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MUNICIPAL BOND RATINGS: ARE THEY WORTHWHILE FOR RURAL GOVERNMENTS?

Patrick J. Sullivan

ABSTRACT

Rural governments in the Northeast purchased credit ratings for a high percentage of their general obligation bonds sold in 1977. This paper examines the effect credit ratings had on the interest cost of GO bonds sold by nonmetro governments in the Northeast. The results suggest that the decision to purchase a rating may be a costly error under certain circumstances.

INTRODUCTION

Local governments in growing areas—including many rural communities in the Northeast—are likely to rely on the municipal bond market for a large share of their capital financing in the future. With cutbacks in Federal intergovernmental aid and limits on State taxing and spending authority, local governments will have to shoulder a larger share of the cost of upgrading public infrastructure. Often, the only practical means of undertaking costly capital programs is through the sale of long-term bonds with payments stretched out over a number of years. One of the primary factors determining the cost of debt financing is the bond's credit rating. Nonetheless, for many rural governments the decision to purchase a credit rating could be a costly mistake. This paper focuses on the costs and benefits of credit ratings for rural governments in the Northeast.

MUNICIPAL BOND CREDIT RATINGS

A bond rating is a judgment concerning the credit quality of a particular issue. While many underwriters and investors perform their own credit analyses before purchasing all or part of a bond issue, the results of these analyses are seldom made public. Only two agencies—Moody's Investors Service and Standard and Poor's Corporation—currently rate a large number of municipal bonds and publish their credit quality judgments. Both Moody's and Standard and Poor's (S&P) use similar rating schemes. Table 1 presents a brief description of the major rating grades assigned by each agency.

The agencies view their ratings primarily as measures of the risk of default which, in turn, depends upon the relationship between debt outstanding—present and expected—and an estimation of the amount of debt which the borrower can successfully repay. Ratings, therefore, serve as a measure of the probability of the timely repayment of principal and interest under a wide range of national and local economic conditions—the

lower the rating, the higher the risk involved in holding the bond (Bahl).

Very few governments have defaulted on bond issues since the 1930's, making it difficult to determine accurately the underlying factors contributing to default risk. In general, for a bond backed by the issuing government's full taxing power—a general obligation bond issue—the analyst is concerned with the size and composition of local revenues and expenditures, the composition of the local economy, the managerial skills of local government officials and a number of other factors affecting revenue stability. For bonds backed by specific and restricted revenues—revenue and special assessment bond issues—the rater's judgment is based much more on the expected performance of the pledged source of revenue over the life of the bond issue. As a result, a government with a low rating on its general obligation debt can have highly rated revenue bonds. For simplicity, our analysis will focus on the costs and benefits of having general obligation debt rated, although the approach is conceptually valid for revenue bonds as well.

THE RATING DECISION

The decision on whether to have a bond rated by Moody's and/or S&P is up to the issuing government.¹ The argument for having one or both of these agencies evaluate the credit worthiness of an issue is that their ratings reduce investor uncertainty and thus reduce the interest cost of marketing a bond:

Unrated issues are confusing to investors and regulators since independent assessments of credit risk are not available. These issues generally sell for higher yields than rated issues, reflecting investors' uncertainties.....(Forbes and Frankle).

This argument overstates the importance of ratings when the issues are small and the investors are comprised of local banks and individuals. While ample evidence exists that favorable ratings have a significant impact on the cost of borrowing, it does not necessarily follow that rated bonds cost less to market than unrated bonds.² Kaufman notes that the decision to purchase a rating should depend upon whether resulting interest savings (if any) exceed the rating agency's fee. When the issue being sold is small, the potential savings from having the

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¹ The rating agencies refuse to evaluate certain types of debt and may withhold publishing a rating on any bond for which insufficient information has been made available (Sherwood, Smith).

² For a review of the effects of ratings on tax-exempt bond yields, see Petersen.

Table 1: Bond rating grades issued by Moody's Investors Service, Inc., and Standard and Poor's Corporation

Quality characterization	Rating grades	
	Moody's	Standard & Poor's
Prime	Aaa	AAA
Excellent	Aa, Aa-1	AA
Upper medium	A, A-1	A, A+
Lower medium	Baa, Baa-1	BBB, BBB+
Marginally speculative	Ba, Ba-1	BB
Very speculative	B, Caa	B
Default	Ca, C	D

Note: An alphabetical rating followed by a 1 or a + indicates a "better quality" security within the rating class.

issue rated are small.³ If the issuer expects to receive a low rating from agency analysts, the potential interest savings would also be small, and could easily be negative.

An examination of general obligation bonds sold in 1977 reveals that local governments in the Northeast, particularly nonmetropolitan governments, purchased ratings for a higher proportion of their general obligation bond issues than did local governments nationwide. Table 2 presents information on the percentage of issues with either a Moody's or a S&P rating or both. The figures are based on 618 general obligation bonds sold by local governments in the Northeast (116 issues of nonmetro governments) and 2976 bonds sold nationwide (1181 issues of nonmetro governments). While nationwide only 48 percent of the nonmetro issues were sold with a credit rating, 73 percent of the issues sold by nonmetro governments in the Northeast had a rating from at least one of the agencies.

To some extent the higher propensity to purchase ratings in the Northeast reflects the comparative size of the issues being sold. Local governments in the Northeast sold a higher proportion of larger sized issues—issues most likely to benefit from a credit rating—than local governments in other regions of the country.⁴

³ The rating fee is not a fixed percentage of the size of the issue. Rather, it depends on the size of the government, the frequency of rating requests, and the complexity of the rating process. The results of a survey of governments which sold general obligation bonds in 1979 indicate that the rating fees for bond issues under \$10 million were in the \$600 to \$4,000 range (Gamello and Streets).

⁴ Twenty five percent of the issues sold in the Northeast were for \$5 million or more compared with 15 percent for the Nation. Of the nonmetro issues sold, 12 percent of the Northeast's issues and 5 percent of the Nation's issues were for \$5 million or more.

However, even for their smaller sized issues, Northeastern governments tended to have a higher percentage rated. Nonmetro governments in the Northeast purchased ratings for twice as many of their smallest issues (under \$1 million) than did nonmetro governments nationwide.

A second basis for the propensity of nonmetro governments in the Northeast to purchase ratings on their bond issues may be the ratings they receive. While many large Northeastern cities were having their credit ratings downgraded in the 1970's, many of the nonmetro issues sold in 1977 received favorable ratings, at least in comparison to nonmetro sales in other regions of the country. Table 3 shows the distribution of rated bond issues among the rating categories. Since Moody's was the dominant rating agency in 1977, rating 45 percent of all nonmetro government bond issues compared to 8 percent rated by S&P, we have used the Moody's rating to classify bond issues whenever possible. Of the Northeastern nonmetro issues sold with a rating, 42 percent were rated A-1 or better. While this is below the percentage of highly rated metro issues, it is much larger than the percentage of highly rated nonmetro issues sold nationwide. To the extent that nonmetro government officials in the Northeast feel their issues will be favorably rated, they have more incentive to purchase a rating.

A final possible explanation for the high percentage of Northeastern issues sold with a credit rating is that, in the opinion of local officials, investors expect and demand that these issues be rated. That is, investors and underwriters purchasing the issues of Northeastern governments have come to expect these issues to be rated and are therefore mistrustful of those without a rating. For nonmetro issues sold elsewhere, ratings are not viewed as necessary and, as a result, are not purchased with such regularity.

The extent to which investors and underwriters would actually treat the same issue differently, depending on whether it was rated or not, is difficult to estimate. Looking at

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Table 2: Percentage of local government general obligation bond issues sold with a published credit rating by size class and metropolitan status, 1977.

Size of issue	United States			Northeast ¹		
	Total ²	Metro	Nonmetro	Total ²	Metro	Nonmetro
	-----Percent-----					
\$0 to \$1 million	29.6	33.3	25.8	41.2	38.1	51.5
\$1 to \$5 million	80.2	80.5	79.7	91.1	93.0	85.5
\$5 to \$10 million	85.8	88.4	77.6	83.7	88.0	58.3
\$10 million and over	89.6	91.0	72.7	89.7	89.4	100.0
All issues	58.1	64.7	48.2	75.2	75.6	73.3

¹ Includes the following 12 states: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont and West Virginia.

² Includes local government bond issues which could not be classified as either metropolitan or nonmetropolitan.

Source: Calculated from unpublished data in the Public Securities Association long-term municipal bond file.

Table 3: Percentage distribution of local government general obligation bond issues sold with a published credit rating by rating category and metropolitan status, 1977.¹

Rating Category	United States			Northeast		
	Total	Metro	Nonmetro	Total	Metro	Nonmetro
	-----Percent-----					
Aaa	5.5	7.4	1.6	8.1	9.0	4.7
Aa, A-1	17.2	21.0	9.7	16.1	16.9	12.9
A-1	20.5	21.0	19.9	20.9	20.3	24.7
A	34.6	31.5	40.6	34.4	34.8	30.6
Baa-1	13.7	11.7	19.0	13.2	11.1	22.4
Baa	7.8	7.4	8.6	6.9	7.4	4.7
Ba	0.7	0.6	0.7	0.4	0.5	0

Note: Columns may not sum to 100.0 because of rounding.

¹ Whenever possible, issues were categorized by their Moody's rating. For issues without a Moody's rating, the Standard and Poor's rating was used.

Source: Calculated from unpublished data in the Public Securities Association long-term municipal bond file.

governments which underwent rating changes, Jantscher found that the rating change had a significant effect on borrowing costs even when the market's view of the issuer's credit position was held constant. Thus, the decision to have an issue rated will most likely affect borrowing costs. However, it remains unclear whether having a rating actually reduced the cost of borrowing for a large percentage of the Northeast's nonmetro bond issuers. It is to this question that we now turn.

ESTIMATING THE INTEREST RATE EFFECTS OF RATINGS

In an attempt to determine the effect ratings had on nonmetro issuer borrowing costs, a simple ordinary least squares regression approach will be adopted to explain variations in the interest rate of new issues sold in 1977. Using a core of bond issue characteristics and national market indicators that previous studies have found to be important determinants of municipal bond interest rates, the regression equation will be estimated for a sample of general obligation issues sold with and without a published credit rating.

The standard model postulates that municipal rates are a function of issue size, issuer size, the amount of debt the issuer has outstanding, the number of bids submitted for the issue, the market rate of interest for tax-exempt securities at the time of sale, the term structure of the tax-exempt yields at the time of sale, the average maturity of the issue, whether the issue is callable before it matures, and the credit rating assigned to the issue.⁵

The dependent variable is the net interest cost (NIC) of the bond issue.⁶ previous research has found NIC declines at a decreasing rate as the size of the issue increases and as the population size of the issuer increases. In the wake of New York City's fiscal problems, it is hypothesized that higher levels of both long-term and short-term debt outstanding are associated with higher borrowing costs. The NIC is further expected to decline at a decreasing rate as the number of underwriter bids submitted on the issue increases and, given the prevailing term structure of interest rates, to increase as the issue's average term to maturity increases. The NIC for bonds callable before the stated maturity date and bonds with low credit ratings is expected to be high relative to the NIC on

noncallable, highly rated issues. If investors mistrust unrated issues, we would further expect unrated issues to have higher NIC's than most rated issues.

The effect of national market trends on NIC is measured by the average yield on tax-exempt bonds and the shape of the tax-exempt yield curve at the time of sale. NIC should be positively related to both of these measures. The average tax-exempt yield measure is a simple average of the Salomon Brothers weekly yield indices for prime grade 1-year, 10-year, and 25-year tax-exempt bonds for the week in which the bond was sold. The slope of the yield curve is measured by the difference between the Salomon Brothers weekly indices for prime grade 25-year bonds and prime grade one-year notes. Since a steeply sloped yield curve affects issues with longer maturities the most, the yield curve measure enters the regression equation as an interaction term with the natural log of the issue's final maturity. As is typical with these regression equations, the rating and existence of call provision variables are all 0-1 dummy variables, with Baa and Ba rated bonds being the excluded set for the bond rating dummies. To reflect their nonlinear effect on NIC, the size of the issue and the population size of the issuer are specified in natural logarithms.

The sample consists of competitively awarded general obligation bond issues sold in 1977 by general purpose local governments and school districts in the greater Northeast.⁷ To simplify comparisons, the bond issues of state governments, special districts, and statutory authorities were excluded as were all refinancing issues and all issues not publicly sold. In cases where one jurisdiction sold several issues during the year, only one issue was included in the sample so that large, frequent issues were not over-represented in the analysis.

Table 4 reports the parameters of two equations regressing the explanatory variables against the net interest cost (expressed as a percentage rate) of the bond issues included in our sample. The first equation is based on a sample comprised of both metro and nonmetro issues. The second equation is based on nonmetro issues alone.

Other analyses have found that the interest cost of a new bond is higher in proportion to the outstanding debt per capita of the issuing government, the fewer bids received, the greater the prevailing market rate of interest, the longer the issue's average maturity, the steeper the yield curve, and the lower the bond's rating. Contrary to expectations, however, population is positively related with NIC in the total sample. This may reflect the general concern over large city financial problems in the late seventies.

⁵ This specification draws heavily on earlier work by Kessel and Hendershott and Kidwell.

⁶ The net interest cost measure of the interest rate payable on a bond issue is a weighted average of the undiscounted interest payments made on the various maturities comprising the bond issue. Because the NIC measure does not take the time of payment into account, it is not a good measure of the true cost associated with the bond issue. Nonetheless, the NIC is the only measure currently reported for most issues.

⁷ To ensure an adequate representation of rural bond issues, 17 states were included in the sample: Connecticut, Delaware, Illinois, Indiana, Maine, Maryland, Massachusetts, Michigan, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia and Wisconsin.

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Table 4: Regression equations for estimating new issue interest rates (NIC) for general obligation bonds sold by general purpose and school district governments in the Northeast, 1977.¹

Explanatory variables	Total sample		Nonmetro issues	
	coefficient	t-value	coefficient	t-value
Constant	-2.481	3.54	-1.978	1.85
Population size in logs	.021	1.77	-.051	2.35
Issue size in logs	.012	.75	-.042	1.28
Long-term debt outstanding per capita	—	3.41	—	1.35
Short-term debt per capita	—	2.25	—	1.40
Number of bids	-.025	5.27	-.023	2.73
Average tax-exempt yield	1.429	9.23	1.496	6.33
Average maturity	.053	9.20	.060	6.79
Yield curve log of final maturity	.192	14.06	.190	9.59
Call provision dummy	.035	1.13	.066	1.24
Credit rating dummy:				
Aaa	-1.073	10.77	-.767	3.37
Aa-1	-.899	3.73	-.651	2.74
Aa	-.945	12.86	-.630	4.41
A-1	-.728	10.24	-.490	3.64
A	-.547	7.94	-.489	3.79
Baa-1	-.289	3.69	-.182	1.30
Unrated	-.616	8.58	-.465	3.50
R ²	.741		.838	
F-ratio	114.8		50.8	
Mean NIC	5.00		4.87	
Number of issues	660		174	

-- Indicates a number greater than 0 but less than .0005.

¹ The Northeast, for this section of the analysis, includes the following 17 states: Connecticut, Delaware, Illinois, Indiana, Maine, Maryland, Massachusetts, Michigan, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia and Wisconsin.

Source: Calculated from unpublished data in the Public Securities Association long-term municipal bond file, the U.S. Bureau of the Census, 1977 Census of Governments, and Salomon Brothers yield data.

In the nonmetro equation, where large cities are excluded, the parameter for population size is negative—larger nonmetro jurisdictions can expect to pay lower interest rates, other things being equal.

With regard to the rating variables, two interesting patterns emerge. First, holding other factors constant, unrated bonds sold at interest rates comparable to or lower than "A" rated issues. For the total sample, unrated bonds sold at NIC's approximately 62 basis points below comparable bonds with Baa ratings (a basis point is one-hundredth of one percent). This falls within the A to A-1 range for rated bond issues. Furthermore, the differences between the parameter for unrated issues and the parameters for A and A-1 rated issues are statistically significant at the 90 percent level of confidence.

The other pattern evident from Table 4 is that the relationship between ratings and NIC is less dramatic for nonmetro issues. Within each rating class, the parameter estimated with the

nonmetro sample is smaller than the parameter estimated with the total sample. Furthermore, within the nonmetro group of issues, the distinction between A-1 and A rated issues and unrated bond issues is insignificant. Thus, the argument that credit ratings are needed to reduce investor uncertainty and lower borrowing costs appears to be inappropriate for an appreciable number of rural issues.

It should be noted that the relationship between ratings and interest rates is probably based more on issue size and issuer size than on geographic location, at least for governments in the Northeast. It seems likely that issues which tend to be purchased by local investors—small issues, particularly those issued by small jurisdictions—are less affected by the lack of a rating. While geographic isolation would certainly tend to restrict issues even further to the local market, most nonmetro issuers in the Northeast are not that far removed from regional money markets.

IMPLICATIONS FOR THE RATING DECISION

In the preceding analysis we found no evidence to suggest that investors found unrated bonds, as a group, to be inferior to bonds sold with medium quality ratings. Especially for the smaller issues of rural governments, the evidence suggests that investors and underwriters assign an average level of risk to issues sold without a rating. Judging from the results of the nonmetro equation, those local officials who chose not to purchase a rating on general obligation bonds sold in 1977 made the correct choice if it appeared unlikely that their issues would have been rated Aa or better.

This last qualification raises an interesting question: would these issues have received high ratings had they been rated? That is, was this particular group of unrated issues composed of bonds of such obvious high quality that the market-assigned level of risk was actually high compared to that which Moody's or S&P would have assigned? While we have made no effort to duplicate the credit rating process here, other studies suggest that the answer to these questions is: not likely. First, according to the agencies themselves, ratings are not based upon market performance nor do they indicate expected market performance. Ratings purport to indicate the relative risk of default, not the relative price stability or the level of interest on a bond issue.⁸ Thus, low interest rates cannot be used to predict what rating an issue would have received from either rating agency. Second, the results of numerous studies examining the rating process suggest that small population size is associated with low credit ratings.⁹ Other things being equal then, smaller sized governments can expect to receive lower ratings from agency analysts. Thus, it seems unlikely that a large percentage of the unrated issues sold in 1977 would have received Aa, Aa-1 or Aaa ratings.

All this is not to suggest that rural officials should never purchase a rating unless they expect to receive a high quality rating. Nor do we mean to imply that the local officials who purchased a rating in 1977 and received something below an A-1 rating made a mistake. Ratings, even low ratings, are important and may be necessary for marketing some types of bond issues. Issues which need to be sold regionally or nationally because their size, complexity, or inherent risk precludes local marketing may require a credit rating. If local market conditions are such that even small, uncomplicated issues have to be marketed on a regional basis, then a credit

rating can help overcome investor and underwriter uncertainty about the issue's credit quality.

However, for rural governments selling small issues, ratings should not be purchased without careful consideration. If the government's issues are typically sold to local investors familiar with the jurisdiction's financial situation, a rating may be unnecessary and could easily be detrimental. A low quality rating for bond issues sold locally can add to borrowing costs since investors and underwriters will react to a low rating whether they feel it is justified or not.

For issues likely to receive an A, A-1, and even an Aa rating, the cost of the rating--both the rating fee and the incidental costs of collecting and presenting the information required by the agency analysts--should be compared with the present value of the interest savings from having the bond rated. Positive savings on interest payments may not justify having a small issue rated when these incidental "up-front" expenses are taken into account.

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⁸ For a discussion of the meaning of credit ratings and their determinants, see Bahl, Sherwood or Smith. That ratings are not good indicators of market performance is argued by Schneeweis.

⁹ Carleton and Lerner, Horton, and Rubinfeld all found that population size is inversely related with risk as measured by the rating agencies.

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