects of an ordered probit model shown in Table 3 are calculated at the mean value of each independent variable. It gives more dynamic insight into the direction of probability changes across different categories as well as the magnitude of these changes within its corresponding boundary.

The results are consistent with the direction of coefficient shown in Table 2. For example, a district with a TAAS exam pass that is 1 percent above the average rate decreases the probability of a BBB rating by 1.47 percent, while it predicts an increase in the probability of getting an A and AA rating by 1.21 and 0.25 percent, respectively. Similarly, a district 1 percent above the average percentage of college admission

decreases the probability of getting a BBB rating by 0.61 percent, while it will increase the probability of getting A and AA ratings by 0.51 and 0.11 percent, respectively.

CONCLUSION

This study adds to the literature on school finance and bond rating practice. Previous studies on school finance tend to explain the variation in credit ratings exclusively from some explicit socio-economic and fiscal measures. Almost no research efforts have focused on other implicit factors that might also play a role in the rating process, such as the effectiveness of management performance. Of course, management performance is difficult to incorporate into credit rating models if the appropriate measures of performance cannot be quantified. The selection of an appropriate performance measure poses a challenge for municipalities and states, but school districts have an advantage here with the development of standardize tests and other metrics of school quality.

This study examines whether management performance factors influence the bond credit ratings of school districts in Texas. We use a sample of 247 bond issues by Texas school districts and match their corresponding socio-economic, financial and education performance information. The ordered probit maximum likelihood estimation provides support that management performance, as measured in the districts performance on standardized test scores and success in student college admission rates, does influence bond credit ratings.

The statistical analysis shows that school districts whose students pass the TAAS exam at a rate above average relative to other schools are likely to have better bond credit ratings, even after controlling for other fiscal and socio-economic factors. Similarly, there is statistical support that school districts that are above average relative to other schools in regard to the percentage of high school graduates that attend college are also likely to have better bond credit ratings.

Principals and district administrators have many incentives to improve performance measures, and now we add to that list that performance improvements increase the probability of receiving a better bond credit rating and, therefore, potentially reduce borrowing costs. In Texas, the school districts bonds are generally insured by the Texas Permanent School Fund and the actual interest costs reflect the benefits of AAA ratings. Presumably the costs of obtaining insurance depend on the underlying credit rating, so management performance will still affect borrowing costs. In other states, school districts do not generally have access to the state credit enhancements, but could obtain credit enhancement through privation insurance options. Insights about the different roles that demographic, economic, financial, and educational performance factors can play in the bond rating process can provide guidance for school district administrators in maintaining bond ratings.

The No Child Left Behind Act (NCLB) signed by President George W. Bush in 2002 requires the implementation of performance standards that hold schools and all school

systems accountable for student achievement. One fiscal consideration is that NCLB links financial resources to the educational performance by the incentives it provides. Consequently, educational performance may begin to have a more direct influence on the allocation of fiscal resources to the school district and thereby affect its credit quality. In particular, the high performing schools and districts are rewarded with bonuses from federal or state governments, while those with unsatisfactory performance have to devote resources to implement corrective actions.³¹

Identifying the significant role that effective performance of school districts plays in the bond rating process may help to enrich the rating criteria in the field of public education, and thus promote the efficiency of the rating process and the accuracy of credit assessment.

There is a continued interest in developing and implementing quantifiable performance measures for government agencies, and the Governmental Accounting Standards Board is currently considering standards for reporting such performance measures when available (<http://www.seagov.org/>). As more data becomes available, then additional research can provide insights on how performance measures in other public sectors might influence credit quality and borrowing costs. It is important for all public officials and administrators to better understand how management performance may impact their borrowing costs.

31. Rae Anne Dodds. "The No Child Left Behind Act (NCLB): A Texas Economic Analysis of Accountability," a dissertation in economics, Texas Tech University, 2005.