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## Moody's US Municipal Bond Rating Scale

### Summary

This *Special Comment* reviews the results of Moody's municipal bond default study, which covers the period from 1970 through 2000, and discusses its implications for the meaning of the municipal rating scale in relation to the corporate rating scale. Briefly, Moody's finds that:

- Average credit loss rates on Moody's-rated municipal bonds have been extremely low, in fact, lower than the loss rates on Aaa-rated corporate bonds.
  - Only 18 Moody's-rated municipal issuers defaulted on long-term bonds, of which 10 were not-for-profit hospitals.
  - The 1, 5, and 10-year cumulative default rates for all Moody's-rated municipal bond issuers have been 0.0043%, 0.0233%, and 0.0420%, respectively compared to 0.0000%, 0.1237%, and 0.6750% for Aaa-rated corporate bonds during the same time period.
  - The average recovery rate on defaulted municipal bonds has been 66% of par, compared to 42% of par for defaulted corporate bonds.
- General obligation (GO) and essential service revenue bonds have been particularly safe investments. No Moody's-rated issuer defaulted on any of these securities during the sample period.
  - Even in the event of default on GO bonds, investors are likely to enjoy a full recovery of principal and interest because municipalities are required to levy additional taxes to repay debt backed by the general obligation pledge.
  - Although many GO issues would likely be rated Aaa on the corporate scale, other GO issues would likely be rated lower because the related GO issuers are experiencing financial stress that could result in default in the future.
  - For general obligation and essential service revenue bonds *sold in taxable cross-border markets*, Moody's will assign ratings based on the corporate scale if such ratings are requested.
- Notwithstanding the default experience of Moody's-rated municipal bonds, significant credit risk is present among many non-rated issues. While Moody's-rated issuer defaults numbered 18 between 1970 and 2000, Moody's is aware that there were substantially more unrated defaults during the same time period.



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## Introduction

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The credit-sensitive portion of the US bond market has historically been segmented into a tax-exempt municipal market and a taxable market for corporate bonds, with distinct investor and intermediary communities and idiosyncratic market conventions. Compared to the corporate bond experience, rated municipal bond defaults have been much less common and recoveries in the event of default have been much higher. As a result, municipal investors have demanded, and rating agencies have provided, finer distinctions within a narrower band of potential credit losses than those provided for corporate bonds.

Like the bond markets themselves, Moody's rating approach to municipal issuers has been quite distinct from its approach to corporate issuers. In order to satisfy the needs of highly risk averse municipal investors, Moody's credit opinions about US municipalities have, since their inception in the early years of the past century, been expressed on the *municipal* bond rating scale, which is distinct from the *corporate* bond rating scale used for corporations, non-US governmental issuers, and structured finance securities.

Compared to Moody's corporate rating practices, Moody's rating system for municipal obligations places considerable weight on an overall assessment of financial strength within a very small band of creditworthiness. Municipal investors have historically demanded a ratings emphasis on issuer financial strength because they are generally risk averse, poorly diversified, concerned about the liquidity of their investments, and in the case of individuals, often dependent on debt service payments for income. Consequently, the municipal rating symbols have different meanings to meet different investor expectations and needs. The different meanings account for different default and loss experience between similarly rated bonds in the corporate and municipal sectors.<sup>1</sup>

However, the distinctions between the municipal and non-municipal markets have begun to blur. Public entities are now issuing more debt in the taxable as well as the tax-exempt markets, and investors are now more likely to purchase and actively trade both municipal and non-municipal securities. In addition, there has been an increase in derivative and swap transactions that involve municipal and non-municipal securities. As a result, issuers, investors and intermediaries are more likely to be concerned about how credit risk, as expressed on the municipal rating scale, compares to risk as graded on the corporate scale.

In this *Special Comment*, we review the unique characteristics of US municipal bond issuers that sharply limit expected credit losses for most state and local government issued debt. We then present historical default statistics for Moody's-rated issuers in the US tax-exempt municipal market. These statistics highlight the extraordinarily low aggregate default incidence and minimal investor loss experience, particularly for US state and local government-related bond issuers.<sup>2</sup> Lastly, we provide guidance on where Moody's municipal ratings for general obligation and essential service revenue bonds would likely be located on the corresponding corporate scale.<sup>3</sup>

In Appendix I, we provide summaries of circumstances surrounding the 18 issuer defaults experienced by Moody's-rated municipal issuers since 1970. In Appendix II we also provide revised municipal rating definitions, which are intended to more clearly describe their historical meanings, rather than represent any change in those meanings.

Going forward, Moody's will continue to provide investors with finer credit risk distinctions provided by the municipal ratings scale. However, for municipal issuers that issue general obligation or essential service revenue bonds in the taxable cross-border markets, we will now provide, upon request, a public rating on the corporate scale that will apply to the issuer's debt issued in the taxable cross-border markets.

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1. See Moody's Investors Service Global Credit Research, *The Evolving Meaning of Moody's Bond Ratings*, August 1999.

2. The database used to conduct Moody's bond default study does not include issues not rated by Moody's, short-term debt, or tax-exempt debt issued on behalf of corporate obligors.

3. Debt referred to as general obligation debt is, for purposes of this report, that of existing, established municipalities and not that of newly created subdivisions such as special assessment districts. Essential service revenue bonds include water, sewer, and water and sewer revenue bonds.

## The Credit Strengths of US Municipal Issuers

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In 1909, John Moody introduced a simple grading system for railroad bonds, which was broadened a few years later to include all industrial bonds. When he later began rating state and local governments, he used a similar but distinct municipal rating scale. The difference between the two rating systems was recognized explicitly in the Government and Municipal Manual of 1920, where Moody's states:

*Municipal ratings "are necessarily based on a broader and more general foundation than are the ratings supplied for the ordinary corporation or railroad issues. In the case of American municipalities the importance of an investment rating is not so great as in the case of the obligations of a private corporation. A municipal obligation is issued under carefully framed laws and the risks are largely eliminated by the restrictions in these laws. Thus, under all ordinary conditions, it can be accepted as a fact that a municipal obligation of a well established and growing city or town is substantially secure insofar as the strength of the principal is concerned. Qualifications in ratings, therefore, are limited, and the variations between one type of municipal bond and another are not very great. This is especially true where the town or city has been long established and has shown a tendency toward substantial growth in wealth and population as the decades have gone by ..."*

The generally low credit risk of municipalities is in part a consequence of the unique laws applicable to such entities. While corporations can file for bankruptcy under Chapter 7 (liquidation) or Chapter 11 (capital structure reorganization), municipalities, when allowed by their governing state laws, file for bankruptcy under Chapter 9. Bankruptcies of municipalities under Chapter 9 differ from corporate bankruptcies in several respects:

- Involuntary bankruptcy filings are not permitted;
- Chapter 9 provides only for an adjustment of the municipality's debts not its liquidation; and
- The municipality's powers are not affected by the filing.

These bankruptcy differences provide for a municipality to continue its existence - including maintaining its operations and revenue collections - during a bankruptcy and allow for a potential payment on its defaulted debt, if any, in the future. It is extremely difficult to conceive of a situation today in which an entire population of a municipality would desert a municipality and leave it uninhabited.

In addition, municipalities have the ability to secure their bonds with a "general obligation" pledge. The full faith and credit of the issuing municipality supports general obligation bonds. The strength of this pledge ensures that all revenue-producing powers of the municipality are promised to be utilized to satisfy the debt, including the municipality's ability to levy taxes sufficient to pay such debt.

To the extent there is a default on general obligation debt, bondholders can seek a *writ of mandamus*. The writ, ordered by a court, directs the appropriate governmental official to levy and collect taxes to pay debt service or to make required debt service payments from other available funds of the municipality. This ability to invoke *mandamus* provides a great degree of comfort that, in almost all circumstances, ultimate recovery on defaulted general obligation payments will eventually equal 100% of principal and interest.

Many other state and local government-related bond issuers share these low risk characteristics, in part because they benefit from the implicit support of the state and local government authorities that create or sponsor them. For example, most water and sewer authorities and public university systems are extremely strong credits, not only because they possess dependable revenue streams and local monopoly positions, but also because they are quite likely to receive financial support from their sponsoring authorities in the event of distress.

Not all tax-exempt issuers, however, share these inherently strong credit characteristics. Some tax-exempt issuers - such as not-for profit hospitals, project financings, and private universities - increasingly share "corporate-like" characteristics, such as exposure to true market competition and a relatively low dependence on direct governmental subsidies and control.

## Default Study for Municipal Bond Issuers

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This *Special Comment* contains Moody's first formal default study of municipal bond issuers. We have compiled this study in response to keen investor interest and in support of our effort to enhance the comparability of municipal ratings to our corporate ratings.

### ***Characteristics of Issuers and Defaulters***

Our municipal bond default study covers tax-exempt long-term bond issuers with credit ratings outstanding at anytime between 1970 and 2000.<sup>4</sup> The database used to conduct this analysis contains 77,746 rating actions for 28,099 separate

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<sup>4</sup> The study excludes short-term debt and tax-exempt debt issued by corporate obligors (i.e. industrial development bonds).

issuers, among which only 18 defaulted.<sup>5</sup> Exhibit 1 shows the percentage breakdown of the issuers by sector and lists the defaulters.<sup>6</sup>

### Exhibit 1 Sectoral Breakdown of Moody's-Rated Issuers and Defaulters: 1970-2000<sup>8</sup>

	Number of Issuers	Number of Defaults	Defaults
General Obligation	14,775	0	
Water and Sewer	1,894	0	
Public Universities	251	0	
Private Universities and Other Not-for-Profits	580	1	Harlingen Higher Education Facilities Corporation, TX - Marine Military Academy
Electric Power	699	2	Washington Public Power Supply System, WA (now Energy Northwest) Vanceburg, KY Electric System - Greenup Hydro Project
Other Municipal Issuers	2,527	2	Connecticut Housing Authority Mortgage, CT Tarrant County Housing Finance Corporation, TX
Other Obligations of State and Local Governments	5,992	3	Belfield, ND* Orange County, CA* Polk County, IA*
Not-for Profit Health Care	1,381	10	Chattanooga Health & Educational Facilities Board, TN - Downtown General County of Beaufort, SC - Hilton Head Hospital Highland Park and Detroit, MI Hospital Finance Authorities - Michigan Health Care Corporation (2) Massachusetts Health & Educational Facilities Authority - Boston Regional Medical Center, MA Massachusetts Health & Educational Facilities Authority - Choate-Symmes Hospitals Michigan State Hospital Finance Authority - Northwest General Hospital Philadelphia Hospitals and Higher Education Facilities Authority, PA - Allegheny Health and Education Research Foundation Philadelphia Hospitals Authority, PA - Metropolitan Hospital Prince George's County, MD - Greater Southeast Healthcare System Sarpy County, NE Hospital Authority No. 1

*\*Polk County, IA and Orange County, CA - defaulted bonds recovered 100% principal and interest; Belfield, ND -- defaulted bonds recovered 55 cents on the dollar.*

The definition of municipal bond default used in this study parallels the definition used in Moody's annual study of corporate bond defaults. Moody's considers a default to have occurred if there was a missed or delayed debt service payment, if the bond obligor ceded its authority to make debt payments to a third party that resulted in the suspension of payments to bondholders, or if there was an exchange in which the bondholders accepted a package of securities that Moody's deemed to be of diminished financial obligation. It is important to note that for purposes of this study a default was not considered to have occurred if an issue was guaranteed by a third-party (for example, a bond insurer or letter of credit provider) unless both the underlying obligor and the third-party guarantor failed to make debt service payments. Additionally, issuers were excluded from the study if they only had a debt rating based on a third-party guarantee.

One characteristic of this study that contrasts glaringly with the corporate default study is the extremely small number of Moody's-rated municipal defaults. Only 18 issuers defaulted out of a total of 375,818 issuer rating years (i.e., the number of issuers times the number of years their ratings were outstanding) between 1970 and 2000. By contrast, during the same time period, there were 819 corporate defaults out of 61,191 corporate issuer rating years. Of the 18 municipal defaults, the sector that experienced the highest number was health care, with 10 occurrences. The remaining defaults were from local governments (3), electric power (2), housing (2), and private universities and other not-for-profit organizations (1). Appendix 1 provides a summary of the events surrounding each of these defaults.

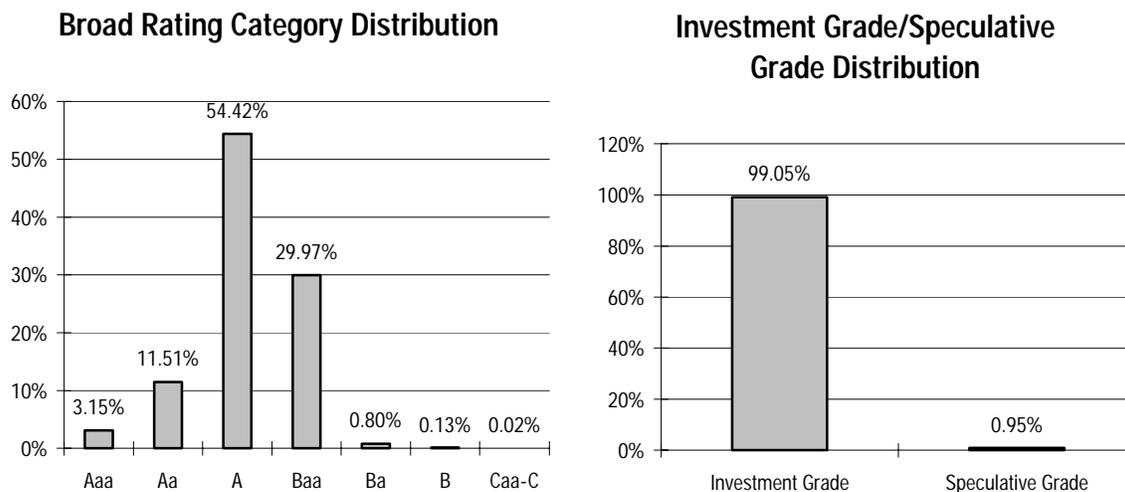
5. *Issues of a particular issuer were grouped together for this analysis. For the purpose of this study, a municipal issuer is defined as jointly unique combinations of obligor, security and purpose.*

6. *Issuers with only insured or letter-of-credit backed (enhanced) debt outstanding are excluded. Issuers with both enhanced and unenhanced debt outstanding are included in the study, but only their unenhanced ratings are included.*

7. *Michigan Health Care Corporation defaulted on its debt issued through two conduit issuers, Detroit Hospital Finance Authority and Highland Park Hospital Finance Authority. Because of the two distinct conduit issuers, the default is counted twice in both the numerator and denominator in the default statistics. For all other purposes in this paper, we have included the default only once.*

The extremely low default rate among municipal issuers is consistent with the highly skewed distribution of ratings. Municipal issuers over this time period were sharply skewed toward investment grade. Over 99% of all initial municipal ratings were investment grade, and nearly 70% were rated single-A or higher. Exhibit 2 presents the full distribution of ratings.

**Exhibit 2**  
**Municipal Rating Distribution, 1970-2000**



***Much Greater Risk in Unrated Market***

The database used to conduct this study contained only Moody's-rated issuers, but it is worth noting that certain evidence suggests that there is a self-selection bias in the Moody's-rated pool: municipal issuers of riskier credits tend not to elect to obtain a Moody's rating. *Income Securities Advisor* reports 1,306 defaults on unrated bonds during the period covering 1980 through September 15, 2002. While Moody's has not independently verified this data, and perhaps up to half of these occurrences may be technical rather than monetary defaults, the number of reported defaults suggests that risk in the unrated market is significantly higher than in the Moody's-rated market.<sup>8</sup>

***Annual and Multi-Year Default Rates***

For this study, default rates are calculated, as in the Moody's corporate bond default study, by taking a fraction in which the numerator represents the number of municipal debt issuers that defaulted on Moody's rated debt over a particular time period (e.g., one year for an annual default rate) and the denominator represents the number of municipal issuers that could have defaulted over that time period (the number of issuers at the beginning of the period). Cohorts of all municipal issuers at each rating level are constructed as of January 1 of each year. We then track the subsequent incidence of default for issuers of each rating level and from each cohort on through to the end of the sample period in order to calculate one- and multi-year default rates.

8. To gain a better understanding of the increase in risk, one should consider that, according to Muller Data, while Moody's rates approximately 80% of the dollar volume of municipal debt issued, it rates only about 50% of the transactions.

Default rates are quite low for Moody's-rated municipal issuers. Since 1970, the one-year, issuer-weighted average annual default rate for all Moody's-rated municipal bond issuers - regardless of their rating level -- is 0.0043%. When segmented by broad rating class - investment vs. speculative grade - extremely low default rates are present for the investment grade sector, 0.0005%, but climb for the speculative-grade sector to 0.3914% (Exhibit 3). One-year default rates do not exceed 0.0009% for any investment-grade rating category. For the Ba, B, and Caa-C categories, however, default rates climb from 0.0667% to 0.8122% and 9.0909%, respectively.

**Exhibit 3**  
**Weighted Average One-Year Municipal Bond Default Rates by Rating Category, 1970-2000**

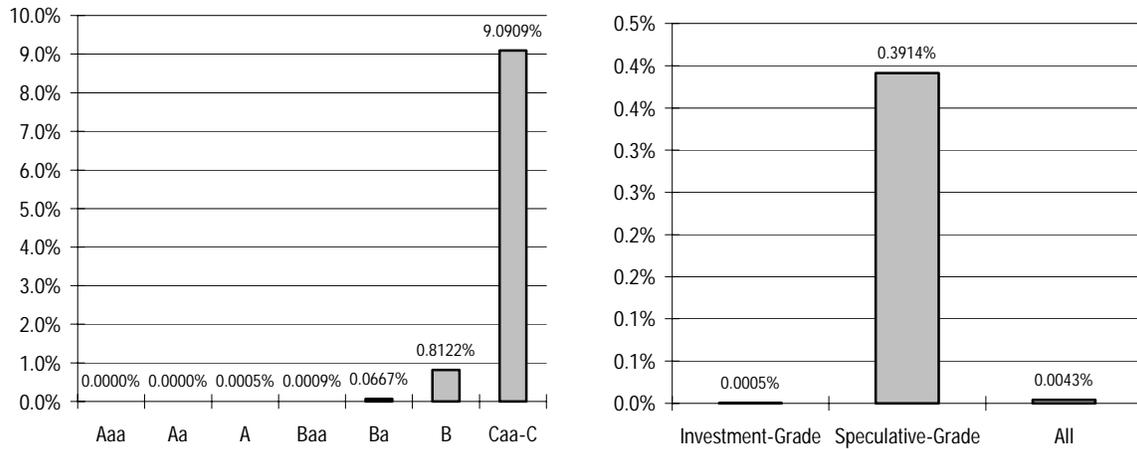


Exhibit 4 presents the issuer-weighted, average multi-year cumulative default rate for the entire sample period. Just as for one-year default rates, cumulative default rates for municipal issuers are relatively low across rating categories. For example, in the Aa rating category, 1, 5, and 10-year cumulative default rates are 0.0000%, 0.0115% and 0.0327% respectively as compared to 0.0230%, 0.2819%, and 0.8029% for corporate issuers in the Aa rating category over the same time period (Exhibit 5). When general obligation and essential service revenue bond issuers are removed from the database, the default rates for the remaining municipal issuers are markedly higher in nearly all rating categories than those experienced in the entire municipal market (Exhibit 6).

**Exhibit 4**  
**Weighted-Average Letter Rating Cumulative Municipal Default Rates, 1970-2000**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Aaa	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
Aa	0.0000%	0.0025%	0.0053%	0.0082%	0.0115%	0.0150%	0.0188%	0.0230%	0.0276%	0.0327%
A	0.0005%	0.0010%	0.0022%	0.0040%	0.0053%	0.0068%	0.0076%	0.0084%	0.0084%	0.0084%
Baa	0.0009%	0.0067%	0.0140%	0.0219%	0.0281%	0.0363%	0.0422%	0.0472%	0.0509%	0.0590%
Ba	0.0667%	0.1783%	0.2199%	0.3137%	0.4201%	0.6029%	0.8128%	1.0536%	1.2357%	1.3390%
B	0.8122%	1.9192%	2.8784%	3.4027%	3.9760%	3.9760%	3.9760%	3.9760%	3.9760%	3.9760%
Caa-C	9.0909%	10.5455%	10.5455%	10.5455%	10.5455%	10.5455%	10.5455%	10.5455%	10.5455%	10.5455%
Investment-Grade	0.0005%	0.0029%	0.0060%	0.0097%	0.0127%	0.0163%	0.0189%	0.0214%	0.0230%	0.0259%
Speculative-Grade	0.3914%	0.6716%	0.8457%	1.0023%	1.1792%	1.3305%	1.5027%	1.6983%	1.8454%	1.9284%
All	0.0043%	0.0091%	0.0138%	0.0189%	0.0233%	0.0280%	0.0320%	0.0358%	0.0385%	0.0420%

**Exhibit 5**  
**Weighted-Average Letter Rating Cumulative Corporate Default Rates, 1970-2000**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Aaa	0.0000%	0.0000%	0.0000%	0.0391%	0.1237%	0.2158%	0.3161%	0.4253%	0.5445%	0.6750%
Aa	0.0230%	0.0349%	0.0749%	0.1800%	0.2819%	0.3970%	0.5050%	0.6272%	0.7096%	0.8029%
A	0.0056%	0.0576%	0.1864%	0.3230%	0.4681%	0.6313%	0.8047%	0.9995%	1.2304%	1.4721%
Baa	0.1373%	0.4391%	0.8403%	1.3918%	1.8953%	2.4492%	3.0283%	3.5970%	4.2155%	4.8649%
Ba	1.2583%	3.5270%	6.1460%	8.7956%	11.4035%	13.7635%	15.6640%	17.5954%	19.4611%	21.2927%
B	6.2390%	13.5183%	20.0205%	25.5537%	30.5992%	34.7919%	38.7896%	41.8463%	44.5875%	47.3825%
Caa-C	19.8637%	33.7766%	44.4370%	52.6044%	57.7748%	63.1367%	67.2654%	71.4090%	74.4723%	76.7930%
Investment-Grade	0.0505%	0.1699%	0.3565%	0.6076%	0.8492%	1.1167%	1.3954%	1.6837%	1.9953%	2.3244%
Speculative-Grade	4.2172%	9.0484%	13.4163%	17.2104%	20.6143%	23.5244%	25.9649%	28.1236%	30.1082%	32.0438%
All Corporates	1.3130%	2.8086%	4.1449%	5.3044%	6.3025%	7.1657%	7.9061%	8.5735%	9.2087%	9.8363%

**Exhibit 6**  
**Weighted-Average Letter Rating Cumulative Municipal Default Rates, 1970-2000**  
**(Excluding General Obligation and Essential Service Revenue Bond Issuers)**

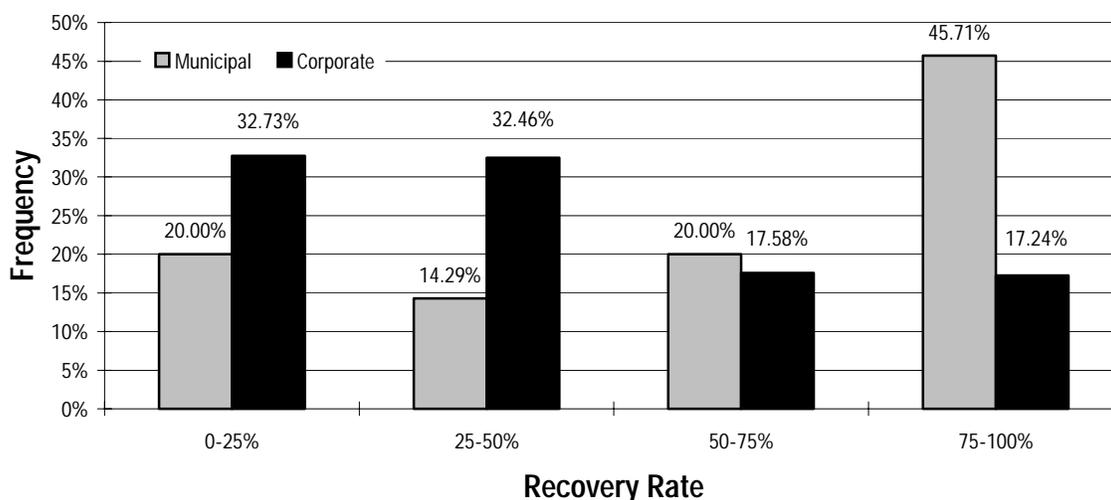
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Aaa	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
Aa	0.0000%	0.0097%	0.0206%	0.0329%	0.0467%	0.0622%	0.0798%	0.1000%	0.1232%	0.1503%
A	0.0020%	0.0042%	0.0091%	0.0171%	0.0230%	0.0296%	0.0333%	0.0374%	0.0374%	0.0374%
Baa	0.0040%	0.0308%	0.0654%	0.1041%	0.1350%	0.1770%	0.2087%	0.2358%	0.2562%	0.3024%
Ba	0.1982%	0.5488%	0.6879%	1.0260%	1.4445%	2.2382%	3.2307%	4.4740%	5.4563%	6.0399%
B	2.4024%	5.9131%	9.1436%	11.0870%	13.4901%	13.4901%	13.4901%	13.4901%	13.4901%	13.4901%
Caa-C	13.6752%	15.9469%	15.9469%	15.9469%	15.9469%	15.9469%	15.9469%	15.9469%	15.9469%	15.9469%
Investment-Grade	0.0022%	0.0120%	0.0255%	0.0420%	0.0553%	0.0720%	0.0845%	0.0962%	0.1041%	0.1190%
Speculative-Grade	1.1345%	1.9976%	2.5697%	3.1268%	3.8200%	4.4841%	5.3146%	6.3495%	7.1746%	7.6683%
All	0.0175%	0.0380%	0.0581%	0.0803%	0.1001%	0.1221%	0.1407%	0.1593%	0.1724%	0.1902%

### Recovery Rates on Defaulted Bonds

Recovery rates are calculated as in Moody's corporate bond default study, by comparing trading prices 30 days post-default to par values, roughly one month following default. Although these are only estimates of the present value of actual recovery rates, they directly measure the recovery that would have been realized by bondholders who liquidated their positions soon after default. The data set consists of recovery rates for 36 defaulting issues, which (consistent with our corporate bond default study) includes both rated and non-rated defaulters.<sup>9</sup>

The data show that municipal bonds recover more on average than corporate bonds and have a higher probability of greater recovery. The average municipal bond recovery is 66% of par as compared to 42% of par for corporate bonds. Additionally, 45% of defaulted municipal bonds recovered 75% or more of par compared with just 16% of defaulted corporate bonds. In fact, 36% of defaulted municipal bonds were quoted at par compared to just 3% of corporate bonds. The distribution of these defaulted bond prices is presented in Exhibit 7.

**Exhibit 7**  
**Defaulted Bond Recovery Rate Distributions: Municipal vs. Corporate**



### Other Financial Crises, Absent Bond Defaults

Since 1970, aggregate credit risk in the municipal market, particularly in the general obligation and essential services sectors, has been extraordinarily low. However, during this same time period, numerous municipalities experienced extreme financial distress and narrowly avoided default on their general obligation bonds due to intervention by a third party, in most cases the state of incorporation. While the "rescued" bonds did not default, they reveal the potential risks in this sector and the implicit support mechanisms that can sometimes mitigate those risks. Bridgeport, CT; Cleveland, OH; New York City, NY; Philadelphia, PA; Troy, NY; and Waterbury, CT (see inset entitled, "Examples of Municipal Fiscal Stress", on page 10, for discussions on several of these municipalities) are examples in which the applicable state government took an active role in managing municipalities that were under severe fiscal crisis. Waterbury Connecticut's problems occurred outside of the time parameter of this study (2001) but we have included it to illustrate a more current incidence of fiscal stress in the municipal marketplace.

While short-term debt is not rated on the long-term scale or analyzed in this municipal bond default study, it is worth noting that several municipalities have defaulted on their short-term obligations. In the inset, *Examples of Municipal Fiscal Stress*, the short term defaults of Cleveland and New York City are discussed.

9. Because of the large number of serial bonds associated with some municipal bond offerings, we often have largely, nearly perfectly correlated sub-samples of bonds associated with a particular default. To ameliorate this, we averaged the prices of multiple serial issues associated with a particular default to arrive at a recovery estimate for the default in question. Prices represent bid prices at which the bonds may or may not have traded.

## Examples of Municipal Fiscal Stress

### Cleveland, Ohio

In January 1980, the state auditor pursuant to the "Local Fiscal Emergencies" statute declared a fiscal emergency in Cleveland, Ohio. The statute was enacted in response to the deteriorating financial condition of the city but was applicable to all municipalities in Ohio. In the years preceding the declaration of a financial emergency, Cleveland's general fund expenses exceeded its revenues by a large margin, which led Cleveland to use restricted funds to meet its obligations as they became due. As a result, Cleveland was not able to issue bonds to refinance or renew outstanding bond anticipation notes and defaulted on these notes. Under the Local Fiscal Emergency statute, the official declaration of the emergency allowed Cleveland to borrow \$15 million from the State of Ohio to pay its overdue debts and other obligations incurred in its normal operations. The loan from the State and the requirement that a financial planning and supervisory commission be established pursuant to the statute to monitor the City's progress allowed Cleveland to emerge from its fiscal emergency situation.

### New York City, New York

In November 1975, New York State enacted the Moratorium Act, which suspended for three years the right to sue the city of New York to force payment of its short-term obligations. Using the terms of this law, New York City deferred payment and thus defaulted on its notes as they came due. The financial emergency that existed in New York City in the early to mid 1970s was a result of spending that exceeded operating revenue for several years. The overspending created accumulated fund deficits and cash flow problems that could be resolved only by short-term borrowing to meet expenditures. When banks refused to roll over the city's short-term debt, the city did not have the funds necessary to pay its obligations as they became due. To provide cash to the city while implementing a plan to return it to balanced budgets under the supervision of a state control board, the state advanced the city money, the Municipal Assistance Corporation for the City of New York (MAC) was established to issue debt on behalf of the city, the city's pension funds provided loans, and the federal government provided loans and guaranteed the city's other loans. The majority of the short-term debt was converted to long-term debt through the MAC. This allowed the city to eliminate its fund deficits by reducing debt service payments by lengthening the repayment time. These actions allowed the city to emerge from its fiscal crisis.<sup>10</sup>

### Waterbury, Connecticut

In March 2001, the Connecticut State Legislature, at the request of Waterbury's Board of Selectmen, declared a financial emergency in the city and enacted legislation to address the city's severely deteriorating fiscal condition, maintain the city's access to the public credit markets, and restore financial stability. The city had accumulated a General Fund deficit in fiscal year 2001 of \$73.4 million or 28.5% of revenues due to aggressive revenue assumptions and the unwillingness of city officials to achieve consensus on revenue and expenditure initiatives necessary to close the growing budgetary gap. Special Act No. 01-1 (the "Act") authorized Waterbury to finance accumulated deficits through the issuance of deficit financing bonds secured by the state's pledge to replenish the debt service reserve fund established for the benefit of the bonds. The bonds were issued in April 2002 to eliminate the deficit. Additionally, the Act created the Waterbury Financial Planning and Assistance Board (the "Board") with broad control over the city's financial operations, including authority to review and approve annual budgets, collective bargaining agreements, and city contracts, as well as all hiring decisions. The Board is authorized to adopt an interim budget and establish a tax rate in the absence of an approved budget. The Board established the 2002 budget and increased the tax rate. The powers utilized by the Board have positioned the city to address future fiscal challenges while projecting balanced budgets.

<sup>10</sup> In the mid-1970s, the MAC scaled back the interest rate payable and extended the maturity of its debt through bondholder approved amendments. This restructuring was part of a series of actions taken to secure fiscal support from the US Government. Moody's has not classified the restructuring as a default because:

- The restructuring was not undertaken to avoid default on the MAC bonds since the MAC bonds were legally separate and distinct from the City of New York and therefore not at risk to a potential bankruptcy;
- The restructuring was approved by MAC bondholders as part of a larger agreement designed to bolster and secure the finances of New York City; and
- Financial and political issues broader than payment on the MAC bonds motivated approval by the bondholders.

## Comparing Municipal Ratings to Corporate Ratings

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Our discussion of the municipal sector's inherent credit strengths and its extremely limited default and loss experience indicates that credit risk in the sector, particularly in the general obligation and essential service revenue sub-sectors, is extremely low. Since 1970, there have been no defaults among the roughly 16,900 Moody's-rated issuers of general obligations bonds, water & sewer bonds, and public university bonds. Moreover, two out of the three defaulting "other taxed-backed issuers" (out of the nearly 6,000 total other taxed-backed issuers) ultimately paid 100% of interest and principal due to investors after default.

Examining only the default and loss experience for corporate ratings and Moody's-rated municipal bonds during the measured time period, one can conclude that nearly all Moody's rated general obligation and essential service revenue bonds would be rated at or near the top of the corporate scale. It is important to note, however, that the time period studied did not include a period of extreme financial distress such as the Great Depression. If such an economic environment were to recur, we believe the general obligation and essential service revenue bonds with higher ratings would be less likely to default than those with lower ratings.

If municipalities were rated on the corporate scale, Moody's would likely assign Aaa ratings to the vast majority of general obligation debt issued by fiscally sound, large municipal issuers. Likewise, Aaa ratings would likely be assigned to the bulk of the senior obligations issued by large, fiscally sound municipal providers of essential services. The rating categories below Aaa would be populated by debt of issuers that (1) were experiencing financial stress or (2) did not have the financial resources or future resources (limited tax base or service area) to withstand some minimum level of financial stress. Moody's expects that nearly all performing municipal general obligation and essential service revenue bonds would be rated Aa3 or higher if rated on the corporate rating scale.

Additionally, given the unique bankruptcy laws that govern municipalities and the anticipated near-100% recovery on any defaulted general obligation bond, we expect that general obligation bonds in default but with an anticipated recovery of 100 percent would likely be rated Ba1 on the corporate scale.

## Conclusion

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The municipal rating scale rank orders credit risk within a narrower band of potential credit risk than the corporate rating scale. There is a small but growing segment of the market for which the ability to compare municipal ratings to non-municipal ratings is important. To enhance the value of Moody's municipal rating scale for the general obligation and essential service revenue bond sectors, we are providing guidance as to how ratings for general obligation and essential service revenue bond sectors would compare to ratings outside of the municipal sector. Moody's expects that nearly all performing general obligation bonds and essential service revenue bonds would be rated Aa3 or higher if rated on the corporate rating scale. Additionally, Moody's expects that a general obligation bond in default but with an anticipated recovery of 100% would likely be rated Ba1 on the corporate scale.

Additionally, to distinguish the municipal rating scale from the corporate rating scale, Moody's has revised its rating definitions for US municipal and tax-exempt debt to better describe the meaning of Moody's US municipal and tax-exempt ratings (See Appendix 2 for definitions). These revisions do not signal a change in our view on any particular credit or on the municipal industry; rather, the change is to explicitly differentiate the municipal rating scale from the corporate rating scale.

Lastly, municipal issuers that issue debt in the taxable cross-border markets can now obtain, by request, a public rating on Moody's corporate scale for their general obligation and essential service revenue bonds issued in such markets.

## Appendix 1 Moody's Rated Defaulters 1970-2000: The Default Stories (In Chronological Order)<sup>11</sup>

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### **Chesapeake Bay Bridge & Tunnel District, VA**

Chesapeake Bay Bridge & Tunnel District defaulted on its Revenue Bonds dated July 1, 1960 on July 1, 1970 when the District failed to make its interest payment on the Series C bonds.

In August 1960, the District issued \$200 million of revenue bonds, Series A, B, and C. Prior to the default in 1970, the district generated sufficient revenues to pay the Series A and B bonds, but due to insufficient revenues and usage, the Series C bonds were repaid from investment earnings and monies in the Reserve Account. When the excess funds were depleted, the District was unable to make required debt service payments.

### **Sarpy County, NE Hospital Authority No. 1**

Sarpy County Hospital Authority defaulted on Revenue Bonds dated 11/1/73 and 7/1/76 in January 1978.

In the 1960's, Doctors Hospital in Omaha, Nebraska was an aging hospital with declining patient usage and out-dated equipment. The Board of Directors of Doctors Hospital decided to build a new 208-bed hospital and close the aging facility. Sarpy County Hospital Authority issued bonds to finance the construction of Midlands Community Hospital in Papillion, Nebraska, 12 miles from Omaha. The ability to recruit physicians from Doctors Hospital in Omaha to practice at Midlands Community Hospital was a key factor in the future success of the new hospital. The recruitment did not go as planned and the hospital opened with only a few doctors. As a result, utilization fell far below the levels necessary to cover operations and maintenance expenses as well as debt service.

In 1976 an event of default was declared under the legal documents, debt service reserves were used to make interest payments, and a receiver for the hospital was appointed and approved by the District Court. As a result, the principal payments due between January 1978 and January 1982 were paid between nine months and three years late.

### **Hilton Head Hospital, SC**

Hilton Head Hospital defaulted on its debt service payment due January 1, 1978.

In 1974, Beaufort County, South Carolina issued \$11.2 million to finance the first health care facility on Hilton Head Island. The bonds were to be repaid from gross revenues of the hospital. Based on the substantial growth of residential, retirement, and resort facilities on the Island in the years preceding the debt issuance, officials decided that it was necessary to develop health care facilities on the Island. The feasibility study for the new hospital projected high utilization of the 40 acute-care and 40 skilled nursing beds and revenues sufficient to cover debt service after use of the capitalized interest fund.

In the mid 1970s, it became apparent that the population on the Island had been over-estimated and the national economic recession of 1974-1975 had further reduced population growth on the Island. Additionally, the hospital opened without being adequately staffed in certain areas that led to a loss of patients to hospitals in Savannah, GA. These factors resulted in patient utilization levels well below projected levels that led to financial strain on the hospital. In April 1976, the hospital missed payments on 1/6 of the upcoming interest due on the bonds. By January 1978, the capitalized interest and reserve funds had been depleted and the hospital failed to pay the interest payment due on January 1, 1978.

### **Washington Public Power Supply System, WA (now Energy Northwest)**

In August 1983, Washington Public Power Supply System (WPPSS) defaulted on \$2.25 billion of revenue bonds for Nuclear Projects 4 & 5.

Washington Public Power Supply System was organized in 1957 as a municipal corporation that allowed publicly owned utilities in the Pacific Northwest to jointly build power generation facilities. As part of the Ten-Year Hydro Thermal Power Plan, WPPSS and other Northwest utilities assumed that demand for electricity in the northwest region would double every ten years beyond the capacity of current power sources. In the early 1970s in response to that forecast, WPPSS planned to construct five nuclear generation facilities to meet this forecasted demand. Bonds were sold to finance the cost of the power plants and were to be repaid through participation agreements with numerous municipal and cooperatively owned electric utilities.

Construction delays and cost overruns on the sizable project and increased costs to meet newly required safety standards drove the cost of completion of the projects to three to four times the original estimates. At the same time

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11. Dun & Bradstreet rated Chesapeake Bay Bridge and Tunnel District at the time of default. The ratings of the issuer's debt were migrated into Moody's portfolio of ratings around 1972. We have chosen to include a description of the default that occurred but the issuer is not included in Moody's default statistics.

demand for energy was declining due to rising energy costs, conservation, and an economic slowdown in the area. In January 1982, WPPSS abandoned construction on projects 4 and 5. In January 1983, the public utilities participating in WPPSS were obligated to begin repaying the debt incurred by the abandoned projects. In order to repay the debt, the utilities would have had to dramatically increase electricity rates on their customers to pay for the failed projects. The uproar due to the increasing rates resulted in challenges to the enforceability of the contracts with participants for repayment of the construction and operation costs of Projects 4 and 5 (including repayment of debt service).

In 1983, the Washington State Supreme Court ruled that the Washington State public agency participants in Projects 4 and 5 did not have the authority to enter into the Project 4 and 5 participation agreements, rendering void the agreements and the source of revenues to pay debt service. WPPSS became unable to service the debt on the \$2.25 billion in bonds issued to finance construction of Projects 4 and 5, thereby precipitating the largest municipal bond payment default in history.

### **Belfield, ND**

In April 1987, the town of Belfield, North Dakota defaulted on debt service payments on \$2.38 million of special assessment bonds. The proceeds of the bonds were used to provide roads, water, and sewer services for a tract of land that was slated for residential development. The bonds were to be repaid with collected property taxes from the properties within the development.

The oil boom of the early 1980's led to a severe housing shortage as workers relocated to the area to secure high paying jobs in the oil industry. The new residential development was to have provided housing for the influx of workers. A few years later the oil market declined and people began to seek housing and employment elsewhere. With only three homes built, the property taxes generated were insufficient to repay the existing debt.

A deficiency levy was instituted on all properties in Belfield to make up the shortfall. The deficiency levy rose to levels that forced an increasing number of homeowners to abandon their properties or to fail to pay their property taxes. Ultimately, the town council refused to raise the levy any further and Belfield defaulted on its outstanding debt.

### **Vanceburg, KY**

Vanceburg, KY defaulted on its December 1, 1987 debt service payment for its Electric System Revenue Bonds - Greenup Hydro Project.

The bonds were issued in 1979 to fund the construction and installation of a power plant structure containing hydroelectric generating units. The bulk of the power generating from this plant was to be sold to Hamilton Ohio Electric Utility. The bonds were secured by a lien on revenues of the Vanceburg Electric System.

A difficult start-up beginning in 1979 plagued the project. The problems included finding a location for the transmission lines to deliver power from Greenup to Hamilton, project cost overruns, and a six-month delay in project completion. In 1984, the City of Hamilton, Vanceburg Electric System's largest customer, filed a lawsuit seeking to have their power sales contract declared null and void alleging various contract breaches and fraudulent inducement to enter into a contract.

The December 1, 1987 default was part of the legal settlement between the towns of Vanceburg and Hamilton in which Hamilton would pay off the Vanceburg bonds and assume the responsibility for the ongoing plant.

### **Metropolitan Hospital, PA**

Metropolitan Hospital defaulted on the debt service due on its revenue bonds in December 1989.

The bonds were issued in 1976 and 1981 by Philadelphia Hospitals Authority to construct Metropolitan Hospital, an osteopathic facility located in downtown Philadelphia. Primarily due to low occupancy rates, the hospital was experiencing severe cash flow problems. As a result of the financial stress, the hospital filed for bankruptcy protection on July 11, 1989. In December 1989, funds were not available to meet the debt service payment due.

### **Choate-Symmes Hospitals, MA**

Choate-Symmes failed to make its debt service payment due on its revenue bonds on January 1, 1990.

In 1982, Massachusetts Health & Educational Facilities Authority issued bonds on behalf of Choate-Symmes to modernize an aged plant, remedy code deficiencies, ease capacity constraints and centralize certain services. The bonds were secured by a mortgage pledge as well as a first lien on gross receipts of the hospitals.

In early 1989, the Massachusetts Rate Setting Commission required that Choate-Symmes refund approximately \$5.5 million in overcollected revenue. This action led Choate-Symmes to file for bankruptcy protection in October 1989. In January 1990, funds were not available to pay the debt service due on the bonds.

#### **Downtown Hospital Association, TN (D/B/A Downtown General Hospital)**

Downtown Hospital Association defaulted on its principal and interest payments due August 1, 1991.

In 1975, Chattanooga Health and Education Facilities Board issued bonds to finance the construction of a new 54-bed hospital, Downtown General Hospital, in downtown Chattanooga as well as to capitalize interest through the construction period. The bonds were secured by a first lien on gross revenues of the hospital. The new hospital replaced the antiquated 54 bed Newell Clinic Hospital.

In the 1980s there were several changes in the health care industry that adversely affected smaller hospitals like Downtown General Hospital. The most notable change was the introduction of the Medicare Prospective Payment System (PPS). The transition from a cost basis to a PPS for Medicare reimbursement had a negative financial impact on the hospital. Additionally, Downtown General did not diversify into new service lines and therefore became particularly susceptible to the shift of hospital services out of the inpatient setting. As a result, the hospital's average daily population dropped from over 50 to 14. Beginning in November 1989, the hospital was unable to make its scheduled monthly payments for upcoming debt service payments. By August 1991, the reserve funds had been depleted and funds were not available to make the August 1 payment.

#### **Northwest General Hospital, MI**

Northwest General Hospital failed to make its interest payment due to bondholders in April 1991.

The bonds were issued by Michigan State Hospital Finance Authority in 1980 to construct an addition to Northwest General Hospital, a 104-bed facility located in Detroit. Throughout the 1980s the hospital was plagued by continued financial deterioration despite financial and management support from an outside organization, Botsford General Hospital. Inadequate reimbursements from state and federal agencies, a decline in hospital admissions, an excess of available beds in the area, and the failure to recruit physicians to admit to the hospital were the reasons cited when Northwest General Hospital's management decided to close the hospital in September 1990.

Although not legally obligated, the Michigan State Hospital Finance Authority provided funds to make the debt service payment due in October 1990. In April 1991, the bonds defaulted when funds were not available to make the interest payment.

#### **Polk County, IA**

Polk County defaulted on a \$2.3 million principal and interest payment due in December 1991 on its Sports Facility Revenue Bonds, Series 1984.

The bonds were issued to finance the track construction at Prairie Meadows racetrack. The bonds were secured by lease payments made by the Racing Association of Central Iowa (RACI) and to the extent necessary, from an unconditional commitment from the county.

The bond default was precipitated by RACI's bankruptcy filing on November 27, 1991 which was in response to actions taken by the county to curtail the losses associated with the racetrack. The financial actions taken by the County included cutting back on RACI's subsidy which in turn, threatened its continued existence and led it to seek protection under Chapter 11 of the Bankruptcy Code. Although the County was prepared to fund the upcoming debt service payments, the funds it was to provide were subjected to the automatic stay under Section 362(a) of the Bankruptcy Code as a result of RACI's bankruptcy filing, and therefore the funds were unavailable to make the necessary debt service payment due.

#### **Connecticut Housing Authority, CT**

Connecticut Housing Authority defaulted on a debt service payment due in July 1, 1994 on its Mortgage Revenue Bonds (New Haven FHA-Insured Projects).

The bonds were issued to finance multi-family housing projects. The repayment of the bonds was secured by the underlying mortgage loans that are insured by FHA pursuant to Section 203(k) of the National Housing Act. Due to delinquencies and defaults on the loans, lengthy foreclosure proceedings, and less than full payment from HUD on the defaulted loans, the Authority was not able to make its required debt service payment.

### **Orange County, CA**

On December 6, 1994, Orange County, California filed bankruptcy petitions for both itself and the Orange County Investment Pool (OCIP). The County had pledged that the OCIP would purchase any tendered Pension Obligation Series B bond, but as a result of the bankruptcy filing, the OCIP was unable to fulfill this obligation and the bonds defaulted on December 8, 1994. The County did not default on the scheduled principal and interest payments of the Series B bonds or any of its other long-term obligations.

The Orange County bankruptcy was the largest municipal bankruptcy in US history. Orange County's bankruptcy filing was a direct result of the investment losses incurred by the Orange County Investment Pool (OCIP) which amounted to approximately \$1.5 billion of the \$7.5 billion pool. The investment strategy of the County Treasurer involved investing in high-risk, interest rate sensitive securities and leveraging the pool to further increase returns. During the period when interest rates were on the decline and remained low, the OCIP succeeded in earning high returns. However, when interest rates began to rise in 1994, the OCIP experienced big losses. Adding to the financial distress of OCIP, when OCIP was unable to repay a \$1.2 billion loan to a Wall Street creditor, the creditor refused to extend the loan and started liquidating the securities that OCIP had pledged as collateral for the loan. To protect itself from other creditors, Orange County filed for bankruptcy for itself and OCIP.

### **Michigan Health Care Corporation, MI**

On June 1, 1995, Michigan Health Care Corporation defaulted on debt service due on its bonds issued by the Highland Park, MI Hospital Finance Authority and its bonds issued by the Detroit, MI Hospital Finance Authority.

Michigan Health Care Corporation's main facilities were located in sites in and around the Detroit area which in the early 1990's was plagued with high unemployment and a decreasing population due to the contraction in the big three's share of the domestic automotive industry. The economic strain on the area, combined with an over-supply of beds in the Detroit health care market caused financial strain on the Corporation. Michigan Health Care Corporation filed for Chapter 11 Bankruptcy on March 31, 1995. This action was attributed to overwhelming legal expenses due to various litigation issues. The filing was preceded by several years of poor financial performance caused by unwise business decisions, high debt load, and high Medicaid and indigent patient load for which reimbursement was unable to cover costs. As a result of the bankruptcy filing, an automatic stay under Section 362(a) of the Bankruptcy Code was invoked and the bond trustee was prohibited from using funds on hand to pay the bonds resulting in a payment default.

### **Allegheny Health and Education Research Foundation, PA**

On July 21, 1998 several entities of the Allegheny Health and Education Research Foundation (AHERF) filed to seek bankruptcy protection under Chapter 11 of the Bankruptcy Code. The filing for protection under the Bankruptcy Code by AHERF triggered an automatic stay under Section 362(a) of the Bankruptcy Code and as a result AHERF defaulted on some of its outstanding bond issues.

The bankruptcy filing followed a long period of financial deterioration for AHERF. Beginning in the mid 1980's, AHERF (the parent of Allegheny General) began an expansion from its Pittsburgh base into the highly competitive Philadelphia health care market. From 1987 until 1997 bond and bank debt grew from less than \$70 million to over \$1.1 billion, as AHERF acquired two medical schools, fourteen hospitals and more than 500 physician practices.

AHERF's problems included operating in the highly competitive Philadelphia and Pittsburgh health care markets, the curb in growth of Medicare reimbursements and reductions in Medicaid payments. Other factors included the increased penetration of managed care plans that negotiated discounts on hospital fees, curbed admissions, shorter length of stays, and expensive treatments and mismanaged endeavors into insurance and physician practices. By 1997, AHERF was losing almost \$1 million a day. In 1998, AHERF attempted to strike a deal to sell a large portion of its Philadelphia holdings. The deal later fell apart in June 1998, AHERF's options were limited and one month later several of its entities filed for bankruptcy.

### **Boston Regional Medical Center, MA**

In February 1999, Boston Regional Medical Center (BRMC) declared bankruptcy and defaulted on principal and interest payments due on its Series 1993B bonds issued through Massachusetts Health & Educational Facilities Authority.

Ongoing deterioration of the hospital's balance sheet, characterized by a dangerously nominal cash position, a steadily increasing debt position due to use of local lines of credit, and a negative fund balance, were the result of four years of large operating deficits. On-going equity transfers to a physician practice subsidiary also contributed to a rate violation of its debt service coverage test in fiscal 1997. An anticipated sale of the hospital did not occur as expected, causing the hospital to file for Chapter 11 bankruptcy protection and close the hospital.

BRMC's assets were liquidated as part of the liquidation plan approved by the bankruptcy court. The proceeds of the sale of the hospital's tangible assets, including its hospital facility and property, was approximately \$22-23 million and was used to pay secured creditors and then unsecured creditors that included Series 1993 bondholders. At the time of the liquidation, approximately \$30 million of Series 1993 bonds were outstanding.

### **Greater Southeast Healthcare System, MD**

In May 1999, Greater Southeast Healthcare System filed for bankruptcy protection and suspended payments on its approximately \$46 million of outstanding Series 1993 bonds issued through Prince George's County, MD.

Greater Southeast Healthcare System was a community based health delivery system that included two hospitals, three nursing homes, a physician care network, and extensive community based programs. The system's flagship, 450-bed Greater Southeast Community Hospital, was located in the southeast quadrant of Washington D.C. with a much smaller 33-bed facility in Fort Washington, Prince George's County. Prior to the bankruptcy, Greater Southeast Healthcare System was viewed as an essential service provider of services in an urban part of Washington D.C., characterized by an aging, declining population with below average socioeconomic characteristics reflected in an increasing reliance on governmental payers.

The organization's weak financial profile deteriorated significantly with changes in reimbursement from Medicaid, legislative changes which eliminated DC Medicaid Disproportionate Share payments to the system, and continued market forces which contributed to the system's declining patient volume and lower reimbursement rates. These revenue pressures coupled with management turnover and labor disputes further contributed to a rapidly deteriorating financial profile. Even after the filing, there were discussions that the District of Columbia might provide some financial assistance given the essentially of the system in the area; however, the District failed to do so. In November 1999, the courts approved the sale of Greater Southeast Community Hospital to Doctors Community Healthcare Inc for \$22.5 million.

### **Tarrant County Housing Finance Corporation**

Tarrant County Housing Finance Corporation defaulted on its Home Mortgage Revenue Bonds, 1983 Series A on November 15, 1999 when it failed to make a required redemption payment to bondholders.

The bonds were issued to finance a pool of single family mortgage loans. Many of the mortgage loans were originally covered by Primary Mortgage Insurance policies issued by Ticor Mortgage Insurance Company. A mortgage pool policy was also issued by Ticor. Ticor began experiencing financial difficulties in early 1986 and in 1988 all mortgage guarantee policies issued by Ticor were cancelled. The pool suffered significant asset deterioration as a result of defaulted loans that were not covered by insurance.

### **Marine Military Academy, TX**

In May 2000, Marine Military Academy declared bankruptcy and suspended payments on its \$10.4 million of debt issued through the Harlingen Higher Education Facilities Corporation, TX.

The Academy is the defendant in several civil lawsuits in which claimants have accused the Academy of not adequately supervising cadets in connection with hazing incidents that occurred between 1993 and 1997. The potential liabilities of the Academy due to the litigation exceeded the Academy's insurance coverage. As a protective measure, the Academy filed for bankruptcy and suspended payments on its debt.

## Appendix 2 Moody's US Municipal Rating Definitions

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Municipal Ratings are opinions of the investment quality of issuers and issues in the US municipal and tax-exempt markets. As such, these ratings incorporate Moody's assessment of the default probability and loss severity of these issuers and issues.

Municipal Ratings are based upon the analysis of four primary factors relating to municipal finance: economy, debt, finances, and administration/management strategies.

Each of the factors is evaluated individually and for its effect on the other factors in the context of the municipality's ability to repay its debt.

### Municipal Long-Term Rating Definitions

- Aaa** Issuers or issues rated Aaa demonstrate the strongest creditworthiness relative to other US municipal or tax-exempt issuers or issues.
- Aa** Issuers or issues rated Aa demonstrate very strong creditworthiness relative to other US municipal or tax-exempt issuers or issues.
- A** Issuers or issues rated A present above-average creditworthiness relative to other US municipal or tax-exempt issuers or issues.
- Baa** Issuers or issues rated Baa represent average creditworthiness relative to other US municipal or tax-exempt issuers or issues.
- Ba** Issuers or issues rated Ba demonstrate below-average creditworthiness relative to other US municipal or tax-exempt issuers or issues.
- B** Issuers or issues rated B demonstrate weak creditworthiness relative to other US municipal or tax-exempt issuers or issues.
- Caa** Issuers or issues rated Caa demonstrate very weak creditworthiness relative to other US municipal or tax-exempt issuers or issues.
- Ca** Issuers or issues rated Ca demonstrate extremely weak creditworthiness relative to other US municipal or tax-exempt issuers or issues.
- C** Issuers or issues rated C demonstrate the weakest creditworthiness relative to other US municipal or tax-exempt issuers or issues.

### Modifiers for Municipal Ratings

Moody's applies numerical modifiers 1, 2, and 3 in each generic rating classification from Aa through Caa. The modifier 1 indicates that the obligation ranks in the higher end of its generic rating category; the modifier 2 indicates a mid-range ranking; and the modifier 3 indicates a ranking in the lower end of that generic rating category.



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