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Measuring the Creditworthiness of State and Local Governments: Municipal Bond Ratings

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Chairman Netzer: Although the four papers presented at this session are indeed a potpourri in that they examine a range of public finance problems rather than a single subject, they all deal with problems that are of considerable importance both intellectually and for informing public policy decisions. All four report on the results of new research on topics which cry out for more research, either because they have been sadly neglected in the past (payroll taxes, for example) or because prior research has failed to address some critical issues (as is the case with our first two papers) or because the forecasts based on prior research appear at variance with fiscal events. I believe that you will share my conclusion that all four make real contributions.

The first paper deals with a topic that has caused increasing anguish among public officials as interest rates have risen and the volume of state-local borrowing has grown, over the past decade: municipal bond ratings. Dr. Roy Bahl, its author, is Associate Professor of Economics in the Maxwell School at Syracuse University. He has done extensive research, writing and consulting on urban and regional economics and state and local finance, both in this country and abroad, while affiliated with the University of Kentucky, West Virginia University and the International Monetary Fund.

Dr. Bahl.
MEASURING THE CREDITWORTHINESS OF STATE AND LOCAL GOVERNMENTS: MUNICIPAL BOND RATINGS

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Syracuse University
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I. INTRODUCTION

The subject of this paper is a relatively obscure area of public finance—the grading of state and local government bonds by the private rating agencies. The objective here is to explore the issue of measurement of the credit strength of state and local governments in terms of identifying a conceptual and empirical approach. The relevance of this exercise—at least to cities in terms of preparation of their prospectus—is underscored by the comparative grading system articulated by the major rating agencies. The anatomy of such an approach is presented in the later sections of the paper. However, the material in the two sections which immediately follow is concerned with the importance of ratings to state-local governments, and with a description of the major rating systems and several proposed alternatives.

Note that the concern here is not with the rating agencies or evaluation of their methods. It is, instead, with how the selling government may present a reasonable picture of its credit strength to the market.

II. THE IMPORTANCE OF RATINGS

The issue of municipal bond ratings and the determinants of these ratings has been largely ignored for most of the twenty years during which the major agencies have been grading municipal credit. But the fiscal crisis which has beset subnational governments has caused scrutiny of all areas of state-local finance, and the rating issue has been touched by two congressional hearings and the introduction of bills (by Representative Patman and Senator Proxmire) which, by producing a Federal Guarantee on State and Local Government

1 Throughout the paper, we will follow the terminology of rating agencies and refer to any state or local government bond as a "municipal."
Debt, would effectively eliminate the need for a rating system.\textsuperscript{2} It is not the intention in this paper to evaluate these proposals or even to assess the probability that they will become fact. Rather, the view taken here is that the traditional rating system is still operative, and that it exerts a strong market effect. Reasonable arguments have been made that municipal ratings determine interest cost differentials. Reilly argues that the difference of a notch in a rating may mean a difference of 25 to 50 basis points (depending on prevailing market conditions).\textsuperscript{3} White's market rating of municipals also indicates a close relationship between quality ratings and market performance.\textsuperscript{4} Earlier research has shown a significant relationship between credit rating and interest costs. Roland Robinson, in the late 1950's, found that interest costs are substantially greater for Baa rated issues than for Aaa — given that investors compound quality and maturity considerations.\textsuperscript{5} Morris found that interest rates vary inversely with credit ratings, when all four grades of investment security are considered, and that (median) interest rates on unrated bonds fall roughly between the A and BBB ratings.\textsuperscript{6} Charlotte Phelps, in a statistical (regression) analysis, rejects the hypothesis that ratings do not influence interest costs in favor of the alternative that "... state and local governments with high credit ratings float bonds at a cheaper rate than governments with a low credit rating."\textsuperscript{7} The magnitude of the rating issue has been dramatized by local administrators like Roy Goodman (formerly finance administrator of New York City). Goodman and his successor, Robert Wilmers, estimate that the downgrading of New York City's bond rating from A to BBB costs 1/4 to 1/2 of one per cent in annual interest costs, or $1.8 to $2.5 million per year on the $500 million of new debt floated annually by New York City.\textsuperscript{8} Given the eight-year life of the City's average bond, this could mean up to $20 million in incremental


interest costs, or, in terms of the public sector trade-offs, hospital space for 500 patients, seven elementary schools, or 2,000 additional policemen.\footnote{Ibid.}

Given that quality ratings do determine differential interest costs, there are two important implications of the ratings for the urban fiscal position. The first has to do with interest costs \textit{per se} because of projections of unprecedented expansion of state and local capital plants, \textit{i.e.}, interest costs already average a substantial fraction of urban expenditures. Moreover, higher interest costs — induced by lower ratings — will marginally distort government budget structures by biasing decisions against debt-financed expenditures. The second is related to the nature of metropolitan fiscal imbalance, and the nature of the differential costs which are related to credit grades. That is, in areas where public service needs are greatest (\textit{e.g.}, the core cities), credit ratings are, in many cases, low. Then, there is a natural, and appropriate, counter-equalizing bias in credit ratings. The counter-equalizing effect occurs because such a bias against the poorer governments works as a partial offset against any Federal and State aids which may be designed to equalize public service levels.

Underlying these two basic factors is the premium which has necessarily been placed on efficiency in government operations and which naturally leads to a search for methods to reduce governmental costs without affecting the quality of services. Viewed in this perspective, the fact that New York City is BBB instead of AAA is most important.

III. A Description of Rating Systems

There are essentially two kinds of municipal rating systems to be compared: (a) the partially subjective system used by the major rating agencies, and (b) the numerical systems which would arrive at specific quantitative ratings.

\textit{Subjective Systems}

In Appendix A is presented a description of the top credit grades of each of the three major private agencies, \textit{i.e.}, Standard and Poor’s, Moody’s and Dun and Bradstreet. These descriptions reveal certain similarities. First, all are apparently concerned with the general economic and management strength of the urban area as well as with its fiscal strength, though there is no definition of how specific measures are combined to determine a credit rating. Essentially, this is the identifying feature of a subjective system, the boundaries between ratings of AAA, AA, etc., are not drawn on objective grounds. A second similarity, at least between two of the three major agencies,
is the inclusion of a statement of the market performance of the various classes of securities, implying that there is some explicit connection between the determination of a quality rating for a specific government and the market performance of that government's securities. If ratings do, in fact, influence the structure of government interest costs, the inclusion of market considerations in the rating process is clearly incorrect.

The actual method which is used to accomplish a rating may be described in general terms. For example, Moody's description of their process is as follows:

Bonds are usually payable in the distant future. Hence, an issue's investment worth is gauged by the anticipated ability of its issues to meet all debt service commitments on schedule, particularly during possible periods of depressed economic circumstances.

The factors which must be taken into account in judging a community's future ability to pay the interest and principal on its bonds cover the spectrum of economic, social, fiscal, and financial data. We examine the stability of the economic base, the relative adequacy of the community's physical plant and municipal services in light of current and probably near-term capital needs, the existing tax burden and the likely growth or decline of the credit base and the impact that each of these factors has on the others.10

Noticeable at least in this statement is the absence of objectively defined benchmarks to enable the detection of abnormalities in certain of the factors outlined, e.g., how high a debt burden is too high, or what is a diversified industry structure? There is no detailed discussion and measurement of specific economic base characteristics, or of reasons why certain economic base factors constitute a potential credit weakness. Moreover, such a method describes a number of important factors but gives no hint as to the relative importance of each.

Objective Systems

Of the numerical rating systems, perhaps the best known is Tyler's rating service.11 By this method, each government is graded on a scale from 00 to 100 with 00 being the best rating. The thirty factors considered in addition to a debt/wealth index reflect stability, growth,


future prospects, management, and legal position of the community. The grading involves, for example, in the case of the six growth indicators, retail sales trends (+1 to −1), income trend (+2 to −2), long-term population trend (+2 to −2), and short-term payroll trend (+2 to −2).

Stability factors include the size of the community and the county or metropolitan area in which it is located, diversification, unemployment, employment in education and public administration, and college enrollment. Weights are generally from +2 to −2, although they may go higher in some cases...

Intangibles are military and non-white population, income distribution, education, sound housing and any other factors the analyst may care to include (large utility plants, etc.). The range may go as high as +4 to −4 in some cases, but these are rare.

Management factors include the maturity schedule, current operations, tax collections and (when available and pertinent) plant conditions, planning, reporting, revenue exploitation, future requirements and special considerations. In most cases, these are in the +2 to −2 range, but may run higher in unusual situations.

Legal factors are tax rate limits, tax priorities, revenue priorities, etc.

The final rating is simply the debt/wealth index adjusted.12

Tyler's rating method is open to much criticism—particularly in regard to the theoretical basis for his weights, the measurements he uses to reflect certain factors, and some of the factors which he sees as affecting the safety of investment in a community. But there is much which is positive to be said about Tyler's approach to this problem. He clearly recognizes the independence of market and quality ratings, and, if the two diverge for a given security he sees it as an indication that the security is a good or bad buy and not as a reason for changing the quality rating. Second, the Tyler rating takes the mystery out of his grading process by publicly disclosing his data, method, and results, so that any investor disagreeing with parts of the process may make his own adjustments. By virtue of his assignment of a number to each government, it becomes possible to compare the position of governmental units. Tyler also acknowledges the problem of subjectivity and sees the possibility for increasing the consistency of the ratings procedure. He notes that the subjectivity of inconsistency may be reduced through the application of data processing techniques to the great volume of local fiscal and socioeconomic information which is compiled and published by various governmental agencies. While Tyler's numerical grading system is open to much criticism in terms of the relative importance of some factors he measures, the rating agencies have much to learn from his approach to the problem.

12 Tyler statement, pp. 4-5.
A second system for numerically grading municipals was developed by Thomas Morris in 1966. He sets out to (a) determine the factors to be considered, (b) determine how to measure them, (c) numerically value the factors, and (d) total the numerical factors to arrive at a numerical rating. But, again, there is no strong statement of exactly what is the credit quality desired to measure, or conceptually how this quality might be impaired. Instead, Morris focuses his attention on variables, penalizing or rewarding governments according to measured values. For example, his system penalizes an area for having employment in service industries in excess of one-third of total employment because "... the community becomes unduly sensitive to this basically unproductive activity." This is questionable on theoretical grounds, and would probably have the effect of penalizing all larger cities, since city size and relative employment in service industries are positively related.

But Morris, like Tyler, does draw attention to the possibility for applying a more precise and systematic rating method and demonstrates that such a system can give reasonable results. He grades 28 communities with his scheme and finds quite close conformity, in an ordinal sense, with the results reached by Standard and Poor's and Moody's.

Quantitative Comparison

To compare the results of Standard and Poor's and Moody's ratings, a sample was drawn of 473 general obligation issues rated by both agencies over the past two years. The resulting distribution of these ratings is described in Table 1. As is shown in the last row of this table, Standard and Poor's rates a greater percentage of issues in the AAA, AA, and A classes, while Moody's rates a greater percentage BBB. This pattern is observed to be true for each of the eight population size classes considered. Both agencies seem to place some premium on size, as evidenced by the single AAA rating among the 231 jurisdictions with populations below 40,000. Further analysis of these data shows that the average Moody's rating is slightly lower than the average Standard and Poor's rating. When a larger sample of 594 issues was examined, 372, or 67 per cent, were rated the same by both agencies. Of those not rated equally, 90 per cent were rated higher by Standard and Poor's than by Moody's.

To compare the rating agency's results statistically, the ratings are assigned a numerical scale:

<table>
<thead>
<tr>
<th>Rating</th>
<th>Numerical Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAA and Aaa</td>
<td>4</td>
</tr>
<tr>
<td>AA and Aa</td>
<td>3</td>
</tr>
<tr>
<td>A and A</td>
<td>2</td>
</tr>
<tr>
<td>BBB and Baa</td>
<td>1</td>
</tr>
</tbody>
</table>

13 Morris, op. cit.
14 Ibid., p. 7.
Table 1. — Distribution of Standard and Poor's and Moody's Ratings of 473 Issues:
By Population Size Groupings

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 20,000</td>
<td>111</td>
<td>0</td>
<td>0</td>
<td>14</td>
<td>16</td>
<td>73</td>
<td>59</td>
<td>22</td>
<td>34</td>
</tr>
<tr>
<td>20,000–39,000</td>
<td>120</td>
<td>1</td>
<td>1</td>
<td>37</td>
<td>21</td>
<td>61</td>
<td>61</td>
<td>20</td>
<td>31</td>
</tr>
<tr>
<td>40,000–60,000</td>
<td>64</td>
<td>3</td>
<td>2</td>
<td>25</td>
<td>18</td>
<td>32</td>
<td>31</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>60,000–80,000</td>
<td>33</td>
<td>5</td>
<td>1</td>
<td>11</td>
<td>7</td>
<td>13</td>
<td>15</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>80,000–100,000</td>
<td>26</td>
<td>1</td>
<td>1</td>
<td>13</td>
<td>8</td>
<td>8</td>
<td>11</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>100,000–200,000</td>
<td>39</td>
<td>5</td>
<td>1</td>
<td>18</td>
<td>9</td>
<td>15</td>
<td>26</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>200,000–500,000</td>
<td>42</td>
<td>10</td>
<td>3</td>
<td>14</td>
<td>20</td>
<td>18</td>
<td>16</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Over 500,000</td>
<td>38</td>
<td>2</td>
<td>1</td>
<td>21</td>
<td>11</td>
<td>14</td>
<td>23</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>473</td>
<td>27</td>
<td>10</td>
<td>153</td>
<td>110</td>
<td>234</td>
<td>242</td>
<td>56</td>
<td>100</td>
</tr>
<tr>
<td>Percent Distribution</td>
<td>5.7</td>
<td>2.1</td>
<td>32.3</td>
<td>23.3</td>
<td>49.5</td>
<td>51.2</td>
<td>11.8</td>
<td>21.1</td>
<td>0.6</td>
</tr>
</tbody>
</table>
Arithmetic means for the 473 issues show Standard and Poor's = 2.18, Moody's = 1.91. The relative variation about these means is approximately the same for the two agencies.

A simple correlation of dummy variables with certain measurable factors yielded the following results: (a) There is no significant association between ratings and population size, for either agency; (b) Higher levels of debt burden — measures of the ratio of overlapping debt to true valuation — are associated with lower credit ratings, for both agencies; (c) Ratings are not significantly associated with the level of per capita income or the level of per capita true value, for either agency; (d) Lower ratings are associated with higher levels of per capita overlapping debt, for both agencies; and (e) Lower ratings are associated with higher debt burden ratios, where the latter is measured as the ratio of overlapping debt to personal income, for both agencies.

To examine systematic relationships between ratings and the structure of a city, the credit rating dependent (dummy) variable is regressed on certain independent variables which are thought to be major determinants of municipal ratings. The results of this multiple regression, shown in Table 2, reveal that less than 25 per cent in the variation in ratings can be attributed to direct and interacting effects of these variables. An analysis of covariance shows that the ratio of overlapping debt to personal income exerts a stronger effect on Standard and Poor's credit rating than on Moody's.

In general, this empirical comparison suggests that debt burden measures are a major determinant of the credit rating, and does not uncover a relationship between credit rating and taxable capacity — though such an effect could have been hidden by collinearity in the variables.

Summary

This comparative description should not be construed as a critique of the agencies' approach to rating municipal bonds. To the contrary, the "quantitative" approaches described above do not appear clearly superior and may in the end be quite as subjective. Though a subjective approach does leave a great deal to be desired, a feasible alternative simply has not been offered.

IV. Conceptualizing the Municipal Credit Rating

One implication of all existing rating schemes is a comparative basis, i.e., without a clear statement of whether absolute levels of certain characteristics suggest a strength or a weakness, it follows that judgments about strengths or weaknesses must be made in relative terms. Then, measurements of City A's characteristics define a rating for City A only in light of comparable measures for Cities B, C, D,
Table 2. — Multiple Regression Equations* of Selected Variables on a Bond Rating Dummy Variable: For 473 Issues Rated Since 1966 by Standard and Poor's and Moody's

<table>
<thead>
<tr>
<th></th>
<th>Ratio of Overlapping Debt to Personal Income</th>
<th>Ratio of Overlapping Debt to True Value</th>
<th>Per Capita Overlapping Debt</th>
<th>Multiple Correlation Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Constant</strong></td>
<td>-0.061*</td>
<td>0.001*</td>
<td>-0.017*</td>
<td>0.001</td>
</tr>
<tr>
<td><strong>Standard</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and Poor's</td>
<td><strong>2.982</strong></td>
<td><strong>(0.001)</strong></td>
<td><strong>(0.005)</strong></td>
<td><strong>.4651</strong></td>
</tr>
<tr>
<td></td>
<td>-0.431</td>
<td>0.089</td>
<td>-0.154</td>
<td>0.062</td>
</tr>
<tr>
<td><strong>Moody's</strong></td>
<td>-0.054*</td>
<td>0.001*</td>
<td>-0.015*</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td><strong>2.633</strong></td>
<td><strong>(0.012)</strong></td>
<td><strong>(0.005)</strong></td>
<td><strong>.4186</strong></td>
</tr>
<tr>
<td></td>
<td>-0.373</td>
<td>0.084</td>
<td>-0.139</td>
<td>.030</td>
</tr>
</tbody>
</table>

* Denotes significance at the .05 level.

Regression coefficients are the top number in each cell, standardized errors are shown in parenthesis, and Beta coefficients are the bottom number shown in each cell.

etc. Before examining the possibility for developing appropriate empirical comparisons, consider first the conceptual framework necessary to evaluate the credit strength of a government. Here, there would seem two possibilities. First, one could rely on a historical record of default and use this record as a basis for grading the quality of municipal credit. That is, one could examine the fiscal and economic characteristics of communities which have defaulted and attribute a poor credit risk to any community having these characteristics. An alternative would be a purely conceptual statement of the factors behind a relatively good or relatively bad credit standing. The relatively small number of defaults on general obligation issues (There have been more defaults on revenue bonds.) in the postwar period leaves us without a feasible historical approach to grading the quality of state-local government debt. The alternative, then, is to turn to a conceptual statement of what makes some local governments better credit risks than others. Such a model should be useful to local officials in identifying their relative positions, as well as in the presentation of their position in the bond prospectus.

Note first that a quality rating is a probability of default, and that the aim of the rating system is to rank governments by their probability of default. Market considerations play absolutely no role in the evaluation of this probability. The municipal rating problem, then, comes down to defining and measuring the probability of de-
fault, and ultimately the discriminator among investment grade securities has to do with expected future performance under alternative assumptions about the performance of the local economic base and the local fisc. A logical and necessary place to begin articulation of this policy is with a statement of the conditions under which default might occur. Three major causes would seem to be (a) a prolonged national recession, (b) local economic decline, apart from national cyclical movements, and (c) a serious fiscal crisis because of the natural revenue-expenditure imbalance caused by (a) or (b) above, and perhaps complicated by public mismanagement. In any case, the question of debt burden enters as a basic factor. In grading the relative safety of a community on these counts, several possibilities come immediately to mind. First, in a period of recession, which communities are apt to be most severely affected. These areas are candidates for a higher default probability. Similarly, areas whose economic base is secularly diminishing because of intraregional movements of persons and industry (e.g., many central cities), or because their employment is concentrated in declining industries, would seem to have a higher long-run probability of default. It is the task in the following four subsections to explain these economic base characteristics in some detail and to present a measurement scheme capable of identifying communities with these adverse characteristics.

However, susceptibility to general economic decline is only one of the conditions necessary for default. Among the others would be annual debt requirements which comprise a relatively large fraction of general revenues in good times, a revenue structure which would transmit the area's economic decline to the local fisc, and a growing level of public service needs — particularly for welfare and educational services. It should be emphasized here that the focus in this kind of analysis is negative. That is, since the credit rating process is essentially an evaluation of the probability of default, we are required to ask how bad might the situation become under the most trying circumstances. That is, we must completely ignore the obverse of how good things might become under the best circumstances. Therefore, the rating approach is pessimistic rather than optimistic throughout this paper.

The Economic Base

Four characteristics of the community economic base which it would seem useful to include in a credit rating model are: (a) expected performance in a period of recession, (b) probability of local industrial decline either because of a recession or because of the decline of certain industries, (c) probability of long-term decline of local economic activity, and (d) projected decline within a region, e.g., the decline of a core city within the metropolitan region.
The first of these would deal with the expected income loss in a community in a period of severe recession, and might be crudely measured as the per cent of labor force employed in durable manufacturing industries, because of the relatively greater susceptibility of these industries in periods of decline. A similar statistic for tourism-related employment might be computed for certain cities. The second, the probability of local industrial decline irrespective of the overall performance of the economy, relates to the diversity of the local employment structure. Though large cities are not one industry towns, there are varying degrees of diversification and, therefore, varying degrees of local stability. There are alternative empirical approaches to quantifying such urban industrial diversity. The third indicator is simply to gauge the expected long-term performance of the local economy, on the expectation that, cet. par., those having expectedly low growth rates are a greater risk. The fourth measure would abstract from the expected growth of the entire region, and attempt to measure the possible secular decline of instability of the government involved, i.e., it may be the case that the metropolitan region is economically healthy, but its central city is not. A comparison of income and/or population growth rates inside and outside the city may be useful indicators of such a pattern.

Somehow, these four economic base factors will have to be combined and compared among cities to derive a ranking of metropolitan areas and specific local governments. To illustrate how such a comparative analysis might be used to evaluate the economic base for these purposes, these statistics may be compared for Buffalo, Dayton, and Atlanta. It should be emphasized that these cities are chosen for illustratory purposes only, and that data presented are neither in sufficient detail to serve the purposes of elaborate analysis, nor current. Nevertheless, this comparison should illustrate the utility of certain indicators for evaluating the overall “health” of an area.

Since comparative analysis requires that norms and abnormalities somehow be established, the first three columns of Table 3 show the average and the upper and lower deciles. The comparisons were made for 212 metropolitan areas, and, where appropriate, for 322 cities. “High” and “low” here are defined in terms of the upper and lower decile values respectively.

These comparisons show Atlanta to have a (relatively) diversified employment structure, a low dependence on durable goods manufacturing, projected growth rates in metropolitan economic activity well above the national average, and a city population growth rate which

---

### Table 3. — Selected Economic Base Indicators

<table>
<thead>
<tr>
<th></th>
<th>Average</th>
<th>High</th>
<th>Low</th>
<th>Buffalo</th>
<th>Dayton</th>
<th>Atlanta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Percent Employed in Durable Goods Industries</td>
<td>15.00%</td>
<td>29.00%</td>
<td>25.00%</td>
<td>25.00%</td>
<td>11.00%</td>
<td></td>
</tr>
<tr>
<td>2. Industrial Diversification Index *</td>
<td>34.37</td>
<td>19.63</td>
<td>4.89%</td>
<td>33.76</td>
<td>60.12</td>
<td>9.44</td>
</tr>
<tr>
<td>3. Projections (1962-75 growth rates)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employment</td>
<td>2.32</td>
<td>2.26</td>
<td>1.15</td>
<td>1.6</td>
<td>1.4</td>
<td>2.9</td>
</tr>
<tr>
<td>Income</td>
<td>4.42</td>
<td>4.37</td>
<td>3.04</td>
<td>4.0</td>
<td>3.4</td>
<td>5.5</td>
</tr>
<tr>
<td>Per Capita Income</td>
<td>2.56</td>
<td>2.51</td>
<td>1.86</td>
<td>2.7</td>
<td>2.1</td>
<td>2.4</td>
</tr>
<tr>
<td>City</td>
<td></td>
<td></td>
<td></td>
<td>8.2</td>
<td>7.6</td>
<td>47.1</td>
</tr>
<tr>
<td>SMSA</td>
<td></td>
<td></td>
<td></td>
<td>20.0</td>
<td>33.9</td>
<td>39.9</td>
</tr>
</tbody>
</table>

* This index was computed by the “minimum requirements” technique. A higher index number indicates a greater degree of specialization, and a lower index number a more diversified employment structure. See Roy Bahl, Robert Firestine, and Donald Phares, “Industrial Diversity in Urban Areas: Alternative Measures and Intermetropolitan Comparisons,” *Economic Geography*, Vol. 47, No. 3 (July, 1971), pp. 414-425.

suggests some growth balance within the SMSA. Conversely for the Dayton metropolitan area, these data indicate a high degree of employment specialization and higher (than Atlanta) dependence on durable goods manufacturing. The income and employment projections for the Dayton SMSA are below average, and Dayton’s core city is growing at a rate considerably below that of the entire metropolitan area. The Buffalo metropolitan area shows a similar (to Dayton) dependence on durable goods manufacturing, and an employment diversification about equal to the national metropolitan average. Metropolitan employment and income projections show Buffalo to be below the national average, and the population of the core city to be growing at a considerably lower rate than that of the metropolitan area.

These comparisons, even if made in 1960, would be subject to certain shortcomings, e.g., the SIC classes and aggregation chosen may bias the results in undesirable ways, and the vulnerability of Atlanta’s economy to Lockheed’s decline is not explicitly denoted. Nevertheless, this illustration does demonstrate that even crude benchmarks might be useful in evaluating the general character of a local economy for rating purposes.
A comparative analysis of this type, supplemental with whatever specific information about the city's economic base, is all one might expect of the rating agencies. Indeed, this kind of analysis involves a great deal of effort. However, because this approach does not account for all of the peculiarities of the city, a strategy is suggested for the city officials and/or the Bond attorneys charged with preparing the prospectus. Comparative statistics might be supplemented with local knowledge of the city's economic base, e.g., heavy industry has been moving out of the city but there is (quantifiable) evidence of in-movement of administrative employment, or sales and construction in the central business district had been off for several years, but new building starts, new planned activity, and/or a downtown renewal plan point to revitalization of the CBD. In sum, the function of the prospectus ought to be one of anticipating the comparative analysis on the strength of the economic base and providing appropriate supporting evidence.

The Fiscal Base

It is hard to conceive of a municipal default which occurs solely because of the performance of the local fisc — i.e., it is more realistic to think in terms of decline in the private sector as the catalyst and factors such as high debt burden and a relatively income elastic revenue structure coming into play to reinforce the situation. Other factors which might contribute to the possibility of default under trying economic circumstances are: (a) a debt retirement schedule weighted heavily in certain years, (b) a declining tax base occasioned by the economic decline of (or decentralization within) the area, together with a rising demand for public services imposed by an increasing amount of low income population, (c) a disposition of local revenues which is inflexible because of substantial earmarking, and (d) a relatively minor state government involvement in financing welfare and education. The necessary condition would seem to be a high debt burden, or alternatively stated, a relatively low margin of safety. Accordingly, it would seem most appropriate to begin an analysis of the determinants of municipal default with debt burden considerations.

Note that the focus throughout is on the marginal contribution of local fiscal characteristics to the probability of default, under alternative kinds of adverse economic circumstances. This slant is taken because it seems unlikely that local governments would otherwise have difficulty meeting debt obligations. In addition to the possibilities of cyclical and autonomous decline discussed above, the "adverse economic circumstances" condition includes the situation where there is a question of whether forecasted levels of activity will in fact occur.

 Debt Burden and the Probability of Default  The probability of
default for a municipal issue will be greater if the local government
debt burden is high, i.e., if the claim of debt retirement and interest
expenses on local tax resources reaches dangerously high proportions.
Immediately, there are three serious measurement problems: first,
which debt is to be considered; second, how is the claim of this debt
on annual revenues to be estimated and compared when there are not
readily available data on annual repayment of principal; and, third,
what is a "dangerous" debt burden level.

The alternative views on the first question, which debt is relevant,
are (a) the debt of a government unit, or (b) the debt of an area,
*i.e.*, including the debt imposed by overlapping governmental juris-
dictions. Both would seem important. The governmental measure
must be an important consideration because governments, and not
areas, may default on a bond; and because it does not necessarily
follow that the default of one government in an area means the
automatic default of all overlapping jurisdictions. On the other hand,
consideration of overlapping debt levels is also essential, first because
intercity comparisons in debt level must be made — *i.e.*, since ratings
are grades of relative safety, interarea comparisons are mandatory to
determine how a city departs from some average, or normal, level of
indebtedness. The complicated fragmentation of local financial re-
sponsibility makes such a comparative analysis of statistics of govern-
mental units *per se* meaningless. Yet another reason for examining
overlapping debt is to measure the total drain on the local tax base,
therefore to generate an estimate of the potential for future debt
increments.

The problem of which debt to consider might be resolved partially
by considering both governmental and overlapping. First, the annual
retirement plus interest obligation of a governmental unit may be
expressed as a fraction of general revenues from own sources to
estimate intercity differentials in the drain on local fiscal resources.
However, governmental accounting practices and fiscal fragmentation
distort this measure badly — to a point where it may not be usable
if taken from Census sources. What is needed is a measure of that
fraction of locally collected revenues which is used to repay debt, and
to meet interest costs. These data are just not available in the needed
form. But note that, while high values of this ratio may suggest a
basically unsound debt level, it does not necessarily follow that ex-
tremely low values are evidence of a strong credit condition. Low
values may, in fact, indicate a serious under-investment in public
facilities — a condition which may not be conducive to adequate
long-run growth.

The alternative to using a measure of the size of the drain on
current revenues is to use as proxy the level of debt outstanding, *i.e.,
to measure the level of a government's overall debt burden. Govern-
ment finance data provide some information on the levels of governmental debt outstanding, but data on overlapping debt are not readily available. There would seem two alternatives to resolving this data deficiency: (a) to examine SMSA aggregates as presented in the Census of Governments, and (b) to undertake the sizeable task of collecting and analyzing local government data.

From actual data on overlapping debt gathered on a community by community basis, three summary indicators would seem useful: (a) per capita overlapping debt, (b) the ratio of overlapping debt to full property value, and (c) the ratio of overlapping debt to personal income. The data presented in Table 4 show Atlanta to have a measurably higher per capita overlapping debt level than either Buffalo or Dayton. But, when the overlapping debt level is matched with estimated true value, Atlanta and Dayton appear relatively low and Buffalo relatively high. These comparisons are most meaningful, if all three cities are constrained to rely heavily on the property tax, i.e., property values would be a meaningful base against which to compare debt outstanding. If the city relies heavily on more elastic non-property tax revenues, the debt-property value ratio overstates the comparative debt burden. There are numerous other qualifying statements to include in the city prospectus. Two examples are the presentation of the maturity schedules of the actual issues to demonstrate the nature of the time drain on local resources, and the natural expansion of the property tax base to project rises or declines in the debt-property value ratios.

**Revenue-Expenditure Imbalance** Nearly all metropolitan central city governments currently face the serious problem of a growing imbalance between expenditure needs and tax resources. On the needs side, core cities are receiving an increasing fraction of low-income families in general, including non-whites, the elderly, and the unemployed. To accentuate the core city needs further, a great mass of daytime commuters to work and to shop must also be provided with public services. On top of these kinds of pressures, there are demands for increased wage rates for public services employees and increased fringe benefits. On the resources side, the low-income population certainly adds less to the revenue base than to expenditure requirements. Also, depending on the rate and base structure of local revenues, core city governments may not be compensated adequately by non-resident users.

The seriousness for municipal bond ratings of a prognosis of heavy expenditure pressure may be evaluated only in light of the local revenue structure. If a declining core city is almost completely dependent on the property tax, its ability to meet debt obligations over the long run may be seriously impaired. On the other hand, substantial reliance on more broadly based non-property taxes may en-
Table 4. — Selected Fiscal Indicators Computer for 212 SMSA’s and 322 Cities

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Average</th>
<th>High</th>
<th>Low</th>
<th>Buffalo</th>
<th>Dayton</th>
<th>Atlanta</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Percent of Population with Incomes below $3,000</td>
<td>19%</td>
<td>28%</td>
<td>—</td>
<td>17%</td>
<td>17%</td>
<td>26%</td>
</tr>
<tr>
<td>2. Percent of Non-White</td>
<td>14%</td>
<td>30%</td>
<td>—</td>
<td>13%</td>
<td>22%</td>
<td>38%</td>
</tr>
<tr>
<td>3. Percent of Substandard Housing</td>
<td>18%</td>
<td>27%</td>
<td>—</td>
<td>17%</td>
<td>14%</td>
<td>22%</td>
</tr>
<tr>
<td>4. Median Family Income</td>
<td>$6,084</td>
<td>$7,613</td>
<td>$4,555</td>
<td>$5,713</td>
<td>$6,266</td>
<td>$5,029</td>
</tr>
<tr>
<td>5. Per Capita Full Value of Property</td>
<td>$6,041</td>
<td>$9,629</td>
<td>$2,453</td>
<td>$3,864</td>
<td>$7,056</td>
<td>$6,935</td>
</tr>
<tr>
<td>6. Percent of Welfare Expenditures by the State Government</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>85%</td>
<td>86%</td>
<td>97%</td>
</tr>
<tr>
<td>7. Percent of Local Schools Expenditures by the State Government</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>52%</td>
<td>24%</td>
<td>68%</td>
</tr>
<tr>
<td>8. Property Taxes as a Percent of Local Government Revenues</td>
<td>56%</td>
<td>86%</td>
<td>27%</td>
<td>75%</td>
<td>30%</td>
<td>38%</td>
</tr>
<tr>
<td>9. Per Capita Overlapping Debt</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>$294</td>
<td>$267</td>
<td>$458</td>
</tr>
<tr>
<td>10. Overlapping Debt as a Percent of Personal Income</td>
<td>14%</td>
<td>23%</td>
<td>5%</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>11. Overlapping Debt as a Percent of Full Value of Property</td>
<td>5%</td>
<td>7%</td>
<td>2%</td>
<td>6.8%</td>
<td>3.0%</td>
<td>4.8%</td>
</tr>
<tr>
<td>12. Governmental Debt as a Percent of Personal Income</td>
<td>8%</td>
<td>15%</td>
<td>1%</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

* Computed from 322 cities.
hance the adequacy of the core city fisc if the outlying portion of
the SMSA is growing. If a local occupational or sales tax is levied,
a proportion of the wealth of non-core city residents may be tapped
to support central city services, though, even here, the continuing
long-term decentralization of industry and retail activity may ulti-
mately deplete the non-property tax base. A final possibility is sub-
stantial reliance on an area-wide revenue base distributed on some
needs basis. This conceivably would tie local revenues to the re-
sources of the entire metropolitan area and not to the declining core
city base. This latter financing arrangement may lessen the long-run
default probability of a declining central city as much as any purely
local fiscal policy. The specifics of the urban revenue structure, and
any indication of how city taxes reach beyond the city tax base,
should always be an integral part of the prospectus.

From Table 3, it might be argued that Dayton and Buffalo are
experiencing greater central city decline than is Atlanta, though the
city of Atlanta has a lower income level and a greater per cent of
the population with incomes below $3,000. More detailed city-
suburb comparisons might be used to determine whether there is a
trend toward increasing intra-metropolitan imbalance. At any rate,
a superficial look at the data suggests that all three have the charac-
teristics of the stereotyped declining core city. On the revenue side,
Buffalo relies on the local property tax to a much greater extent than
does either Dayton or Atlanta. The State of Georgia improves
Atlanta’s fiscal strength by assuming nearly all financial responsibility
for welfare and a fairly large share for education. Dayton’s fiscal
strength is not supported to the same extent by the State of Ohio’s
posture toward education and welfare.

Long-term Revenue Stability and Adequacy The possibility for
default may be increased if, in the long run, the local revenue base
proves to be inadequate by failing to expand with increasing expendi-
ture needs. If the local government is dependent to a great extent on
the property tax, the long-term growth in revenues may not be ade-
quate to meet the needs of, for example, a large central city. On the
other hand, a growing bedroom suburb might find the property tax
to be an adequate long-term source of revenue. Then, the long-term
adequacy factor as it relates to the local revenue structure may be
evaluated only in light of the characteristics of the governmental unit
in question.

A second feature of the local revenue structure which has been
considered relevant for purposes of municipal rating is that of revenue
stability. Specifically, the question is how will the local fiscal base
perform in a period of economic decline, i.e., will it magnify or
dampen the decline in transmitting it from the private to the public
sector? If heavy reliance is placed on the income-elastic sales and

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income taxes, a sustained decline in economic activity could affect
tax collections by a substantial amount. Alternatively, the property
tax shows the most stable yield in a period of recession, therefore
governments relying heavily on the property tax will probably fare
best. But, again, it does not follow that property taxes are conducive
to greater long-term stability in all types of communities. The kind
of tax structure which is most conducive to long-run adequacy of
local fiscal resources is another question which cannot be answered
apart from a consideration of the type of governmental unit being
examined.

The position here is that the cost, in terms of revenue growth, of
relying heavily on the property tax is high. All other things being
equal, a core city undergoing long-term decline would seem to be a
relatively higher risk if it relies heavily on the property tax.

Revenue Flexibility Inflexibility in the revenue structure may also
contribute to a higher probability of default. If there is a substantial
earmarking of local receipts, the potential for transferring funds to
meet the most pressing needs is limited. A second factor which may
reduce the flexibility of local revenue systems is the rapid growth of
revenue bonds. The dedication of local revenues to meeting these
liabilities substantially increases the rigidity of local revenue systems.

Revenue Base Diversity Some smaller suburban governments face
the problem of a relatively few taxpayers accounting for a substantial
proportion of total local receipts. In this situation, the potential for
local fiscal decline is relatively great. If a few large firms comprise
a relatively high fraction of assessed value or property tax receipts,
local revenues may be only as stable as these firms, and the safety of
principal and interest may be less than in the presence of a more
highly diversified tax base. In addition, a suburb with such tax base
concentration will perform poorly during periods of prolonged re
cession, and will have fiscal base more susceptible to autonomous
local fiscal decline.

Intergovernmental Assistance and Revenue Adequacy The long-
term adequacy of local government revenues may not be properly
evaluated without consideration of state and federal assistance pro-
grams, for intergovernmental revenues are playing an increasingly
important role in the financing of modern urban government. In
fact, the most important element in the fiscal health of Central Cities
may well relate to the intergovernmental dimension. Many would
hold that the key to the fiscal future of American cities lies in the
resolution of their problem of providing for the poor and for the
children, and the American experience over the past decade suggests
that at least one potential solution to these problems involves increasing reliance upon state government.

There are two general ways in which state government might affect
the credit rating of local governments by affecting the adequacy of its local fisc. First, direct state assistance (either through a grant program or transfer of function) should be a major consideration in evaluating the fiscal health of local governments, for intergovernmental revenues average about 30 per cent of locally raised city government revenues. State and federal financial assistance is a vital consideration in evaluating the debt repayment potential of local governments. This is an especially important consideration for those core cities which are experiencing a strong upward pressure on local expenditures. In such cases, continued state and federal participation in local finances strengthens the local fiscal position. In states where the welfare function has been directly transferred to the state government, or where primary financing responsibility has been assumed by the state, the prognosis for core-city fiscal adequacy is considerably brighter. During periods of declining economic activity, requirements on the paying government for public assistance payments increase, and, if tax receipts are also down, the city's fiscal position could become precarious. However, if welfare is a state function, much of the cumulative financial pressure is shifted from the city to the generally more affluent state government with its broader tax base. The transfer of function option also enables the city to avoid the high drains on the local budget in more prosperous times, since labor shortages have, in past years, attracted great numbers of the low income and unskilled to the larger urban areas.

The second opportunity for state government to raise the credit rating of its local governments is to create a general atmosphere which is conducive to efficient local government debt management. The ACIR points out that, in several states, especially those with detailed constitutional provisions for local debt, existing law as it has been judicially interpreted tends to remove or bias the choice of local governments among alternative kinds of long-term borrowing. The lack of clear definitions of debt, together with existing state provisions that make popular referendum a mandatory condition for the issuance of full faith and credit obligations, has stimulated the creation of additional special districts and financing authorities. In general, these restrictions on local government have spawned expensive borrowing practices.

The ACIR makes four suggestions as to how state government might increase the efficiency of local government borrowing and debt practices:

1. Authority to issue bonds should be legally vested in the governing

bodies of local governments, subject to a permissive legislation only, on petition, and with participation in any such referendum available to all eligible local voters and the results determined by a simple majority vote on the question.

2. Constitutional and statutory provisions limiting local government debt or debt service by reference to the local base for property taxation should be repealed.

3. States should consider measures to regulate long-term borrowing of local governments by reference to the net interest cost or prospective bond issues in relation to the currently prevailing interest rate on high quality municipal securities.

4. States should make available technical and advisory assistance to local governments with regard to the issuance of long-term debt; and the state agency responsible for this function should be empowered to prescribe the minimum content of official statements prepared by local governments in connection with their issuance of long-term debts, in order to provide prospective investors with data needed to evaluate the security offerings.\textsuperscript{17}

At least the first three of these factors might be included as subjective factors which have a positive influence on the credit rating.

V. Conclusions

This paper is addressed to state and local officials charged with developing a statement of a government's credit strength. The intention is to develop a general conceptual and comparative empirical framework which might suggest the material which should be presented in the prospectus.

Note that the illustrative comparative analysis of 1960 economic base and fiscal statistics presented above does not provide a quantitative municipal rating system. To do so, these data would somehow have to be combined to derive a single comparative measure for each government. At this point in time, it does not seem possible to carry the quantitative analysis to that extreme because of the many subjective factors which must be considered. For example, if a declining core city and a heavy dependence on the property tax may be quantitatively documented, it remains to consider how the state government will intervene on behalf of the city via grants-in-aid or direct assumption of responsibility for welfare and education. However, there would seem to be room to develop a set of indicators, along the lines described above, which would be useful in substantiating an argument as to the comparative economic and fiscal health of governments.

Nevertheless, every attempt at quantification of the relevant factors should be made. City governments should rethink their old methods of presenting their credit strength to the market — the opportunity costs of not doing so may be very high indeed.

\textsuperscript{17} Ibid., pp. 72-82.
Appendix A

Bond Rating Definitions

Standard and Poor's

AAA-Prime — These are obligations of the highest quality. They have the lowest probability of default. In a period of economic stress the issuers will suffer the smallest declines in income and will be least susceptible to autonomous decline. Debt burden is not inordinately high. Revenue structure appears adequate to meet future expenditure needs. Quality of management would not appear to endanger repayment of principal and interest.

AA-High Grade — The investment characteristics of bonds in this group are only slightly less marked than those of the prime quality issues. Bonds rated AA have the second lowest probability of default.

A-Upper Medium Grade — Principal and interest on bonds in this category are regarded as safe. This rating describes the third lowest probability of default. It differs from the two higher ratings because there is some weakness, either in the local economic base, in debt burden, in the balance between revenues and expenditures, or in quality of management. Under certain adverse circumstances, any one such weakness might impair the ability of the issuer to meet debt obligations at some future date.

BBB-Medium Grade — This is the lowest investment grade security rating. Under certain adverse conditions, several of the above factors could contribute to a higher default probability. The difference between A and BBB ratings is that the latter shows more than one fundamental weakness, whereas the former shows only one deficiency among the factors considered.¹

Moody's

Aaa — bonds with the smallest degree of investment risk; interest payments are protected by large or by an exceptionally stable margin, and principal is secure; changes in various protective elements are most unlikely to impair the fundamentally strong position of such issues.

Aa — high quality of all standards but rated lower than best bonds because of lower margins of protection, greater amplitude of fluctuations of protective elements, or some other elements which make the long-term risk appear somewhat larger than on the best bonds.

A — higher medium-grade obligations with adequate factors giving security to principal and interest but with elements present which suggest a susceptibility to impairment sometime in the future.

Baa — lower medium-grade bonds which are neither highly protected nor poorly secured; interest payments and principal appear adequate for the present, but certain protective elements may be lacking or may be characteristically unreliable over any great length of time.²

Dun and Bradstreet

Prime Grade: These situations exhibit more or less uniformly strong characteristics with respect to all basic credit factors and are lacking in significant unfavorable characteristics. Bonds of this group are assumed to involve the least risk of nonpayment or delay in payment.

Better Good Grade: These situations, while inherently strong, fail to meet requirements for PRIME GRADE credit quality, normally because they exhibit some characteristic which, while sub-standard, is amply offset by other factors.

Good Grade: These situations measure up to prevailing standards as to the majority of basic credit factors and are lacking in significant weaknesses. The odds in favor of continuity of debt service payments are high.

Better Medium Grade: These situations exhibit elements that fall short of meeting GOOD GRADE standards, but the elements of strength present on the whole outweigh any significant weaknesses. The odds comfortably favor continuity of debt service payments.

Medium Grade: These situations exhibit elements that fall short of average performance and have weaknesses that in at least some respects exceed acceptable levels. Security of principal is regarded as good, but interruption of payments could occur under sufficient pressure.

Lower Medium Grade: These situations are sub-standard as to the preponderance of basic credit factors, but other factors must be considered and such situations may work out without interruption of debt services. The group contains elements of speculation.

Marginal Grade: These are distressed situations, or situations exhibiting significant weaknesses such that continuity of debt service payments is dependent on a fortuitous combination of circumstances which cannot reasonably be expected to continue indefinitely.

Default: These situations are in default as to interest, principal, or both on the class of bonds under study. Ordinarily, an appraisal of the credit prospects will depend on clarification of the situation, including development of proposals to cure the default.³


Chairman Netzer: Our second paper takes up a subject of long and obvious interest to policy-makers, the burden of state-local tax systems by income class. Over the years, there has been a good deal of research on the subject; in this generation, most of the research has been in the form of adaptations of an approach developed by Professor Richard Musgrave and published in the National Tax Journal twenty years ago. Nearly everyone who has done research on the topic is dissatisfied with his own results — and most emphatically so in my own case — and with policy-makers' perceptions of the realities. The paper before us presents a new approach, which overcomes some of the most serious deficiencies in the analyses done heretofore. Its author, Dr. Donald Phares, is Assistant Professor of Economics at the University of Missouri — St. Louis, and Staff Economist at the University's Center for Community and Metropolitan Studies. He did his graduate work at Syracuse University and has written on a variety of issues in urban economics and state-local finance.

Dr. Phares.