The Use of Accounting Information Before and After the Award of the MFOA's Certificate of Conformance

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Abstract

This study examines whether the Municipal Finance Officers Association's Certificate of Conformance (CC) provides an effective signal to financial statement users of cities' financial reporting quality. Bond ratings were modeled prior to and subsequent to the award of the CC. The model using accounting data subsequent to the award of the CC had a higher rate of classificatory accuracy (55.6%) than the model using accounting data prior to the award of the CC (50.6%). However, the difference in classificatory accuracy between the two models was not statistically significant.

I. Introduction

Since the fiscal crises of several large cities in the mid-1970s, interest in the need for quality financial reporting has heightened. Research into the quality of municipal financial statements have found frequent instances of deficient reporting (e.g., Ernst & Whinney, 1979; Ingram and Robbins, 1987). Deficient financial reporting is believed to be attributable to inadequate incentives of local government officials, high costs (Evans and Patton, 1983, 1987), and inadequate audits (U.S. General Accounting Office, 1986). Lowered bond interest costs and improved bureaucratic reputations provide incentives for local government officials to provide high quality financial reports (Evans and Patton, 1983, 1987). However, if users of financial statements are unable to perceive differences in the quality of financial reports, local government officials have no incentives to provide high quality financial statements. Quality differences may be difficult and costly to decode even by experts, so an easily understood surrogate of disclosure quality may be desirable. The Municipal Finance Association's Certificate of Conformance (CC)[1] award is one potential mechanism that can be used to signal high quality financial statements (Evans and Patton, 1983, 1987).

Prior research investigating participation in the CC has found several factors that are related to a city's decision to participate in the CC program. Evans and Patton (1983,1987) found that a city's need to reduce interest costs and signal high quality management was associated with an increased likelihood of CC participation, while differential costs of participation decreased the likelihood of CC participation. Their evidence is consistent with the hypothesis that managers have incentives to signal high quality financial reports, and that managers believe that the CC is an effective signal.

Other research has found that cities with the CC had lower net interest cost but similar bond ratings (Wilson and Howard, 1984). Benson, et al. (1986) found that in a model predicting net interest cost, the slope coefficients of accounting variables were different for cities that had won the CC. Benson, et al. concluded that their research provides evidence that bondholders evaluate accounting information differently when the city holds the CC. Finally, Feroz and Wilson (1992) found that new bond issues underwritten by a regional firm, but not a national firm, have lower net interest costs when the city holds the CC.

The results of cross-sectional research investigating the CC are generally consistent with the CC being an effective signal of high quality financial statements. However, no CC study has examined the same cities through time. Therefore, prior research has not provided evidence of whether the CC actually provides an effective signal to financial statement users, or alternatively, whether the CC tends to be awarded to cities that already are known to have differing characteristics.

The purpose of this study is to investigate whether the CC provides an effective signal of high quality financial statements to one group of financial statement users, bond raters. Specifically, this paper examines whether bond raters rely more heavily on financial statements that have been awarded the CC. Bond rater reliance on financial statements is proxied by the ability of financial ratios to predict bond ratings. The hypothesis to be tested is that the bond rating model is more accurate for cities that have won the CC relative to non-CC cities. To control for profile differences between cities that have been awarded the CC and other cities, this study uses a matched-pairs design in which each city acts as its own control by appearing in both the CC group and the non-CC group.

The remainder of the paper is organized as follows. The first section presents the empirical method used to test the hypothesis, including data and sample selection. The second section presents the results. The third section presents a summary and conclusions.

II. Empirical Methods

In this section, an overview of the research design is provided, and the sample selection criteria and the data are described. Then, the accounting variables to be included in the model is selected.

Two statistical models of the following form are developed:

$$BR = \alpha + \beta_1(X_1) + \ldots + \beta_j(X_j) + \varepsilon \qquad (1)$$

where:

BR = Moody's bond rating coded 4=Aaa, 3=Aa, 2=A, 1=Baa.
X1 through **Xj** are the accounting variables used to predict ratings.

Because of the nature of the dependent variable, the models were estimated using multichotomous ordered logistic regression. Both models include the same cities. The observations for the non-CC model were for a time period prior to the winning of the CC. The observations for the CC model were for a time period subsequent to the winning of the CC. The percentage of observations correctly classified were used to assess and compare the predictive accuracy of the two models. To test whether raters rely more heavily on ratings after the city has been awarded the CC, a z-test of proportions[2] was used. If the percentage of observations correctly classified by the CC model is significantly higher than that of the non-CC model, the null hypothesis of no difference in predictive accuracy is rejected.

The primary difficulty in testing the effect of the CC on users' reliance of accounting information is that the same factors that influence CC participation (e.g., form of government, Evans and Patton (1983, 1987)) may also affect the extent of reliance placed on accounting information. The reason for including the same cities in both models discussed above is to reduce the possibility that omitted variables are responsible for both the award of the CC and the use of accounting information.

Because bond ratings are predicted both before and after the award of the CC, the first sample selection criterion is that the city must have won the CC during the sample period. Data for cities that won the CC are available for fiscal years ending 1977-1985.3 Accounting information is available from the Bureau of Census Survey of Governments, but only through fiscal years ending in 1985. Therefore, the sample was restricted to the period 1977-1985.

Prior local government bond rating research has predicted ratings without regard to whether the rating was actually reviewed in the year the statistical model was tested (e.g., Carleton and Lerner, 1969; Michel, 1976). Because ratings are not reviewed for years in some cases, the statistical model predicted ratings with accounting information that could not have been used by raters. To avoid this problem, only cities with bond ratings that have been reviewed are included in the sample. In summary, for a city to be included in the sample, all of the following criteria must apply: (1) accounting information is available during the sample period (i.e. 1977-1985), (2) the city's general obligation (G.O.) bond must be rated (i.e. reviewed) in a year after the city did not win the CC, (3) the city's G.O. bond must be rated in a year after the city did win the CC. The final sample consisted of 81 cities. Because each city appears in both statistical models, each model will have 81 observations.

Before the two logistic regression models can be estimated, accounting variables must be selected. Numerous studies have used accounting information to explain local government G.O. bond ratings (Horton, 1971; Michel, 1977; Wallace, 1981; Wilson and Howard, 1984) or ratings changes (e.g., Raman, 1981; Copeland and Ingram, 1982; Marquette, et al. 1982, 1986). Accounting data gathered by the Bureau of Census are used in this study. Copeland and Ingram (1982) is the only rating/rating change study to rely exclusively on Bureau of Census data.[3] Therefore, the variables used by Copeland and Ingram will serve as a basis for the variables selected for this study. The Copeland and Ingram paper did not disclose which accounting variables were significantly related to rating changes. They used 28 accounting variables to explain rating changes.

Of the 28 variables, 10 were trend variables. Because ratings, rather than rating changes, are being predicted the 10 trend variables are not considered. Table 1 lists the remaining 18 variables and the default risk constructs they are intended to proxy.[4]

All eighteen variables could be used to predict ratings, but with only 81 observations per model this procedure would lead to data overfitting (Stone and Rasp, 1991). To alleviate data overfitting, a subset of the variables is selected through the use of a stepwise logistic regression model applied to the pooled observations. This procedure selected a sample set of predictor variables for both the CC and non-CC models. To assure that the CC and non-CC observations have equal weight in the selection of variables, all CC and non-CC observations are used in the stepwise model. The stepwise model adds the most significant variable to the model, one variable per step, until no additional variables meet the specified minimum significance level for entry into the model. As a compromise between the need to enter all important variables into the model and the need to exclude unimportant variables, the minimum level of significance was set to .25 The next section presents the results of the empirical analysis.

III. Results

The first step in the empirical analysis is to develop the stepwise regression model to select a subset of accounting variables. This subset of accounting variables is used to predict ratings in both the CC and non-CC models. The null hypothesis of no difference in predictive accuracy (i.e. percent correctly classified) of the CC vs. the non-CC model is tested by using a z-test of proportions. The one-tailed alternate hypothesis is that the predictive accuracy of the CC model is greater than that of the non-CC model.

The seven variables chosen by the stepwise model were (1) long-term debt/population, (2) Long-term debt/total revenues, (3) long-term debt issued/capital

TABLE 1
Accounting Variables Used to Predict Bond Ratings

Default Risk Factors	Operational Variables
Relative Magnitude of Debt Requirements	
1. Long-term debt burden	Long-term debt/population
2. Long-term debt turnover	Long-term debt/total revenues
3. Short-term debt turnover	Short-term debt/total revenues
4. Matching source & use of funds	Long-term debt issued/capital expenditures
5. Long-term debt coverage	(Cash + securities)/long-term debt
Relative Magnitude of Debt Service Requirements	
6. Current services coverage	Sinking funds/(debt retired + interest expenditures)
7. Current revenue requirement	(Debt retired + interest expenditure) / total revenues
Relative Magnitude of Other Service Requirements	
8. Total service provision	Total expenditures/population
9. Service mix	Service mix diversification index[1]
10. Vital service coverage	Vital expenditures[2]/total revenues
11. Vital expenditure weight	Vital expenditures/total expenditures
12. Deferrable budget	Capital expenditures/total expenditures
Relative Adequacy of Revenues	
13. Direct revenue	Own revenue per capita
14. Per capita revenue	Total revenue per capita
15. Revenue diversification	Revenue diversification index[3]
16. Self-reliance	Own revenue/total revenue
17. Reliance on property tax	Property tax/total revenue
18. Current Surplus	Total revenue/total expenditure

1. SER-MIX = $(1 - e_1/E)(1 - e_2/E)\ldots(1 - e_9/E)$ where E is total expenditures and e_1-e_9 are the specific service expenditures; education, health, highways, welfare, sanitation, financial administration, dire, police, and other expenditures. The more balanced the service expenditures, the larger the index.
2. Vital expenditures include education, health, welfare, sewage, fire and police protection, and interest coverage.
3. REV-DIV = $(1 - r_1/R)(1 - r_2/R)\ldots(1 - r_9/R)$ where R is total revenue and r_1-r_9 are the specific revenue sources; property tax, general sales tax, income tax, outside revenue, and other revenue. The more balance the sources of revenue, the larger the index.

expenditures, (4) (cash + securities)/long-term debt, (5) total expenditures/population, (6) own revenue/total revenue, and (7) property tax/total revenue. These seven variables are used to fit multichotomous logistic regression models to the CC and non-CC data. Table 2 shows the results of these two models. The models shown in table 2 are used to form ratings predictions.

Table 3 shows the models' predicted ratings compared to the models' actual ratings. The rating prediction model prior to the award of the CC resulted in a correct classification rate of 50.6% (41/81). The rating prediction model subsequent to the award of the CC resulted in a correct classification rate of 55.6% (45/81). The classificatory accuracy of the rating models is similar to that of most prior studies relying primarily on accounting data (Carleton and Lerner, 1971; Morton, 1976; Michel, 1977; Raman, 1982), but slightly less than most of the prior studies that also used socio-economic and/or financial reporting variables (Ingram and Copeland, 1982; Wilson and Howard, 1984).

A z-test of proportions is used to test the null hypothesis that the classificatory accuracy of the CC model (55.6%) is equal to that of the non-CC model (50.6%). The alternate hypothesis is that the classificatory accuracy of the CC model (55.6%) is greater than that of the non-CC model (50.6%). The z-score is calculated as follows:[5]

$$z = \frac{[\,(55.6\% - 50.6\%) - (41.3\% - 42.4\%)\,]}{\{[(53.1\%(1-53.1\%)][(1/81)+(1/81)]\}^{.5}} = .85 \qquad (2)$$

The one-tailed p-value associated with the z-score is .198. The test is not significant at conventional significance levels. Thus, we are unable to reject the null hypothesis of no difference in classificatory accuracy between the CC and non-CC models. Despite the higher predictive accuracy of the CC model (55.6% vs. 50.6%), the difference is not large enough to be statistically significant. The results imply that raters do not rely on the CC as a signal of the quality of financial statements.

TABLE 2
Bond Rating Prediction Models

Panel A: Prediction Model Statistics Prior to the Award of the CC

Variable	Parameter Estimate	Wald Chi-Square	Pr > Chi-Square
Intercept 1	-4.568	5.822	0.016
Intercept 2	-0.507	0.090	0.765
Intercept 3	2.440	1.915	0.166
Long-term debt/population	1.508	5.263	0.022
Long-term debt/total revenues	1.505	3.260	0.071
Long-term debt issue/capital exp.	0.042	2.552	0.110
(Cash+securities)/long-term debt	-0.211	1.254	0.263
Total expenditures/population	1.685	1.327	0.249
Own revenue/total revenue	1.188	0.391	0.532
Property tax/total revenue	-4.586	3.347	0.067

Panel B: Prediction Model Statistics Subsequent to the Award of the CC

Variable Estimate	Parameter Chi-Square	Wald Square	Pr > Chi-
Intercept 1	-3.865	3.859	0.050
Intercept 2	-0.238	0.016	0.898
Intercept 3	2.695	1.968	0.161
Long-term debt/population	-1.892	3.497	0.062
Long-term debt/total revenues	0.709	0.753	0.385
Long-term debt issue/capital exp.	0.029	1.536	0.215
(Cash+securities)/long-term debt	-0.358	2.130	0.144
Total expenditures/population	1.053	0.918	0.338
Own revenue/total revenue	2.090	1.025	0.311
Property tax/total revenue	-6.670	6.801	0.009

Note: See Table 1 for an explanation of the variables. There are three intercepts per model because there are four levels of the dependent variable (Aaa,Aa,A,Baa) and the multichotomous logit models consider the ordinal nature of the dependent variable.

TABLE 3
Classificatory Accuracy of Bond Rating Prediction Models

Panel A: Bond Rating Predictions Prior to the Award of the CC

PREDICTED	ACTUAL AAA	AA	A	BAA
AAA	1	3	1	
AA	4	20	17	1
A		11	20	1
BAA			2	
Totals	5	34	40	2

Success Rate 41/81=50.6%
Proportional Odds Ratio (Random Chance Classification)=42.4%

Panel B: Bond Rating Predictions Subsequent to the Award of the CC

PREDICTED	ACTUAL AAA	AA	A	BAA
AAA	1	2	2	
AA	4	23	15	1
A		8	21	2
BAA		1	1	
Totals	5	34	39	3

Success Rate 45/81=55.6%
Proportional Odds Ratio (Random Chance Classification)=41.3%

Several possible explanations exist to explain the results of the empirical analysis. First, the signal provided by the CC may simply be too subtle to make a large difference in the way bond raters utilize accounting information. Second, bond raters may be able to make an independent judgment about the quality of a city's financial reporting that obviates the need for external signals of financial statement quality such as the CC. Third, if the quantity of financial reporting is unrelated to quality, because the MFOA examines only the outputs of the financial reporting system for the presence of certain prescribed disclosure items, the CC will signal quantity but not quality of financial reporting. Finally, if accounting information is not a sufficiently important aspect of the rating process, differences in the quality of accounting information will not be detected by bond rating models. Regardless of the explanation, the results of this study provide evidence that the CC does not appear to provide an effective and important signal to bond raters. The final section will present the conclusions.

IV. Summary and Conclusions

Prior local government research has found numerous instances of deficient financial reporting (e.g., Ernest & Whinney, 1979; Ingram and Robbins, 1987). The MFOA created the CC program to encourage the conformance to GAAP and to recognize financial reporting that goes beyond GAAP. The CC is a highly visible and easily interpretable mechanism that can be used to signal high quality financial statements (Evans and Patton, 1983, 1987). Prior CC research found that cities that choose to participate in the CC program have different characteristics (e.g., form of government) than other cities (Evans and Patton, 1983, 1987). Other CC research found that cities that hold the CC have lower net interest cost (Wilson and Howard, 1984; Feroz and

Wilson, 1992), and that bond investors use accounting information differently for cities that hold the CC vs. other cities (Benson, et al., 1986).

However, no prior study examined the same cities through time. Therefore, prior research has not provided evidence of whether the CC actually provides an effective signal to financial statement users, or alternatively, whether the CC tends to be awarded to cities that are already known to have differing characteristics. This study controlled for differing characteristics between cities by examining the same cities over time. Bond ratings were modeled prior to and subsequent to the award of the CC. The model using accounting data subsequent to the award of the CC had a higher rate of classificatory accuracy (55.6%) than the model using accounting data prior to the award of the CC (50.6%). However, the difference in classificatory accuracy between the two models was not statistically significant. Therefore, the empirical evidence of this study was unable to support the hypothesis that bond raters rely more heavily on the accounting data of cities that have been awarded the CC. Possible extensions of this research include investigating whether the CC provides an effective and relevant signal to other user groups such as investors, residents, or the employment market for municipal officials.

V. Suggestions For Future Research

Several areas are open to future research. First, researchers could investigate whether the CC provides an effective and relevant signal to other user groups such as investors, residents, or the employment market for municipal officials. Second, other potential signals of financial reporting quality could be investigated.

Endnotes

1. Since 1984, the Municipal Finance Officers Association has been known as the Government Finance Officers Association (GFOA). Since January 1986, the GFOA has awarded the Certificate of Excellence in Financial Reporting rather than the Certificate of Conformance. The names "Municipal Finance Officers Association" and "Certificate of Conformance" are used here because the time period covered by the sample relates more closely to the time period in which these names were in use.
2. This test is described in many statistics textbooks such as Anderson, et al. (1990). The z-score is calculated as follows:

$$z = \frac{[(p_{CC} - pn_{CC}) - (pr_{CC} - pr_{NCC})]}{\{[(p_A(1-p_A)][(1/n_1)+(1/n_2)]\}^{.5}} \qquad (3)$$

where

pcc and **pncc** are the correct classification rates of the CC and non-CC models, respectively.
prcc and **prncc** are the random chance classification rate of the CC and non-CC models, respectively.
pa is the average classification rate for both models.
n1 and **n2** are the number of observations in each group.

3. In an effort to encourage the presentation of quality financial statements, the MFOA has awarded the CC since 1945 (MFOA, 1983). The MFOA newsletter lists all entities awarded the CC; this data is available from 1977-1985. The GFOA does not have data to indicate which cities won the CC prior to 1977.
4. The Bureau of Census provides data on over 100 accounting variables. However, the variables used by prior rating research tend to differ from that used by the Bureau of Census. For example, Wilson and Howard (1984) used General Fund Revenues while the Bureau of Census provides revenue figures by source (e.g., property tax) rather than by fund.
5. See footnote 2 for the formula used to calculate the z-score.

References

1. Anderson, David R., Dennis J. Sweeney and Thomas A. Williams, *Statistics for Business and Economics,* West Publishing Company, St. Paul, Minnesota, 1990.
2. Benson, Earl D., Barry R. Marks, and K. K. Raman, "The MFOA Certificate of Conformance and Municipal Borrowing Costs," *Advances in Accounting,* Vol. 3, pp.221-232, 1986.
3. Carleton, Willard T. and Eugene M. Lerner, "Statistical Credit Scoring of Municipal Bonds," *Journal of Money Credit and Banking,* Vol. 1, No.3, pp. 750-764, 1969.
4. Copeland, Ronald and Robert W. Ingram, "The Association Between Municipal Accounting Information and Bond Rating Changes," *Journal of Accounting Research,* Vol. 20, No. 2, pp.275-289, 1982.
5. Ernst & Whinney, *How Cities Can Improve Their Financial Reporting,* Ernst & Whinney, Cleveland, Ohio, 1979).
6. Evans, John H. and James M. Patton, "An Economic Analysis of Participation in the Municipal Finance Officers Association Certificate of Conformance Program," *Journal of Accounting and Economics,* Vol. 5, No. 2, pp.151-175, 1983.
7. Evans, John H. and James M. Patton, "Signalling and Monitoring in Public Sector Accounting," *Journal of Accounting Research,* Vol. 25, pp. 130-158, 1987.
8. Feroz, Ehsan H. and Earl R. Wilson, "Market Segmentation and the Association between Munici-

pal Financial Disclosure and Net Interest Costs," *The Accounting Review,* Vol. 67, No. 3, pp. 480-495, 1992.

9. Horton, Joseph J., Jr. "Statistical Classification of Municipal Bonds," *Journal of Bank Research,* Vol. 1, No. 3, pp. 29-40, 1970.
10. Ingram, Robert W. and Ronald M. Copeland, "State Mandated Accounting, Auditing and Finance Practices and Municipal Bond Ratings," *Public Budgeting and Finance,* pp.19-29, 1982.
11. Ingram, Robert W. and Walt A. Robbins, *Financial Reporting Practices of Local Governments,* Government Accounting Standards Board, Stamford, Connecticut, 1987.
12. Marquette, Jesse F., R. Penny Marquette, and Katherine A. Hinckley, "Bond Rating Changes and Urban Fiscal Stress: Linkage and Prediction," *Journal of Urban Affairs,* pp.81-95, 1982.
13. Marquette, R. Penny and Jesse F. Marquette, "Improving Models of Municipal Bond Rating Changes: Surrogation of Subjective Bias," *Research in Governmental and Nonprofit Accounting,* Vol. 2, pp.235-259, 1986.
14. Michel, Allen J., "Municipal Bond Ratings: A Discriminant Analysis Approach," *Journal of Financial and Quantitative Analysis,* pp.587-598, 1977.
15. Morton, T. Gregory, "A Comparative Analysis of Moody's and Standard & Poor's Municipal Bond Ratings," *Review of Business and Economic Research,* pp.74-81, 1976.
16. Raman, K. K., "Financial Reporting and Municipal Bond Rating Changes," *The Accounting Review,* Vol. 56, No. 4, pp.910-926, 1981.
17. Raman, K. K., "Alternative Accounting Measures as Predictors of Municipal Financial Distress," *Journal of Accounting,* Auditing, and Finance, pp.44-50, 1982.
18. Stone, Mary and John Rasp, "Tradeoffs in the Choice Between Logit and OLS for Accounting Choice Studies," *The Accounting Review,* Vol. 66, No. 1, pp. 170-187, 1991.
19. United States General Accounting Office, *CPA Audit Quality: Many Governmental Audits Do Not Comply With Professional Standards,* General Accounting Office, Washington, D.C., 1986.
20. Wallace, Wanda A., "The Association Between Municipal Market Measures and Selected Financial Reporting Practices," *Journal of Accounting Research,* Vol. 19, No. 2, pp.502-520, 1981.
21. Wilson, Earl R., and Thomas P. Howard, "Municipal Market Measures and Selected Financial Reporting Practices: Additional Evidence," *Journal of Accounting Research,* Vol. 22, No. 2, pp.207-224, 1984.