Volume Title: The Postwar Quality of State and Local Debt

Volume Author/Editor: George H. Hempel

Volume Publisher: NBER

Volume ISBN: 0-87014-217-8

Volume URL: http://www.nber.org/books/hemp71-1

Publication Date: 1971

Chapter Title: Evaluations by Rating Agencies

Chapter Author: George H. Hempel

Chapter URL: http://www.nber.org/chapters/c3431

Chapter pages in book: (p. 101 - 124)

7

EVALUATIONS BY RATING AGENCIES

Ratings are assigned to many state and local bond issues by the major rating services. These ratings are determined by experienced bond analysts and are based on their assessment both of instrument and borrower characteristics and of changes in the external environment in which the issue will exist. When the ratings assigned to state and local issues are aggregated, the movements in the aggregate distributions should provide the rating agencies' evaluation of prospective quality.

In this chapter, the meaning and application of the rating classifications used are reviewed. Some of the characteristics that the rating agencies use and the historical record of ratings are briefly examined. Then, percentage distributions of the number and dollar amount of state and local debt outstanding and issued annually in each rating category are analyzed.

The Meaning and Use of Agency Ratings

Three companies – Moody's Investors Service, Inc., Standard and Poor's Corporation, and Dun and Bradstreet, Inc. – have rated state and local issues in recent years. All three agencies emphasize the fact that they grade individual issues of state and local units in terms of credit risk and do not consider the investment merits of the issue in rating decisions. Dun and Bradstreet has generally confined its analysis to a limited number of large issues, while Moody's Investors Service, Inc., and Standard and Poor's Corporation classify a much broader category of securities. Table 18 shows that Moody's has rated approximately two-thirds of the dollar amount of state and local debt outstanding in the postwar period. Moody's or Standard and Poor's have rated slightly over three-fourths of the dollar amount of newly issued state and local debt. Table 18 also shows that a substantially higher proportion of

TABLE 18

Proportionate Dollar Amounts of Long-Term State and Local Debt Outstanding and Newly Issued Which Are Rated

Year of Manual	Percentage of Long-Term Debt Rated	Percentage of General Obligations Rated	Percentage of Limited Liability Obligations Rated	Rated Limited Liability Obligations As Per Cent of All Rated Debt
	Long-Term State and Local Debt Outstanding[a]			
1943[b]	77.0	85.4	25.6	4.7
1949	73.7	73.7	73.5	10.6
1952	70.2	73.7	52.4	12.3
1954	73.2	81.2	48.4	16.0
1956	67.3	77.6	43.8	20.0
1958	65.7	83.0	33.6	18.0
1960	64.3	74.2	46.5	25.9
1966	67.5	82.3	45.4	27.0
	Long-Term Newly Issued State and Local Debt[c]			
1957-58	76.3	83.5	55.9	19.0
1959	78.2	86.7	61.0	25.6
1960	72.4	84.0	45.8	19.2
1961	77.7	91.7	46.8	18.7
1962	78.9	89.5	55.3	21.8
1963	76.0	84.2	63.5	33.4
1964	78.5	90.8	55.4	25.4
1965	79.3	90.8	55.9	23.2
1966	75.4	89.1	51.9	25.3
1967	80.0	93.2	56.3	25.1
1968	84.1	92.2	71.9	34.2
1957-68[d]	78.6	88.9	57.9	25.2

Sources: Data from Moody's Investors Service, Inc. and the Investment Bankers Association.

[a]Dollar value rated by Moody's Investors Service.

[b]Issues of $200,000 or over; for all other years for issues of $600,000 or over.

[c]Dollar value rated by Moody's Investors Service, by Standard and Poor's Corporation or by both.

[d]The figures in these rows are totals or percentages of totals for the period listed.

general obligations are rated as compared to limited liability obligations.[1]

In this study the rating classification of Moody's Investors Service are used because Moody's began publishing ratings for a sizeable proportion of the bonds outstanding as early as 1919 and because the Investment Bankers Association uses the Moody's rating for its rating information on new state and local issues.[2] Moody's describes its rating symbols in the following manner (descriptions condensed):

Aaa—bonds with the smallest degree of investment risk, interest payments are protected by a 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 given 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.

Ba—bonds whose future cannot be considered as well assured; usually the protection of interest and principal may be very moderate and thereby not well safeguarded during both good and bad times over the future.

B—bonds where the assurance of interest and principal payments or of maintenance of other terms of the contract over any long period of time may be small.

[1]Figures are not available for the proportionate dollar amount of state and local debt outstanding that is rated by Standard and Poor's. Since the total number of state and local issues outstanding is not available, the proportionate number of rated issues cannot be computed. Unpublished figures furnished by the Investment Bankers Association indicate that slightly less than 50 per cent of the total number of long-term state and local issues from 1957 through 1968 were rated by Moody's or Standard and Poor's. Representatives of Moody's and Standard and Poor's gave three reasons for not rating state and local issues: (1) issues of units where debt outstanding is less than a specified amount ($600,000 for Moody's) or was sold privately; (2) issues that are not rated as a matter of policy, e.g., real estate bonds; and (3) issues where data essential for sound rating judgment is missing.

[2]Dun and Bradstreet rates a substantially smaller number of issues and Standard and Poor's did not begin rating state and local debt until the early 1950's. While the opinions of these rating services differ on specific issues, the over-all rating distributions are quite similar (see George H. Hempel, "The Postwar Quality of Municipal Bonds," p. 200).

Caa—bonds of poor standing which are in default or contain present elements of danger with respect to principal or interest.

Ca—bonds which are speculative in a high degree; such issues are in default or have other marked shortcomings.

C—lowest rated class of bonds; have extremely poor prospects of ever attaining any real investment standing.[3]

The percentage distributions in this section include distribution for both the dollar value and the number of rated long-term state and local debts outstanding at a point in time and the same figures for rated long-term debt issued during a particular time period. The distinction between and the comparability of these two types of rating distributions should be understood before one analyzes the rating agency's assessment of instrument and borrower characteristics and of changes in the external environment.

Typically, there is only one rating for all long-term general obligations of a particular state or local governmental unit and for all long-term issues of a specific revenue project. Some governmental units or revenue projects have more than one rating because special security is pledged for some of the bonds. New issues of a previously rated unit or revenue project are usually assigned the same rating as the outstanding debt unless there are material changes in the credit situation. Therefore, new issues of a previously rated unit or revenue project usually increase the dollar value outstanding in a rating category but usually do not affect the number of state and local issues in a rating category. The serial retirement of most long-term state and local debt is also reflected by a decline in the dollar value of long-term debt outstanding but not in the number of issues outstanding. Finally, changes in the rating of state and local bonds after they are issued are reflected in both the number and dollar value of long-term state and local debt outstanding in a specific rating classification. The distributions based on the number and dollar value of rated debt outstanding should provide an accurate profile of the rating agency's evaluation of the quality of all rated long-term state and local debt at that time.

Rating distributions based on long-term debt issued during a particular time period reflect both the number and dollar value of each new issue that is rated. Some governmental units may have several new issues with the same rating in a single time period. Each of these issues is reflected in the rating distributions by dollar value and number issued. The ratings reflected in these distributions are those assigned at the time of issue and neither retirements nor rating changes affect these distributions. The rating distributions based on the number and dollar value of rated debt issued should give an indication of

[3]Moody's Investors Service, Inc., *Moody's Municipal and Government Manual*, New York, 1969, p. vi.

movements in the rating agency's evaluation of the quality of rated long-term state and local debt.

Because of the differences discussed in the preceding paragraphs, the rating distributions of long-term state and local debt outstanding should not be compared directly with the rating distributions of long-term and local debt issued. This seems particularly true for rating distributions based on the number of state and local bonds outstanding and on the number of newly issued bonds, since the two types of distributions are based on noncomparable data. Limited comparisons seem permissible when dollar value outstanding and the dollar value issued are based upon reasonably comparable data. Possible rating changes after the bonds are issued and possible maturity differences within rating categories limit the significance of a comparison between the rating distributions based on the dollar value outstanding and those based on the dollar value issued.

Another possible limit to comparability of rating distributions based on the two methods used here is the advent of bonds with Public Housing Authority contracts in 1951. These Public Housing Authority bonds are all rated Aaa. Thus, if they are included in the rating distributions, they tend to improve average bond quality. Since these bonds are guaranteed by the federal government, many bond analysts feel they should be treated as federal rather than state and local debt. The rating distributions of outstanding long-term state and local debt studied here do not include Public Housing Authority bonds because the raw data available for the purpose of analysis exclude these bonds. In contrast, the raw data on rated long-term state and local debt issued include Public Housing Authority bonds. In this study the rating distributions for rated long-term debt issued are presented both including and excluding Public Housing Authority bonds.

Characteristics Considered by Rating Agencies

Before analyzing the percentage distributions of rated long-term state and local debt, one should be aware of the processes followed and characteristics considered in assigning a rating to an issue and of the past payment performance of rated issues.

The processes used by the two agencies rating a high proportion of state and local bonds, Moody's Investors Service and Standard and Poor's Corporation, generally consist of two steps.[4] First, all of the pertinent characteristics about the issuing unit or the project being financed is gathered and investigat-

[4]The rating process used by Dun and Bradstreet involves a smaller number of analysts and is more formalized. The characteristics considered by Dun and Bradstreet also seem to be similar to those formulated in the conceptual model in Chapter 2.

ed by an experienced bond analyst. Most of these analysts specialize in geographic areas or particular types of revenue-producing projects. Second, a rating committee considers all of the data collected by the analyst until the committee members reach substantial agreement on the appropriate rating category. The rating committee typically consists of the analyst who prepares the data, several senior analysts, an investment counselor and any other member of the rating agency who has intimate knowledge about the area or project being evaluated. Most new issues that meet the agency's minimum prerequisites for being rated are assigned to a rating category. If the governmental unit has similar issues which have already been rated, the examination of the new issue is usually perfunctory and the same rating is assigned to it unless there is evidence of any fundamental change in the situation.

When interviewed, representatives of Moody's and Standard and Poor's state that their respective agencies used instrument and borrower characteristics similar to those discussed in the conceptual model in Chapter 2 and used in this study. These representatives were then asked about the standards (or desired levels) for instrument and borrower characteristics in a rating category and about the weights applied to these characteristics or groups of characteristics. The answer in both cases was that neither the specific analyst nor the rating committees have formal standards or weights for instrument or borrower charactistics or groups of such characteristics. The effect of the future external environment was also considered in an informal manner. The representatives of both rating agencies seemed to feel that purely objective measurements were not appropriate for selecting the rating category of a state and local issue. Instead, they emphasized the importance of careful study and decisions made by experienced bond analysts and committees.[5]

Results from two past analyses of the instrument and borrower characteristics affecting the ratings assigned to state and local issues supported the agency's statements that they used characteristics similar to those in the

[5]In the author's opinion there are several factors which support such a nonmechanistic evaluation of instrument and borrower characteristics and the future external environment to determine the ratings assigned to state and local issues. First, the instrument and borrower characteristics should be analyzed in conjunction with each other rather than separate measures. Second, many measures affecting the quality of an issue, e.g., the future economic environment, cannot be accurately expressed in quantitative terms. Third, various rating analysts may give different weights to characteristics and to interrelationships among characteristics, and these weights may change as conditions change.

On the other hand, the agencies' present nonmechanistic evaluation of instrument and borrower characteristics and the future external environment has several disadvantages. First, the characteristics that decide the ratings of state and local issues are largely uncontrollable. Second, the weights given to characteristics might be shifted unconsciously among different rating situations. Third, there is no assurance that final rating decisions are consistent over longer periods of time. Finally, it is more difficult for interested persons (like the author) to use and assess agency ratings.

conceptual model formulated and used in this study.

Carleton and Lerner used multiple discriminant analysis[6] to test the effect of six simple characteristics (debt to assessed values, debt to population, log population, log debt, average collection rate and school district or not) on the ratings of general obligations. Their analysis showed: (1) the means of the characteristics they studied were ordered among bond ratings in the fashion predicted by the conceptual model; (2) the signs of the weights that most effectively discriminated between the various ratings were consistent with the conceptual model; and (3) using discriminate function weights and knowledge of the rating distribution for the sample, Carleton and Lerner were able to predict the actual ratings in 53 per cent of the cases and within one rating category in an additional 40 per cent of the cases.[7]

In the second test, the author used multiple correlation analysis[8] to test the linear relationships between twenty-three instrument and borrower characteristics (all of the quantitative characteristics available at the time of the study) and a selected sample of general obligations. The sample was selected by randomly choosing twenty general obligations in each of the top four rating categories from all the larger issues in that category that had maintained the same rating from 1949 through 1963. The results of this analysis demonstrated that the means of nearly all of the characteristics studied were ordered among bond ratings in the manner predicted by the conceptual model in both 1949 and 1963.[9]

Linear regression equations based on five characteristics, selected by factor analysis to limit multicollinearity (estimated true property value to over-all tax supported debt, percentage of property taxes uncollected, deviation from average population change in the preceding seven years, over-all tax supported debt as a per cent of disposable personal income and the nonwhite proportion of the population) explained approximately 55 per cent of the rating differences in 1949 and approximately 39 per cent in 1963. The signs of the coefficients of the five characteristics were consistent with the conceptual model. The regression equations were good rating predictors for other samples in the same year. The coefficients of the five characteristics did change

[6]A multivariate statistical technique designed to assign weights to several characteristics in a manner so that the characteristics studied have the maximum ability to predict into which of several different credit classifications a bond issue will fall.

[7]Willard T. Carleton and Eugene M. Lerner, "Statistical Credit Scoring of Municipal Bonds," an unpublished research report financed by the Federal Deposit Insurance Corporation, Washington, D.C.

[8]A multivariate statistical test used to measure the extent and nature of the linear relationship between a dependent variable and two or more relatively independent variables.

[9]George H. Hempel, "Postwar Quality of Municipal Bonds," pp. 226-235.

between 1949 and 1963, however, and the 1949 equation was a relatively poor predictor for 1963 ratings.[10]

Past Payment Performance of Rated State and Local Issues

One method which is useful in assessing how well ratings measure prospective quality is an analysis of the past payment performance of rated state and local issues. The ratings of 264 state and local units which defaulted during the 1929 depression period and of the 6 postwar default situations that had rated issues are examined in the following paragraphs.

Table 19 summarizes the 1929 rating distributions for 264 state and local units which defaulted during the 1929 depression period. The 264 units include the general obligations of all defaulting states, all defaulting incorporated municipalities and school districts with a 1930 population of over 10,000, all counties with a 1930 population of over 50,000, and all other districts with a 1930 population of over 25,000. The Seattle Street Railway issue was the only defaulting revenue bond rated in 1929. It was rated Baa, but is not included in Table 19. While the 264 defaulted issues in Table 19 seem relatively small when compared to the total number of defaults, the dollar value of these issues is over three-fourths of the total amount of defaulted state and local debt in that period.

The proportionate totals in Table 19 show that 78 per cent of the defaulting issues were rated Aa or better in 1929. The defaulting issues rated Aa or better in 1929 constituted 94.4 per cent of the total dollar value of the 264 issues. Many of the bonds rated A or below were the debts of Florida municipal units which had experienced financial difficulties before 1929. The large proportion of defaulting state and local issues in the top rating categories appears to be partly explained by the large percentage of issues in the top rating categories in 1929 – 53 per cent of all rated issues were rated Aaa, 24 per cent were rated Aa, 18 per cent were rated A, and 5 per cent were rated Baa or lower. Furthermore, the ratings at that time appear biased in favor of large governmental units. Nearly 98 per cent of the 310 cities with populations of over 30,000 were rated Aa or better. Nevertheless, it is disturbing that such a high proportion of the 264 defaulting issues were rated Aa or better in 1929.

Chart 20 was formulated to demonstrate what happened to the ratings of the 264 defaulting units from 1926-37. Unfortunately, the only year in this period for which there is an over-all rating count is 1929. Chart 20 reveals that the quality of this group of issues as assessed by the rating agency began

[10] *Ibid.* When asked about the changes in the coefficients of the characteristics, representatives of the two major rating agencies stated that some nonmeasurable factors had changed appreciably between the two periods. The two factors specifically cited were: the improvements in the quality of state and local financial administration and the much greater predicted stability for economic activity.

TABLE 19

1929 Ratings for Bonds Which Defaulted During the 1929 Depression Period

1929 Moody's Rating	States	Cities and Towns[a]	School Districts[a]	Counties[b]	Other Districts[c]	Total	Percentage of Total
			Based on Number of Issues				
Aaa	1	67	31	25	3	127	48.1
Aa	–	46	18	15	–	79	29.9
A	–	16	3	5	–	24	9.1
Baa	–	5	1	2	–	8	3.0
Nonrated	–	9	12	2	3	26	9.9
Total	1	143	65	49	6	264	100.0
			Based on Par Value of Issues (in millions of dollars)				
Aaa	160.3	1,021.9	130.6	229.6	247.0	1,789.4	78.8
Aa	–	258.0	26.0	69.0	–	353.0	15.6
A	–	47.3	3.4	16.6	–	67.3	3.0
Baa	–	25.8	1.3	9.7	–	36.8	1.6
Nonrated	–	2.3	5.7	.3	13.9	22.2	1.0
Total	160.3	1,355.3	167.0	325.2	260.9	2,268.7	100.0

Source: Unpublished list of names and par values by *The Daily Bond Buyer.*

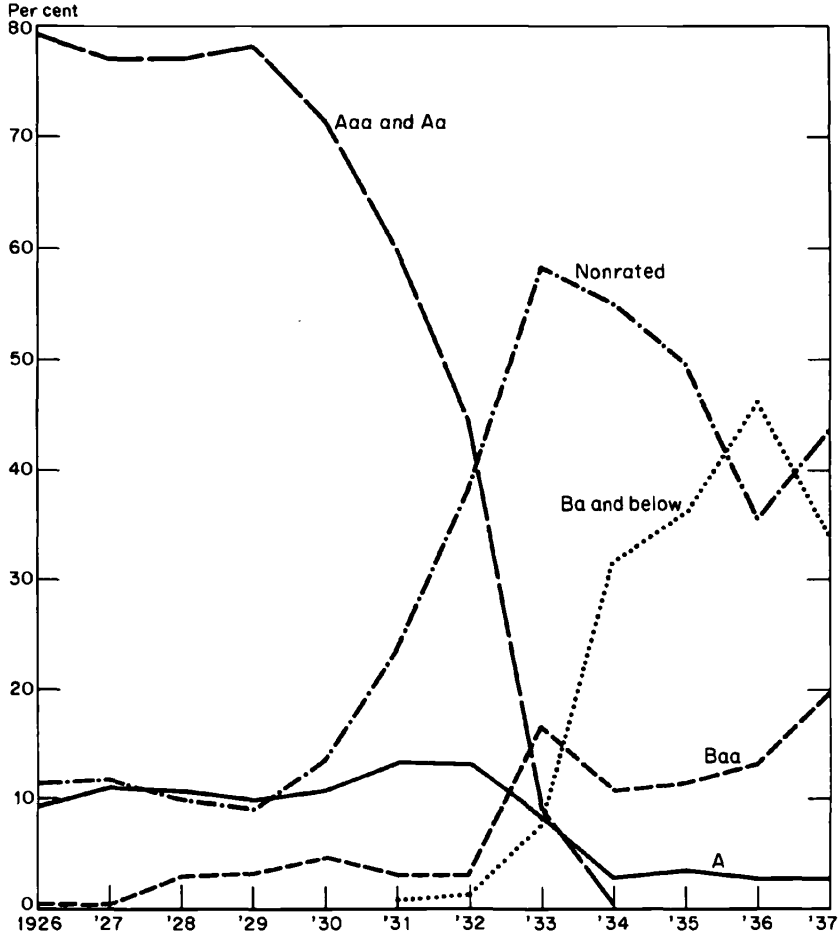
[a]With populations over 10,000 in 1930 census.

[b]With populations over 50,000 in 1930 census.

[c]With populations over 25,000 in 1930 census.

CHART 20

Percentage Rating Distributions of 264 Defaulting Bonds, 1926-37



Sources: Rating information from Moody's Investors Service *Manuals,* 1925-38. Default data from NBER files based on data from *The Bond Buyer,* Investment Bankers Association, Dun & Bradstreet, Moody's Investors Service, etc.

declining appreciably in 1931, the first year state and local default situtations became widespread. By 1934, when nearly all of the defaults had occurred, the rating distribution reflected the very weak quality of these 264 state and local units. This reflection would not have been of much benefit to the investor who bought one of the "high quality" Aaa or Aa rated issues in 1931.

Another type of analysis was applied to the same group of defaulting units. The rating of these units in each year from five years before the year of

TABLE 20

Rating Distributions of State and Local Debt Issues Which Defaulted in the 1929-37 Period

Rating	5 Yrs. Before Yr. of Default	4 Yrs. Before Yr. of Default	3 Yrs. Before Yr. of Default	2 Yrs. Before Yr. of Default	1 Yr. Before Yr. of Default	Year of Default	Year After Default
Aaa	95	92	83	68	33	8	
Aa	50	52	52	47	46	16	2
A	16	15	17	29	26	16	4
Baa	3	3	6	6	20	41	27
Ba		1	3	5	8	12	35
B						5	23
Caa & below							1
Nonrated	13	14	16	22	44	79	85
Total	177	177	177	177	177	177	177

Note: The 264 largest default situations were studied; however, accurate date of default information was not available on 87 of these situations.

Source: Rating information from Moody's Investors Service *Manuals,* 1925-38. Default data from NBER files which are based on data from *The Bond Buyer,* Investment Bankers Association, Dun and Bradstreet, Moody's Investors Service, etc.

default to the year following default are summarized in Table 20. The data in Table 20 show that the rating agencies begin to recognize the probability of default for significant numbers of the units beginning approximately one year before the unit defaulted. The number of Aaa or Aa rated issues was still 44.1 per cent of all the defaulting issues in the year prior to default. Unfortunately, we do not have sufficient data at this time to analyze how much of a downward rating shift occurred in nondefaulting units during similar time periods.

Two qualifications should be made to any conclusion arising from the analysis of the rating distributions of the 264 defaulting units. First, most of the issues studied did not have any final loss of interest or principal. If the investors were able to wait out the depression period, they usually suffered no final loss. Second, as a result of the depression and default experience in this period, substantial adjustments have been made in the way state and local issues are rated. For example, large size is no longer considered synonymous with high quality. It is also no longer assumed that all taxes levied will be collected. Because of these and similar adjustments, many analysts believe that ratings assigned to state and local issues before the mid-1930's are not comparable with those assigned after that time.

Only six rated state and local issues have defaulted since the 1929 major default period. All six were limited liability obligations and five of the six issues were rated for the first time by Moody's Investors Service in January 1958. At that time the revenue bonds of the West Virginia Turnpike Commission, the revenue bonds of the Burt County Bridge Commission and the Parkersburg Bridge Revenue Bonds were rated Caa. At approximately the same time, the Dunbar Bridge Revenue Bonds and the revenue bonds of the Bellevue Bridge Commission were rated Ca. The Calumet Skyway Toll Bridge Revenue Bonds were rated Caa by Moody's Investors Service in August 1963. The ratings of these six defaulting issues have not been changed since they were first rated by Moody's.

Three of these six limited liability obligations were rated by Moody's after they had defaulted. The revenue bonds of the Bellevue Bridge Commission and the Burt County Bridge Commission had been in default for several years before they were rated. The Calumet Skyway Revenue Bonds were rated for the first time approximately a month after their default. It was impossible for agency ratings to be indicative of these three default situations. It might even be argued that these cases illustrate that unrated state and local issues are more likely to default than rated issues. However, the revenue bonds of the West Virginia Turnpike Commission and of the Dunbar and Parkersburg bridges defaulted from several months to two years after Moody's rated them. One of the primary reasons for the differences in the timing of ratings is that the earnings records were available for the West Virginia Turnpike, Dunbar Bridge and Parkersburg Bridge revenue bond situations for several years before they defaulted. Thus, financial records as well as agency ratings had

forecasted low quality before the defaults occurred.

The most favorable conclusion one can derive from the past payment performance of rated state and local issues is that the new and more sophisticated rating processes started in the mid-1930's (after the weak performance before the mid-1930's) are largely untested as an indicator of prospective quality. In spite of the lack of historical proof, the consensus opinions of groups of sophisticated bond analysts (i.e., agency ratings) are analyzed as meaningful indicators of prospective quality.

Aggregated Rating Distributions

The percentage distributions by rating categories based on the number of outstanding long-term state and local bonds rated by Moody's Investors Service for most years from 1938 through 1969 are presented in Table 21. These rating distributions indicate that the quality of rated state and local bonds improved considerably during World War II and the years immediately thereafter. For instance, the proportionate number of outstanding rated state and local bonds classified as Aaa or Aa rose from 10.5 per cent in 1938 to 29.4 per cent in 1950. Over the same period, the proportion of rated state and local bonds classified as Ba or below fell from 19.2 per cent to 8.8 per cent.

Throughout the 1950's the quality of rated long-term state and local debt as indicated by the distributions of the number of rated bonds outstanding appears to have remained relatively stable. Since the late 1950's, however, the rating distributions in Table 21 suggest that the quality of rated long-term state and local debt may have deteriorated slightly. The proportion of state and local bonds rated A or Baa increased throughout the 1950-69 period. The proportion of bonds rated Ba or below declined in the 1950's; however, this decline was approximately offset by the similar decrease in the proportion of bonds rated Aaa or Aa in that decade. Since the late 1950's, the decline in the proportion of bonds rated Aaa or Aa has continued, but there was little change in the number of bonds rated Ba or lower. The rating distributions in Table 21, therefore, appear to indicate that the over-all quality of rated long-term state and local debt had deteriorated moderately in the 1960's. This slight deterioration was caused by a movement from the high rating categories (Aaa and Aa) into the medium rating categories (A or Baa) rather than to an increase in the relative number of issues rated Ba or below.

The rating distributions of the number of rated state and local bonds issued from 1957 through 1968 are presented in Table 22. The proportionate number of newly issued bonds that were classified as A remained fairly constant throughout the 1957-68 period. The proportion of newly issued bonds that were classified as Aaa or Aa fell slowly from 1957 through 1965, while those classified as Baa and Ba or below increased in this same period. The decreasing proportion in the higher rating categories and the increasing proportion in the lower rating categories indicate that the quality of newly issued

TABLE 21

Percentage Distribution of Rated State and Local Debt Outstanding, by Number of Issuers
(per cent in rating category)

Year of Manual	Aaa	Aa	A	Baa	Ba	B	Below B
1938[a]	1.5	9.0	40.4	29.8	13.5	3.7	2.0
1939[a]	1.2	14.3	39.2	29.0	11.5	3.3	1.4
1943[a]	1.6	16.0	38.4	28.9	10.0	3.9	1.3
1947[a]	5.7	23.8	38.5	20.4	6.9	3.5	1.2
1948[a]	4.8	23.2	38.7	24.3	5.4	2.5	1.0
1949	5.6	23.1	37.2	23.7	6.5	2.9	1.0
1950	5.6	23.8	38.2	23.7	5.7	2.2	.9
1951	4.6	24.7	39.4	23.3	5.2	2.2	.7
1952	4.3	22.7	39.6	24.9	5.5	2.3	.7
1953	3.8	24.2	40.3	23.9	6.3	1.3	.1
1954	3.9	23.3	40.7	26.5	4.5	1.1	.1
1955	3.3	21.6	44.7	25.4	4.1	.8	.1
1956	3.1	20.9	46.6	25.5	3.3	.6	.1
1957	2.8	19.6	47.5	26.7	2.8	.5	.0[b]
1958	2.8	20.1	47.4	26.7	2.4	.4	.1
1959	2.6	18.6	47.3	28.4	2.7	.3	.1
1960	2.4	16.7	46.0	31.5	3.0	.3	.1
1961	2.3	17.0	47.6	29.6	3.1	.2	.1
1962	2.3	16.2	47.9	30.4	2.9	.2	.1
1963	2.3	15.7	47.2	31.6	2.8	.3	.1
1964	2.9	13.9	49.0	31.4	2.5	.3	.1
1965	3.0	13.9	48.3	31.9	2.5	.4	.1
1966	3.0	14.1	47.4	32.5	2.6	.4	.1
1967	3.5	13.1	47.1	33.5	2.4	.3	.1
1968	3.4	12.4	48.3	33.3	2.2	.3	.1
1969	3.1	14.1	46.9	33.4	2.1	.3	.1

Note: Public Housing Authority bonds are not included. Rows may not add up to 100.0 per cent because of rounding.

Source: Unpublished information from Moody's Investors Service, Inc. Rating count for 1962, 1964, 1965, 1966, 1967, 1968 and 1969 were made by the National Bureau of Economic Research staff.

[a]Issues of $200,000 or over; for all other years of issues of $600,000 or over.

[b]Amount less than .05 per cent.

TABLE 22

Percentage Distributions of Rated Long-Term State and Local Bonds Issued, by Number of Issues in Year of Issue (per cent in rating category)

Year	Aaa	Aa	A	Baa	Ba & Below
		Including Public Housing Bonds			
1957	8.2	27.4	43.1	19.4	1.9
1958	7.9	25.7	42.6	21.7	2.1
1959	8.4	24.1	41.3	23.9	2.2
1960	9.0	22.6	41.7	24.2	2.5
1961	7.7	22.1	43.1	24.5	2.6
1962	8.6	21.0	43.5	24.3	2.6
1963	6.2	20.3	42.4	27.9	3.2
1964	8.5	19.9	41.8	27.0	2.8
1965	7.6	18.8	42.3	28.0	3.2
1966	9.2	21.3	40.1	26.7	2.7
1967	8.1	20.2	41.1	28.5	2.3
1968	7.4	18.2	44.0	28.1	2.3
		Excluding Public Housing Bonds			
1957	6.6	27.8	43.9	19.8	1.9
1958	4.1	26.7	44.4	22.6	2.2
1959	5.6	24.8	42.6	24.7	2.2
1960	5.9	23.4	43.1	25.0	2.6
1961	3.8	23.0	44.9	25.6	2.7
1962	5.0	21.8	45.2	25.3	2.7
1963	4.2	20.7	43.4	28.4	3.3
1964	3.7	20.9	44.0	28.4	3.0
1965	3.8	19.4	44.2	29.2	3.3
1966	4.0	22.5	42.3	28.2	2.8
1967	3.8	21.1	42.9	29.8	2.4
1968	3.2	19.1	46.0	29.4	2.4

Note: Rows may not add up to 100.0 per cent because of rounding.

Source: Data from the Investment Bankers Association.

rated long-term state and local debt deteriorated slightly in the period from 1957 through 1965. The distributions in Table 22 also indicate that the quality of newly issued rated long-term bonds remained relatively stable in 1966 and 1967, then appeared to deteriorate slightly again in 1968.

When aggregate quality is emphasized, the percentage rating distributions based on the dollar value of outstanding and newly issued rated long-term state and local debt are probably more significant than similar distributions based on the number of rated issuers or issues. The distributions based on number are primarily useful as an indication of the quality of smaller rated issuers or issues. The rating distributions of the dollar value of rated long-term debt outstanding at several intervals from 1938 through 1966 appear in Table 23. These rating distributions indicate that the quality of rated state and local bonds outstanding improved during the postwar period until the mid-1950's, remained relatively stable in the mid- and late-1950's, then deteriorated moderately in the 1960-66 period. The proportion of rated state and local bonds

TABLE 23

Percentage Distributions of Rated State and Local Debt Outstanding, by Dollar Value of Debt Outstanding
(per cent in rating category)

Year of Manual	Value of Rated Bonds ($ millions)	Aaa	Aa	A	Baa	Ba	B & Below
1938	14,507[a]	6.9	17.4	47.9	19.9	5.5	2.5
1939	15,914[a]	7.5	17.4	48.1	20.7	4.3	2.1
1943	14,179[a]	8.1	17.0	48.4	21.2	3.7	1.5
1947	15,067[a]	10.8	18.2	52.9	13.1	3.0	2.1
1949	13,312	8.1	25.7	52.1	11.1	2.5	.5
1952	17,939	10.2	26.0	49.5	11.8	1.9	.6
1954	23,441	11.7	30.5	45.1	10.6	1.7	.4
1956	28,428	11.7	28.8	47.1	10.6	1.6	.3
1958	33,402	9.9	28.4	48.7	11.5	1.3	.2
1960	39,303	11.8	33.3	36.5	16.5	1.5	.5
1966	63,599	8.5	27.8	41.2	19.4	2.3	.8

Note: Public Housing Authority bonds, which are rated, are not included. Rows may not add up to 100.0 per cent because of rounding.

Source: Unpublished information from Moody's Investors Service, Inc. Rating count for 1966 by NBER staff.

[a]Issues of $200,000 or over; for all other years for issues of $600,000 or over.

outstanding that were rated Aaa or Aa is higher and the proportion rated Baa or below is lower for the later years covered in Table 23. The primary deviation from this pattern was the 1960-66 period when the proportion rated Aaa or Aa declined and the proportion rated Baa or below increased.

The rating distributions for the dollar value of long-term state and local debt issued annually from 1945 through 1968 are presented in Table 24. When Public Housing Authority bonds are included, the rating distributions indicate that the quality of newly issued bonds improved moderately from the mid-1940's through the mid-1950's. The data in Table 24 indicate that when Public Housing bonds are included, the quality of rated bonds issued in the mid- and late-1940's seems roughly the same as the quality of the same bonds issued in the mid-1960's.

When Public Housing Authority bonds are not included, the rating distributions in Table 24 indicate that the quality of newly issued rated bonds remained constant from the mid-1940's through the mid-1950's, then deteriorated in the late 1950's and the 1960's. The most noticeable change in the late 1950's and early 1960's was the shift from the Aaa and Aa rating categories into the A and Baa rating categories. In the mid-1960's the shift was from the A rating category into the Aa and Baa categories. In 1968 there was a marked change into the A rating category from the Aaa and Aa categories.

The moderate deterioration indicated by the rating distributions of newly issued long-term state and local debt conforms with the previous conclusions from Table 23 on rated debt outstanding. The moderate deterioration indicated by both tables is noteworthy because it occurred despite the retirement of most of the low rated state and local bonds issued before the end of World War II.

Because of the substantial differences between general obligations and limited liability obligations and the increasing proportion of limited liability obligations newly issued and outstanding, it seems worthwhile to examine separate distributions for these two categories. There is no assurance that a particular rating will give the same indication of quality for a limited liability obligation as for a general obligation. Some observers feel the increasing proportion of limited liability obligations explains shifts in the total rating distributions. Other observers feel that although limited liability obligations are less safely secured than general obligations, the fact is not adequately recognized in the assigned ratings. Thus, deterioration may be occurring even if there are no major shifts in the total rating distributions.

Table 25 reveals the percentage distributions of rated general obligations. The rating distributions by dollar value outstanding indicate an improving trend in quality through the mid-1950's, leveling in the late-1950's, and moderate deterioration in quality from 1960 to 1966. The over-all level of quality of general obligations outstanding seems slightly higher in 1966 than it was in the 1940's. The percentage distributions based on the dollar value of general

TABLE 24

Percentage Distributions of Rated Long-Term State and Local Bonds Issued, by Dollar Value in Year of Issue
(per cent in rating category)

Year	Aaa	AA	A	Baa	Ba & Below
	By Dollar Value Including Public Housing Bonds				
1945	4.2	16.2	46.1	27.0	6.4
1946	7.6	22.7	47.6	19.2	2.8
1947	16.4	50.2	20.2	11.6	1.4
1948	33.9	23.2	31.2	10.5	1.1
1949	9.4	30.2	38.3	20.1	2.0
1950	12.6	41.2	32.6	12.0	1.5
1951	27.0	31.4	28.6	11.6	1.5
1952	23.5	21.2	42.5	10.6	2.1
1953	24.4	31.9	32.1	11.0	.6
1954	22.4	27.0	38.1	11.0	1.5
1955	22.2	29.6	35.0	12.2	1.0
1956	11.7	32.5	42.0	12.3	1.5
1957	11.3	38.2	38.9	11.0	.5
1958	16.4	36.1	35.0	10.8	1.7
1959	15.3	29.9	41.0	13.0	.9
1960	14.6	30.0	39.6	14.4	1.3
1961	12.5	36.4	37.4	12.8	.9
1962	17.3	22.6	45.6	13.2	1.3
1963	17.5	21.2	42.5	16.7	2.1
1964	13.2	28.2	41.6	15.5	1.5
1965	12.3	29.7	37.9	18.8	1.3
1966	10.0	32.5	32.2	24.1	1.3
1967	12.5	32.7	30.3	22.8	1.6
1968	8.7	27.9	40.3	22.1	.9
	By Dollar Value Excluding Public Housing Bonds				
1951	15.0	36.5	33.2	13.4	1.8
1952	10.1	25.0	50.0	12.5	2.4
1953	13.0	36.7	36.9	12.7	.6
1954	13.3	30.2	42.6	12.3	1.6
1955	11.2	33.8	39.9	13.9	1.1
1956	7.2	34.1	44.1	13.0	1.6
1957	10.1	38.7	39.4	11.2	.5
1958	13.7	37.3	36.2	11.1	1.7
1959	10.2	31.7	43.4	13.7	1.0
1960	7.4	32.5	43.0	15.7	1.4
1961	9.1	37.8	38.9	13.3	.9
1962	12.4	23.9	48.3	14.0	1.4
1963	14.8	21.9	43.9	17.2	2.1
1964	5.9	30.5	45.1	16.8	1.7
1965	7.3	31.5	40.0	19.9	1.4
1966	5.0	34.3	34.0	25.4	1.3
1967	8.7	34.2	31.7	23.8	1.7
1968	5.0	29.1	41.9	23.0	1.0

Note: Rows may not add to 100 per cent because of rounding.

Source: Data from 1945-56 based on rating counts by NBER staff and data from 1957-68 from Investment Bankers Association.

TABLE 25

Percentage Distributions of Rated General Obligation Bonds
(per cent in rating category)

Year of Manual	Aaa	Aa	A	Baa	Ba & Below
Distributions by Dollar Value Outstanding					
1943	8.5	17.2	48.0	20.8	5.5
1949	11.9	17.0	55.8	11.6	3.7
1952	11.5	25.0	51.4	9.7	2.4
1954	13.8	30.5	44.7	9.4	1.6
1956	11.6	30.7	46.6	9.9	1.3
1958	11.5	27.7	49.2	10.6	1.0
1960	13.2	35.4	35.2	14.6	1.5
1966	9.4	30.9	39.9	18.1	1.6
Distributions by Number of Issuers					
1943	1.6	16.5	38.2	27.9	15.7
1948	5.3	24.0	38.2	23.5	9.1
1949	6.0	23.9	36.6	22.4	11.1
1950	6.1	24.3	37.9	22.7	8.9
1951	5.1	24.1	39.3	23.1	8.3
1952	4.8	22.9	39.2	23.9	9.1
1953	4.4	23.7	40.5	23.1	8.4
1954	4.3	22.9	40.7	26.0	5.9
1955	3.8	21.7	44.2	25.0	5.2
1956	3.3	21.2	46.7	24.5	4.3
1957	3.0	19.9	48.3	25.3	3.5
1958	3.2	20.2	47.7	26.1	2.8
1959	3.0	19.0	47.8	27.1	3.0
1960	2.7	17.2	46.6	30.1	3.4
1961	2.6	16.9	48.6	28.5	3.4
1962	2.7	15.9	49.2	29.2	2.8
1963	2.5	16.2	48.0	30.2	3.1
1964	2.6	14.6	49.9	30.3	2.7
1965	2.6	14.1	49.5	31.1	2.7
1966	2.6	15.0	48.6	30.9	2.9
1967	3.0	13.2	48.6	32.6	2.6
1968	3.0	12.3	49.4	32.9	2.1
1969	2.8	14.6	48.2	32.2	2.2

(continued)

TABLE 25 concluded

Year of Manual	Aaa	Aa	A	Baa	Ba & Below
	Distributions by Dollar Value Issued				
1957-58	14.7	37.3	36.2	10.9	.9
1959	13.8	36.9	35.6	12.4	1.2
1960	8.9	33.5	41.0	14.9	1.7
1961	11.2	39.2	36.0	12.5	1.1
1962	15.6	25.2	44.2	13.4	1.5
1963	13.0	26.6	43.8	14.9	1.6
1964	7.1	34.4	41.8	15.4	1.4
1965	9.1	33.0	37.8	18.7	1.4
1966	5.5	36.8	31.5	24.8	1.3
1967	10.7	38.0	30.2	18.9	2.2
1968	7.2	35.1	34.9	21.9	.9
1957-68[a]	10.2	34.7	37.0	16.6	1.4
	Distributions by Number Issued				
1957-58	5.8	27.4	43.8	21.0	2.1
1959	6.1	25.5	42.0	24.1	2.4
1960	6.4	23.8	42.8	24.3	2.7
1961	4.0	23.2	44.9	25.1	2.8
1962	5.4	22.5	44.7	24.7	2.7
1963	4.5	22.4	43.4	26.6	3.1
1964	3.8	22.0	44.0	27.3	3.0
1965	4.2	20.6	43.8	28.0	3.4
1966	4.3	23.2	42.8	26.9	2.8
1967	4.3	21.8	42.8	28.7	2.4
1968	3.4	20.1	45.2	28.8	2.5
1957-68[a]	4.8	23.2	43.7	25.6	2.7

Note: Public Housing Authority bonds are not included. Rows may not add up to 100.0 per cent because of rounding.

Sources: Data from Moody's Investors Service and the Investment Bankers Association.

[a]The figures in these rows are totals or percentages of totals for the period listed.

obligations newly issued help demonstrate why the rating distributions for the dollar value of outstanding general obligations indicated that the quality was strengthened in the 1950's, then weakened in the 1960's. The percentage distributions by dollar value issued from 1957 through 1968 usually indicated quality above that of outstanding issues in the early postwar years and below that of issues outstanding in 1958 and 1960.

The percentage distributions for the number of issuers with rated general obligations outstanding indicate that the quality of general obligations improved in the early postwar years but began deteriorating by the mid-1950's. A very moderate deteriorating trend appears evident since that time. The rating distributions for the number of newly issued general obligations also appear to indicate a moderate deteriorating trend in the quality of general obligations from 1957 through 1968. During this period, the proportionate number of newly issued general obligations that were rated Aaa or Aa declined slowly and the proportion that were rated Baa or Ba and below increased slowly.

Table 26 shows the percentage distributions of rated limited liability obligations. An examination of these distributions reveals that the proportions in most rating categories has fluctuated considerably during the postwar period. The largest fluctuation occurred between the rating distributions by dollar value outstanding for 1956 and 1958. Between those two dates, several large limited liability obligations were changed from the Aaa to the Aa rating category. Examination of the rating distributions by dollar value outstanding indicates that the quality of outstanding rated limited liability obligations increased until the mid-1950's and has weakened consistently since that time. The quality of outstanding rated limited liability obligations seemed roughly the same in 1966 as it was in 1949.

The rating distributions for the number of issuers of outstanding rated limited liability obligations also indicate an improvement in quality in the early postwar years, but a moderate deterioration since the mid-1950's. These distributions show that the percentage of limited liability obligations rated Aaa or Aa is lower and the percentage rate Baa or below is higher in the mid-1960's than in the immediate postwar period. The distributions by number of limited liability obligations issued show that the quality of newly issued limited liability obligations appeared to weaken slightly from 1957 through 1968.

Summary

When combined, all of the rating distributions analyzed indicate three moderate but distinct trends in the rating agency's evaluations of the postwar quality of rated long-term state and local debt. First, the quality of rated state and local bonds improved from the end of World War II into the early

TABLE 26

Percentage Distributions of Rated Limited Liability Obligations
(per cent in rating category)

Year of Manual	Aaa	Aa	A	Baa	Ba & Below
Distributions by Dollar Value Outstanding					
1943	.4	13.1	57.2	28.8	.5
1949	3.4	19.4	46.6	21.6	9.1
1952	.8	32.2	36.4	27.2	3.4
1954	1.0	30.1	47.5	16.4	5.0
1956	12.1	21.4	49.0	13.2	4.3
1958	2.9	31.7	46.2	15.5	3.7
1960	7.5	27.2	40.3	21.8	3.3
1966	5.8	19.4	44.9	22.8	7.1
Distributions by Number of Issuers					
1943	1.9	15.8	36.1	42.4	3.8
1948	.0	14.2	44.3	34.0	7.5
1949	2.0	17.5	40.0	33.5	7.0
1950	1.8	19.4	40.5	30.8	7.5
1951	1.6	28.3	39.5	24.5	6.1
1952	1.4	21.2	41.6	30.6	5.2
1953	.8	27.5	39.2	28.8	3.7
1954	1.4	25.4	40.8	28.6	3.6
1955	.7	21.0	47.3	27.3	3.7
1956	2.1	19.4	45.9	29.9	2.7
1957	1.8	18.2	43.9	33.6	2.6
1958	.8	20.0	45.9	29.7	3.6
1959	.7	16.7	44.6	34.6	3.4
1960	.9	14.3	43.2	37.9	3.7
1961	1.4	17.2	43.7	33.9	3.8
1962	1.8	13.2	45.4	35.4	4.2
1963	1.3	12.9	43.2	38.6	4.0
1964	4.0	10.7	44.6	36.3	4.4
1965	4.5	12.8	42.8	35.7	4.3
1966	4.7	10.9	43.0	38.1	3.4
1967	5.7	13.0	40.6	37.0	3.8
1968	5.2	12.6	43.3	35.5	3.5
1969	4.5	12.1	42.4	37.6	3.4

(continued)

TABLE 26 concluded

Year of Manual	Aaa	Aa	A	Baa	Ba & Below
		Distributions by Dollar Value Issued			
1957-58	.8	41.0	43.5	12.4	2.4
1959	.7	17.5	64.3	17.3	.3
1960	2.0	28.7	50.4	18.6	.3
1961	.5	32.1	50.7	16.5	.2
1962	7.3	18.1	58.9	15.0	.8
1963	17.6	13.0	44.3	21.9	3.3
1964	3.0	19.8	54.1	20.9	2.2
1965	1.8	26.7	46.8	23.5	1.2
1966	3.8	27.3	40.7	27.1	1.1
1967	2.3	26.8	37.2	32.6	1.0
1968	1.2	18.1	54.6	25.0	1.0
1957-68[a]	3.9	23.5	49.0	22.3	1.4
		Distributions by Number Issued			
1957-58	1.3	23.2	49.1	25.1	1.3
1959	.9	17.4	49.5	31.2	.9
1960	.9	18.5	46.4	32.9	1.4
1961	1.6	21.0	45.7	30.5	1.2
1962	1.2	16.5	49.5	30.3	2.4
1963	2.4	10.5	42.6	40.0	4.7
1964	3.2	13.8	44.3	35.7	3.0
1965	1.5	12.6	45.9	37.0	3.0
1966	2.6	18.8	39.9	35.7	2.9
1967	1.1	21.0	40.0	36.1	1.8
1968	1.9	13.7	50.3	32.1	2.1
1957-68[a]	1.8	16.5	45.6	33.7	2.4

Note: Rows may not add up to 100 per cent because of rounding.

Sources: Data from Moody's Investors Service and the Investment Bankers Association.

[a]The figures in these rows are totals or percentages of totals for the period listed.

1950's. Second, the quality of rated bonds remained relatively stable during the 1950's. Third, their quality has deteriorated moderately during the early and mid-1960's. The net effect of these postwar shifts in rating agencys' evaluations is that the quality of long-term state and local debt was roughly the same in the mid-1960's as it was in the years immediately following World War II.

Since rating agencies looked at roughly the same instrument and borrower characteristics examined in this study and at the future external environment, the preceding conclusion would seem to indicate that rating agencies felt the weakening in instrument and borrower characteristics was approximately overcome by an improvement in the future environment in which state and local debt will exist. The primary factor leading to this external improvement is the rating agency's assessment of a decrease in the probability of a serious economic decline.