



**DEBT INDICATORS AND CRITERIA  
FOR THE ASSESSMENT OF CALIFORNIA'S  
TOTAL OUTSTANDING PUBLIC DEBT**

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*California State Treasurer  
and Chairman*

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Stephen Shea and Paula Alger of the California Debt Advisory Commission's staff coordinated the project.

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# DEBT INDICATORS AND CRITERIA FOR THE ASSESSMENT OF CALIFORNIA'S OUTSTANDING PUBLIC DEBT

## EXECUTIVE SUMMARY

How good is the fiscal health of America's state and local governments? The signals are mixed at best. Certainly, the outward signs point to greatly improved fiscal health since the 1970s, when there were well-publicized financial crises in New York and Cleveland and when many other American cities seemed poised on the edge of fiscal difficulties of their own. On the other hand, some experts fear trouble may lie ahead. The next New York-style financial emergency may only be as far away as the next national recession.

One special source of concern is the growth of state and local debt. Since the early 1970s, there has been a dramatic increase in state and local debt outstanding. Between 1973 and 1987, for example, total debt outstanding for state and local governments grew from \$188 billion to \$719 billion, representing an average growth of 10 percent annually. In California, state and local government debt outstanding grew from \$19 billion in 1973 to \$72 billion in 1987--also equal to about a 10 percent yearly growth rate.

In part, this debt has been issued to meet growing commitments for school, roads, prisons, and other public services. But other forces have been at work as well. The growth in debt has been spurred by significant reductions in federal aid to state and local governments--a condition which shows no signs of being reversed--and by the public's resistance to new or increased taxes which makes debt financing an increasingly attractive option.

Against this backdrop, interest in the measurement of the fiscal condition of state and local government has grown significantly, assuming particular urgency since New York's problems came to light. Prior to that time, analysis of government fiscal health was largely the province of the bond rating agencies, Moody's and Standard and Poor's, which provide investors with evaluations and ratings of the financial instruments issued by thousands of governmental units nationally each year. However, the rating agencies' methodologies periodically have been criticized as overly subjective. Moreover, critics argue that the bond ratings, focused as they are on the probability of default, are not sufficient to evaluate the complexities of modern government finance.

In recent years, a number of analysts have employed more quantitative approaches to the analysis of government debt capacity and fiscal health, using a range of economic and financial measures and increasingly sophisticated statistical techniques. While these methods have yielded much valuable insight into the fiscal health of governments, to date no set of theories has emerged which identifies the measures of fiscal condition which are most critical as indicators of fiscal health. Nonetheless, the past two decades have seen significant progress in the development of indicators which encompass not only government's capacity to issue and support bonded debt but also its broader fiscal condition--its ability to provide what has been characterized as "a reasonable level of services at a reasonable sacrifice."

Despite the lack of consensus on which indicators are most important--or perhaps because of it--experts in the field generally agree on the need to continue working to develop the indicator methodology. The need to develop improved techniques for analyzing the overall fiscal condition

of state and local governments is widely recognized, both for use by government managers and by others who monitor--or are affected by--the financial condition of government.

With these concerns in mind, the California Debt Advisory Commission (CDAC) asked KPMG Peat Marwick to take a comprehensive look at the literature surrounding government credit ratings and the measurement of the fiscal health of state and local governments. The goals of this project were to clearly identify the major developments in this area and to develop a potential methodology for using these indicators to assess the overall financial condition and debt position of California state and local governments.

In addition to this executive summary, the final report on the project has two parts: (1) a review of the literature surrounding the use of fiscal indicators for financial and credit analysis; and (2) the description of a theoretical framework and recommended set of indicators for potential use by the State of California in assessing the level of total outstanding debt of California state and local governments. Based on the literature review, the theoretical framework, and the associated indicators developed, a set of recommendations is presented in the second part of the report.

## Literature Review

The systematic study of state and local government finances probably began with the first bond ratings prepared by Moody's beginning in 1919. These analyses were not particularly sophisticated, and a large number of government defaults during the Great Depression of the 1930s led to significant improvements in bond rating techniques during the three decades following World War II.

Still, many analysts continue to raise questions about the subjectivity of bond ratings and about their fundamental usefulness as comprehensive indicators of the fiscal condition of state and local governments. This was not a particularly large public policy concern in the 1940s and 1950s. Government fiscal conditions were generally very good during this period, and there were no defaults (or near defaults) by state or local governments--and certainly nothing of the magnitude that was the rule during the Depression.

Interest in improving and expanding on the bond ratings became increasingly intense during the 1960s and 1970s, however, as many U.S. cities began to experience serious economic and social problems, and these problems began to be reflected in their fiscal condition. The problems with the current understanding of state and local finances became most obvious in the face of the near default by New York on a portion of its debt in 1975.

In response to these developments, three major strands of research and analysis have emerged in this area: (1) the development of statistical models to replicate or predict the credit ratings assigned by the credit rating agencies; (2) the use of indicators to analyze the fiscal health or fiscal strain faced by government (and particularly local government); and (3) the development of guidebooks for use by government managers and policy makers in gauging the fiscal health and credit condition of their jurisdictions.

The first of these strands--the prediction of credit ratings--began to develop in the 1960s. In these studies, analysts specify a number of fiscal and economic indicators that are hypothesized to match the factors used by Moody's and Standard and Poor's. These indicators are used in statistical models to either predict credit ratings or to explain differences in the interest rate yields on various governments' bonded debt.

These studies demonstrate varying degrees of accuracy in predicting bond ratings and interest rate yields, with reported accuracy ranging from about 50 percent to over 80 percent of the

cases analyzed. One problem area in many of the analyses is the prediction of non-investment grade issues. While these studies have identified a wide range of potential indicators of government fiscal condition and debt position, they have limitations for use in the current study since they do not use indicators to assess fiscal condition. Instead, the indicators are used to predict the assessments of fiscal condition developed by others--the bond rating agencies or investors.

The second--and more important--strand in the literature is the measurement of government fiscal condition using various economic and fiscal indicators. These studies frequently focus on the level of fiscal stress or distress being experienced by the governments being analyzed. Although the first important work in this segment of the literature first appeared in 1973, the major impetus for work in this area has come since the New York fiscal crisis.

While they are much closer in content and goals to the current study than the bond rating analyses, these studies differ from the work undertaken in this project in important ways. First, they generally are concerned with the overall fiscal health of the governments being analyzed. This study is concerned with government fiscal health as it affects the capacity of California governments to maintain a given level of outstanding debt. Second, these studies have mainly focused on the fiscal health of major U.S. cities, as opposed to smaller cities, other types of jurisdictions, or governments in aggregate. In large part, this characteristic is a function of the fact that analysts view the major problems with state and local finances as involving cities. Certainly, this has been the experience of the past 15 years. Moreover, there is more likely to be data for analyzing fiscal condition for major cities, while data on other types of jurisdictions, with the exception of state governments, tend to be more fragmented and much less uniform.

Despite these limitations, the fiscal health indicator studies are the area of greatest research activity today, and it is the area where the most important breakthroughs in the use of indicators is likely to occur in coming years.

The final strand in the literature also is largely a product of the late 1970s. In these studies, the theories underlying the bond rating analyses and the fiscal health analyses have been assembled into guidebooks to allow public officials and others to assess their individual jurisdiction's fiscal condition. The most familiar example of this type of work is the earlier work done for the Commission to develop an indicator set for use by local governments

These studies employ many of the techniques--and indeed, many of the indicators--developed in the fiscal health indicator analyses. A major difference is that they take a more microeconomic approach and are designed to be applicable primarily to specific units of government--again, mainly cities. They normally examine a broad range of fiscal and economic variables and provide government managers with a consistent methodology for collecting, maintaining, and analyzing economic and financial data over time.

Although a significant amount of work has been done in all three of these areas of research, there is no set theory which identifies the best indicators of government fiscal condition. The indicators identified as part of the literature review vary widely in the types of data they examine. In part, this is a result of a lack of consistent data for state and local governments and, to a more limited degree, state and local economies. However, it also is a product of the general lack of a set of standards for what constitutes fiscal health or strain.

Future research in this area will, in all likelihood, continue to elevate the level of sophistication in analysis, pointing toward some generally accepted set of standards for assessing fiscal health. Certainly, the probable uncertainties faced by state and local governments in the years ahead should make continued work on indicators a vital concern of government decision makers.

## A Theoretical Framework

The second phase of the project involved the development of a theoretical framework and model set of ideal indicators for the assessment of the outstanding public debt of California state and local governments in aggregate. The framework and indicator selection described in this phase of the study draw heavily from the body of the literature reviewed in the the first part of the study.

Based on the first phase of the study, several important general characteristics of any assessment system were identified. These include:

- (1) First, there must be a recognition that no single statistical measure will provide an accurate assessment of the implications of a given level of outstanding debt-- a number of indicators will have to be developed and applied through a single analytical framework.
- (2) The measures that are used in this analytical framework should be assessed over time, since economic and fiscal conditions can change dramatically in a relatively short period of time, and often trends are the most important indicators of future fiscal or credit condition.
- (3) Assessment of the level of debt outstanding cannot be separated from assessment of governments' overall fiscal condition and the larger economic environment in which the governments must operate.
- (4) Some measures of comparability are desirable since no consistent set of performance standards have been identified. A familiar example of this comparisons data is the development of interstate comparisons.
- (5) Finally, it is important to recognize the limitations imposed by the availability of data. This is particularly a problem in this case, since a large number of local jurisdictions are involved, each with its own reporting standards and definitions.

With these general issues in mind, a theoretical framework was next developed. It is shown in Exhibit ES-1. The framework is essentially a process for assessing the level of implications of the level of debt outstanding and for monitoring it over time.

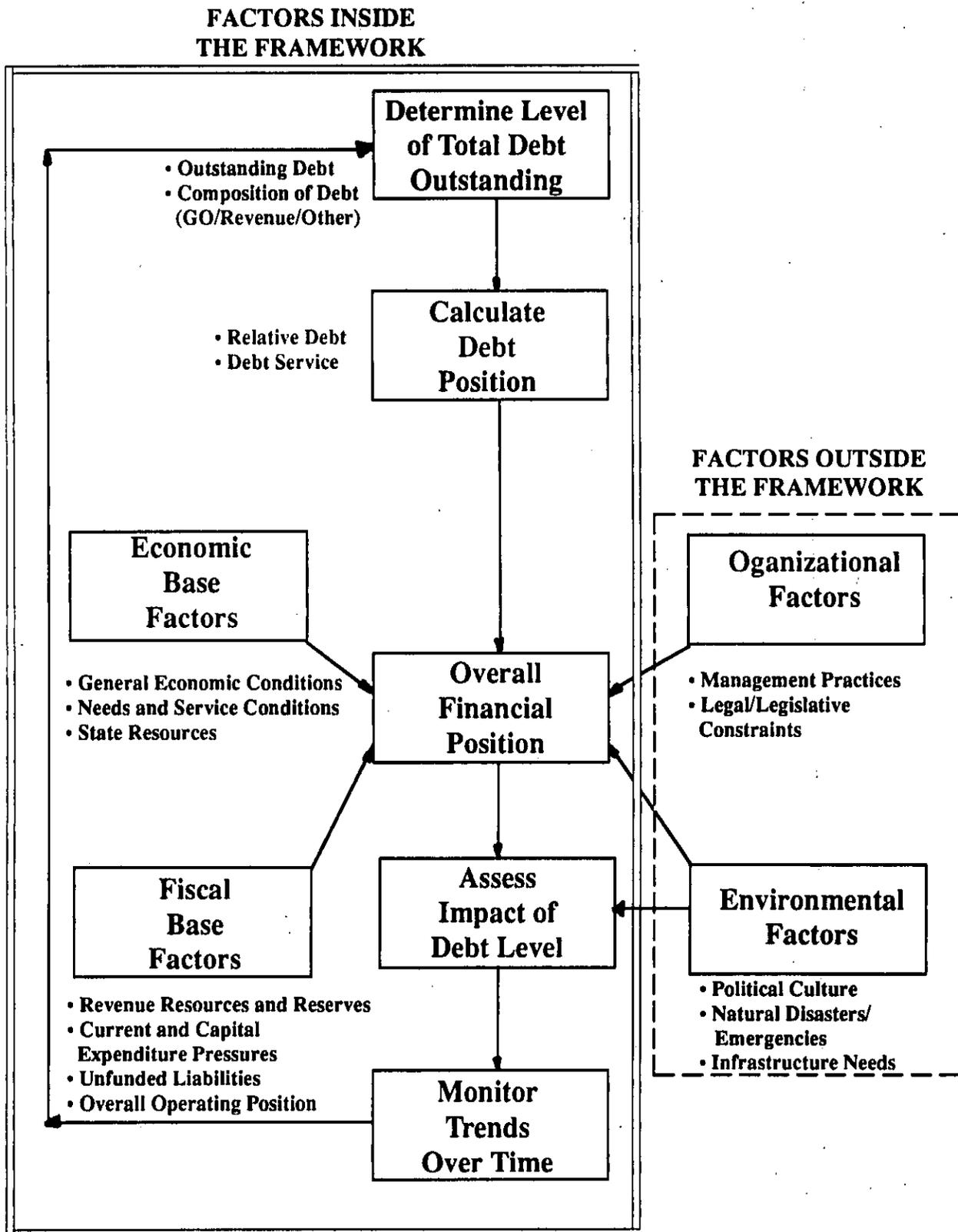
The framework envisions the use of three types of fiscal indicators: (1) indicators of debt position; (2) economic base indicators; and (3) fiscal base indicators.

The first of these involve various measures of the level and composition of government debt outstanding. This would include the total amount of debt outstanding, the types of debt outstanding (general obligation, revenue bond, special assessment, etc.), and the burden the debt imposes on current government expenditures in the form of debt service obligations.

The second set of factors is intended to reflect the economic conditions in which government must operate. These indicators are important because economic conditions both increase the demands for government services and may limit the government's ability to support debt by reducing current revenue flows or increasing expenditures.

The third set of indicators are measures of the fiscal performance of government--primarily its revenue and expenditure position and how these two sides of the fiscal equation combine to form an overall operating position.

**FIGURE ES-1  
A FRAMEWORK FOR ASSESSING  
CALIFORNIA'S TOTAL OUTSTANDING PUBLIC DEBT**



As the model shows, two sets of factors are viewed as important in the assessment process but do not lend themselves to the use of fiscal indicators. The first of these includes general environmental factors--such as the political culture of the governments under analysis or the level of infrastructure needs that may drive the issuance of debt in the first place. The second is organizational factors, such as management practices and legal constraints. These factors are indirectly measured by the general economic and fiscal indicators discussed above but are not separately specified in the framework. An important example of this in California is the constitutional constraints on governmental finances. There is no single measure of these constraints, but measures of fiscal capacity can be adjusted to reflect the effects of these limitations on potential revenues.

## Indicator Selection

Using this general framework and a list of indicators developed from the literature review, a model of set of indicators were next developed. A final set of 40 indicators was chosen for use in the assessment framework. Exhibit ES-2 shows how the indicators fit into the framework. As the exhibit shows, the indicators reflect debt position, economic base factors, and fiscal base factors. The main report discusses the definitions of these indicators and how they fit into the framework.

The indicators were selected based on how well they fit into the theoretical framework. In this sense, they represent an "ideal" set of factors for monitoring the level of debt outstanding and its implications. However, the analysis shows that there are important limitations on the availability of information to create a number of these indicators, particularly on a statewide aggregate basis. Often the data needed to create a given indicator exist for some levels of government, but often not for all levels of government. There also are definitional differences among levels of government even when the information does exist, and the data that are available generally will lag up to two years behind the fiscal year in which they occur.

One other important issue related to the indicators is the overlap between the recommended indicator set and the indicators identified for use in the Commission's *Handbook*, which is currently in development. Between the two studies, a total of 52 different measures are specified with precise matches on only six indicators: debt outstanding, debt outstanding (trend), per capita income, per capita revenue, per capita expenditures, and fund balance (operating position). Many of the other indicators used in the studies are similar but are different in their specification. For example, the *Handbook* includes as an indicator a measure of population, while the current study recommends the use of population change over time. These differences are primarily a result of the different emphasis of the two reports. The *Handbook* is geared to specific local applications, while the current study attempts to develop indicators with a more broad-based applicability.

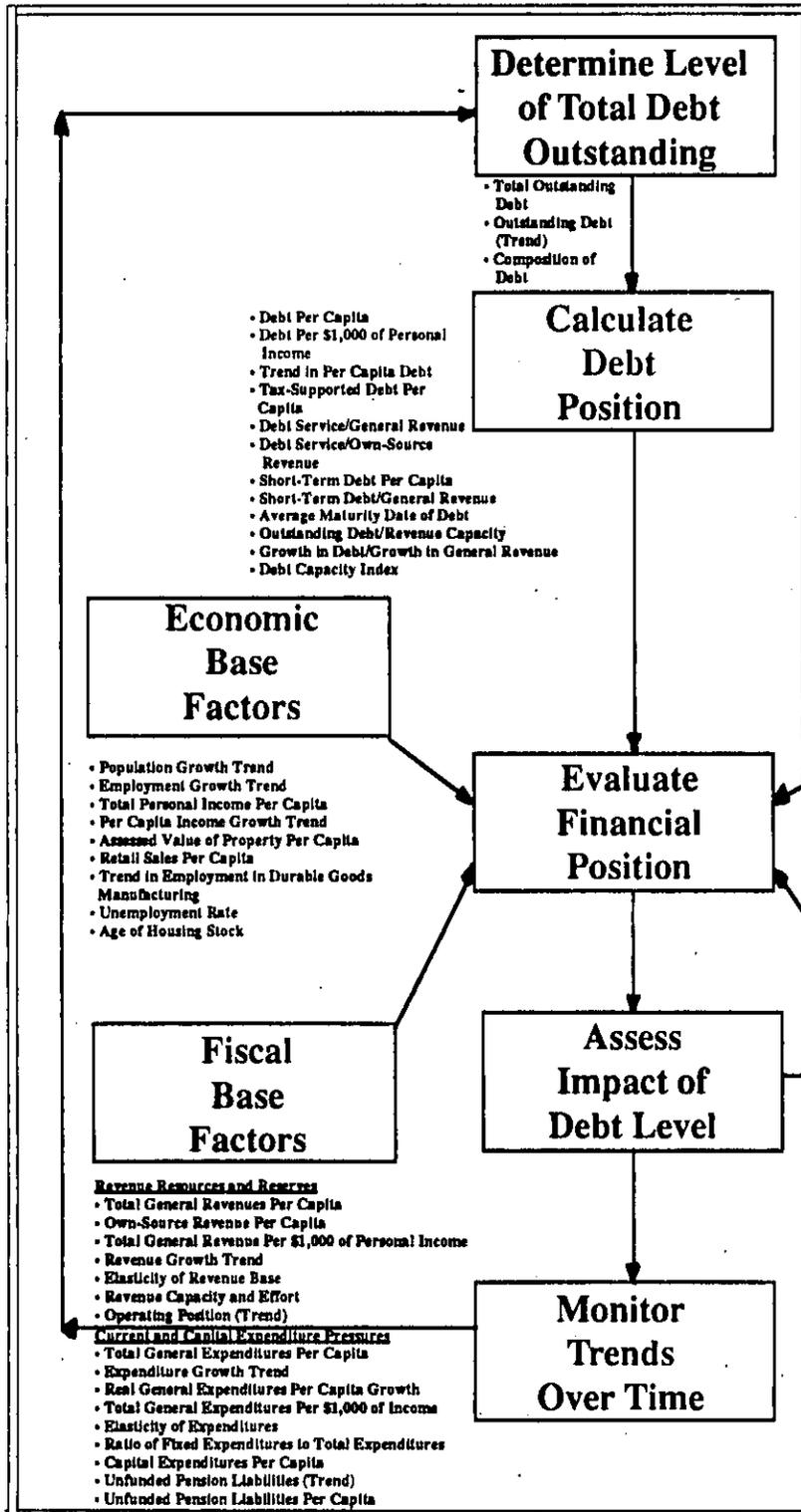
## Recommendations

From the two parts of the study, a series of conclusions and recommendations are developed relative to the potential future use of indicators by the Commission. These recommendations are divided into general conclusions and recommendations, data base issues, and recommendations relative to the development of indicators.

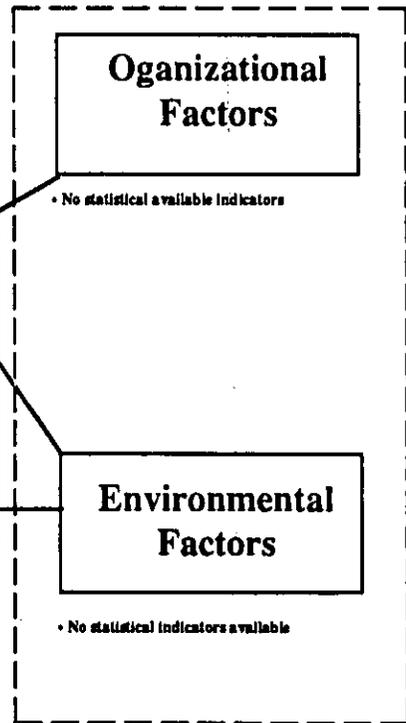
The general conclusion of the study is that a set of indicators for assessing the outstanding public debt of California state and local governments can be developed, but the indicators would have a number of significant inherent limitations. There are problems with available data and particularly with the comparability of information for different types of California government. Moreover, no set of general indicators can be expected to reflect current and future capital needs of California governments adequately, which is a key factor in determining the level of debt that will

**FIGURE ES-2  
A FRAMEWORK FOR ASSESSING  
CALIFORNIA'S TOTAL OUTSTANDING PUBLIC DEBT  
WITH SELECTED INDICATORS**

**FACTORS INSIDE  
THE FRAMEWORK**



**FACTORS OUTSIDE  
THE FRAMEWORK**



be required. Because of these limitations, the indicator set would reflect useful information about the overall debt condition of California governments, but it would lack the detail to provide a precise answers to the questions of what the debt capacity of California governments is, how much of the government's debt capacity is current being used and how much is available for future use. More useful applications of such an indicator system might be the analysis of the debt levels of individual governments or homogeneous groups of governments (e.g., the State, cities or counties) or as one analytical tool in a larger capital budgeting process.

Despite these limitations, it is recommended that, *given the availability of resources*, the Commission would be well served to develop more information on the debt position of California state and local government, including a comprehensive indicator set. Such information would not be intended as a way of limiting or otherwise restricting the use of debt by any level of government but could provide a more detailed and comprehensive base of information for state and local decision makers than is currently available. It would also provide a useful basis for CDAC's ongoing assessment of the debt situation which should be a central input to future State decision making on the use of debt financing.

Specific recommendations presented in the study are as follows:

#### *General Conclusions and Recommendations*

(1) *It is possible to construct a basic set of measures to aid in the evaluation of the credit condition of California state and local governments. These measures would work best if applied to individual units of government or to homogeneous groups of governments (e.g., the State, counties, cities). The application of an indicator set to the task of assessing the overall level of debt in the State would provide government analysts and decisions makers with useful information, but as a broad, free-standing analytical tool, the indicator approach alone would be problematic for several reasons.* First, some of the data simply are not available to create needed indicators for all of the diverse types of government in California. The report indicates that data do not exist for a number of the variables in the ideal indicator list. Second, even if data for individual governments are available for a given indicator, its analytical powers are likely to be weakened by the process of aggregation. Moreover, there also would be significant problems with the aggregation of data from dissimilar units of government in any case. Third--and most importantly--by themselves, indicators can tell only part of the story of government credit condition. To be most useful, they should be related to the capital spending demands likely to face government--that is, it is necessary not only to evaluate government's debt capacity and its current utilization of debt but also to examine in detail what forces may affect its use of debt over time. While most governments in California have capital planning processes, there needs to be further development of information in the area.

(2) *Because of the limitations on the use of an indicator system as an isolated analytical tool, one important alternative application of the indicators would be as one analytical tool in a comprehensive capital budgeting process for individual units of government.* In this context, the indicator set would not be expected to provide definitive answers concerning credit condition but could provide insights into the trends and composition of debt for use by policy makers and analysts in managing and planning capital expenditure programs. The process would provide a consistent, orderly method of maintaining and analyzing economic and financial information relevant to the credit condition of state and local government. Used in this way, the indicator system would be valuable both to local governments and to the State, which is currently considering the creation of its own formal capital budgeting process.

(3) *At the State government level, the indicators by themselves could also play an important role in the ongoing monitoring and analysis of government debt in California that is part of CDAC's basic mission. In this regard, we recommend that the Commission, if it does develop this process, prepare for the Treasurer and publish an annual status report on the condition of*

*outstanding debt in California, using information currently available to it and information developed through the indicator process. Several valuable reports have been prepared on this topic for the Commission and the General Assembly in the past, but they quickly become dated. These data should be routinely available, and an annual report would appear to offer the appropriate vehicle for the presentation of this information.*

*(4) At the local government level, it is recommended that the Commission continue to pursue its plans to provide training to local governments in the use of indicators. Taking into account points (1) and (2) above, this training might profitably be combined with training for local governments on capital budgeting and the use of indicators in a comprehensive capital budgeting process.*

*(5) It should, however, clearly be recognized that the further development of these recommendations by CDAC would require considerable resources to accumulate data, to develop new sources of data where necessary, to maintain the data once created, and to produce on-going analysis. From the standpoint of the Commission, these costs should certainly be weighed carefully against other programmatic commitments.*

*(6) It should be carefully delineated that the purpose of this process would not be to attempt to establish limits on the use of debt by state or local governments. Rather, its purpose should be to provide a central source of information on debt issued and outstanding that can be studied by policy makers, and which can help guide their decisions on future policies regarding the use of debt financing. Governments publish annual financial reports not as a means of limiting expenditures but because the collection and presentation of financial information is a key to understanding how government is functioning. This same spirit should guide this process.*

#### *Data Base Issues*

*(1) While the assessment process outlined in this report should not be expected to provide definitive answers to the complex issues of credit condition and fiscal health, it can provide important benchmarks that will point to the deterioration of key factors influencing the credit condition of California governments. In this regard, the indicator list developed for this study represents a reasonable starting place for any analysis of this type; however, if the Commission elected to go forward with the development of an assessment framework, it should do so with the understanding that significant further work needs to be done on the identification of data to be used in the analysis.*

*(2) In this regard, we recommend that a further step in the current evaluation process should be an assessment of the information currently available on local government finances. This could be done through an evaluation of a sample of local reports submitted to the Controller. This sample would be drawn from all types of local governments reporting to the Controller, since there are important differences in the forms on which information is collected for the various units of government. Information reported to the Controller should be compared with actual financial report data and internal information on the sample jurisdictions. Sources of problems should be identified and procedures developed for eliminating all but simple errors. It should be recognized that it is unlikely that data for several thousand governments will be completely pure, but major problems could be eliminated with the cooperation of the Controller.*

*(3) It is recommend that attention be given as well to data available through other sources, although a survey of potential sources indicates that these alternatives are likely to be limited. One possible source of such data is California Municipal Statistics (CMS), a private firm which maintains a data base of debt information on California units of government. Exploration of this issue could be part of the evaluation process recommended in recommendation (2) above.*

(4) *Because improvements in existing data sources seem workable--and again assuming the Commission wants to pursue this process--we would recommend against the Commission seeking authority to develop its own information requirements for state and local government. This is true because such an effort would be likely to share many of the same problems as the current data sources and would impose an unwelcome new reporting requirement on local governments. In fact, given constitutional requirements dealing with state mandates, it might involve local costs that might require State reimbursement.*

(5) *Although the Commission should not undertake its own, separate data gathering effort, the Commission should develop its own data base if it pursues the indicator process. The Commission already maintains information on new debt issues and related information, so this would be a natural extension of that data collections process. It is further recommended that the Commission work with the Controller and other sources to get information prior to its formal publication to insure the timeliness of information available for assessment.*

(6) *If this data base is developed, consideration should be given to possible other uses for it in addition to the assessment of outstanding debt. For example, it could eventually be used to maintain detailed information on par values, interest coupons, "true" and "net" interest costs, call provisions, refunding provisions, and other features of the California credit market that would be useful to government policy makers and analysts alike. Clearly, a plan would be needed for the overall design of the data base to accommodate a logical, efficient expansion of its use.*

#### *Indicators*

(1) *It should be clearly recognized that the model indicators in this study are only a starting point in the range of analytical approaches given a consolidated data base of debt and other financial information. Other indicators along the same lines clearly are possible and would be relevant to various types of analysis.*

(2) *In this regard, an important step once a data base is developed would be to apply statistical techniques to the indicators in the framework and other potential indicators to test their usefulness. This testing procedure should be an continuing part of the assessment process. A first step in this direction would be to conduct correlation analysis on the indicators to determine the interrelationships among them. Another statistical approach would be to use factor analysis to explore the interrelationships among sets of indicators. (Factor analysis is designed to group large number of variables into "factors" representing similar or like behavior. In this case, it can be used to systematically sort through the variables, select the variances that are quantitatively important.) Finally, for time series, regression analysis could be used to analyze the statistical relationships between the various indicators and a single dependent variable--such as the level of aggregate debt in the state. The issue in this final analysis would be the degree to which the various indicators "explain" a given level of debt outstanding statewide (or alternately, for an individual government).*

(3) *We recommend that the Commission--if it decides to continue developing an indicator process--should eventually work toward the development of data for substate jurisdictions or aggregations as well as for the statewide aggregate. While the emphasis clearly should be on developing aggregate indicators, some time and analysis should be taken to understand the detail underlying the statewide trends. This means distinguishing among governments of various sizes and types. This need not be an immediate goal of the process, but it clearly is important to work toward disaggregation as an important resource for government policy makers.*

(4) *It is also important that any indicators developed by the Commission in the future focus on time trends, as well as static indicators of credit condition at a given point in time. This is*

especially important since there are few standards for measuring performance. Thus, trends over time--deterioration or improvement--are particularly important.

(5) *In this regard, we recommend that over time the Commission consider developing an economic model to project indicators into the future based on different assumptions about the general condition of the state and national economies.* Not only will this help better explain how and why credit conditions change, but it will allow sensitivity analysis to see how California government's credit strength would hold up assuming various paths for the state economy. This same sort of analytical treatment should also be applied to the capital planning process described in earlier conclusions.

(6) *Finally, we would recommend that a part of the indicator effort be the development of interstate comparisons for state-level data, probably using Census data as a base.* (The development of interstate comparisons for substate data is possible but is considerably more problematic and expensive potentially for very limited results.) The value of state-level comparisons is to provide decision makers with a frame of reference for evaluating the level of debt. It is perhaps not the best available standard of measure. However, it is a familiar one, and one in which decision makers often have an interest. Given the availability of resources, it is preferable to do interstate comparisons for all 50 states. Obviously, not all states mirror the size and complexity of California, but it is often difficult to gauge which subset of states is most important (e.g., 10 largest, 10 industrial, Sunbelt states, Western states), and a complete data set for all states would insure that the Commission would have the information to meet changing needs.

\* \* \* \* \*

For the most part, state and local governments in the United States have enjoyed a number of years of relative fiscal ease; however, there is no guarantee that economic conditions will continue to perform well, and in fact, history suggests that any economic expansion is eventually followed by a slowdown. The State of California has an opportunity to begin to put into place a process for analyzing and detecting changes in the credit and general fiscal conditions of its governments. This is an appropriate time to begin such an undertaking.

**PART 1: REVIEW OF LITERATURE**

# DEBT INDICATORS AND CRITERIA FOR THE ASSESSMENT OF CALIFORNIA'S TOTAL OUTSTANDING PUBLIC DEBT:

## Part 1: Review of the Literature

### INTRODUCTION

How good is the fiscal health of America's state and local governments? The signals are mixed at best. Certainly, the outward signs point to greatly improved fiscal health since the 1970s, when there were well-publicized financial crises in New York and Cleveland and when many other American cities seemed poised on the edge of fiscal difficulties of their own. On the other hand, some experts fear trouble may lie ahead. The next New York-style financial emergency may only be as far away as the next national recession. For example, in their recent book on the condition of American cities, John Yinger and Helen Ladd present a hard-edged scenario for some local governments:

[S]ome central cities may be caught in a vicious circle of fiscal and economic decline. Deteriorating city fiscal health forces service cuts or tax increases, which may drive away high-income taxpayers. The loss of high-income taxpayers undercuts revenue-raising capacity and boosts service costs, thereby causing yet further declines in city fiscal health.<sup>1</sup>

One special source of concern is the growth of state and local debt. Since the early 1970s, there has been a dramatic increase in state and local debt outstanding. Between 1973 and 1987, for example, total debt outstanding for state and local governments grew from \$188 billion to \$719 billion, representing an average growth of 10 percent annually. In California, state and local government debt outstanding grew from \$19 billion in 1973 to \$72 billion in 1987--also about a 10 percent yearly growth rate.

In part, this debt has been issued to meet growing commitments for school, roads, prisons, and other public services. But other forces have been at work as well. The growth in debt has been spurred by significant reductions in federal aid to state and local governments--a condition which shows no signs of being reversed--and by the public's resistance to new or increased taxes which makes debt financing an increasingly attractive option.

Against this backdrop, interest in the measurement of the fiscal condition of state and local government has grown significantly, assuming particular urgency since New York's problems came to light. Prior to that time, analysis of government fiscal health was largely the province of the bond rating agencies, Moody's and Standard and Poor's, which provide investors with evaluations and ratings of the bonds issued by thousands of governmental units nationally each year. However, the rating agencies' methodologies periodically have been criticized as overly subjective. Moreover, critics argue that the bond ratings, focused as they are on the probability of default, are not sufficient to evaluate the complexities of modern government finance.

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<sup>1</sup> Helen F. Ladd and John Yinger, *America's Ailing Cities: Fiscal Health and the Design of Urban Policy* (Baltimore: The Johns Hopkins University Press, 1989), p. 291.

In recent years, a number of analysts have employed more quantitative approaches to the analysis of government debt capacity and fiscal health, using a range of economic and financial measures and increasingly sophisticated statistical techniques. While these methods have yielded much valuable insight into the fiscal health of governments, to date no set of theories has emerged which comprehensively explains which measures of fiscal condition are most critical as indicators of fiscal health. Nonetheless, the past two decades have seen significant progress in the development of indicators which encompass not only government's capacity to issue and support bonded debt but also its broader fiscal condition--its ability to provide what one writer has characterized as "a reasonable level of services at a reasonable sacrifice."<sup>2</sup>

Despite the lack of consensus on which indicators are most important--or perhaps because of it--experts in the field generally agree on the need to continue working to develop the indicator methodology:

The need to develop improved techniques for monitoring the overall fiscal conditions of local governments is widely recognized, particularly in view of the fiscal crisis faced by major cities in recent years. Fiscal indicators . . . are needed by government officials for effective city management and for design of tax and grant programs. Private individuals also need such information, since their economic well-being depends on the fiscal health of the cities in which they reside.<sup>3</sup>

With these concerns in mind, the California Debt Advisory Commission asked KPMG Peat Marwick to take a comprehensive look at the literature surrounding government credit ratings and the measurement of the fiscal health of state and local governments. The goal of this project is to clearly identify the major developments in this area and to develop a methodology for using these indicators to monitor the financial condition and debt position of California state and local governments.

This report reflects the first stage of the project. It traces the development of various indicators and methods of evaluating of government debt condition and fiscal health, examining three major branches of research in this area: (1) studies which are designed to evaluate and rate government creditworthiness; (2) those that examine the broader issue of government fiscal health through various economic and financial indicators; and (3) studies which are prepared as guidebooks for government officials to analyze the credit standing and general fiscal health of their jurisdictions. The discussion begins with perhaps the oldest and most widely known indicators of government fiscal health: the bond ratings published by Moody's and Standard and Poor's.

## DEBT ANALYSIS

State and local governments in the United States began to borrow long before they began to issue bonded debt. New York City, for example, received several loans in the eighteenth century and at least one dating back to the 1600s. As government began to expand in the United States, initial capital expenditures were financed by loans, sales of public land, donations, lotteries and taxation.<sup>4</sup> Ultimately, though, these approaches proved inadequate, and by the early nineteenth century, government bond issues made their appearance.

Almost from the first, there were problems with some of this debt. At the state level, many of the early debt issues were used to finance canals, railroads, and banks. Some of these issues

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<sup>2</sup> Katherine Bradbury, "Fiscal Distress in Large U.S. Cities," *New England Economic Review* (November/December 1982), p. 34.

<sup>3</sup> J. Richard Aronson, "Municipal Fiscal Indicators," U.S. Department of Housing and Urban Development, Urban Consortium Information Bulletin (Washington, D.C., 1980), p. iii.

<sup>4</sup> Albert M. Hillhouse, *Municipal Bonds: A Century of Experience* (New York: Prentice-Hall, Inc., 1936), p. 31.

eventually defaulted because the projects they supported were ill-conceived, poorly managed, or in the case of canals, quickly became obsolete. Following the depression of 1837, nine states defaulted on payment of interest on their bonds during the 1840s and did not resume payments for several years.<sup>5</sup> A second wave of state defaults came in the years following the Civil War. In part, these occurred in southern states impoverished by the War and Reconstruction, but fiscal difficulties also extended to states caught by the financial panic in 1893 and subsequent depression.

Municipal governments followed a similar course. A number of municipalities defaulted in the 1840s and 1850s, a period when municipal finances were affected by volatile economic conditions and rising demands for services. There was also an upswing in municipal defaults in the 1870s for many of the same reasons as the state defaults in the period. According to one estimate, as much as one-fifth of the indebtedness of all municipal governments was in default at some point in the 1870s.<sup>6</sup> Although less widespread, there was another round of municipal defaults following the panic and depression of 1893.

Despite these periodic bouts of serious financial difficulty, there was not a systematic resource for evaluating the creditworthiness of government debt--much less the general condition of government finances--until a century after the first state and local bonds were issued. Moody's began rating municipal bonds in 1919 as an outgrowth of the corporate bond rating service it pioneered in 1909. Although it issued so-called letter ratings before World War II, Standard and Poor's did not begin its formal rating system until 1949.<sup>7</sup>

While they provided the first indicators of creditworthiness--and by extension fiscal health--these early ratings proved to be of limited value as predictors of financial difficulty owing to their lack of sophistication and to the inadequacy of information available on governmental finances:

During this period municipal rating was characterized by superficiality and inexperience. The staff at Moody's did not exceed four people at any time between 1920 and 1935, and available information was skimpy. A continuing problem was the poor quality of governmental financial reporting procedures.<sup>8</sup>

In those early days, virtually all bond issues were rated either Aaa or Aa, Moody's top two ratings. According to one commentator, ". . . the rule of thumb was the number of railroads passing through a town. One railroad called for a single A, two for Aa and so forth."<sup>9</sup>

This system began to unravel in 1929 with the onset of the Great Depression. As was the case in the 1800s, severe economic distress led to serious fiscal problems for many state and local governments, and a wave of defaults followed. One study found that among local governments in the 1930s, there were 4,770 recorded defaults, compared with only 185 during the 1920s and less than a hundred during the 1940s.<sup>10</sup> The total number of local governments with debt in default at one time peaked at 3,251 in mid-1935, declining thereafter and virtually disappearing during the relatively prosperous, fiscally constrained years of World War II. Significantly, of the rated bonds

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<sup>5</sup> Paul Studensky, *Public Borrowing* (New York City: National Municipal League, 1930), p. 40.

<sup>6</sup> Hillhouse, p. 39.

<sup>7</sup> James F. Reilly, "Municipal Bond Ratings," in U.S. Congress, Joint Economic Committee, Subcommittee on Economic Progress, *State and Local Public Facility Needs and Financing, Volume 2--Public Facility Financing* (Washington, D.C.: 89th Congress, 2d Session, 1966), p. 231; Brenton W. Harries, "Standard and Poor's Corporation New Policy on Rating Municipal Bonds," *Financial Analysts Journal*, Vol. 24, No. 3 (May-June 1968), p. 68.

<sup>8</sup> John E. Petersen, *The Rating Game* (New York: The Twentieth Century Fund, 1974), p. 52.

<sup>9</sup> Reilly, p. 232.

<sup>10</sup> U.S. Advisory Commission on Intergovernmental Relations, *City Financial Emergencies* (Washington, D.C., Report A-42, July 1973), p. 16.

which plunged into default in the 1930s, almost half had been rated Aaa in 1929, and almost 80 percent were rated Aa or better.<sup>11</sup>

Learning from these problems, Moody's greatly upgraded its rating procedures and expanded its staff. It also became, according to some analysts, considerably more conservative in assigning ratings on issues where there was the chance of future economic instability or in cases where issues were to be financed in unusual ways.<sup>12</sup> As a result, many major revenue bond issues in the post-War period were simply not rated. (This policy was later modified to allow provisional ratings subject to construction risks or other uncertainties.)

During this same period, major changes were also occurring in the nation's economic structure. There was a marked increase in knowledge of how the economy works and in the tools available to smooth the business cycle. The nation thus became less vulnerable to sharp economic swings, and from the 1940s to the 1960s, this led to greatly improved fiscal health for state and local governments nationally.

In this environment, actual defaults or other major payment difficulties by state and local jurisdictions became much rarer. There were only 431 defaults among local governments from 1945 through 1969, and almost three out of four of those involved small governmental units and small amounts of money.<sup>13</sup> As the specter of widespread default receded, the emphasis of bond ratings underwent a subtle change, focusing not only on the possibility of default but also on the relative quality of various debt issues. The emphasis on quality necessitated an increasingly sophisticated approach to credit analysis on the part of the rating agencies.

In developing their ratings today, Moody's and Standard and Poor's apparently employ similar procedures and work from the same basic information based on their published comments on the process. When an issue is to be rated, they gather or update financial and economic information on the issuing government and also accumulate information on the project for which the bonds are being issued. Included among the basic sources are financial reports, various economic indicators, and information on the project such as engineering reports and legal opinions. There may also be meetings with and presentations by representatives of the issuing government and, less frequently, visits to the government by rating agency staff. From this process, a rating is developed by the two firms' internal rating committees, and a rating is assigned (Table 1). Finally, the issuing government is notified, and the firms publish their ratings in various regular reports.

Although the outlines of the process are well understood, a major complaint about the rating process is that neither bond issuers nor those who use the ratings to make investment decisions are fully informed about the specific factors that go into a particular rating, much less about the relative importance of individual factors in the rating process. The information the agencies provide on their methods tends to be fairly general. In its publication, *Debt Rating Criteria*, for example, Standard and Poor's says that four factors are central to its ratings. These include:

1. Economic factors, such as the income and employment mix of the governments citizens and the diversity of its economic base;
2. Debt factors, including the type of security being pledged to debt repayment, overall debt burden, debt history and trend;
3. Administrative factors, such as the form of government issuing the debt and its ability to implement its plans and meet its legal requirements;

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<sup>11</sup> Petersen, p. 51.

<sup>12</sup> *Ibid.*, p. 52.

<sup>13</sup> *City Financial Emergencies*, p. 16.

**TABLE 1**  
**RATINGS USED BY MOODY'S AND STANDARD AND POOR'S**  
**TO RATE STATE AND LOCAL GOVERNMENT DEBT**

Moody's Rating*	Standard & Poor's Rating*	Description
Aaa	AAA	Bonds of the best quality, carrying the small degree of investment risk. Capacity to pay principal and interest is extremely strong.
Aa	AA	Bonds have a strong capacity for repayment by all standards. Vary from the higher grade bonds only by a small degree.
A	A	Have a strong capacity to repay principal and interest, although they are considered more susceptible to the adverse effects of changes in "circumstances and economic conditions" than debt in the higher grades.
Baa	BBB	Bonds are considered to be medium grade obligations. They are considered to have adequate capacity to repay obligations, but are more likely to be affected by adverse conditions.
Ba	BB	Bonds are judged to have speculative elements. This is the lowest level of speculation. Uncertainty of position is a characteristic of bonds in this class.
B	B	These bonds generally lack the characteristics of a desirable investment. More highly speculative than higher grade bonds.
Caa	CCC	Bonds of generally poor standing. Such issues may be in default or there may be danger of default under Moody's approach.
Ca	CC	Bonds are speculative in a high degree.
C	C	Issues are considered to have extremely poor prospects of ever attaining any real investment standing. Standard and Poor's reserves this category for income bonds on which no interest is being paid.
-	D	Debt is in default, and payment of interest and/or repayment of principal is in arrears.
Con.(...)	-	Bonds for which the security depends upon the completion of some act or the fulfillment of some condition--rated conditionally.

Source: Moody's Investor Services, *Moody's on Municipals* (New York: Moody's, 1989); Standard and Poor's, *Debt Rating Criteria: Municipal Overview* (New York: Standard and Poor's, 1986).

\* Both firms further subdivide these categories. Bonds in the Aa, A, Baa, Ba, and B groups, which Moody's believes possess the strongest investment attributes are designated Aa1, A1, Baa1, Ba1, and B1. In Standard and Poor's system, ratings from AA to B can be modified by the addition of a plus or minus sign to show relative standing within the major categories.

4. Fiscal factors, including the government's financial performance versus its budget, its balance sheet position and fund balances.<sup>14</sup>

These factors are supported by a detailed discussion of analytical factors influencing a rating, but nowhere is there an indication of how these factors are used to differentiate between, for example, a AAA bond and one that is rated A. In fact, a managing director of Standard and Poor's was quoted in 1985 as saying that "there isn't as much objective criteria as one would like, and even objective criteria are open to interpretation."<sup>15</sup> The article in which this observation appeared included the comment that among the variables Standard and Poor's factors into a rating are the number of construction cranes "silhouetted on the skyline" and the lunchtime bustle of a city's downtown business district.

In a 1988 speech, Claire Cohen, vice president for state ratings at Moody's, sketched a similar list of rating factors, suggesting that her firm also focuses on four sets of factors:

1. Debt, including the amount of tax-supported debt involved and the structure of outstanding debt obligations;
2. Financial operations, meaning the same sorts of financial operating characteristics that interests Standard and Poor's--fund balances (and particularly free surplus balances), spending responsibilities, available revenue sources and their diversity, and growth trends in both spending and revenues.
3. Administrative/government factors, which indicate how well a government is set up to perform the functions, such as the quality and timeliness of its financial reporting; and
4. Economic and social characteristics, which help to identify and analyze the sources of wealth available to the government.<sup>16</sup>

Despite these broad similarities, it is possible to discern some differences of focus between the two agencies. Standard and Poor's, for example, places a greater emphasis on economic base factors, while Moody's generally pays greater attention to the financial condition of the government.

Not surprisingly, the vagueness of the bond rating process and the lack of clear information on what factors are important in determining ratings have given rise to a body of literature analyzing government creditworthiness and looking beyond the ratings to the larger problem of gauging government fiscal health. As Alan Rabinowitz wrote in 1969: "The more one considers the rating problem, the more one realizes how intimately connected it is with our inability to date as a nation to come to grips with the 'urban problem' or to define adequately a 'good city.'"<sup>17</sup>

In the area of analyzing creditworthiness, the studies that have appeared can be divided into two types. The first are efforts by some analysts to find numerical systems that would arrive at clearly definable quantitative ratings of government debt--an improvement on the techniques of

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<sup>14</sup> Standard and Poor's Corporation, *Debt Rating Criteria: Municipal Overview* (New York: Standard and Poor's, 1986), p. 23.

<sup>15</sup> James R. Ramsey and Merlin M. Hackbart, "State and Local Debt Capacity: An Index Measure," *Municipal Finance Journal*, Vol. 9, No. 1 (Winter 1988), p. 10.

<sup>16</sup> Claire Cohen, "Demystifying the State Bond Rating Process," *The Fiscal Letter*, Vol X., No. 2 (March/April 1988), p. 2.

<sup>17</sup> Alan Rabinowitz, *Municipal Bond Finance and Administration* (New York: Wiley-Interscience, 1969), p. 89.

Moody's and Standard and Poor's. The second type includes research aimed at attempting to explain, using statistical models, the ratings being assigned by the rating agencies or, in a variation, the bond yields associated with the ratings.

### The Search for an Objective Rating System

One of the earliest efforts to develop an alternative method of analyzing creditworthiness was a project organized by James E. McCabe at the Maxwell School of Syracuse University and first reported in 1941.<sup>18</sup> In his evaluation of the existing rating system, McCabe found a "lack of uniform, accurately weighted universally accepted standards for credit appraisal purposes."

He set about formulating an alternative set of standards by presenting an extended list of possible rating factors to a group of municipal credit experts and asking them to rate the factors' importance in determining creditworthiness. From this ranking, a smaller, weighted list was developed. This list included factors that turn up again and again in later studies: debt factors, tax factors, quality of administration, economic and social stability of the government, and the stability of its current operations. After using the list to rate issues from 25 cities, McCabe found that the results were strikingly similar to Moody's ratings.

During the fiscally serene years from the end of World War II to the early 1960s, there was scant interest in the bond rating issue, and a review of the literature unearthed few developments in this period. In fact, there was little open criticism of the rating agencies' work during this period since, with one minor exception, all of the bonds that defaulted in the period were unrated by the agencies.<sup>19</sup>

Interest in the accuracy of the firms' ratings was rekindled in the 1960s as the nation became increasingly--and painfully--aware of the growing problems in its urban areas. In this period, the bond ratings of a number of large cities began to slide, while interest rates were rising, creating a difficult fiscal dilemma for many municipal governments. One result was a new round of criticism of the rating agencies and their methods.

Responding at least in part to this criticism, Congress held a series of hearings in 1967 and 1968 on the rating agencies' methods and their impact on the government debt market. At about the same time, a special ratings study committee of the Investment Bankers Association was formed to study the rating process and, while generally praising Moody's and Standard and Poor's, it nevertheless faulted their efforts on several points, including "their failure to establish and publish explicit standards and norms."<sup>20</sup>

The new round of criticism generated several new efforts to find a quantitative alternative for analyzing debt. One system was developed by Thomas Morris in 1966.<sup>21</sup> Morris' system was designed to numerically grade municipal bonds. Under this system, governments were penalized or rewarded according to measured values. For example, the system penalized an area for having more than a third of its total employment in service industries, largely because the service sector represented an unproductive activity in Morris' view. In his analysis he graded 28 communities, and like McCabe, he found relatively close conformity with the rating agencies.

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<sup>18</sup> Ibid., p. 85.

<sup>19</sup> Petersen, p. 53.

<sup>20</sup> Ibid., p. 55.

<sup>21</sup> Thomas E. Morris, "Municipal Bond Ratings--Perspective, Evaluation, and Improvements," (Philadelphia: University of Pennsylvania, Institute of Investment Banking, 1966).

A better-known quantitative rating system from this same period was developed by Walter Tyler. Tyler was long associated with Standard and Poor's. He headed its municipal bond department and was instrumental in creating the firm's rating system. In 1966, he set up his own rating service which used a numerical rating system.<sup>22</sup> Under Tyler's approach, each government was graded on a scale from 00 to 100, with 00 being the best rating. According to Tyler: "We favor the numerical system, since it instantly reflects even a slight change, and since it facilitates a comparison of yields at which bonds are offered."<sup>23</sup> More than two dozen factors entered into the calculation (Table 2).

Tyler's rating started with a debt-wealth index of his own creation. It was a single figure designed to reflect a debt issuer's ability to pay. As its title indicates, the index has two major components--wealth and debt.

The index's wealth aspect was composed from three separate measures: property value, income, and a percentage of the jurisdiction's median home value. The property value figure was a per capita measure which Tyler based on local assessed values adjusted to more accurately reflect full market value. (Governments often assess property at a fraction of full market value, and the assessments had to be adjusted for comparability and to avoid underestimating a jurisdiction's wealth.) The income factor was measured by per capita income, while the home value amount was equal to one fourth of the median value of homes, a figure taken from the federal Census of Housing. The heavy emphasis on property value measures reflects the overwhelming reliance on property taxes by local governments 20 years ago.

Tyler's debt measure was calculated by deducting a jurisdiction's debt covered by sinking funds and utility earnings from its overall debt level. To the remainder, he added the overlapping debt of other jurisdictions, including state government, which would be borne by the same taxpayers. The debt figure was also expressed on a per capita basis to allow for interjurisdictional comparisons.

After calculating the debt figure, Tyler expressed it as a percentage of the "per capita wealth" factor computed from his three wealth measures. This ratio became the basic debt-wealth index, and this value was adjusted up or down by 30 other factors which, Tyler believed, indicated "the stability, growth, future prospects, management and legal position" of the jurisdiction being rated.<sup>24</sup>

A cursory review of Tyler's quantitative procedure raises almost as many questions as the rating agencies' methods, the major problem being the rationale for the measures selected and their weighting. Nonetheless, Tyler's approach has been praised by some analysts as an important effort toward quantification of the rating process and for the open disclosure of the factors which underlie a given rating. Perhaps as importantly, it was one of the first uses of a multiple factor index to reflect in a single figure a range of information about government fiscal condition. Later, such indexes became fairly common in the literature of government fiscal analysis.

### Replicating the Rating Agency Ratings

Tyler's main purpose in developing his rating system was to produce a rating service to compete with Moody's and Standard and Poor's; however, at about the same time, other researchers were taking an interest in statistically replicating the existing ratings for other purposes. One of these purposes was interest on the part of banks, insurance companies, and the Federal Deposit Insurance

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<sup>22</sup> Walter H. Tyler, "How Are Those Municipal Bonds Rated?" *Institutional Investor*, Vol. II, No. 5 (May 1968), p. 79.

<sup>23</sup> *Ibid.*

<sup>24</sup> *Ibid.*

**TABLE 2**  
**FACTORS CONSIDERED IN THE TYLER BOND RATING SYSTEM**

Factor	Factor
<p><b>Debt/Wealth Index*</b></p> <p><b>Indicators of Stability</b></p> <ul style="list-style-type: none"> <li>• Size--community and area</li> <li>• Economic diversification</li> <li>• Unemployment</li> <li>• Preferred employment</li> <li>• College Enrollment</li> </ul> <p><b>Legal Factors</b></p> <ul style="list-style-type: none"> <li>• Tax rate limits</li> <li>• Tax priorities</li> <li>• Revenue priorities</li> <li>• Other legal quirks</li> </ul> <p><b>"Intangibles"</b></p> <ul style="list-style-type: none"> <li>• Military population of the area</li> <li>• Non-white population</li> <li>• Income distribution</li> <li>• Educational attainment</li> <li>• Percentage of sound housing</li> <li>• Other factors (a large utility plant, propensity for earthquakes, etc.)</li> </ul>	<p><b>Management</b></p> <ul style="list-style-type: none"> <li>• Maturity schedule of debt outstanding</li> <li>• Current operations</li> <li>• Tax collections</li> <li>• Plant condition</li> <li>• Planning</li> <li>• Reporting</li> <li>• Revenue exploitation</li> <li>• Financing needs</li> <li>• Any irregular practices</li> </ul> <p><b>Growth Indicators</b></p> <ul style="list-style-type: none"> <li>• Retail sales trend</li> <li>• Income trend</li> <li>• Long-term population trend</li> <li>• Short-term population trend</li> <li>• Long-term payroll trend</li> <li>• Near-term payroll trend</li> </ul>

Source: Walter H. Tyler, "How Are Those Municipal Bonds Rated?" Institutional Investor, Vol. II, No. 5 (May 1968), p. 79.

\* The debt/wealth index is the starting point for the rating system. The wealth portion of the index is composed of three measures: property value, income, and median home values for the jurisdiction. The debt measure is calculated by deducting a jurisdiction's debt covered by sinking funds and utility earnings from its overall debt level. The debt amount is then expressed as a percent of the a "per capita wealth" amount calculated from the three wealth measures. Other factors are used to adjust this figure up or down to achieve a final numerical rating.

Corporation (FDIC) in better understanding the quality of government securities held for investment purposes.

There were several important reasons for these groups to be interested in bond ratings. Most importantly, banks held a large amount of municipal securities--about 40 percent of all outstanding debt in the late 1960s when the first rating studies were produced--making the quality of these securities of obvious concern not only to bankers but to the FDIC because of its bank regulatory function.

In this connection, in 1969, the FDIC supported research by William Carleton and Eugene Lerner to develop a statistical scoring system to duplicate Moody's ratings.<sup>25</sup> They employed a statistical analysis of about 500 bonds to estimate equations which would classify bonds into the grades used by Moody's. Although Carleton and Lerner's approach was novel for municipal debt, it was not entirely new. Analysts had been producing similar studies for corporate bonds at least since the 1950s.<sup>26</sup>

Table 3 summarizes the key variables used in the Carleton and Lerner study, as well as a number of other major studies in this area. The indicators in the table are categorized into three major divisions, including (1) those factors reflecting the economic base of the jurisdiction under consideration; (2) those factors reflecting the jurisdiction's revenue and spending patterns; and (3) those factors representing debt capacity and utilization.

Following on Carleton and Lerner's work in the same year was a similar scoring system developed by Joseph Horton, who worked for the FDIC.<sup>27</sup> Horton's work was an extension of the Carleton and Lerner study but used a larger number of non-investment grade bonds (Ba) bonds in its sample and an expanded list of variables as predictors, including more measures of income and debt and a special indicator for water and sewer bonds, presumably because of rating problems with them. Horton also included variables distinguishing between so-called "better" and "poorer" states, a subdivision based on his analysis of the state's positive or negative economic and social characteristics and how they were likely to affect the credit rating of their local governments.

Subsequent studies in the similar vein were prepared by Daniel Rubinfeld in 1973, T. Gregory Morton in 1976, Allen Michel in 1977, Jerome Osteryoung and Dallas Blevins in 1978, Duane Stock and Terry Robertson in 1981, and Stephen Willson in 1986.<sup>28</sup>

Rubinfeld's study was different from the earlier examinations because he looked at the impact of credit ratings on debt yield as well as attempting to predict the ratings themselves. His

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<sup>25</sup> William T. Carleton and Eugene M. Lerner, "Statistical Credit Scoring of Municipal Bonds," *Journal of Money, Credit and Banking*, Vol. 1, No. 4 (November 1969), pp. 750-764.

<sup>26</sup> See, for example, W. Braddock Hickman, *Corporate Bonds: Quality and Investment Performance* (New York: National Bureau of Economic Research, Inc., 1958); and Lawrence Fisher, "Determinants of Risk Premiums on Corporate Bonds," *The Journal of Political Economy* (June 1959).

<sup>27</sup> Joseph J. Horton, Jr., "Rating Index for Municipal Bonds," *Financial Analysts Journal*, Vol. 25, No. 2 (March-April 1969), pp. 72-75. (Although the publication of the Horton article predates the Carleton and Lerner study, Horton's work is based on the Carleton and Lerner study.)

<sup>28</sup> Daniel L. Rubinfeld, "Credit Ratings and the Market for General Obligation Municipal Bonds," *National Tax Journal*, Vol. 26, No. 1 (March 1973), pp. 17-27; T. Gregory Morton, "A Comparative Analysis of Moody's and Standard and Poor's Municipal Bond Ratings," *Review of Business and Economic Research*, Vol. XI, No. 2 (Winter 1975-76), pp. 74-81; Allen J. Michel, "Municipal Bond Ratings: A Discriminant Analysis Approach," *Journal of Financial and Quantitative Analysis*, Vol. XII, No. 4 (November 1977), pp. 587-598; Jerome S. Osteryoung and Dallas R. Blevins, "State General Obligation Bond Credit Ratings," *Growth and Change*, Vol. 9, No. 3 (July 1978), pp. 29-35; Duane Stock and Terry Robertson, "Improved Techniques for Predicting Municipal Credit Ratings," *Journal of Bank Research*, Vol. 12, No. 3 (Autumn 1981), pp. 153-160; Stephen R. Willson, "Credit Ratings and General Obligation Bonds: A Statistical Analysis," *Government Finance Review*, Vol. 2, No. 3 (June 1986), pp. 19-22.

TABLE 3  
VARIABLES USED IN SELECTED BOND RATING AND YIELD ANALYSIS STUDIES\*

Factor	Carleton & Lerner (1969)	Horton (1969)	Bahl (1971)	Hastie (1972)	Rubinfield (1973)	Morton++ (1975-76)	Michel (1977)	Browne & Syron (1977 & 1979)	Osteryoung & Blevins (1978)	Stock & Robertson (1981)	Willson (1986)	Ramsey & Hackbart (1988)
<b>Economic Base Factors</b>												
• Employment in Durable Goods Manufacturing			x									
• Employment Growth Trend			x									
• Farm Income									x			
• Hospitals in Jurisdiction									x			
• Income--Actual and Per Capita						S				x		
• Income Trends--Actual and Per Capita			x									
• Industrial Diversification**			x	x								
• Land Area									x			
• Largest Taxpayer as a Percent of the Tax Base											x	
• Median Family Income			x		x							
• Percent Change in Black Population						S						
• Percent of Population College Students				x								
• Percent of Population Non-White			x									
• Percent of Population Below Poverty Level			x									
• Percent of Substandard Housing			x									
• Population	x	x				M			x	x		
• Population Change			x	x							x	
• State of Origin+		x			x	S		x				
• Ten Largest Taxpayers as a Percent of Tax Base											x	
• Total Rural Highway Miles									x			
• Tourist Orientation of Economy						M/S						
• Unemployment Rate								x			x	
• Value of Mineral Production									x			
<b>Revenue and Spending Factors</b>												
• Average current tax collection rate (tax collections/tax levy)	x	x			x		x	x				
• Expenditures for Personal Services as a Percent of Total Revenues							x					
• Full Value of Property Per Capita			x									
• Pension Fund Obligations as a Percent of Total Assets								x				
• Pension Fund Obligations as a Percent of Total Revenue							x					
• Percent of Current Expenditures Spent on Interest						S						
• Percent of Local Schools Expenditures by the State Government			x									
• Percent of Welfare Payments by State Government			x									
• Property Taxes as a Percent of Local Government Revenues			x									
• Revenue Per Capita							x					
• Ratio of Assessed Value to True (Market) Value										x		

TABLE 3--Continued  
 VARIABLES USED IN SELECTED BOND RATING AND YIELD ANALYSIS STUDIES\*

Factor	Carleton & Lerner (1969)	Horton (1969)	Bahl (1971)	Hastie (1972)	Rubinfield (1973)	Morton** (1975-76)	Michel (1977)	Browne & Syron (1977 & 1979)	Osteryoung & Blevins (1978)	Stock & Robertson (1981)	Willson+ (1986)	Ramsey & Hackbart (1988)
<b>Revenue and Spending Factors--Cont'd.</b>												
• Ratio of Government Expenditures to True Property Values						M						
• Taxes Per \$1,000 of Assessed Value						M						
• Total Tax Levy										x		
• Welfare Payments as a Percent of Total Revenues							x					
<b>Debt Factors</b>												
• Block Size of Issues				x								
• Debt as a Percent of Personal Income			x									x
• Debt as a Percent of True Property Value				x								x
• Debt/Assessed Value Ratio	x	x			x	M	x	x				
• Debt Outstanding			x	x					x			
• Debt Per Capita	x					M	x	x				x
• Debt Service as a Percent of Revenue												
• Debt Service as a Percent of Total Taxes Collected							x					x
• Debt Trends	x							x		x		
• Debt/True Property Value						M/S				x		
• Debt/Wealth Index			x									
• Default History				x								
• Federal and State Aid as a Percent of Debt Service							x					
• Maturity Term of Outstanding Debt				x								
• Overlapping Debt Per Capita			x									
• Overlapping Debt as a Percent of Personal Income			x									
• Overlapping Debt as a Percent of Full Value of Property												
• Past Credit Rating									x			
• Revenue as a Percent of Debt Service							x					
• School District Bond Issue?	x											
• Short-Term Debt as a Percent of Total Revenue							x					
• Short-Term Debt Per Capita								x				

Source: William T. Carleton and Eugene M. Lerner, "Statistical Credit Scoring of Municipal Bonds," *Journal of Money Credit and Banking*, Vol. 1, No. 4 (November 1969), pp. 750-764; Joseph J. Horton, "Rating Index for Municipal Bonds," *Financial Analysts Journal*, Vol. 25, No. 2 (March-April 1969), pp. 72-75; Roy Bahl, "Measuring the Creditworthiness of State and Local Governments: Municipal Bond Ratings," *National Tax Association, Proceedings* (September 1971), pp. 600-622; K. Larry Hastie, "Determinants of Municipal Bond Yields," *Journal of Financial and Quantitative Analysis* (June 1972), pp. 1729-1748; Daniel L. Rubinfield, "Credit Ratings and the Market for General Obligation Municipal Bonds," *National Tax Journal*, Vol. 26, No. 1 (March 1973), pp. 17-27; T. Gregory Morton, "A Comparative Analysis of Moody's and Standard and Poor's Municipal Bond Ratings," *Review of Business and Economic Research*, Vol. XI, No. 2 (Winter 1975-76), pp. 74-81; Allen J. Michel, "Municipal Bond Ratings: A Discriminant Analysis Approach," *Journal of Financial and Quantitative Analysis*, Vol. XII, No. 4 (November 1977), pp. 587-598; Lynn E. Browne and Richard F. Syron, "Big City Bonds After New York," *New England Economic Review* (July/August 1977), pp. 3-15; Browne and Syron, "The Municipal Market Since the New York City Crisis," *New England Economic Review* (July/August 1979), pp. 11-26; Jerome S. Osteryoung and Dallas R. Blevins, "State General Obligation Bond Credit Ratings," *Growth and Change*, Vol. 9, No. 3 (July 1978), pp. 29-35; Duane Stock and Terry Robertson, "Improved Techniques for Predicting Municipal Credit Ratings," *Journal of Bank Research*, Vol. 12, No. 3 (Autumn 1981), pp. 153-160; Stephen R. Willson, "Credit Ratings and General Obligation Bonds: A Statistical Analysis," *Government Finance Review*, Vol. 2, No. 3 (June 1968), pp. 19-22; James R. Ramsey and Merlin M. Hackbart, "State and Local Debt Capacity: An Index Measure," *Municipal Finance Review*, Vol. 9, No. 1 (Winter 1988), pp. 7-18.

\* Several studies evaluated the usefulness of a range of other factors. Only variables in the actual analytical equations are included in this table.

\*\* Based on a "minimum requirements approach," which evaluates the actual work force in a jurisdiction in various industrial sectors.

+ Covers several approaches to distinguishing among various states, usually on the basis of statewide economic differences.

++ S = Standard and Poor's; M = Moody's. Morton develops separate analyses for the two firm's ratings.

study was also based on a sample limited to communities in the New England states, and he indicates that there may be some problems generalizing from such a narrow geographical sample.

Morton's work followed much the same pattern as his predecessors, but it examined both Moody's and Standard and Poor's ratings. Interestingly, he found that the statistical variables which best predicted the two ratings were significantly different, as Table 3 shows. By cross tabulating cities rated by both firms, he found that Standard and Poor's ratings tended to be higher.<sup>29</sup>

In his 1977 study, Michel used more variables than in most of the earlier studies and also examined the prediction of ratings over time. Osteryoung and Blevins followed many of the procedures of the earlier studies, but in contrast to those studies, their focus was on state general obligation bond ratings, their reasoning being that there were significant differences underlying state and local bond issues: "(1) the tax bases supporting the debt are different (for example, income versus property taxes), and (2) the legal recourse available to bondholders is different."<sup>30</sup>

In their study, Stock and Robertson added the wrinkle of performing separate analyses for different types of bonds, finding that this approach improved their predictive capabilities. For example, city-issued debt would be analyzed separately from school district debt. Except for studies which examined state debt only, most earlier analyses had made distinctions only between general obligation and revenue bond debt, ignoring differences in the types of jurisdictions. Stock and Robertson argued that differences in sources of revenues available to various types of government and differing legal restrictions make differentiation critical to developing an accurate predictive model.

Finally, in 1986, Stephen Willson looked at a very detailed list of variables, seeking those that did the best job predicting Moody's ratings. He concluded that only economic factors--including the largest taxpayers as a percentage of the tax base and the unemployment rate--had any real ability to capture differences in ratings among jurisdictions, thus indicating in his view that Moody's must consider economic factors of greatest consequence in assigning its ratings.

Although the various studies in this area came to a range of conclusions and used a variety of indicators, there clearly are some factors which turn up repeatedly in the analyses. Among the economic base indicators shown in Table 3, for example, the one factor most commonly used is a population measure, turning up in five of the 12 studies summarized. As might be expected, the larger the population of the government being analyzed, the higher the credit rating. The analysts speculate this might best be viewed as a measure of the economic potential of the government and, in a more narrow sense, the marketability of its debt. That is, the debt of larger--and generally better known--jurisdictions could be viewed as more desirable and presumably receive a higher credit rating.

Another relatively common measure is state or local income, although there was variation in the actual measure chosen. Stock and Robertson, for example, use average per capita income, noting that this data is not specifically available for many local governments. Rubinfeld uses median family income, while Osteryoung and Blevins use a value for farm income, finding that in the case of state general obligation bond ratings, states with large farm incomes tend to have the highest ratings.

An interesting form of variable used by Horton, Rubinfeld and Morton in predicting Standard and Poor's ratings is labeled "state of origin" in the table. In reality, these three analyses use somewhat different indicators in an attempt to recognize the differential rating impact of a jurisdiction's geographical location.

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<sup>29</sup> Morton, p. 81.

<sup>30</sup> Osteryoung and Blevins, p. 29.

Horton's measure, for example, discriminates between "better" states and "poorer" states--the implication being that because of their state's history of economic poverty or fiscal problems, some jurisdictions may be penalized with lower ratings. Horton finds this especially the case for municipalities in the Southeast, although he also includes Minnesota and cities and school districts in New Jersey in the measure because of limitations in those states on taxing and assessing powers. The other group, the "better" states, includes states mainly in the Northeast and Midwest, who Horton said had demonstrated strong economic and social factors and fiscal responsibility over many decades. Ironically, this group included states like New York and Ohio, in which major cities were to have major problems with their credit in only a few years. Horton's division between poorer and better states left a third group in the middle without either particularly good or bad records.

In contrast, Rubinfeld's state of origin variable was designed to distinguish Massachusetts governments from other New England governments in the study and so performed a much more limited role than Horton's indicator. Similarly, Morton found that a New England indicator was useful in his analysis of the Standard and Poor's rating, with New England jurisdictions generally receiving higher credit ratings than similar jurisdictions in other parts of the country.

Among measures classified as representing either revenue capacity or spending responsibilities in Table 3, one factor, average tax collection rate, is found in some form in five of the studies. In this case, the tax collection rate is viewed as indicative of the government's and its citizen's willingness to carry its debt and meet its debt obligations. A high bond rating would be expected to be connected to a high level of tax compliance. In a similar vein, the variable could also be viewed as an indicator of the management capability of the government. Property tax collection rates in excess of 80 or 90 percent are not uncommon at the local level, but really high rates of compliance (i.e., 97 percent and above) are generally only achieved by governments with active and effective tax collection efforts.

Although Stock and Robertson were the only researchers to actually separate bond issues by type of jurisdictions, several of the other studies did attempt to explicitly adjust for certain types of debt in their analyses. Carleton and Lerner argue that school districts would be likely to receive lower credit ratings in general than other forms of government, all things being equal, presumably because school districts have a more limited range of tax resources available and are more dependent on possibly uncertain outside sources of funding, such as state and federal aid. Horton differentiates among the types of bond issues involved, distinguishing water and sewer bond issues from other types of bond issues.

As might be expected, virtually all of the studies use some form of debt measure, the most common being the ratio of debt to assessed value and the level of per capita debt. In general, the higher the level of debt, the lower the bond rating. Willson was the only author to conclude that no debt measure was useful in predicting bond ratings in some fashion.

Significantly, two of the studies--Carleton and Lerner and Osteryoung and Blevins--use a measure of the government's total outstanding debt, but they use it to measure different effects. Carleton and Lerner suggest that it is a proxy for marketability and economic diversification, while Osteryoung and Blevins conclude that the lower the amount of outstanding debt, the better a jurisdiction's bond rating is likely to be, simply because a lower debt burden would be viewed more favorably by credit analysts.

The studies demonstrated varying degrees of accuracy in predicting bond ratings, ranging from an accuracy rate of about 50 percent to over 80 percent. For example, Carleton and Lerner correctly predicted 54 percent of the bonds in the sample evaluated into one of five Moody rating groups. Ninety-six percent were classified within one grade of the correct classification. However, the place where the index faltered was in predicting non-investment grade bonds--the Ba classification. Only about a third of the Ba bonds were correctly classified. Osteryoung and Blevins

correctly predicted the ratings of state general obligation debt ratings in more than 90 percent of the cases, while Stock and Robertson claimed to have successfully predicted the ratings in more than eight of ten of the issues they analyzed.

Although analysts continue to refine the techniques of bond rating replication, this type of study clearly has limitations. In the case of the current study, these analyses are not a neat fit because they largely focus on predicting the ratings of the investor services that already exist, rather than focusing on the issue of whether the agency ratings actually measure the real level of creditworthiness or fiscal health of the jurisdiction. While they suggest some important analytical relationships, they are not a suitable base for a comprehensive set of debt indicators.

Detractors raise other, more serious, problems as well. For example, in a 1982 article, Edward Altman cited several factors which he believes limits the degree of improvement that can be made in these studies in the future.<sup>31</sup> First, he argues that the studies done to date have developed highly sophisticated statistical techniques, and any further improvements are likely to be marginal. Second, he says that there are differences in some cases between the two rating agencies, which introduces serious ambiguity in what the analyst is trying to measure. Finally, and most importantly, he argues that the bond rating process is largely subjective and that "statistical models based solely on reported data cannot effectively replicate a process that is subjective."<sup>32</sup>

### Predicting Bond Yield

One approach to dealing with the objections Altman raises is to analyze a factor less prone to narrow, subjective judgement than bond ratings. In this case, one obvious answer is bond yields. Recall that in the Rubinfeld study, one of the purposes of developing a model for predicting bond ratings was as part of an analysis of whether bond ratings had any effect on the interest yield of the security. Rubinfeld was not the only analyst working in this area. At least three other studies from the 1970s were primarily concerned with predicting bond yield rather than credit rating.

The earliest of these studies was developed by Larry Hastie in 1972, prior to the New York fiscal problem. The other two studies were developed by Lynn Browne and Richard Syron of the Boston Federal Reserve and were published in 1977 and 1979, after the New York crisis.<sup>33</sup> The Hastie article presents a number of interesting features in contrast to the bond rating analyses and is worth looking at in some detail.

Hastie was concerned with the factors which effect the yields on local government general obligation bonds. He speculated initially that municipal bond yields are a function of investor assessment of two types of factors: (1) the actual risk of the government defaulting on a bond issue; and (2) some estimate of the issue's marketability. To test this assumption, he developed a number of indicators (Table 3).

To measure the default risk of a municipality, Hastie used three types of indicators: measures of debt burden, indicators of the health of the city's economic base, and its default history.

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<sup>31</sup> Edward I. Altman, "Computerized Bond Rating Replication: Worthwhile or Futile?" *Journal of Bank Research*, Vol. 12, No. 4 (Winter 1982), pp. 250-253.

<sup>32</sup> *Ibid.*, p. 253.

<sup>33</sup> K. Larry Hastie, "Determinants of Municipal Bond Yields," *Journal of Financial and Quantitative Analysis* (June 1972), pp. 1729-1748; Lynn E. Browne and Richard F. Syron, "Big City Bonds After New York," *New England Economic Review* (July/August 1977), pp. 3-15; and "The Municipal Market Since the New York City Crisis," *New England Economic Review* (July/August 1979), pp. 11-26.

As a measure of debt burden, Hastie chose overall debt as a percent of the true value of taxable property. In this case, "overall debt" reflects not only the jurisdiction's own outstanding debt but also the debt of overlapping jurisdictions. As Tyler did, Hastie focused on true market value as opposed to the governments' assessed property value because of the inexactness of assessed value and the difficulties it presented for comparisons.

Hastie used two variables as economic base indicators. One was a measure of the jurisdiction's economic diversity, based on a "minimum requirements" analysis which approximates the minimum percentage of the labor force that is required by various sectors of the city's economy to maintain economic viability.<sup>34</sup> The object of the index is to measure for comparative purposes the amount of economic diversity exhibited by a jurisdiction--the more diverse a city's economic base, the more favorable its bond yield is expected to be.

Also as a measure economic stability, Hastie used the number of college students as a percent of the city's population. His speculation was that a university would provide a large and highly visible stabilizing influence in a local economy, and that this would be recognized by investors and would be reflected in bond yields.

The final factor that Hastie used as a measure of default risk was the actual default history of his sample governments from the 1930s through the 1960s. This was based on the assumption that a record free of previous defaults would produce a more favorable yield than a clouded credit history.

For Hastie, marketability is concerned with the price that buyers pay and sellers receive when bond holdings change hands. He uses several factors as indicators to reflect different aspects of a municipality's ability to market its debt successfully.

One of these factors was the size of the blocks of the bond issue available, the assumption being that the larger the issue, the more attractive the bonds would be to large institutional investors and the better the yield. A second measure of marketability was the size of the issuer's net debt outstanding, a factor used in several of the earlier studies. The assumption here was that the larger the amount of debt outstanding, the higher the interest premium the government would have to pay to encourage investors to take more of its debt. Hastie also included an indicator for "future issue marketability." Interestingly, the factor he selects for this forward-looking measure was past population growth rates. He speculated that past population growth reflects a good estimate of the changing demand for capital outlays in a city, which lag behind actual changes in population. Finally, the issues were analyzed based on their terms of maturity to see if longer or shorter terms produced a more marketable issue.

From this analysis, Hastie drew a number of conclusions generally supporting his original hypotheses. First, he found that the debt-to-value ratio is an important factor in determining yields--the larger the debt ratio, the higher the interest cost for a jurisdiction. Similarly, higher yields are demanded from local governments with default problems in their pasts or which have less diverse economies. He also found relatively strong statistical support for the notion that the presence of a university enhances a city's image of economic stability and reduces its cost of borrowing.

With respect to the marketability factors, Hastie found that larger blocks of bonds sell at lower yields, and that the larger a government's outstanding debt, the higher its interest costs. These findings generally agree with the conclusions drawn by Osteryoung and Blevins and run counter to the findings in the Carleton and Lerner study. In fact, Hastie addressed the Carleton and Lerner

<sup>34</sup> Hastie, p. 1731. The "minimum requirements approach" is a statistical technique which produces an index approximating the minimum percentage of the labor force of a jurisdiction required by various industrial sectors. In general, a higher index number indicates a greater degree of specialization, and a lower index number a more diversified employment structure.

finding, suggesting that they had failed to directly measure economic diversity. Thus, the level of debt outstanding primarily reflected the relationship between net debt and economic diversification.

Hastie also found that population was a powerful factor in explaining bond yields. In this case, he found that the more rapidly a jurisdiction had grown--and therefore the larger and more pressing its capital requirements--the more interest it would be forced to pay.

Finally, Hastie found that the effect of the term of maturity of an issue depended on who dominated the market for government debt--individuals or banks. According to Hastie, banks clearly preferred short- or intermediate-terms bonds. When individuals dominated the market, the demand for bonds was found to be spread more evenly along the term structure.

Hastie also found that the relative significance of the factors he analyzed varied with dominance in the market. When banks were dominant, the debt ratio, economic diversification, and block size measures were most significant. When individuals were dominant, factors like population growth and past defaults took on greater significance.

As a final note, Hastie speculated that his finding that higher net debt implies higher interest costs suggests that "large cities may face a crisis in borrowing costs as they seek financing in order to solve the complex problems of the inner city."<sup>35</sup> That insight was quickly tested as New York City and other major cities began experiencing significant problems with their debt during the mid-1970s. It was the bond market in the wake of these problems that was the subject of the two studies by Browne and Syron.

The Browne and Syron studies examine the relationship between various economic factors and the yields on bonds issued by 29 cities with populations over 300,000. This was a significantly different sample from the Hastie study, which used municipalities in a range of sizes. The two Browne and Syron studies looked at 23 variables divided broadly between fiscal characteristics (e.g., debt per capita, taxes per capita, various spending measures) and various socio-economic factors, such as median family income, changes in population and families below the poverty level.

Among these variables, the researchers found only a handful to be consistently related to bond yields of the major cities at a significant statistical level. In their 1977 study, these included the city unemployment rate, the ratio of pension benefits to city assets, and the volume of short-term debt per capita.<sup>36</sup> In the later study, the list included the unemployment rate, outstanding short-term debt per capita, and variables indicating whether the cities in the sample were located in the Northeast or the West (both areas with relatively high interest rates).<sup>37</sup> In neither study, however, did these factors produce a comprehensive reading on yields, and analysis of yields based on these factors alone substantially underestimated the relative yields in several of the cities, particularly those in close geographical proximity to New York City.

Nonetheless, one significant conclusion Browne and Syron did reach is the double cost of short-term debt:

First, relying heavily on short-term obligations necessitates frequent trips to the market and makes a city vulnerable to swings in credit conditions. Second, by raising investor concern about fiscal stability, heavy use of short-term debt increases the interest rate that a city must pay on its longer-term obligations.<sup>38</sup>

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<sup>35</sup> Hastie, p. 1748.

<sup>36</sup> Browne and Syron (1977), p. 11.

<sup>37</sup> Browne and Syron (1979), p. 22.

<sup>38</sup> Browne and Syron (1977), p. 14.

This point underscores some of the major features of New York City's problems, which included heavy reliance on short-term debt to fund current operations on a continuing basis.

Perhaps as important as the factors which proved significant in explaining bond yields in the Browne and Syron study were those which did not. Factors which consistently played a major role in other studies--overall debt burden, the degree of overlapping debt, population and population growth--were found to have limited power to explain yields on the big city bonds Browne and Syron analyzed. They offer one possible explanation for this: the relative difficulty investors have in gaining good comparative data on such factors on a timely basis, even for the largest cities. In the absence of this basic economic and fiscal information, then, decisions are made on the basis of highly visible indicators like the unemployment rate and, in this case, the level of short-term debt and the proximity to New York City. In this regard, they make an important point which becomes a factor again and again in these studies:

Investors in corporate securities are able to examine largely comparable data for different firms. Most information is assembled according to generally accepted accounting principles and a variety of firm characteristics can be compared to industry norms.<sup>39</sup>

Unfortunately, such comparisons are much more difficult to make for state and (particularly) local governments. Although groups like the Municipal Finance Officers Association have developed financial standards for governmental accounting, the use of the standards remains fairly limited, and many governments do not follow the same accounting standards. This not only affects investors' ability to rate issues but also probably increases government interest costs.

## Other Studies

Two other studies in the literature deal with bond ratings and the factors which predict them but are not directly concerned with predicting either bond ratings or yields. In a 1971 paper, Roy Bahl sought to identify measures of creditworthiness of state and local governments based on a conceptual model developed from examining the factors underlying bond ratings.<sup>40</sup> In a 1988 study, the most recent study of debt indicators in the literature, James Ramsey and Merlin Hackbart developed a state and local debt capacity index which can be used to predict the fiscal ability of a debt issuer to incur new debt based on past performance.<sup>41</sup>

Of these two studies, the analysis by Ramsey and Hackbart is the narrower in its objectives--paralleling the studies discussed earlier but taking a somewhat different analytical tack. After reviewing the literature on the determinants of bond ratings and bond data for Kentucky, the authors come to the conclusion that four quantitative factors were fundamental to the bond rating process. These include:

- (1) the ratio of appropriation-supported debt service to revenue;
- (2) The ratio of appropriation-supported debt to personal income;
- (3) Appropriation-supported debt per capita; and

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<sup>39</sup> Ibid., p. 15.

<sup>40</sup> Roy W. Bahl, "Measuring the Creditworthiness of State and Local Governments: Municipal Bond Ratings," National Tax Association, *Proceedings* (September 1971), pp. 600-622.

<sup>41</sup> James R. Ramsey and Merlin M. Hackbart, "State and Local Debt Capacity: An Index Measure," *Municipal Finance Journal*, Vol. 9, No. 1 (Winter 1988), pp. 7-18.

- (4) The ratio of appropriation-supported debt to full value of property.

(The focus on appropriation-supported debt arises from a peculiarity of Kentucky law which makes the issuance of general obligation debt relatively rare. Therefore, the authors use appropriation-supported debt to lump general obligation and revenue bond debt together.)

Based on this work, the authors design a debt capacity index to measure a jurisdiction's capacity to issue more debt without damaging its credit rating. To create their index, the authors examined trends in the four factors from 1972-84 relative to debt outstanding for the Commonwealth of Kentucky. During this period, the relationship among these factors was sufficient, the authors assert, to allow Kentucky to maintain an AA rating on its general obligation bonds and an A rating on revenue bonds. The authors do not provide any evidence that these criteria actually represent valid indicators of credit condition but instead assert that the relationship is historical and presumably can be expected to continue.

Having constructed the historical index relationships, the authors then use them to evaluate projected state debt service levels. They find that on the basis of the index, the state could undertake a higher level of debt service than was actually expected without jeopardizing its credit rating.

The study is of interest because it deals with one of the major criticisms of this entire area--the inability to find firm standards for how much debt is too much or when a government faces fiscal trouble. In this case, Ramsey and Hackbart use the past as a benchmark and weigh potential future events against it. Of course, the entire exercise is based on what we have seen to be subjective ratings, and there is no certainty that the rating standards for the Commonwealth might not change. Still, the past is a better indicator than many others considered in these studies, and as the authors note:

This article does not suggest that the debt index can be unilaterally used to make current budgetary decisions or that rating is the only factor to be considered in analyzing debt. Rather, it attempts to initiate the discussion of a process that can assist policy makers in making choices today that have long-term impacts.<sup>42</sup>

The Bahl analysis is similarly concerned with providing government decision makers with a framework for evaluating their credit standing. As a basis for his analysis, Bahl reviewed both subjective rating approaches, like those used by Moody's and Standard and Poor's and so-called quantitative approaches like the one developed by Walter Tyler. He found both approaches useful but incomplete. According to Bahl, the subjective approach lacks objectively defined benchmarks, while the Tyler approach is almost as subjective, since relatively arbitrary weights are assigned to the various indicators used.

Having made these points, Bahl turned to the question of what makes some governments better credit risks than others, the goal being to provide a framework for state and local government officials to evaluate their relative position and to better present their position in the bond prospectus. Bahl argued that the rating problem comes down to defining and measuring the probability of default. Unlike some of the other studies which contained marketability factors, market considerations play no role in the evaluation of creditworthiness in Bahl's approach.<sup>43</sup>

Bahl was more interested in factors that could be used to predict future performance as opposed to current ratings. This approach was in keeping with his focus on default risk as central to

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<sup>42</sup> Ibid., p. 17.

<sup>43</sup> Bahl, p. 608.

the determination of creditworthiness, his objective being to identify the conditions under which default might occur. It also provides a point of connection to the other major strand in the fiscal analysis literature--the studies of fiscal strain--which is concerned with identifying fiscal stress and predicting fiscal problems before they develop.

Bahl identified three likely causes of default: (1) a prolonged national recession; (2) local economic decline, apart from a national recession; and (3) a serious fiscal crisis because of the natural revenue-expenditure imbalance caused by (1) and (2) or by mismanagement. As indicators of these phenomenon, he selected a number of indicators, dividing them into broad categories--in this case, those that deal with the government's economic base and those that deal with its fiscal condition (Table 3.).

Bahl used four economic base indicators. First, he speculates that the potential effects of a major economic recession might best be reflected in the percentage of a jurisdiction's employment in durable manufacturing, since this industrial sector is highly susceptible to recessionary pressures. Thus, the higher the level of durable manufacturing employment, the more likely the jurisdiction would be hurt by recession and the stronger the possibility of default. He notes that a similar measure for tourism industries might be appropriate for cities which depend heavily on that industry.

As a second economic base measure, Bahl selected an industrial diversification index, which measures the degree of diversification of a local industrial base using the "minimum requirements approach" also used by Hastie. Presumably, the more diverse a local base, the more insulated it would be from the risk of default in bad economic times or from cyclical problems with major industries.

A third economic base measure is really a set of three indicators--projected growth in employment, income and per capita income--that provide insights into the long-term performance of the jurisdiction's economy. Bahl's presumption was that jurisdictions with low employment and income growth would face a greater risk of default than those which exhibit a long-term pattern of stronger growth.

A final measure was designed to detect central city economic problems by comparing growth rates for income and population in the central city with similar trends in the surrounding metropolitan region. Bahl views the conditions in the state or local economy as laying the ground work for government financial problems. Thus, a weak economic situation may lead to financing problems that raise the possibility of default. In this vein, he identifies a number of fiscal base factors which can be used to judge the health of a jurisdiction's fiscal base.

One major fiscal base factor is the government's debt burden. Bahl argued that it is necessary to examine both the individual government's outstanding debt plus the debt of overlapping jurisdictions. Thus, he used a measure of the government's outstanding debt per capita plus three measures of overlapping debt: (1) per capita overlapping debt; (2) the ratio of overlapping debt to full property value; and (3) the ratio of overlapping debt to personal income.

In addition to the debt indicators, Bahl is also interested in the revenue and spending balance of the government. He suggests that a major problem, particularly for central cities, is growing demands for services that are not or cannot be met by the local revenue structure. High level of spending demand can be caused either by actual conditions within the jurisdiction or by intergovernmental circumstances--i.e., local governments called on to assume an unusually high share of local welfare and education expenditures which can overburden local resources severely.

With these possible weak points in mind, Bahl's fiscal indicators include not only measures of local socio-economic health--such as median family income and substandard housing--but also the percentage of education and school expenditures carried locally.

On the revenue side, he includes indicators that measure how much of the jurisdiction's tax base relies on the property tax and the relative size of the property tax base. He speculates that the more a government relies on non-property tax sources like the sales tax, the less likely it would be to default. He also is interested in measuring how strong the local property tax base is, which explains the per capita property values.

Bahl does not attempt to analyze existing ratings or to draw any final conclusions from the indicators he does examine. Significantly, he does conclude that "there would seem to be room to develop a set of indicators . . . which would be useful in substantiating an argument as to the comparative economic and fiscal health of governments."<sup>44</sup>

## MEASURING THE FISCAL HEALTH OF GOVERNMENTS

The Bahl study can be viewed as a bridge between studies that focus on debt position, bond ratings, and creditworthiness and those that fall into the second major strand in the analysis of government financial position--studies concerned with measuring the overall fiscal condition of state and local governments through the use of fiscal indicators.

In some respects, these studies are similar to the bond rating and yield analyses. Although most of those studies were primarily concerned with replicating or predicting the work of Moody's and Standard and Poor's, they nonetheless offer useful insights into the overall fiscal health of government. In fact, as one analyst has pointed out, bond ratings often provide the first warning of fiscal difficulties despite their shortcomings as measures of fiscal health:

[P]artly because of increased reliance on debt in troubled times, and partly because the bond market may provide the only official notification of fears about the ability of government to raise revenue, the "fiscal crises" of New York and Cleveland appeared first in the bond market, although the causes and effects permeated all aspects of their operations.<sup>45</sup>

In fact, the two types of analyses involve many of the same kinds of data and use many of the same basic indicators.

Despite these similarities, though, the fiscal indicator studies go beyond the bond rating analyses, seeking to discern more wide ranging and subtle insights into the fiscal health of state and local government. The central concern of most of the credit analyses is the probability of default, and yet, since the Depression, the possibility of default has become so remote for most governments that its usefulness as a measure of fiscal condition is limited at best. Fiscal indicator analyses, on the other hand, attempt to assess the current fiscal condition of governments, often in comparison to other similarly situated jurisdictions, and they often seek to identify trends which may lead to future problems, even if none are apparent at the present. They seek in short to monitor and evaluate what is variously labeled fiscal "stress," "distress," or "strain."

Interest in this type of analysis actually predates the bond rating studies. Studies of the local economic base, a key strand in modern fiscal strain studies, dates back as far as 1927, when Robert Haig and R.C. McCrea produced a regional economic survey of New York and its surrounding

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<sup>44</sup> Ibid., p. 619.

<sup>45</sup> Bradbury, p. 34.

areas. As early as 1957, researchers began to take note of fiscal disparities among metropolitan areas.<sup>46</sup>

Concerns over the fiscal condition of local governments grew more intense during the 1960s, when American cities were faced with a broad range of social and economic stresses. These early studies pointed the way to later analyses using fiscal indicators, finding, for example, that while taxes and expenditures were higher in central cities, per capita income was often substantially lower. Interest in this type of analysis grew even more intense after the fiscal crises in New York; however, the first study that looked expressly at government fiscal condition and its measurement actually predated the New York crisis by a couple of years. It was a study published by the U.S. Advisory Commission on Intergovernmental Relations (ACIR) in 1973.

### City Financial Emergencies

The ACIR study, called *City Financial Emergencies*, was prompted by public and private sector financial uncertainties at the time. Major factors cited in the report were the bankruptcy of the Penn Central Railroad in 1970 and the federal bail-out of Lockheed Corporation to prevent another massive bankruptcy.<sup>47</sup> In the same period, Cleveland laid off more than a fifth of its total work force in an effort to deal with its financial problems. The study's objectives were straightforward: (1) to look at the causes of past financial distress in U.S. cities; (2) to look at the fiscal conditions in a sample of major U.S. cities; and (3) to outline the roles of the various levels of government in the treatment and prevention of fiscal emergencies in cities.

Underscoring what has become a common refrain in these studies, the ACIR noted that because of a diversity of viewpoints, no single definition of city financial emergencies was satisfactory. The study offers this definition: "situations in which a city reaches the point at which it can no longer perform its existing levels of services because of inability to meet payrolls, pay bills, pay amounts due other government agencies, or pay debt service on bonds or maturing short-term notes because it lacks either the cash or appropriations authority."<sup>48</sup>

Using this definition, the study examines historical patterns in defaults on outstanding debt, focusing on eight cities which had suffered major past fiscal problems to identify warning signs associated with serious financial difficulties. From this analysis, the ACIR concludes that six factors foreshadow the possibility of financial emergency:

- (1) An operating fund revenue-expenditure imbalance in which current expenditures significantly exceed current revenues in one fiscal period;
- (2) A consistent pattern of current expenditures exceeding current revenues by small amounts for several years;
- (3) An excess of current operating liabilities over current assets (a fund deficit);
- (4) Short-term operating loans outstanding at the conclusion of a fiscal year (or in some instances the borrowing of cash from restricted funds or an increase in unpaid bills in lieu of short-term operating loans);

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<sup>46</sup> Robert M. Haig and R.C. McCrea, *Regional Survey of New York and Its Environs* (New York, 1927); Harvey Brazier, *Some Fiscal Implications of Metropolitanism*, (Washington, D.C.: The Brookings Institution, 1957).

<sup>47</sup> *City Financial Emergencies*, p. 1.

<sup>48</sup> *Ibid.*, p. 3

- (5) High and rising rate of property tax delinquency; and
- (6) A sudden substantial decrease in assessed values for unexpected reasons.<sup>49</sup>

Using these factors as a frame of reference, the study examined fiscal conditions in 30 major U.S. cities. It found most of the cities free of significant fiscal problems and concluded that there was adequate time to take corrective actions in the few cases where there were indications of fiscal problems. Ironically, just two years later, New York--one of the cities in the study--nearly defaulted on its debt, and in 1978, Cleveland, another city in the study, faced its own fiscal crisis.

An important limitation of the ACIR study was the narrowness of its indicators of fiscal health. The study focused on budgetary conditions mainly. It remained for later studies to examine the link between government fiscal condition and broader economic and social trends.

### Analyses of Comparative Fiscal Condition

Table 4 is a summary of the significant points in a selection of the literature on government fiscal condition and its analysis. The studies shown in the table cover the range of analyses completed in this area from the time of the New York fiscal crisis to the present.

The first of these studies was completed by Richard Nathan and Charles Adams in 1976 in the wake of the New York crisis.<sup>50</sup> Nathan and Adams respond to the New York problem, cautioning against generalizing from New York's experience in viewing the problems of other major U.S. cities. They argue that a given urban area's ability to cope with urban fiscal ills is a function of the seriousness of the economic and social problems its faces (urban hardship) and the relationship of the central city to its suburbs.

Nathan and Adams evaluate urban hardship using an index which reflects unemployment, dependency (people below 18 or over 65 as a share of the total population), educational attainment, income, housing conditions, and poverty. They found that 29 of the 55 cities in their study faced some level of relative hardship.

From this, they concluded that at the time there were a number of central cities with much more serious social and economic problems than New York, and that this finding demonstrated an obvious distinction between social and economic distress on the one hand and fiscal distress on the other:

The performance of city government and the roles played by adjoining local governments, regional organizations, and state governments all have a bearing on how well specific "hardship" situations are handled. Two cities or suburbs which rank closely in the interarea hardship index may exhibit significant differences in terms of the actual level of distress resulting from these conditions.<sup>51</sup>

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<sup>49</sup> Ibid., p. 4.

<sup>50</sup> Richard P. Nathan and Charles Adams, "Understanding Central City Hardship," *Political Science Quarterly*, Vol. 91, No. 1 (Spring 1976), pp. 47-62. There is another branch in the literature which includes articles dealing with urban hardship and similar concepts. These studies generally examine urban economic and social trends, and although a few incorporate fiscal variables in their measures of urban distress, their real interest is not in the financial analysis of government so much as it is in understanding the dynamics of the modern urban complex in the United States. See, for example, Harold L. Bunce and Sue G. Neal, *City Need and Community Development Funding* (Washington, D.C.: U.S. Department of Housing and Urban Development, 1979); Katherine L. Bradbury, Anthony Downs, and Kenneth A. Small, *Urban Decline and the Future of American Cities* (Washington, D.C.: The Brookings Institution, 1982).

<sup>51</sup> Ibid., p. 60.

TABLE 4  
KEY FEATURES OF SELECTED STUDIES OF FISCAL STRAIN

Study	Year	Index or Indicator Used	Fiscal Stress/Strain Concept Used	Study Coverage
Nathan and Adams	1976	Hardship Index	Focuses on the seriousness of social and economic conditions facing governments and their relation to suburban areas.	55 large U.S. cities
ACIR, "Fiscal Blood Pressure"	1977	Fiscal Blood Pressure	Relationship between index of tax effort and the change in tax effort over time.	50 state and local governments
Congressional Budget Office	1978	Composite Measure of Fiscal Need*	Urban need: A concept with three dimensions--social, economic and fiscal. Study attempts to identify areas where urban needs are greatest.	45 large U.S. cities
U.S. Treasury Department	1978	ESP Composite Strain Index**	Strain is measured by a composite of weighted factors and compared to another composite index based on rankings in several other studies.	48 largest cities
Aronson and King	1978	Seven indicators of debt burden and condition	Defines fiscal problems in terms of trends in an area (New York) known to be having financial difficulties.	State and local governments; New York
Touche Ross/First National Bank of Boston	1979	None	Fiscal stress described in terms of a dynamic adjustment process between fiscal capacity (the city's underlying economic resources) and the demand for public goods and services.	66 medium and large cities
Stonecash and McAfee	1981	None	Fiscal strain should be analyzed in terms of behavior within cities over time.	None (critique of prior studies)
Oregon Fiscal Indicators	1983	None	Fiscal strain should be analyzed in terms of a broad range of indicators using the best available data.	134 Oregon cities
Bradbury	1982 1983 1984	Structural Fiscal Distress Index	Identifies two types of distress: (1) "budgetary" distress related to a government's short-term ability to balance its budget; and (2) "citizen" or "structural" fiscal distress, representing a long-term imbalance between a government's spending and its revenue-raising capabilities.	153 cities over 100,000 population
Ladd and Yinger	1989	Fiscal Health Index	Focuses on the measurement of trends in structural fiscal distress, consisting of broad economic, social and fiscal trends that are outside a city's control.	86 large cities

Source: Richard P. Nathan and Charles Adams, "Understanding Central City Hardship," *Political Science Quarterly*, Vol. 91, No. 1 (Spring 1976), pp. 47-63; U.S. Advisory Commission on Intergovernmental Relations, *Measuring the Fiscal "Blood Pressure" of the States--1964-75*, Report No. M-111 (Washington, D.C., 1977); U.S. Congress, Congressional Budget Office, "City Need and the Responsiveness of Federal Grant Programs" (Washington, D.C., 1978); U.S. Department of the Treasury, "Fiscal Impact of the Economic Stimulus Package on 48 Large Urban Governments" (Washington, D.C., 1978); J. Richard Aronson and Arthur E. King, "Is There a Fiscal Crisis Outside of New York?" *National Tax Journal*, Vol. 31, No. 2 (June 1978), pp. 153-163; Touche Ross & Co. and National Bank of Boston, *Urban Fiscal Stress: A Comparative Analysis of 66 U.S. Cities* (New York and Boston, 1979); Jeff Stonecash and Patrick McAfee, "The Ambiguities and Limits of Fiscal Strain Indicators," *Political Studies Journal*, Vol. 10, No. 2 (December 1981), pp. 379-395; The University of Oregon, Bureau of Governmental Research and Service, *Oregon Municipal Fiscal Indicators* (University of Oregon, October 1983); Katherine Bradbury, "Fiscal Distress in Large U.S. Cities," *New England Economic Review* (November/December 1982), pp. 33-43; and "Structural Fiscal Distress in Cities--Causes and Consequences," *New England Economic Review* (January/February 1983), pp. 32-39; and *Urban Decline and Distress: An Update*, *New England Economic Review* (July/August 1984), pp. 39-55; Helen F. Ladd and John Yinger, *America's Ailing Cities: Fiscal Health and the Design of Urban Policy* (Baltimore: The Johns Hopkins University Press, 1989).

\* There are also indexes of social need and economic need.

\*\* ESP = Economic Stimulus Package

While drawing these conclusions, the study does not explicitly attempt to measure the direct fiscal consequences of urban distress on the government's ability to raise revenues, deliver services, or meet its debt obligations. These elements were added by later studies.

In contrast to the Nathan and Adams study, which focused on social and economic factors, the ACIR followed up its 1973 study of city financial emergencies with a study measuring fiscal strain through the calculation of an index of a government's "fiscal blood pressure."<sup>52</sup> This index is a two-part measure that takes account of tax effort--the ratio of a government's tax revenue relative to its personal income--and the change in tax effort over time. These two factors are indexed by expressing them as a percent of the median value of the measure. A government with a fiscal blood pressure equal to the median on both counts would have a blood pressure of 100/100.

The Commission used data for state and local government *combined* and categorized them into those with blood pressures which are: (1) high and rising; (2) high and falling; (3) low and rising; and (4) low and falling. The higher the two factors above the median 100/100, the more fiscal strain the state and its localities were assumed to be under.

The advantage of combining the state and local data is that it allows interstate comparisons without the problems created by the variance of functions and tax resources among different levels of government in different states. However, the study has limitations, as well. The combination of governments, for example, does not allow micro-level conclusions to be drawn--a state may show good fiscal blood pressure in aggregate while individual units would show bad conditions if analyzed separately. Moreover, the factors are limited to revenue side of the budget equation and make no explicit link to the demands they must support, nor to broader economic and social factors which also help determine a jurisdiction's true "fiscal blood pressure."

The ACIR's fiscal blood pressure study is part of a larger body of research which seeks to produce comparative measures of state and local governments' revenue raising capacities. This work has most often been connected with the allocation of federal assistance and was begun by the ACIR in the early 1960s.<sup>53</sup> Its basic premise is that per capita income, a common measure of revenue-raising capacity in federal grant programs, does not adequately reflect the revenue capabilities of state and local governments because many of the revenue sources they use are tied to bases other than income (e.g., severance taxes, sales taxes, fuel taxes, etc.). Fiscal capacity as an alternative to current federal grant measures was heavily debated in the early 1970s in connection with Nixon-era discussions of federalism, including the enactment of General Revenue Sharing and the equity of the revenue sharing formulas.

Under the ACIR methodology, the measurement of fiscal capacity is tied to what is called a Representative Tax System (RTS) (and in later versions, a Representative Revenue System). Essentially, actual state and local tax collections per capita are compared to the RTS. In this regard, tax capacity is defined as the absolute amount of revenue that could be raised by a state if it applied a nationally uniform set of tax rates to a common set of tax bases:

The system is "representative" in that national average tax rates are applied in each state to standardized tax bases. Because the same tax rates are used for every state, estimated tax yields vary only because of differences in the underlying bases. The . . . capacity measure is not concerned with individual state-local tax policy choices such

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<sup>52</sup> U.S. Advisory Commission on Intergovernmental Relations, *Measuring the Fiscal "Blood Pressure" of the States* (Washington, D.C., Report M-111, 1977).

<sup>53</sup> See U.S. Advisory Commission on Intergovernmental Relations; *Measure of State and Local Fiscal Capacity and Tax Effort* (Washington, D.C., Report M-16, 1962); *Measuring the Fiscal Capacity and Effort of State and Local Areas* (Washington, D.C., Report M-58, 1971); *1982 Tax Capacity of the Fifty States* (Washington, D.C., Report M-142, 1985); *1986 State Fiscal Capacity and Effort* (Washington, D.C., Report M-165, 1989).

as whether a state imposes a low or high tax burden compared to other states. The capacity measure pertains only to the level of economic resources in any state, resources that by common practice may be said to be potentially taxable whether or not the particular state actually taxes those resources and regardless of the intensity with which a state utilizes those taxable resources.<sup>54</sup>

Fiscal capacity is a parallel measure that includes additional nontax revenues, such as user charges. In both cases, the goal is to define what the government could do in the way of raising revenues if it had to. This measure is then compared to a measure of tax or fiscal effort, as in the blood pressure measure, which reflects what the government actually is doing relative to its capacity. Thus, the ideal situation for a government from a strictly fiscal point of view would be to have a high fiscal capacity and a low tax or fiscal effort.

While there is an extensive literature on fiscal capacity and effort, it has only a limited application in the current study. These measures are useful indicators for measuring one facet of fiscal condition, but like the measure of fiscal blood pressure, their focus on the revenue side of the fiscal equation. Moreover, there is a continuing and lively debate over what the measures actually reflect, since they are based on national averages and do not (and really cannot) take into account what are very real differences among the states in their fiscal policies. It does little good for a state to know that it has a high fiscal capacity if, for example, it is constitutionally prohibited from using that capacity.

### Fiscal Strain and Federal Assistance

A broader effort to measure fiscal strain can be found in two studies prepared by the federal government during the late 1970s.

The first of these studies was conducted by Peggy Cuciti for the Congressional Budget Office (CBO) in 1978. It was designed to assist Congress in considering renewal and adoption of several grant programs.<sup>55</sup> The report is concerned with defining the concept "urban need," with measuring relative levels of need among large U.S. cities, and with assessing how well federal grant programs flow funds to cities demonstrating the greatest needs.

Urban need, according to the report, has three dimensions: "social, economic, and fiscal--corresponding roughly to the problems faced by people, businesses, and local governments in urban areas."<sup>56</sup> The report uses data on 45 large cities to develop indexes to measure the comparative level of each of these facets of need and uses the need indicators to evaluate how well existing grant programs respond to the level of urban need. In the fiscal area, the study identifies two types of fiscal problems faced by local governments:

The first type are fiscal problems as manifested in unbalanced budgets, low liquidity, high taxes, large debt, and low bond ratings. These problems stem from local policy choices and management practices as well as from underlying social and economic conditions. The second type of fiscal problem is more long term and stems from a mismatch between the need of the local population for public services and the resources available to the local government to pay for those services.<sup>57</sup>

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<sup>54</sup> ACIR (1985), p. 1.

<sup>55</sup> U.S. Congress, Congressional Budget Office, "City Need and the Responsiveness of Federal Grants Programs" (Washington, D.C., 1978).

<sup>56</sup> *Ibid.*, p. xi.

<sup>57</sup> *Ibid.*, p. 6.

This distinction between relatively short-term problems, which can be effectively addressed by governmental action, and longer-term structural problems, which imply continuing fiscal stress, is an important distinction in the literature's development and plays a major role in later studies.

To measure the first type of fiscal problem, CBO identifies four major indicators: (1) cumulative budget deficits; (2) cash reserves; (3) the ratio of outstanding debt to annual revenue collections; and (4) tax effort, measured in this case by the taxes paid in the jurisdiction relative to the value of its property tax base. It evaluates long-term fiscal needs using an index labeled a "composite measure of fiscal need." This index is derived from four sources. The first of these is a measure of tax effort, in this case defined as taxes as a percent of income; the second is the property tax base per capita. The other two measures are themselves indexes developed to account for community development needs, tax effort, and fiscal capacity.

While the CBO study represents a more comprehensive approach to measuring fiscal stress and gauging relative fiscal health, it is not without problems. In the fiscal area, a particular problem, acknowledged in the report, is the fact that "all of the measures of fiscal need, except tax base, are sensitive to differences among city governments with respect to the number of public services they are responsible for providing."<sup>58</sup>

The CBO report does, however, make one telling point that is relevant to any set of indicators of government fiscal condition. Noting that definitions of urban need vary, Cuciti underscores the problems this lack of specificity can cause for any analysis:

The selection of problems to be focused on is crucial because not all problems are distributed in a similar fashion. Whereas economic decline may be the major problem in New York, low levels of income and education may be the difficulty in Tampa. If only one set of problems is measured . . . then the residents of one city or another may feel that their legitimate needs are being ignored. Even if there were agreement on the dimensions of urban need, existing data and measurement methods have a number of limitations that restrict the identification of differences among cities. Some problems don't lend themselves to quantitative measurement at all . . . while others can be measured in several different ways.<sup>59</sup>

The other federal study was conducted by the Treasury Department and also appeared in 1978. It also examined measures of urban fiscal strain--in this case as part of the Treasury's responsibility to evaluate the fiscal impact of the Economic Stimulus Package (ESP) of the period. It analyzed the fiscal condition of 44 large U.S. cities.<sup>60</sup>

The Treasury's approach to this problem was to develop its own index of urban strain and to combine the relative rankings it produced with rankings from several other indexes available at the time to create a composite index of urban strain. The components of the Treasury's index, and their assigned weights are as follows:

- |     |   |           |
|-----|---|-----------|
| (1) | Change in population, 1972-76   | 37 points |
| (2) | Change in city per capita own source income compared to change in national per capita income, 1969-74 | 27        |

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<sup>58</sup> Ibid., p. 47.

<sup>59</sup> Ibid., p. 77.

<sup>60</sup> U.S. Department of the Treasury, Office of State and Local Finance, "Report on the Fiscal Impact of the Economic Stimulus Package on 48 Large Urban Governments" (Washington, D.C., 1978).

(3)	Change in per capita own-source revenue compared to change in own per capita income, 1969-74	12
(4)	Change in per capita long-term debt outstanding compared to change in per capita income	12
(5)	Change in full market property value, 1971-76	12
		100

According to the Treasury, the measures, as well as the assigned weights, were developed from a review of the literature on fiscal stress. However, some analysts have criticized the study as being subjective not only in the choice of indicators--a familiar problem--but also in the weightings assigned.<sup>61</sup> Nonetheless, the study did find a distribution of relative urban strain among the cities it examined that was relatively close to other studies of the time.

### Other Studies

As the level of sophistication in studies of fiscal stress increased in the late 1970s, analysts began to add new wrinkles to deal with some of the more prominent criticisms of the fiscal strain studies. One of the recurring criticisms, as we have seen, was the lack of a clear cut definition of what constitutes fiscal strain. A second--and closely related--criticism was the lack of standards against which fiscal condition can be measured, thus explaining the prevalence of interurban comparisons.

In a 1978 study, J. Richard Aronson and Arthur King attempted to deal with the lack of standards by making the standard a government--New York--that was generally conceded to be in fiscal difficulty at the time.<sup>62</sup> In their study, they defined seven measures of fiscal stress and compared how these measures changed over time in New York versus all other state and local governments and a combination of five other large cities (Chicago, Detroit, Houston, Los Angeles, and Philadelphia). From these comparisons, they attempted to determine whether other state and local governments were moving toward the same fiscal difficulties as New York.

The fiscal measures Aronson and King selected were exclusively constructed around measures of short- and long-term debt--the areas of its finances where the New York's crisis had first surfaced. The indicators used in the study included:

- (1) Long-term debt retired plus total annual interest payments divided by revenue from own sources (L+I/O);
- (2) Long-term debt retired plus total annual interest payments divided by total revenues (L+I/T);
- (3) Long-term debt retired plus total annual interest payments divided by state personal income (L+I/Y);

<sup>61</sup> "Municipal Fiscal Indicators," pp. 21-22.

<sup>62</sup> J. Richard Aronson and Arthur E. King, "Is There a Fiscal Crisis Outside New York?" *National Tax Journal*, Vol. XXXI, No. 2 (June 1978), pp. 153-163.

- (4) Long-term debt retired plus total annual interest payments plus short-term debt outstanding at the end of the fiscal year divided by revenue from own sources  $(L+I+S)/O$ ;
- (5) Long-term debt retired plus total annual interest payments plus short-term debt outstanding at the end of the fiscal year divided by total revenues  $(L+I+S)/T$ ;
- (6) Long-term debt retired plus total annual interest payments plus short-term debt outstanding at the end of the fiscal year divided by state personal income  $(L+I+S)/Y$ ;
- (7) Short-term debt outstanding divided by the cash and security holdings of the governmental unit  $(S/C)$ .

The authors looked at trends in these indicators for New York for the period from 1961 to 1975. They found a clear build up of fiscal pressures in the city, particularly with respect to short-term debt. The same analysis was then applied to data for other governments. Examining the patterns in the data, though, the authors found no particular signs of danger. There also were no signs of deterioration similar to New York in the composite of the five other large cities.

Like the ACIR fiscal blood pressure study described earlier, the Aronson and King study combined state and local governments. Once again, this approach avoids problems created by differences in assignments of tasks among levels of government, but it also hides trends in individual jurisdictions which could be as bad as those observed in New York but which would be hidden in the data aggregation. Obviously, the methodology could be applied to individual governments, although this was not Aronson and King's objective.

Another well-known study in the period was a 1979 report on the urban fiscal crisis by the accounting firm of Touche Ross and the First National Bank of Boston.<sup>63</sup> The report was the result of a two-year study, again undertaken in the wake of the New York problem. Its goal was to provide insights into municipal fiscal stress and the financial performance of cities under widely differing social, economic, and fiscal conditions.

The study was based on an analysis of 66 medium to large cities, although interestingly, all cities over one million in population were omitted to avoid distorting the results. The largest city in the sample was Baltimore, meaning that many of the cities--like New York, Newark and Detroit--which were having difficulties were excluded from the analysis by definition.

The cities in the sample were analyzed in terms of four groups of indicators--reflecting economic conditions, social conditions, structural conditions, and financial performance. Many are familiar from studies already discussed. The researchers divide the various indicators into three groupings, intended to reflect a city's economic, social, and structural conditions. (Structural conditions reflect the government's tax and spending characteristics, along with its relationship with surrounding jurisdictions.)

Once the various indicators are established, the study goes a step further, dividing the cities into clusters. These clusters reflect the analysts' view of jurisdictions with homogeneous economic, social and structural conditions. Four initial clusters were created:

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<sup>63</sup> Touche Ross & Co. and the First National Bank of Boston, *Urban Fiscal Stress: A Comprehensive Analysis of 66 U.S. Cities* (New York City, 1979).

- High investment and income cities
- Above average investment and income cities
- Average investment and income cities
- Below-average investment and income cities.

These clusters were further subdivided based on whether they had high or low levels of socially dependent populations, creating an overall framework with 16 possible clusters of cities. The city financial variables--reflecting tax, spending, and debt factors--were then used to assess relative fiscal stress by comparing each city's performance with the average performance of all of the cities in its cluster.

From their analysis of these clusters, the authors drew several important conclusions about the nature of fiscal stress and its measurement. First, they concluded, not surprisingly, that older industrial cities were more likely to be fiscally stressed, although that was not always the case. Their data revealed evidence of fiscal strain among some younger, fast-growing cities. From this, they concluded that fiscal stress is not inevitable, and that "achieving a financial equilibrium between the demand for public services and financial resources appears to be within the grasp of management control of most cities."<sup>64</sup>

They also concluded that simply looking at economic and social indicators will not tell the full story of a city's potential fiscal problems. Financial indicators are also an important part of the analysis, and in their view, the analysis of financial indicators poses a major problem for analysts because they found municipal data collection and financial reporting systems to be generally inadequate for use in city fiscal management and analysis.

In total, the authors found indications of serious fiscal stress in only four of the 66 cities analyzed. They found eight other cities with modest levels of fiscal stress.

The Touche Ross study provides one of the more comprehensive specifications of financial and economic indicators among the studies of fiscal stress conducted in the 1970s, but commentators have raised several methodological objections to the study. The most notable of these is the exclusion of very large cities, which might have significantly altered the averages and the study findings.<sup>65</sup>

Another criticism raised about the study, as well as most of the other studies of the 1970s, can be found in a 1981 article by Jeff Stonecash and Patrick McAfee. They surveyed the various attempts to develop fiscal indicators to that point and developed a thesis on the development and use of such indicators that is critical of any approach based on comparative data like the Touche Ross study. "The argument of this analysis," they write, "is that while the general model of change in urban area [found in other studies] is probably valid, it will be very difficult, and perhaps prohibitively expensive, to establish valid cross-sectional indicators of the 'true' conditions which are part of the model."<sup>66</sup>

Instead they argued that effective analyses should be tailored to individual governments and should be concerned with behavior *within* individual jurisdictions over time. Thus, the analysis of

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<sup>64</sup> Ibid., p. 3.

<sup>65</sup> Roy Bahl, *Financing State and Local Government in the 1980s* (New York: Oxford University Press, 1984), p. 55.

<sup>66</sup> Jeff Stonecash and Patrick McAfee, "The Ambiguities and Limits of Fiscal Strain Indicators," *Policy Studies Journal*, Vol. 10, No. 2 (December 1981), p. 390.

each government would be a separate exercise, and no conclusions would be drawn, as in the Touche Ross publication and other studies, from comparisons to averages across governments.

Despite these objections, the comparative analysis continued to be the favored approach in studies of fiscal strain in the 1980s. In this regard, a 1983 study by the University of Oregon Bureau of Governmental Research and Service provides a good example of how the general research on this issue--which typically focuses on a relatively small number of large cities--could be applied to a larger number of smaller governments.<sup>67</sup>

The Oregon study provides a detailed review of the fiscal strain literature and lays out a methodology for gauging the fiscal health of 134 Oregon cities over 1,000 in population. As indicators of fiscal health, the study uses 17 indicators culled from an initial list of 106 drawn from various national studies. As in many of the earlier studies, they cover a range of fiscal, economic, social and debt-related factors.

The study's authors themselves raise a number of problems with the resulting analysis, including the fact that it covers only a very limited time period, that a methodology was not found to differentiate among various special situations that tend to skew the data, and that there was a general lack of data in certain key areas, such as unfunded liabilities.<sup>68</sup> Significantly, another problem would be gathering the data used to conduct the study on a regular basis. This information came from federal sources unlikely to be available in a period of reduced federal spending on state and local aid. Nonetheless, the authors found indications of fiscal stress in a number of cities and suggested that monitoring of the fiscal indicators continue as new data became available.

### Structural Fiscal Distress

Recall that in the CBO study discussed earlier, a useful distinction was made between the types of fiscal distress a government might face. One type of distress takes the form of relatively short-term fiscal problems, often stemming from management decisions or local policy decisions. While they may be serious, these difficulties are not intractable. The second source of distress poses a more significant and long-lived problem. This is stress stemming from a long-term mismatch between the demand for services in a jurisdiction and its ability to raise revenues to meet those demands. In this case, the distress is structural and may be dealt with only through what effectively amounts to outside intervention, such as aid programs.

This division between structural and non-structural distress was given greater definition in a series of articles published in the early 1980s by Katherine Bradbury of the Boston Federal Reserve Bank.<sup>69</sup> Bradbury distinguishes between "budgetary" and "citizen" or "structural" fiscal distress:

The first relates to a city government's short-run difficulty in balancing its budget . . . . The second type of fiscal distress . . . occurs when a local government poorly performs its dual function of providing a package of local public services and collecting taxes and other revenue to pay for them. Indications of high citizen fiscal distress are high tax rates or low service levels.<sup>70</sup>

<sup>67</sup> The University of Oregon, Bureau of Governmental Research and Service, "Oregon Municipal Fiscal Indicators: An Exploratory Study," (Eugene, Oregon, Report BGRS No. 83-17, 1983).

<sup>68</sup> Ibid., p. 44.

<sup>69</sup> Katherine L. Bradbury, "Fiscal Distress in Large U.S. Cities," *New England Economic Review* (November/December 1982), pp. 33-43; "Structural Fiscal Distress in Cities--Causes and Consequences," *New England Economic Review* (January/February 1983), pp. 32-39; "Urban Decline and Distress: An Update," *New England Economic Review* (July/August 1984), pp. 39-55.

<sup>70</sup> Bradbury (1982), p. 33.

In general, budgetary distress may be a simple case of poor management or decision making by government officials or by the public. In contrast, structural distress is not tied to local conditions so much as to local abilities.

According to Bradbury, budgetary distress is best measured by directly examining various aspects of the government's accounts for evidence of imbalance, such as surplus or deficit, over-reliance on short-term debt, and indicators of the relative magnitude and cost of carrying outstanding debt. These she labels "red ink indices," and the three specific measures she selects for her analysis are:

- (1) Average current account surplus or deficit as a percent of budget;
- (2) Average short-term debt as a percent of total revenues; and
- (3) Average debt service costs as a percentage of total revenue.

(The current account surplus noted in the first measure is simply the difference between a government's total revenues and total expenditures expressed as a percent of the average of expenditures and revenues.)

Using these indicators, she studied a sample of 153 cities, representing all U.S. cities with a population over 100,000 in 1970. From this analysis, she found that Northeastern cities had the highest level of budgetary distress, while cities in the West had the lowest. Looking at shifts between 1972 and 1977 in one of the later studies, she found an overall improvement--linked at least in part to the reduction of short-term debt following New York's problems--although some cities did show slippage in their fiscal condition over the period.

To measure the level of structural fiscal stress, Bradbury examined a number of indicators which fit generally into six categories reflecting various aspects of long-term government revenue and spending balance. These include: (1) the size of the tax base; (2) the amount of intergovernmental aid; (3) overlapping government tax collections from local taxpayers; (4) the range of the jurisdiction's service responsibilities; (5) local input prices and production conditions (costs); and (6) service needs. She noted that there is a seventh factor that has an effect in some areas, which is externally imposed limitations on tax and budget authority like Proposition 13.

In her 1983 and 1984 studies, Bradbury created two indices, which combine various indicators to provide a consolidated measure of fiscal distress. In the 1983 study, she developed a "structural distress" index, which relates a city's basic service responsibilities to the revenue it has available to meet those responsibilities. One reason for calculating a combined index is the fact that service responsibilities are not independent. Under the index, a higher value indicates a more distressed situation. She found that the structural distress situation is worse in the Northeast and West. Structural distress in the western cities was a significant problem because of overlapping jurisdictions taking resources out of the local tax base. Strain in the Northeast was a function of relatively low revenue-capabilities, the above average costs of government, and high service responsibilities.<sup>71</sup>

In her 1984 study, Bradbury created a second distress index, which was designed to provide a comparative measure taking into account not only government financial factors but economic and social factors as well. The components of the index include: (1) the unemployment rate; (2) the percentage of population in poverty; (3) violent crime rate; (4) percentage of 1980 housing units built before 1950; and (5) city tax effort relative to the average for the area.

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<sup>71</sup> Bradbury (1983), p. 37

To calculate the index, Bradbury ranked the 153 cities in the sample according to each index and divides the distribution into thirds. Cities in the third with the best values were assigned a +1, while the middle third was given a zero value and the lowest third a -1. The cities' component scores were then summed to form an index value. Thus, the best attainable index value is +5 (+1 for each of the five factors), while the lowest is -5. She examined the index values geographically and over time (1975 to 1980), noting changes. The index served in the analysis as the starting point for a discussion of some of the methods that could be used to overcome distress problems.

She found that some cities' show consistent signs of fiscal distress over time, suggesting to her that the problems they face cannot be addressed by the cities acting alone. For the most part, these "persistently distressed cities" had experienced population, employment, and retail sales losses over the previous decade and were generally located in more slowly growing metropolitan areas than the average city in her survey. They also had fewer overlapping governments to spread service and taxing responsibilities.

Finally, she examined various policy options for dealing with these persistently distressed jurisdictions. However, she concluded that many of the trends toward population and employment declines may be impossible to stop, especially if they are dealt with from the local level only. She argues that state governments have the resources and geographic breadth to aid in this effort, as does the federal government. She was not optimistic about the possibility of large-scale state or federal involvement in the near-term, however.

The most recent study found in the literature--a book by Helen Ladd and John Yinger published in 1989--builds on Bradbury's work.<sup>72</sup> The work uses a broader range of indicators, makes more explicit distinctions between financial and socio-economic factors in its analysis, and examines differences in structural fiscal distress both across cities, as Bradbury did, and across time, which Bradbury did only to a limited degree.

In their analysis, Ladd and Yinger first use economic and social factors to define hypothetical revenue capacity and "standardized" spending requirements for 86 cities. For example, a city's revenue-raising capacity is defined as the amount of revenue it could raise from broad-based taxes at a selected tax burden on its residents. A city's standardized spending requirements are the amounts it must spend per capita to provide public services of average quality--the higher a city's costs, the higher its level of need.

The revenue and spending factors are combined to create a measure of standardized fiscal health which is simply the difference between the revenue and spending measures. This is not a reflection of the local government's performance so much as it is a measure of relative capacity under standardized conditions for the jurisdictions being analyzed. An index value greater than zero implies that the jurisdiction's revenue capacity is at least adequate to deliver a basket of average services.

Using these measures, adjustments are made to reflect the limitations and responsibilities imposed by other levels of government. For example, few local governments have the power to unilaterally impose any tax, and this fact is reflected in a measure of restricted revenue-raising capacity. Similarly, the cities' service responsibilities are adjusted to reflect differences in the service provision requirements placed on each jurisdiction. Thus, a city's actual fiscal health is measured by its restricted revenue capacity minus its actual need. This figure is then expressed as a percent of the standardized fiscal health measure.

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<sup>72</sup> Ladd and Yinger, work previously cited.

This approach helps to answer many of the criticisms raised about earlier studies. Since it explicitly builds a common base of comparison and then adjusts for real differences, it is better suited for interstate comparisons. It also makes a direct link between economic factors and financial indicators. Moreover, by examining the role outside factors (e.g., grants, revenue restrictions) play in determining actual fiscal health, the study allows for a clear discussion of the role the state government in particular plays in influencing local fiscal health. This allows Ladd and Yinger to develop a detailed discussion of intergovernmental relations and the role of the various levels of government in dealing with city fiscal distress.

## GUIDEBOOKS FOR ASSESSING FISCAL CONDITION

A final branch of the literature of fiscal health and financial analysis are the various studies that provide tools for the use of individual governments to assess their own fiscal condition. These studies are derived from several types of sources. The most common is the local government associations--notably the International City Management Association (ICMA) and the Municipal Finance Officers Association (MFOA)--but contributions have also been made by academic researchers, professional analysts, and public agencies like the California Debt Advisory Commission with an interest in the fiscal condition of governments within their jurisdiction.

One of the earliest of these analyses was published by the International City Managers' Association (later the International City Management Association) in 1943.<sup>73</sup> Its goal was the general measurement of municipal activities, not specifically financial analysis, although that was a central focus. Through the years, the ICMA and MFOA have developed a number of guidebooks to overall city fiscal and debt management, each presenting the latest developments in the monitoring and analysis of various local government activities.<sup>74</sup>

One of the best known of these guidebooks was authored by Lennox Moak and Albert Hillhouse and was published by the Finance Officers Association in 1975. It focused on local government finance concepts.<sup>75</sup> At about the same time, the MFOA also published a second work on the administration of local debt.<sup>76</sup> Similarly, the International City Management Association published a guide to local government management policies, aimed primarily at city managers and their staffs.<sup>77</sup>

The Moak and Hillhouse book provides a number of useful insights into the analysis of local government finances. The authors outline, for example, a number of standards that they say are used commonly in credit analysis by the credit-rating agencies, by investment bankers, and by large institutional investors. These include several indicators of the condition of a local government's general obligation debt:

- (1) Net direct and overlapping tax-supported debt per capita;
- (2) Net direct and overlapping tax-supported debt to adjusted assessed valuation;

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<sup>73</sup> Clarence E. Ridley and Herbert A. Simon, *Measuring Municipal Activities* (Chicago: The International City Managers' Association, 1943).

<sup>74</sup> See, for example, International City Managers' Association, *Techniques in Municipal Administration* (Chicago: The International City Managers' Association, various editions); *Municipal Finance Administration* (Chicago: International City Managers' Association, 1955).

<sup>75</sup> Lennox L. Moak and Albert M. Hillhouse, *Concepts and Practices in Local Government Finance* (Chicago: Municipal Finance Officers Association, 1975).

<sup>76</sup> Lennox L. Moak, *Administration of Local Government Debt* (Chicago: Municipal Finance Officers Association, 1976).

<sup>77</sup> J. Richard Aronson and Eli Schwartz (eds.) *Management Policies in Local Government Finance* (Washington, D.C.: International City Management Association, 1976).

- (3) Percentage of current property tax in delinquency;
- (4) Percentage of debt service on tax-supported debt to total revenues, or as a segment of the total operating budget;
- (5) Average life of tax-supported debt outstanding; and
- (6) Shape of the debt service curve.

They also suggest that debt service coverage--operating revenues to total debt service--and the excess of the depreciated value of capital plant over debt should be examined for revenue bond debt, and they outline a number of other important measures, including the jurisdiction's budget condition (balanced or not) and various indicators dealing with its economic and tax base of the jurisdiction. They suggest three key economic base indicators, including the community's tangible property values (land, structures, etc.) per capita; the per capita resources of its banks and other financial resources (intangible property wealth, generally), and various measures related to the size and composition of the local population and work force.<sup>78</sup>

Moak and Hillhouse offer several indicators for evaluating a jurisdiction's tax base:

- (1) The overall productivity of the total tax base (measured by per capita taxes as a percent of per capita income);
- (2) Limitations on broadening the tax base (legal administrative, political, or competitive);
- (3) The property tax base;
- (4) Stability of the local tax system, evaluated based on by such indicators as the percentage of nonproperty taxes to total revenue, the percentage of nontax local revenues to total revenues, and the percentage of federal and state aid to total revenues; and
- (5) Tax base growth rates.

They also discuss the idea of combining these various indicators into a single composite index for analytical purposes to allow comparisons among local governments to given local decision makers a sense of where they stand compared to similar jurisdictions.

One interesting aspect of this system is that the authors provide general performance standards for some of their indicators. For example, they suggest that the current property tax delinquency rate is best in a range of three to five percent of the total property tax levy. The percentage of debt service on tax-supported debt to total revenues should have an upper limit of 25 percent, while the average life of tax-supported debt outstanding should optimally have an upper limit standard of 10.5-15 years. In this latter case, they reason that credit is a revolving power, and the more rapidly it is retired, the more rapidly it can be drawn upon if needed. In this regard, they suggest that a 20-30 year average life would point to debt structure problems for the local government. The authors do not present standards for the economic and tax base measures. Indeed, they warn about the dangers of seeking comprehensive answers from the financial statistics available:

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<sup>78</sup> Moak and Hillhouse, p. 392-393.

Ratios and standard measures must be applied with caution. Analysis or management by slide rule is dangerous. A particular measure must be applied in an atmosphere of healthy skepticism. It may be wise to explore the limitations as well as to draw on its strengths.<sup>79</sup>

As in the case of the fiscal distress studies, there was an increased interest in developing these type guidebooks following the New York City crisis. One of the earliest of these studies appeared in 1976 and was authored by Richard Aronson and Eli Schwartz for the International City Management Association.<sup>80</sup>

Following as it did on the heels of the New York crisis, the Aronson and Schwartz study focused on indicators that point toward local debt problems of the sort that New York had. They review trends in local debt among major cities, using New York as a benchmark, much as Aronson and King did in their 1978 study discussed earlier.

The important addition of this work to the literature is to provide a checklist of fiscal health indicators, similar to the ones Moak and Hillhouse presented, except more extensive. They note that "the proper use of ratios involves a knowledge of the 'rule of thumb' standards of financial adequacy and a certain amount of judgmental expertise which can only be developed by practice."<sup>81</sup> Their checklist of indicators of fiscal health includes indicators of health of the tax base and indicators for the particular jurisdiction. These standards are shown in Table 5.

The Municipal Finance Officers Association also developed a fiscal indicators guidebook for local officials in the late 1970s.<sup>82</sup> The Association's 1978 study is divided into two parts. The first describes the conditions which contribute to local financial difficulties and a detailed list of indicators associated with these difficulties. The second part of the study provides procedures by which local governments can collect and track the trend data discussed in the first part.

The MFOA identifies five key factors which can cause fiscal problems for a municipality. The first of these is declining economic vitality in the community. Obviously, any local government is a candidate for fiscal problems if its economy is in decline, and the study outlines various indicators--including retail sales trends, population trends, income trends and trends in property appraisals--to identify and quantify the basic economic direction of the jurisdiction. Most of these indicators--and indeed the concept of examining the economic base--are similar to many of the other analyses discussed earlier.

The second condition leading to fiscal problems, according to the MFOA, is the loss of financial independence and flexibility. Financial independence, according to the study, can be lost in several ways--by becoming overly reliant on volatile outside funding sources (federal aid), by incurring excessive debt, by having statutory limits or requirements imposed by state government, and by becoming committed to programs whose costs cannot be easily controlled.

A third factor pointing to financial difficulty is declining municipal productivity. Productivity is a difficult factor for governments to measure since there are many services which have no tangible aspects. However, Aronson and Schwartz suggest examining several factors, such as the number of municipal employees per capita and municipal enterprises with operating losses as proxies for a direct productivity measure.

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<sup>79</sup> Ibid., p. 379.

<sup>80</sup> J. Richard Aronson and Eli Schwartz, "Determining Debt's Danger Signals," *Management Information Service Report*, Vol. 8, No. 12 (Washington, D.C.: International City Management Association, December 1976).

<sup>81</sup> Ibid., p. 8.

<sup>82</sup> Philip Rosenberg and C. Wayne Stalling, "Is Your City Heading for Financial Difficulty: A Guidebook for Small Cities and Other Governmental Units," (Washington, D.C.: Municipal Finance Officers Association, 1978).

**TABLE 5**  
**INTERNATIONAL CITY MANAGEMENT ASSOCIATION**  
**CHECKLIST: INDICATORS OF FISCAL HEALTH**

**The Health of the Base**

Total local debt as a percentage of the property tax base (assessed value).\*

- Less than 5% is very good.
- Over 10% signals possible trouble.

Growth rate of total debt.

- Should not exceed growth rate of tax base.

Total debt per capita

- Less than \$400 is good.
- Over \$1,000 signals possible trouble.

Regional growth rate of personal income

- Should roughly parallel that of national GNP.

**The Particular Jurisdiction**

Liquid assets (cash + securities)/short-term debt.

- Ratio of 5.0 is average; higher is better.

Short-term debt

- Should all be retired each fiscal year.
- Carry over or "roll over" between years signals trouble.

Debt service (annual retirement of long-term debt plus all interest) as a percentage of total revenue from own sources.

- Should be less than 20-25%.
- With total short-term debt added to debt service, should still be less than 40%.

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Source: J. Richard Aronson and Eli Schwartz, "Determining Debt's Danger Signals," Management Information Service Report, Vol. 8, No. 12 (Washington, D.C.: International City Management Association, December 1976), p. 14.

\* Total debt is debt for all local governments (including special special districts, etc.) impacting on the tax base.

The fourth sign of fiscal difficulties in the MFOA's analysis is a large amount of municipal costs being deferred or postponed to the future. This trend is reflected in the level of short-term debt or situations where long-term debt funds are applied to operating (non-capital) programs. Also significant, the authors say, are such budget-balancing expedients as the deferral of pension costs and cuts in funding of capital items. Such budget juggling allows a backlog of needed infrastructure improvements to build up and will inevitably compound fiscal difficulties.

These indicators would fit well into the fifth measure in the MFOA list of factors--the use of unsound financial management practices. This factor runs the gamut of practices from a steady pattern of budget overruns to growing levels of uncollected taxes. Any fiscal problems a jurisdiction might experience because of largely uncontrollable factors like the economy can be seriously exacerbated by government management practices.

The ICMA published its own extensive handbook for evaluating local fiscal condition in 1980. This work, prepared for the Association by Sanford Groves and Maureen Godsey Valente, was subsequently updated in 1986.<sup>83</sup>

The ICMA prescribes an extensive list of fiscal indicators to be monitored and analyzed by local officials. The approach is labeled the Financial Trend Monitoring System (FTMS). The authors say the system is designed to identify "the factors that affect financial condition and rationally [arrange] them to facilitate analysis and measurement."<sup>84</sup> They outline 12 factors representing the primary forces shaping government fiscal condition. These are associated with 36 indicators that measure different aspects of the basic factors. The 12 factors are subdivided into three major categories: environmental factors, organizational factors, and financial factors. The framework of FTMS is illustrated in Figure 1. Much of the handbook is dedicated to discussing how the various indicators are formed and analyzed.

A similar approach to government financial analysis was developed by Robert Berne and Richard Schramm, also in 1986.<sup>85</sup> Their book is less targeted at local decision makers and analysts as it is at the general student of public finances. According to Berne and Schramm, a government's fiscal condition depends on:

- (1) Community tastes and needs (poverty, education, unemployment, etc.);
- (2) The local conditions affecting the production and distribution of public goods and services (e.g., population, density, climate);
- (3) The costs of labor, capital, and other productive resources;
- (4) The wealth of the community;
- (5) The political and governmental structure of the jurisdiction and the surrounding area;
- (6) Federal and state policies affecting local resources and responsibilities; and
- (7) Government financial policies and practices (e.g., tax rates, debt levels, etc.).

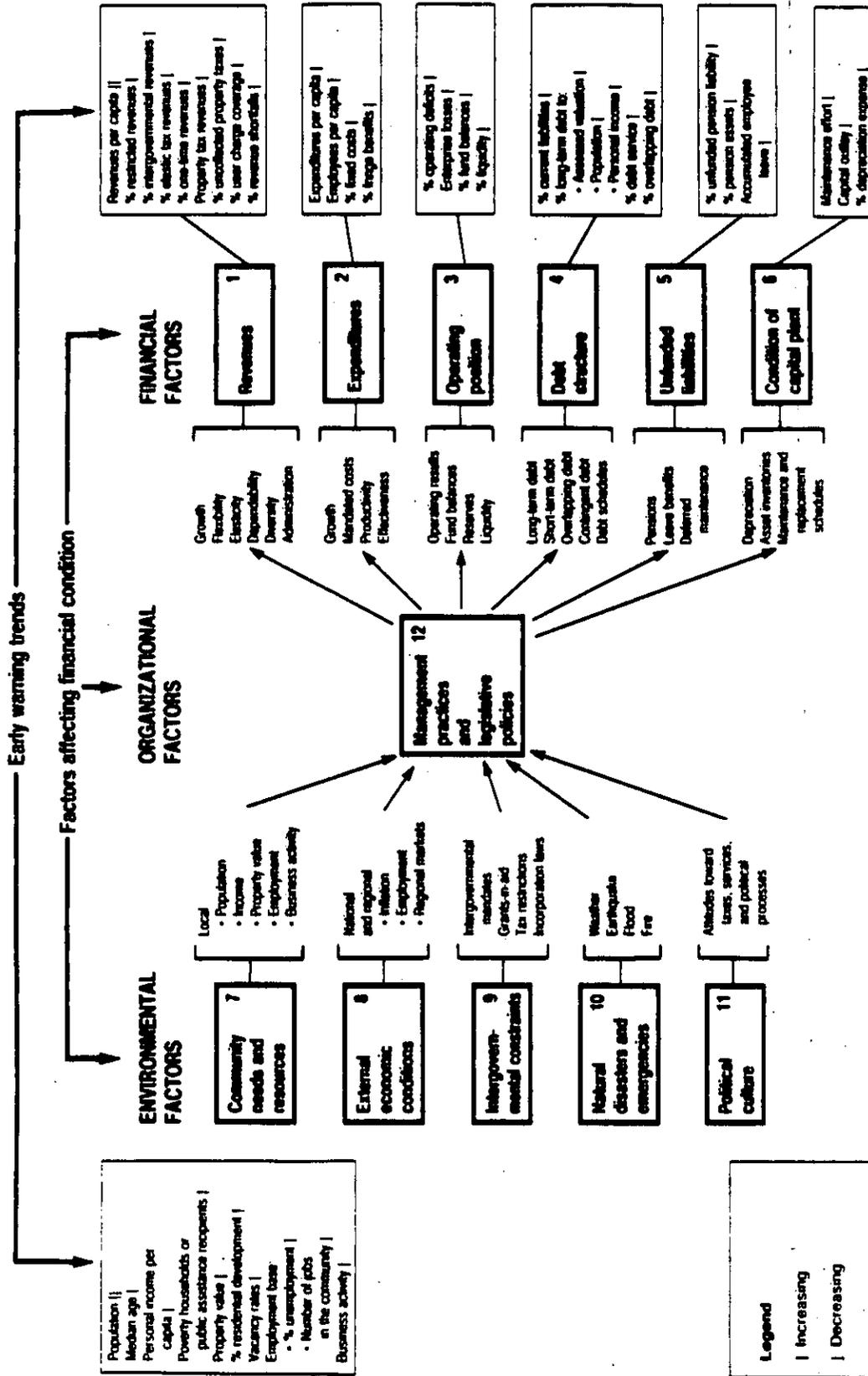
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<sup>83</sup> Sanford M. Groves and Maureen Godsey Valente, *Evaluating Financial Condition: A Handbook for Local Government, 2nd Edition* (Washington, D.C.: The International City Management Association, 1986).

<sup>84</sup> *Ibid.*, p. 3.

<sup>85</sup> Robert Berne and Richard Schramm, *The Financial Analysis of Government* (Englewood Cliffs, New Jersey: Prentice-Hall, 1986).

**FIGURE 1**  
**FRAMEWORK FOR THE FINANCIAL TREND MONITORING SYSTEM**



Source: Sanford M. Groves and Maureen Godsey Valente, *Evaluating Financial Condition: A Handbook for Local Government* (Washington, D.C.: International City Management Association, 1986) p. 6.

For each of these general categories, the authors develop a set of indicators. These indicators are considerably more extensive than those used by Groves and Valente and are, in fact, the most detailed list of indicators found in any of the literature surveyed for this report. Interestingly, although the Berne and Schramm and Groves and Valente lists of indicators do overlap in several places, both use a number of variations on indicators that are not used by the other.

A final example of this type of analysis is the draft report prepared for the California Debt Advisory Commission in 1988.<sup>86</sup> This report follows an approach similar to that used in the ICMA and Berne and Schramm studies and will not be discussed in detail in this report. In this case, a number of indicators are specified for use by local officials in evaluating their debt position and overall fiscal health. The focus appears to be more pragmatic than the Berne and Schramm study, for example, since most of the indicators are formed from data that should readily available to local officials.

## CONCLUSIONS

This report has discussed various studies relating to the analysis of the creditworthiness and general fiscal health of state and local governments.<sup>87</sup> These analyses began with the first credit ratings prepared by Moody's early in this century and have been refined through a host of developments since then. Table 6 summarizes the key developments in this area.

The report identifies three major types of studies that make up the literature of fiscal health analysis. First among these are the various analyses that seek to predict bond ratings or yields. For the most part, these studies make use of a range of fiscal and economic indicators as predictors, with

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<sup>86</sup> Boyer, Bennett, & Shaw Management Consultants, "Indicators for Evaluating the Debt Condition of California Local Governments," Draft Report Prepared for the California Debt Advisory Commission (December 1988).

<sup>87</sup> A number of references from earlier research by the California Debt Advisory Commission were reviewed as part of this analysis but were not included in the final text, either because they were directly relevant to the literature review or because the information in them was replicated or paralleled in works that were cited in the review. These references include: Jeffery I. Chapman, "Baseline Analysis of California Public Debt," (Napa, California: John J. Kirlin and Associates, October 1982); Terry Nichols Clark, Robert S. Kaplan, and Albert Mandansky, "Fiscal Management of American Cities: Funds Flow Indicators," *Journal of Accounting Research*, Vol. 15 (Supplement, 1977), pp. 54-106; Commonwealth of Massachusetts, *Debt and Credit Rating Management for the Towns of Cohasset, Duxbury, Hingham, Marshfield, Norwell, and Rockland* (Boston: Commonwealth of Massachusetts, Department of Revenue, Division of Local Services, Municipal Data Management and Technical Assistance Bureau, January 1988); Jennifer Cryor, "Municipal Bonds," *Management Information Services Report*, Vol. 19, No. 6 (Washington, D.C.: International City Management Association, June 1987); U.S. Environmental Protection Agency, "Financial Capability Guidebook" (Washington, D.C.: Government Printing Office, March 1984); Paul G. Farnham, "Re-examining Local Debt Limits: A Disaggregated Analysis," *Southern Economic Journal*, Vol. 51, No. 4 (April 1985), pp. 1186-1201; Sanford M. Groves, W. Maureen Godsey, and Martha Shulman, "Financial Indicators for Local Government," *Public Budgeting and Finance*, Vol. 1, No. 2 (Summer 1981), pp. 5-19; George C. Kaufmann, "Debt Management," in J. Richard Aronson and Eli Schwartz (eds.), *Management Policies in Local Government Finance* (Washington, D.C.: International City Management Association, 1981); State of California, Legislative Analyst, "The Use of Tax Exempt Bonds in California: Policy Issues and Recommendations," (Sacramento, December 1982); Herman B. Leonard, *Measuring and Reporting the Financial Condition of Public Organizations* (unpublished manuscript), (Cambridge: Harvard University, Kennedy School of Government, 1985); Moody's Investor Services, *Moody's on Municipals and Pitfalls in Issuing Municipal Bonds* (New York: Moody's Investor Services, January 1982); Municipal Finance Research Center, *A Review of Debt Capacity and Debt Management for the State of Alaska*, Report to the Legislative Budget and Audit Committee, Alaska State Legislature (Washington, D.C.: Government Finance Officers Association, August 1983); John Ross and James Greenfield, "Measuring the Health of Cities," *Fiscal Stress and Public Policy*, Vol 9 (Beverly Hills, California: Sage Publications, 1980); Wade S. Smith, *The Appraisal of Municipal Credit Risk* (New York: Moody's Investors Services, 1979).

varying degrees of success. This entire line of analysis is plagued by the fundamentally subjective nature of the bond ratings themselves.

The second strand in the literature are the studies of state and local government fiscal condition. Although precursors of this type of analysis date back several decades, what we now know as studies of fiscal stress or distress actually dates to 1973 and a study of city financial emergencies developed by the U.S. Advisory Commission on Intergovernmental Relations. This strand of the literature gained a significant boost from the fiscal problems many local governments faced during the mid- and late 1970s. Like the bond rating analyses, these studies make use of a range of indicators; however, the selection typically is broader than in the bond rating studies and is more likely to deal with future prospects for the governments being analyzed.

A final branch in this literature includes the guidebooks developed based on many of the same techniques and indicators as the first two strands but organized in a way that allows them to be used by state and local officials to tailor special analyses of their own credit position.

Although the three types of studies have somewhat different purposes, there are some common themes which emerge from a review of the entire body of literature in this area. For example, regardless of the type of study, it is common to select indicators broadly reflecting economic, fiscal (revenue and spending), and debt factors. The determinants of an individual government's fiscal condition are varied, and the studies show statistically that a variety of indicators are essential for any valid analysis of that condition. To analyze creditworthiness, for example, it is not simply enough to examine a jurisdiction's debt condition. It is important to look beyond debt structure to the workings of the government's general finances, to the finances of surrounding jurisdictions, and at the condition of the economy in which the government must operate.

**TABLE 6**  
**A CHRONOLOGY OF EVENTS RELEVANT TO THE ANALYSIS**  
**OF STATE AND LOCAL CREDIT AND FISCAL HEALTH**

Year	Description
1838	First recorded default by a local government--Mobile, Alabama.
1840s	Sharp increase in state and local government defaults owing partly to economic difficulties and over-extension of credit by some jurisdictions.
1873-79	Another period of high default activity in the aftermath of the Civil War and the Panic of 1873.
1893	Panic and depression set off another round of municipal defaults.
1909	Moody's begins rating corporate bond ratings, beginning with railroad debt.
1919	Moody's begins rating municipal bonds issues as outgrowth of its corporate bond ratings.
1930s	A new round of state and local defaults stemming from the Depression that began in 1929. Major problems with ratings as many jurisdictions default; improvements made in staffing and methods at Moody's.
1932	Dun & Bradstreet establishes its municipal credit reports.
1940s	Government credit conditions improve significantly during World War II, owing partly to strong economic growth and partly to wartime restrictions on government spending.
1941	James McCabe of Syracuse University develops one of the earliest alternative systems for rating government debt based on a set of indicators developed by polling experts in municipal credit analysis.
1949	Standard and Poor's begins issuing letter ratings for government debt issues. (Letter ratings for some issues dated to before World War II.)
1949	The Comptroller of the Currency issues new regulations governing securities held by banks, intensifying interest in ratings.
1957	Further changes in investment regulations by the Comptroller of the Currency.
1957	Early work on fiscal disparities among governments, a precursor to fiscal strain analyses.
1962	U.S. Advisory Commission on Intergovernmental Relations introduces first measures of fiscal capacity and tax effort.
1965	Moody's lowers New York City tax-secured bonds from A to Baa, touching off major controversy over validity of bond ratings (July).
1966	Standard and Poor's follows suit on New York rating, lowering their rating from A to BBB.
1966	Walter Tyler establishes competitor company to produce quantitatively based ratings of municipal bond issues.
1968	Standard and Poor's begins to charge a fee for its ratings.

**TABLE 6--Continued**  
**A CHRONOLOGY OF EVENTS RELEVANT TO THE ANALYSIS**  
**OF STATE AND LOCAL CREDIT AND FISCAL HEALTH**

Year	Description
1968	Congressional hearings on bond market prompted in part by highest interest rates in 33 years, partly by the sharp growth in tax exempt issues and their effects on the overall municipal credit market; and partly over governmental dissatisfaction with the ratings. No major legislative results.
1969	William Carleton and Eugene Lerner publish early analysis predicting municipal bond ratings.
1970	Moody's begins charging a fee for its ratings.
1970	Penn Central bankruptcy causes uncertainty over debt issues by public and private entities.
1970	Cleveland lays off 2,000 workers because of major budget problems.
1971	Dunn & Bradstreet becomes part of Moody's, itself a wholly-owned subsidiary of Dunn & Bradstreet, Inc.
1973	Advisory Commission on Intergovernmental Relations publishes City Fiscal Emergencies, the first detailed analysis of city fiscal difficulties and their causes.
1975	New York Urban Development Corporation (UDC) defaults on debt; New York City and New York State unable to refinance debt, setting off fiscal crisis and generating significant interest in municipal fiscal health.
1976	Richard Nathan and Charles F. Adams develop one of the earliest urban hardship index.
1977	Advisory Commission on Intergovernmental Relations publishes first version of its "fiscal blood pressure" of state and local fiscal health, based on tax effort measurements.
1978	Cleveland faces major fiscal problems and near default on a portion of its debt.
Late 1970s	Extensive work on measures of government fiscal health conducted by a variety of researchers.
1980	J. Richard Aronson published "Municipal Fiscal Indicators," summarizing much of the work to that time on the measurement of fiscal health and distress.
1982-84	Katherine Bradbury publishes a series of articles that distinguish between budgetary (largely short-term) fiscal distress and structural (long-term) fiscal distress. Bradbury develops two fiscal distress indexes.
1989	Helen Ladd and John Yinger publish America's Ailing Cities, the most recent and most extensive analysis of urban fiscal stress and public policy.

Source: KPMG Peat Marwick, Policy Economics Group.

Second, while the broad categories of indicators are fairly consistent, there is wide variation in the specific indicators used in the studies. This variety not only is found among the three types of studies but also among the various studies *within* the three categories. This variation in indicators used reflects the range of data available to analysts, the different goals of the various studies, and the general murkiness in the literature about what is being measured and how best to go about measuring it.

Despite these ambiguities, there are certain key indicators which appear in a great many of the studies. Population, for example, is used in a large number of the studies, as is some measure of state or local personal income. Various measures of revenue capacity and debt burden also find their way into most studies. This suggests that while there still is no comprehensive set of indicators for measuring state and local government fiscal health, there is an emerging body of indicators that have proven statistically significant in a number of studies or which have gained some level of acceptance among experts in this field.

A major difficulty in tying these indicators together in a comprehensive package is the lack of standards for evaluating their meaning. Particularly in the area of credit analysis, there are some very general rules of thumb for interpreting the various indicators have been developed through the years, but there is no fixed group of standards that can serve as an overall guide. Most of the rules of thumb are essentially general guidelines accepted by experts and are not necessarily grounded in any rigorous analytical framework.

Unfortunately, there is unlikely to be any such set of standards at anytime in the near future. As a number of the studies indicate, one of the clear facts that emerges from these studies is the degree of diversity among governments. What represents fiscal stress and the specter of default for one government may be handled with little fanfare by another.

Because of the lack of standards, a common approach used in a majority of the studies (with the exception of the guidebooks) is comparative analysis of a number of governments. Comparing governments with each other, most analysts acknowledge, is fraught with complications, and the validity of such comparative analysis is questionable in some cases because of a variety of differences: in the population of the jurisdictions under consideration, in services provided, in legal requirements, and in the financial information reported by the governments to name just a few. Nonetheless, at this point, comparisons against the mean or median represent the best available method of developing standards for ongoing fiscal analysis. They also represent a source of continuing interest among elected officials and others who make use of this type of analysis.

Despite the lack of a clear cut theory and a comprehensive set of indicators of overall fiscal health, most of the analysts seem to agree that good fiscal health depends on two conditions, which were well summarized in a 1979 study. These conditions include:

- A strong economy that produces sufficient revenue to meet the cost of public services while simultaneously providing private employment and income that reduces the need for some public expenditures; and
- Sound resource and fiscal management that minimizes waste, provides information needed to make sound fiscal choices and avoids the spending of more revenue than can be raised dependably.<sup>88</sup>

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<sup>88</sup> Wayne Stallings, "Measuring the Fiscal Condition of Local Governments: A Growing Concern," *Resources in Review* (March/April 1979), p. 3.

The studies reviewed in this report suggest that state and local fiscal problems often follow economic problems, and while the studies suggest that fiscal distress is an outcome of economic strain, it is by no means inevitable.

In assessing the work done thus far, it is possible to develop several observations about the likely direction of future research in this area. Probably the most important of these is that the research will continue--and that it is important that it does continue. Our state and local governments have enjoyed improved fiscal conditions in the last few years, but this trend will not continue forever. The various indicators of fiscal condition can be an important tool in helping state and local officials avoid fiscal hot water. Clearly, the use of indicators to evaluate state and local government creditworthiness and general fiscal health is preferable to making no attempt to analyze trends in fiscal condition at all. The measurement and evaluation of financial condition is still at a primitive stage, but it promises to be a useful tool to avoiding government fiscal problems in the future.

Research is likely to continue to evolve in the direction of greater sophistication, with a broad range of indicators examining multiple facets of a government's fiscal condition and the conditions in its surrounding economy. The distinction made by Bradbury between budgetary fiscal distress and structural distress has been advanced significantly by the work of Ladd and Yinger, and work in this direction is likely to continue.

Another likely trend is an increasing focus on changes in condition over time and possibly on the forecasting of fiscal indicators as a way of predicting government fiscal condition under varying economic circumstances. Bradbury and especially Ladd and Yinger have demonstrated the value of examining time series data on various indicators, while work done by Bahl and by Ramsey and Hackbart point toward the application of economic forecasting techniques to the existing methodologies of analyzing historical data.

Unfortunately, how quickly these trends advance may depend on the data that are available. The fiscal analysis of state and local government has long been characterized by data inadequacies and inconsistencies related to the multitude of methods governments use to maintain their fiscal records. This problem has been compounded recently by the federal government's reduced involvement in state and local programs. Reduced federal involvement has had the simultaneous effect of reducing data collection and analysis of state and local issues by federal agencies. There clearly is a need for more extensive and timely data to make the indicator studies more useful to policy makers. The question is how to bring about the needed improvements in data collection methodologies.

The last decade has witnessed a major expansion in the demands placed on state and local governments in this country. State and local governments have been required to shoulder greater responsibilities because of federal aid cut-backs and because of the burgeoning needs of their citizens in many areas where state and local government was scarcely involved two decades ago. Inevitably, with these stresses and with the vagaries of the economy, there will be another round of fiscal problems for state and local governments. Although there is much work to be done, it seems clear that a comprehensive set of fiscal indicators can be an invaluable tool in detecting fiscal problems before they fester into major crises and in helping government's maintain their fiscal integrity in unsettled times.

**PART 2: THEORETICAL FRAMEWORK, INDICATORS  
AND RECOMMENDATIONS**

## Part 2: Theoretical Framework, Indicators, and Recommendations

### INTRODUCTION

Concern over the level of public debt and whether it is "too high" or "too low" is common among public officials nationwide. In this regard, California is no exception. The level of public indebtedness and its implications for state and local finances have long been--and will continue to be--important public policy issues in a state with over 5,500 units of governments operating at least partly through debt financing.

Clearly, the use of debt has an important role in modern public finance. Debt financing makes it unnecessary for governments to carry the full burden of long-term capital projects in their current budgets, thereby reducing fiscal stresses and making it possible for the governments to deliver a wider range of services for the same public dollars. Debt financing also allows the cost of long-term projects to be shared between current and future taxpayers who will benefit from the projects. The use of debt may also allow projects to be undertaken more quickly and provide greater flexibility in the means of meeting public needs. Finally, in an era when there is substantial public resistance to tax increases, debt financing may also offer an important alternative for meeting the expenditure demands government faces without higher taxes.

On the other hand, the history of state and local finances nationally is spotted with instances where public credit has been misused or over-used with occasionally disastrous results. Moreover, the Loma Prieta earthquake underscores the importance of governments maintaining flexibility in their finances, including their debt financing.

There is little in the data currently available to suggest that California is approaching dangerous levels in terms of its use of debt financing. Although the dollar amounts of outstanding debt in the State are large in absolute terms, the levels are below national averages when adjusted for population size or state income. In the 1986-87 fiscal year, for example, state and local per capita debt in California totaled \$2,601, according to federal statistics, well below the U.S. average of just under \$2,953 per capita. In that year, California ranked 33rd among the 50 states in per capita debt burden. Nonetheless, large amounts of debt continue to be proposed and issued by California governments for a growing range of purposes, and uncertainties linger about what current debt financing trends may imply for the future. This concern was voiced in mid-1989 by California State Treasurer Thomas Hayes:

There is an increasing and dangerous trend to issue more and more debt. . . . Unless we're careful, we will end up like the federal government--mortgaging our children's future by saddling them with a staggering load of debt payments.<sup>89</sup>

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<sup>89</sup> Thomas W. Hayes, California State Treasurer, text of a speech delivered on July 18, 1989.

The problem for policy makers in dealing with these concerns is that there are no convenient standards for judging the appropriate level of debt for a unit of government--much less for a state like California made up of thousands of governmental units. As the Legislative Analyst Office has observed: "There is not simple formula or 'rule of thumb' to come up with the level of indebtedness that it is appropriate for California to have, or for that matter to say how much debt is 'too much.'"<sup>90</sup> This conclusion is amply supported by the results of the literature review contained in the first part of this project. The appropriate level of indebtedness for a government or group of governments is a complex concept--a function of economic conditions and fiscal needs that change over time and can only be fixed inexactly at any given point.

This problem is complicated by a lack of consistent, centralized data. California is fortunate to have a legal requirement that local governments report their finances to the State Controller on a more-or-less uniform basis, but this does not remove the problems inherent in the available information:

One of the first discoveries made in analysis of the amount and type of debt issued [in California] is that not all agencies use the same categories or time spans as they gather and classify information on debt. For example, some data are collected on a calendar year, while others are collected on a fiscal year. Many small issues are privately placed and may never be reported. Others may just slip through the collection agencies' files.<sup>91</sup>

Other agencies--and notably the California Debt Advisory Commission (CDAC)--collect information on debt in the State, but this collection effort focuses primarily on specific concerns, such as new debt issues. There is as yet no repository that brings together the data resources and analytical approaches that are needed to monitor and analyze this complex issue on a routine basis, even though continuing concerns among policy makers and the very lack of precision in current methods make efforts to improve information and analysis especially critical. The role of the assessment process in this case is not to serve as a governor or limit on the use of debt by government. Rather, its goal should be to provide policy makers with the information they need to make informed judgements about how debt should fit into the overall financing of California government.

To a very large degree, the State of California has consistently acknowledged the importance of this task over the last decade. The Debt Advisory Commission was created in part to act as a statistical center for state and local debt issues in California, and early on, the Commission adopted bylaws which set "devising an 'early warning system' to alert public officials and the public generally to emerging debt-related problems in the public sector" as one of its roles.<sup>92</sup> This concern has been supported by numerous analytical studies prepared by CDAC and the Legislative Analyst in recent years examining state and local debt and its implications.<sup>93</sup> More to the point, CDAC also has developed a program of research, of which the current study is a part, to consider the feasibility of developing a system for assessing the level of outstanding debt on a continuing basis. The question is not so much whether the State has a legitimate, continuing interest in the issue, but rather a question of how best to approach the task with the statistical tools and information available.

The use of statistical indicators appears to offer a valid potential approach to help meet this need. Fiscal indicators are statistics which measure various facets of the fiscal health or performance

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<sup>90</sup> State of California, Legislative Analyst, "The Level of State Indebtedness," *The 1989-90 Budget: Perspectives and Issues*, (Sacramento, 1989), p. 155.

<sup>91</sup> John J. Kirlin and Associates, "Analyses of California Public Debt," (Sacramento, August 1983), p.42.

<sup>92</sup> State of California, Legislative Analyst, "The Use of Tax-Exempt Bonds in California: Policy Issues and Recommendations," (Sacramento, Report 82-20, December 1982), p. 265.

<sup>93</sup> See, for example, *Ibid.*; Kirlin and Associates; California Debt Advisory Commission, "Policy Options Concerning California Public Debt," (Sacramento, August 1983) and "The Use of General Obligation Bonds by the State of California," (Sacramento, September 1987).

of a state or local government unit (or a related group of governments). To accomplish this, indicators must be chosen to reflect both the economy in which the government operates and the results of its financial operations. Indicators have at times been narrowly applied--to such issues as evaluating the creditworthiness of individual governments--and at other time broadly applied--to the measurement of the general fiscal health and distress of cities and regions.

In this portion of the report, a process is developed for using indicators to assess the level of outstanding public debt for California governments. However, the approach to this process in reality is not--and indeed cannot--be much different from the general analysis of government fiscal condition. This is true because public debt is not an element that can be viewed in isolation. It is part of the overall fiscal make-up of government, and the factors which underlie the overall condition of government also underlie the government's capacity to sustain a given level of debt. The primary difference is that the concern in this instance is more specifically focused on the composition and trends in debt initially, rather than as a piece of the larger fiscal picture.

It is also important to understand that the review and possible development of an indicator methodology does not guarantee final answers to the question of the *appropriate* level of debt. Instead, it provides a consistent framework for putting the level of outstanding debt into a proper context. There is a large amount of debt outstanding in California, but how does this volume relate to the size of the State economy, the fiscal capacity of state and local government, and the needs of Californians in general? Properly specified, indicators should be able to provide the State with valuable insights into these questions.

## SUMMARY OF LITERATURE REVIEW

The analysis in the following sections is built on the work in Part 1 of this study which reviewed the literature on the analysis of government fiscal condition and debt position. The review showed that over the past two decades in particular, there has been considerable research directed toward three primary ends:

- (1) Predicting or providing an alternative to the credit ratings most often associated with the firms of Moody's Investors Services and Standard and Poor's Corporation;
- (2) Monitoring and assessing the fiscal health of state and local governments--and especially the health of major U.S. cities; and
- (3) Developing guidebooks for use by local officials in assessing their jurisdiction's fiscal health.

Although these three strands in the literature pursue somewhat different ends, they share a common interest in identifying statistical measures or indicators which can be used to monitor and evaluate various aspects of government fiscal condition in a way that is detailed enough to detect changes--particularly those pointing to fiscal deterioration and the onset of financial difficulties.

The literature review revealed that these earlier studies used a wide range of fiscal indicators for this task. A few factors--such as measures of population and income--recur in most of the analyses, but many indicators were found to have at least some analytical significance in one or more of the studies and not consistent set of key factors emerges from the research to date. The lack of a consistent set of indicators--even among studies with basically the same analytical goals--illustrates the major difficulties with the indicator approach. First, there is no clear-cut set of indicators that can always be expected to reflect the fiscal condition of a group of state and local governments accurately--in some respects, the development and use of indicators remains as much art as science.

Second, even where there are commonly used measures, there is little agreement among analysts and public officials about how to interpret them--i.e., where does poor fiscal health or questionable credit condition begin? How is it reflected by changes in the level of debt burden or expenditures by the government? Because of the lack of definite standards, many of the studies have relied on intergovernmental comparisons, which introduce an entirely separate set of advantages and problems.

From the standpoint of the current research effort, the earlier studies were different in that their focus was on individual units of government, rather than on governments in aggregate. With only rare exceptions, the studies do not develop composite measures for all units in a given geographical area (e.g., a county or state) or for a given category of government (e.g., cities, counties). There are relatively few studies like the current one which seek to define a set of aggregate indicators that reflect the overall credit condition for all of the governments within a state.

Despite these problems, there have been significant improvements in this area of study in recent years, and the difficult fiscal circumstances that may lie ahead for state and local governments underscore the need to continue making improvements in fiscal analysis systems. The current project represents one step in that direction.

### ASSESSING THE LEVEL OF OUTSTANDING DEBT

The level of outstanding debt in California--about \$72 billion for all forms of state and local indebtedness in 1986-87--is a large figure, representing roughly ten percent of all state and local indebtedness nationally. California state and local governments have more debt outstanding in aggregate than any other state except New York. But the figures by themselves really convey relatively little insight into the actual credit condition of California. It may, in fact, create misimpressions if taken out of context, and it clearly does not reveal any real insight into the appropriateness of the debt and its uses or the degree of burden it imposes on government.

The first of these two issues--the appropriateness of the debt and its uses--is largely a question of public policy and is not directly tied to an analysis of what effect the debt may have on government's fiscal position (although that may be an element in the policy consideration of the question). In effect, governments must decide how they will use debt in their overall financing scheme, and these decisions will vary from government to government and from state to state. For a given jurisdiction, the appropriate level of debt is a function of a number of factors, the most important of which is the actual need for public projects that the debt is used to finance. However, it also includes the availability of other funding sources, legal constraints, and the political environment in which the government must operate.<sup>94</sup>

The policy judgement about what the appropriate level of debt has important implications for government. If the level identified as appropriate proves to be too high, the result may be severe fiscal problems, affecting the government's bond rating and limiting its overall fiscal flexibility. If the level identified is too low, it may mean that needed public facilities and infrastructure are not being built, which will have repercussions for the State's future development. Except at the extremes, the definition of the appropriate level of debt is largely a function of policy judgement, and concern over this issue has led the Legislative Analyst to recommend that the Legislature arrive at its own definition of the appropriate level of debt and produce a multi-year capital improvements budget consistent with it.<sup>95</sup> Because it is largely a public policy issue, the use of indicators is of little direct value in assessing this particular issue. Its role is to provide policy makers with an informational basis on which to base their judgements.

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<sup>94</sup> Legislative Analyst, "The Level of State Indebtedness," p. 156.

<sup>95</sup> Ibid.

The second issue, the level of debt and the burden it imposes on government, is critical to all governments, since the burden imposed by debt is a central factor in the overall equation of their fiscal health. Addressing the issue requires seeking insights into two questions:

- What is the debt capacity of government? That is, how much total debt can it carry?
- How much of the government's debt capacity is currently being used and how much is available for future use?

Whether a given level of debt represents an unsustainable burden can only be understood in the context of the larger financial position of government. A given level of debt becomes burdensome when it begins to intrude on the efficient financial operations of a governmental unit. Ability to pay is a function of the relationship between the resources available to the governmental unit and the demands placed upon it.

Measuring and evaluating these conditions is a difficult proposition and is still relatively primitive in technique, despite a voluminous amount of research on the issue carried out in recent years. It follows, then, that as a part of the overall fiscal make-up of government, the assessment of the level of outstanding debt and its implications is also a relatively complex process which is also in its infancy. Nonetheless, it is possible to develop a logical process for the assessment of the questions of debt capacity and usage, and the next section describes the basic framework for such a process.

## A FRAMEWORK FOR ASSESSING PUBLIC DEBT

To develop a process for evaluating the outstanding debt of California governments, it is necessary to describe the general characteristics of such a process, to construct a framework or "model" for organizing the data to be analyzed, and to identify and evaluate the information resources that would be needed to make the framework workable. In this regard, it is useful to begin by describing the general characteristics of the process that should serve as a basis for constructing the assessment framework.

### General Characteristics

The first major characteristic of the analytical framework presented in this study is that it does not consist of a single measure or formula for assessment of the level of debt outstanding. Instead, it is a multi-part framework for organizing and interpreting a range of measures related to the fiscal health and credit condition of a given unit of government or group of governments-- whether state, local, or both. These pieces must be viewed together to develop a complete understanding of the implications of a given level of outstanding debt. The approach is not to design a statistical construct which produces a set of statistics that defines the credit condition of government and thus produces what appears to be a clear cut answer to the question of how much debt is too much. Rather, the framework is designed to provide a systematic approach to thinking about the government's level of outstanding debt and what it means in the overall scheme of California governmental finances.

This characteristic points to several other important implications about how the framework should be constructed. For example, to be effective, these measures must be applied over time, and

for this reason, the framework must incorporate a clear time dimension.<sup>96</sup> It must be concerned not simply with the current credit condition of California state and local government but also with how it has changed over time and how it might change in the future given variable economic circumstances and changing service demands on government.

It is also clear that the concerns addressed in the framework must be closely related to the larger fiscal condition of government. Although the focus is the level of debt outstanding and its implications, this is, in fact, largely a major subset of the overall fiscal operations of government. As the literature review showed, financial condition has been variously analyzed in previous studies and can be defined simply as the probability that, over time, government will be able to balance the sources of cash available to it with the demands that it confronts.

Another important characteristic of the framework is that it must also encompass the larger economic environment in which government operates. To a large degree, the economy dictates the resources that are available to government, and it also helps--in conjunction with the public policy process--to define the demands that are placed on government. For example, a weak economy reduces government's ability to generate resources, while it may create the demand for more social welfare spending at the same time. On the other hand, a strong economy can generate significant new income without the need for increased taxes and reduces some of the demands on government that accompany economic difficulties.

For use in policy analysis, the measures that make up the framework must also be comparable with different standards in order to provide useful results. The level of outstanding debt--as well as most other measures of government fiscal position like revenues or expenditures--are all relative concepts. They need to be compared with some base line to give meaning and provide context. One such baseline is how they change over time, hence the importance of the time dimension discussed earlier. But they must also be related to measures of the broader economy and interrelated with each other. Thus, a central concern will be how debt relates to state population and income, two critical indicators of the level of state economic activity, and we will also be concerned with the relationship of debt and the revenues which must support it. Moreover, a point of concern for policy makers may be how the various parts of the framework can be compared with similar measures in other states, and while this is not a primary objective of this model, it is a feature which should be provided for in the analytical process.

The usefulness of the framework also depends on a clear understanding of the limitations and qualifications of the fiscal measures included in it. It is, for example, difficult to capture the full complexity of government fiscal condition with unerring accuracy while maintaining a manageable set of data that can be maintained and comprehended by analysts and policy makers alike. The range of information that can be collected and analyzed concerning government fiscal processes is huge, and the selection of the "best" indicators inevitably must surrender some explanatory value in the interest of manageability.

Moreover, particularly where local government data are involved, there is a practical limit on accuracy of the information available for a reasonable level of effort (not to mention resources). Even for the data elements selected as components of the framework, some inevitably will prove to be incorrect, inadequate, or out of date, limiting their usefulness. Moreover, a set of generic measures may overlook special features of a government or the environment in which it operates and thereby fail to capture its fiscal status accurately. Analysts must be mindful of these limitations to avoid the pitfalls of reading too much into the data.

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<sup>96</sup> Robert Berne and Richard Schramm, *The Financial Analysis of Government* (Englewood Cliffs, New Jersey: Prentice-Hall, 1986), p. 68.

This especially is a problem for an effort like the current one which seeks to define measures of credit condition that can be generalized in their application from individual governments to the state as a whole. Each level of aggregation--from individual city to groups of cities, from cities to combinations of cities, counties, and other jurisdictions--necessarily imposes some loss of detail and some reduction in analytical power. This is not necessarily a fatal flaw, but it is a characteristic which should be recognized as the theoretical framework is discussed.

For the purpose of constructing the theoretical framework, it is assumed that the appropriate financial and economic data are available over time for California and California governments as a group. In practice, of course, this will not be the case, and the application of the model will depend on further development work. The model itself specifies an "ideal" approach to the assessment of outstanding debt which ultimately will have to be tempered by limitations on data needed for analysis. These limitations are discussed in detail later in this paper.

## **A Theoretical Framework**

As noted earlier, the implications of a given level of outstanding debt are closely related to the overall fiscal condition of government. Thus, the process of assessing debt begins with an understanding of debt position and then attempts to put it into context with the larger financial position of California governments. This process is illustrated in Figure 2.

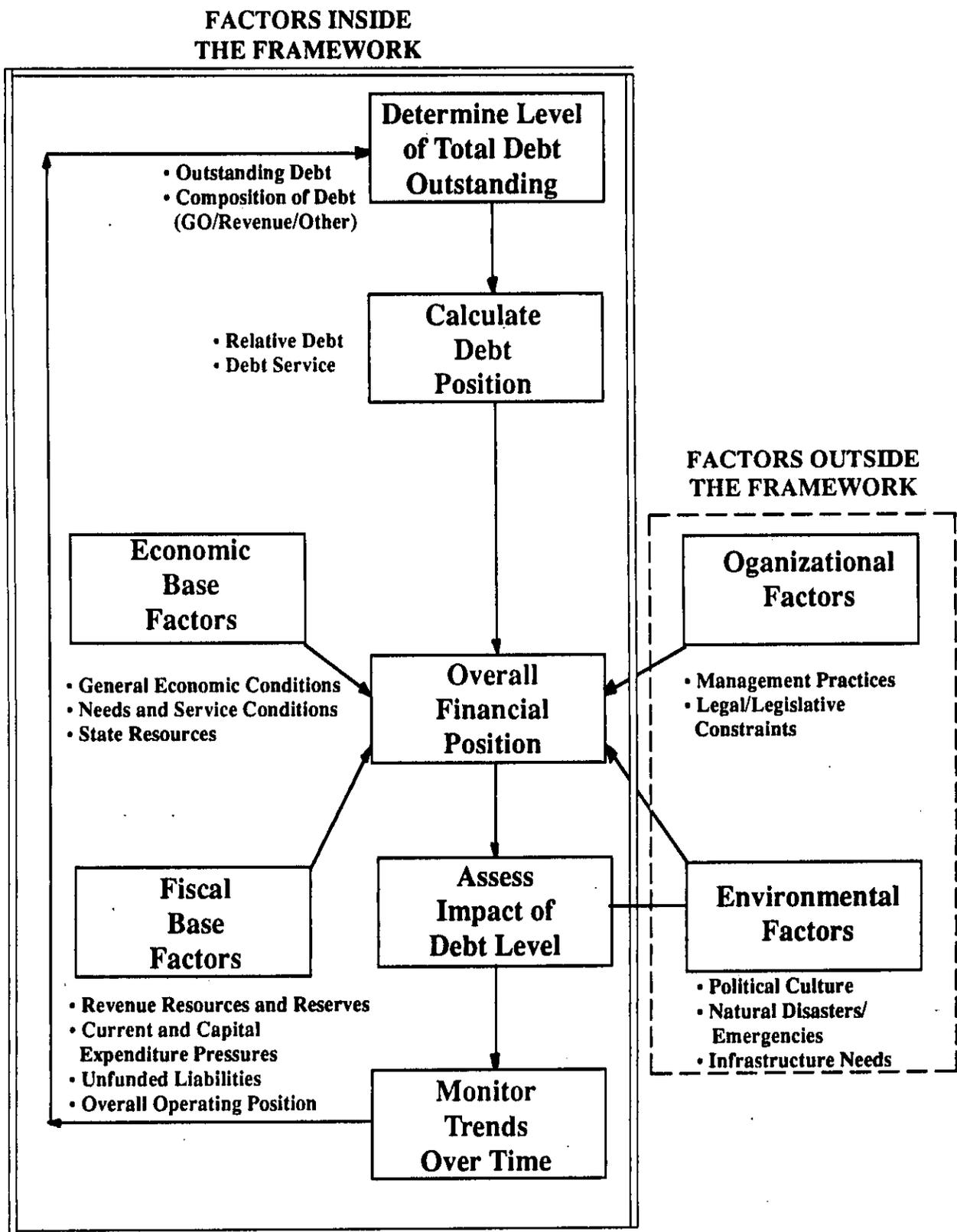
As it is envisioned in the figure, the framework for assessing outstanding debt is really a multi-step process. This process begins with a determination of what the level of outstanding debt is. From a theoretical standpoint, this means defining the types of credit instruments that are part of outstanding debt for California governments. From a practical standpoint, it means gathering basic data on debt outstanding, preferably disaggregated by level of government, type of debt, and term (i.e., short-term and long-term). Various sources exist for data on the level of outstanding debt in California, but most of these present at least some statistical problems that, as a first step in the assessment, must be understood and which, if the Commission goes forward with the project, should be clarified if possible. Moreover, the data must be brought together in a combined data base that allows for consolidated manipulation and analysis.

While it is the focal point for the assessment process, the level of debt outstanding must next be put into a context where it can be more easily evaluated. To accomplish this, the next step in the assessment process is to develop a set of indicators of the extent of debt usage by government, whether it is excessive or not, and to what extent the government has room to add more debt. In this part of the framework, traditional measures of debt burden are evaluated and are supplemented with additional indicators of debt composition, capacity, and reserves.

Once these debt position indicators have been identified, they must be assessed in terms of the overall fiscal position of government. The framework designed for this analysis suggests that a government's overall fiscal position is a function of its debt position and four other major elements:

- Economic base factors--relating the condition of government to the economic environment in which it must operate;
- Fiscal base factors--relating overall financial condition to the revenue reserves and expenditure demands faced by government;
- Environmental factors--relating financial position to elements like the effects of natural disaster or the level of demands for capital spending which are typically cannot be accurately reflected through fiscal indicators like the ones in this study; and

**FIGURE 2  
A FRAMEWORK FOR ASSESSING  
CALIFORNIA'S TOTAL OUTSTANDING PUBLIC DEBT**



- Organizational factors--relating the financial position of government to its management practices and other constraints (such as legislative limitations on expenditures or other constraints).

The importance of the economic base factors in assessing the implications of a given level of outstanding debt has already been discussed. Within the framework, the economic base factor actually reflects three separate aspects of the state economy. The more general of the three, which helps to define the other two, includes measures reflecting the overall economic health of the State--the economic environment in which government must operate. As Roy Bahl has observed, at least four aspects of a government's economic circumstances are important in determining its fiscal and credit condition: "(a) expected performance in a period of recession, (b) probability of local industrial decline either because of a recession or because of the decline of certain industries, (c) probability of long-term decline of local economic activity, and (d) projected decline within a region."<sup>97</sup>

In addition to general measures of economic performance, it is also useful to distinguish aspects of economic performance that are directly related to the resources available to government and the service demands likely to be placed on it. For example, on the resources side, a major concern is the income of its citizens, since that is one of the broadest measures of ability to pay, and ultimately, all government revenues are related to income in some fashion. For local governments, a central interest is measures reflecting the size and health of property values, which are closely tied to the performance of the ad valorem property tax. Another indicator might seek to monitor retail sales, an important characteristic of state and local sales taxes.

On the service demand side of the economic base factor, interest is focused on the governmental expenditure consequences of economic conditions. For example, strong private sector economic activity may reduce unemployment, implying fewer demands for social services and less demand on government. High or rising unemployment may mean increased pressures on social services. The intention of this portion of the framework is to get some sense of the inherent pressures likely to confront government in relation to the potential resources it has available to meet them.

The fiscal side of the equation must reflect the interplay of government revenue, expenditure, and debt policy. In this regard, the level of debt outstanding for a unit of government is less a function of its capacity to carry debt as it is its overall mix of obligations and resources--the "likelihood that the sources of cash available to the government and the required uses of cash at any point in time can be brought into equilibrium."<sup>98</sup>

The fiscal component of the framework encompasses indicators of the relative fiscal position and performance of state and local governments as distinguished from general economic performance. As Figure 2 shows, it also reflects several major aspects (apart from debt position which is treated separately in the framework).

As in the case of the economic segment of the model, this segment must incorporate general indicators of fiscal condition. These would include measures of the overall operating condition of the governmental units under analysis--whether it is running a general revenue surplus or deficit or the trend in its overall operating condition (surplus or deficit) over time.

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<sup>97</sup> Roy Bahl, "Measuring the Creditworthiness of State and Local Governments: Municipal Bond Ratings," National Tax Association, *Proceedings* (September 1971), p. 609.

<sup>98</sup> Berne and Schramm, p. 68.

As part of a comprehensive model, it is also necessary to look at the major components of the financial position of the jurisdiction under analysis (whether state, local, or an aggregate of the two): its revenues, its expenditures, and its pension liabilities. In each of these areas, a major concern is how limiting the government's current practices are--how easily could they respond to fiscal crisis? If per capita revenue burden is relatively high or if a large share of government tax revenue is legally dedicated to specific uses (e.g., education programs) and not easily available for general spending, this may indicate weakness in the government's ability to respond to poor economic condition and thus to maintain its credit condition in times of fiscal stress.

The environmental and organizational factors are much more difficult to reflect in statistical terms and in fact are shown as being outside the overall assessment framework in Figure 2. This is *not* to imply that they are unimportant elements in determining either the level of outstanding debt or overall fiscal condition. In fact, they may be crucially important. However, there is little empirical evidence of their direct effects on financial position, and most efforts to analyze such effects in the research literature have yielded vague or inconclusive results at best. This is even more of a problem with aggregate state level data than it would be for a single local jurisdiction.

Realistically, these aspects of financial condition are best gauged in a subjective manner. In addition, some evidence of their impact on government's fiscal condition is reflected in indicators of the fiscal base. For example, it is possible to develop some idea of overall management practices based on the operating position (surplus or deficit) of government over time. (Obviously, this would be much clearer for a single government than for all California governments.) Similarly, the impact of legislative restrictions on appropriations in California in recent years has been reflected in levels of general obligation debt, which have trailed off because of constraints imposed on their use.

The final two components of the framework are not represented by indicators but are critical steps in the assessment process. The first--assessment of the impact of the level of debt--simply indicates that the various indicators must be brought together and weighed to reach a conclusion about the implications of the debt level. The final step suggests the critical need to maintain and monitor data over time. As such, it feeds back to the beginning of the process. Viewed overall, the framework implies an ongoing, annual process of information collection and analysis.

## INDICATOR SELECTION

With a basic theoretical framework in place we can now turn our attention to the individual indicators that give substance to the model. As the literature review suggests, there are numerous potential indicators of debt position and general financial condition from which to choose. To develop a useable indicator list, a three-step methodology was followed initially.

First, a set of evaluation criteria was defined that can be used to evaluate individual indicators. These criteria encompass the question of how well individual indicators fit the model, but they go further to judge their practical usefulness in assessing the debt levels of California governments. Second, a detailed compilation of potential fiscal and economic indicators was developed based on the variables used in the various studies reviewed in the first part of this study. These indicators provide an exhaustive list of the factors commonly used to analyze government credit condition and fiscal health. Finally, a set of recommended indicators was selected using the evaluation criteria and the structure of the framework as guides.

(A logical fourth step in this process would be the calculation of the selected indicators for various California state and local jurisdictions and the creation of an aggregate set of indicators for the state as a whole. This, however, is beyond the scope of the current study but may be the subject of later study by the Commission.)

One important caveat attached to this process is recognition that the selection of individual indicators is largely a subjective process even with the model and evaluation criteria as guides. There is no accepted body of understanding about which measures of credit condition work best. Indeed, as the literature review in Part 1 of this report illustrated, a variety of approaches have been taken (although they frequently share common elements). In this case, some indicators were selected because they fit the evaluation criteria well, but others were selected because they fit the framework and the type of analysis that appears necessary for a comprehensive assessment of the level of outstanding debt. The indicators specified here represent one "ideal" set of indicators, and the rationale for their inclusion is discussed in detail later in the report. It is clear that other analysts at other times could create a different--but still valid--list.

In this regard, another logical step in a subsequent study would be to develop a data base for at least a sample of California jurisdictions and test the relevance of various indicators statistically using quantitative techniques such as factor and regression analyses. The ability to perform such analyses would require, of course, the availability of a data base of economic and fiscal variables for California state and local governments. As will be discussed in a subsequent section, a comprehensive data base of this type does not currently exist, and it is beyond the scope of the current project to develop such an analysis. Thus, the subjective nature of the indicators selection process is acknowledged but is also unavoidable.

## Evaluation Criteria

To distinguish among the many indicators available, four evaluation criteria were used initially. These include: (1) consistency; (2) scope; (3) simplicity; and (4) comparability.

The indicators selected obviously need to be *consistent* with the general theoretical framework described above. Thus, we are more interested in income trends than in the number of college students in a jurisdiction, since income would appear to represent a better--or at least broader-based--measure of economic activity than college students, even though a college student indicator was used in one study in the literature review.

In the same vein, we are also concerned with the *scope* of the indicators selected. To be of practical use, an indicator system must be applicable to California governments in the aggregate, as well as individually. Thus, we focus our indicator selection on factors that commonly applicable to most governments, rather than specialized factors that are found only in jurisdictions of a particular type. For example, a factor that might be used to analyze the credit strength of local governments is their level of state shared revenue. Since it must apply broadly, our model would be more interested instead in broader measures of government fiscal capacity, such as own-source income or overall revenue capacity.

To be useful the indicators selected also should be relatively *simple* to develop, to maintain, and to explain to policy makers. Complex formulations may cause problems because they often require analysts to make assumptions which are largely subjective, or they produce results that are difficult to interpret. The debt/wealth measure developed by Walter Tyler in the late 1960s and discussed in the literature review is an obvious example of this problem. The index could be used to provide important insights into the nature of creditworthiness, but it was based on a large number of subjective conclusions, not only about the factors that determine credit condition but about the relative role they play in that determination. Nonetheless, it is important to balance simplicity against the need to reflect what is in reality a very complex process. Thus, this factor must be balanced against the others.

Similarly, some of the more complex indicators require assumptions that go beyond available data. For example, the measures of fiscal health developed by Ladd and Yinger, also discussed in

the literature review, require separate estimates of a jurisdiction's revenue raising capacity (and the restrictions on it) and its "standardized" expenditure need. These features are useful in the context of the authors' analysis, but they would be less desirable in an analytical tool to be used on an ongoing basis.

A final major select criterion is *comparability*. Since there are no hard standards for most indicators of credit strength, it will inevitably be necessary to compare jurisdictions at some level to provide a frame of reference for judging performance. Thus, our preference is for indicators scaled for use in such comparative analysis. In general, data presented on a per capita basis, as a percentage of personal income, or through some other common base is more useful than raw statistics which provide absolute levels only. For this reason, the selection process generally rejects measures like total revenues as indicators and focuses on revenues per capita. Similarly, trends are best reflected in terms of growth rates rather than as absolute change over time--i.e., revenue growth should be evaluated as having grown at some annual percentage rate rather than in absolute dollar terms. Moreover, since one possible use of this information in aggregate would be to create interstate comparisons, it is important to gather data that is generally available and is therefore susceptible to interstate analysis.

Although there is a high degree of subjectivity in all of these indicators, they nonetheless provide a fairly clear group of indicators from among the many suggested by a review of the past research in the area.

### An Initial Evaluation

Appendix A shows a detailed compilation of indicators taken from the nearly three dozen studies discussed in the literature review. In total, the listing includes 151 indicators. Review of the range of indicators represented in this list suggests that it adequately covers the universe of possible fiscal measures for use in this study. The Appendix also contains an evaluation of the usefulness of the individual indicators based on the four evaluation criteria described above. The evaluation process is straightforward. If the indicator meets a particular criterion, it receives a plus (+). If it does not meet the criterion, it receives a minus (-). If it is unclear how well it fits a given criterion (perhaps because of uncertainties about the availability of data), it receives a zero (o).

This evaluation process shows that a large number of the indicators are consistent with the goals of the theoretical framework: they measure some critical aspect of government fiscal condition, the conditions in the economic environment in which government operates, or the condition of government credit position. But many are oriented toward the analysis of the credit or fiscal condition of local governments specifically and are too narrowly based for this study's requirements.

In general, most of the indicators are sufficiently simple to meet the test posed by that evaluation criteria; however, as will be discussed later, simple definition does not necessarily imply a simple process of finding and aggregating data to produce them.

A common problem with many of the indicators that originated with statistical studies of credit condition or fiscal health is that they do not meet the comparability criterion. For example, population is a commonly used factor in many of these studies because fiscal distress and credit performance are often highly correlated with the size of the jurisdiction under analysis. However, for comparative purposes, actual population size is probably less valuable than population growth trends.

Population would be a valuable indicator for analyzing substate data, since it makes sense to organize this information according to various population size categories, both to simplify the

analysis and to provide a method of distinguishing the clear differences between a city like Point Arena (population 484) and Los Angeles (population 3.3 million).

In some cases, it proved difficult to distinguish among the usefulness of some indicators. For example, governmental debt per capita and governmental debt as a percent of personal income both offer useful methods of viewing debt on a comparable basis. In this case, both indicators were selected in the interest of presenting a comprehensive picture of how government debt relates to the broader economy.

Having sorted through the large number of indicators available, a final set of 40 indicators were chosen for use in the assessment framework. This selection is based on identifying indicators that reflect the various components of the theoretical framework, with preference given to indicators that are commonly used by professionals in debt analysis. Figure 3 integrates the indicators that were actually selected as being the best set to measure the level of debt outstanding into the theoretical framework, while Appendix B provides definitions of the of the individual indicators used in the framework.

It is useful to consider the indicators and their use in assessing outstanding debt in terms of where they are located in the model. In the following sections, the various indicators and their implications are discussed in detail.

## **Outstanding Debt**

The first step in the assessment process would be to assemble information on what levels and types of debt are carried by government in California, how this debt has changed over time, and possibly how levels of debt in the state compare with aggregate debt levels in other states as a point of reference. Other information, such as the level of new issues by year is available and would also be a useful addition to the range of general information on the debt base which is envisioned in this phase of the assessment process.

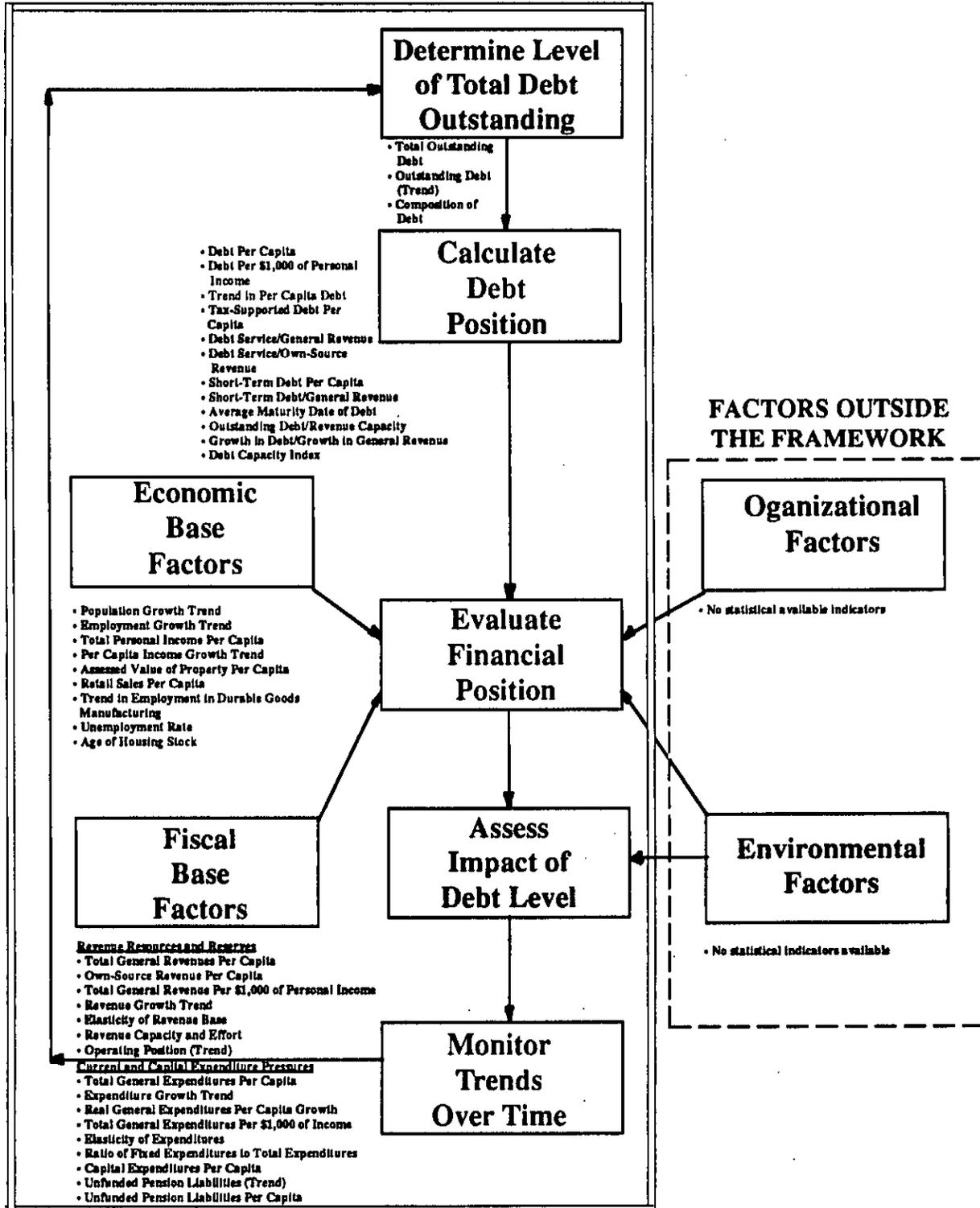
In gathering this information, it is important that all available debt information be collected and summarized. In subsequent segments, it will be useful to narrow the forms of debt actually evaluated, but at this point, the emphasis would be on identifying the full range of indebtedness outstanding against California governments with detailed information by type of debt instrument, type of jurisdiction, and term of the debt (short or long).

For California, this implies gathering information on an extraordinarily wide range of debt instruments, including general obligation bonds, a wide range of specialized debt instruments, including tax increment bonds, mortgage revenue bonds, industrial development bonds, sales tax bonds, and others. These various types of debt are summarized in Table 7. The proliferation of security instruments used in the state can, of course, be traced to the effects of Proposition 13 in the late 1970s. The Proposition limited the ability of local governments to finance their activities by restricting property tax increases and the use of general obligation debt. As a result, there has been a dramatic increase in the range of alternative bond sources authorized through the years, and as a result, California is a national leader not only in the amount of debt issued but also in the variety of instruments used.

California state and local governments also issue a variety of short-term debt instruments which, while not technically bonded debt, are a form of government indebtedness which has a role in the assessment of government's overall credit position. In general, short-term debt is defined to be debt payable within one year from the date of its issuance. In California, these short-term instruments can include tax and revenue anticipation notes (TANs and RANs), issued in anticipation of receiving tax or other revenue income in the future, and bond anticipation notes (BANs), issued

**FIGURE 3  
A FRAMEWORK FOR ASSESSING  
CALIFORNIA'S TOTAL OUTSTANDING PUBLIC DEBT  
WITH SELECTED INDICATORS**

**FACTORS INSIDE  
THE FRAMEWORK**



**TABLE 7  
MAJOR SECURITIES SOLD IN CALIFORNIA**

Type of Security	Issuer	Improvements Financed	Payment Source	Type of Approval
General Obligation Bonds	State and local governments governments	Real or personal property	Unlimited revenue resources of the government	Issuer's board and 2/3 public vote.
User-Supported Revenue Bonds	Cities, counties, special service authorities	Revenue-producing facilities	In most cases, user charges for revenue-producing facilities	Normally majority public vote.
Sales Tax Bonds	Transportation authorities, transit districts, and redevelopment agencies	Transportation facilities, mass transit systems, and any public purpose approved in the redevelopment agency plan, with 20% for low and moderate income housing	Dedicated sales tax revenue	Varies: Either issuer board by ordinance or issuer board approval and majority public vote.
Marks-Roos Bonds	City/county joint powers authority	Real property	Any local revenue source already received. May also used general fund pledge if other sources are inadequate.	Issuer's board by ordinance.
Local Facilities District Bonds	City/county district	Real property	Same as Marks-Roos	Issuer's board and 2/3 public vote.
Special Assessment Bonds (Various Acts)	Cities, counties, some special service districts, except schools	Improvements inside district, usually streets, sewers, and lights	Benefit formula spreads project cost on parcels in the district	Petition by property owners. Issuer board can initiate.
Mello-Roos Bonds	Cities, counties, service districts (fire, park, library, schools)	In or outside district, construction of schools, jails, libraries, etc.	Non-ad valorem tax based on any reasonable standard except value. (Floor space or acreage are commonly used.)	2/3 of district voters. If under 12 voters, owners get one vote per acre.
Commercial Rehabilitation District "Senior Obligation" Bonds	City/county "community rehabilitation districts"	Rehabilitation of public facilities outside redevelopment project areas	First lien on 25% of property tax within district plus optional fees and charges in district	Issuer's board approval and majority public vote.
Tax Allocation Bonds	City/county redevelopment agencies	Site clearance; general infrastructure usually in district	Tax increments in district	No vote required.
Certificates of Participation	Government entities with leasing/borrowing powers	Any legal purpose—often realty, furnishings, equipment	Lease rental, installment sales, or loan agreement payments	Issuer's board by ordinance.
Lease Revenue Bonds	Government entities able to issue revenue bonds and certain non-profits	Usually for real property	Lease rental from lessee's general or enterprise funds	Issuer's board by ordinance.
Mortgage Revenue Bonds	State agencies, city and county housing authorities, redevelopment agencies.	Single or multi-family rental housing	Mortgage payments, rental income, insurance	Issuer's board by ordinance.
Industrial Development Bonds	City and county authorities	Broad powers include manufacturing plants, industrial parks, day care centers, equipment, site preparation, retail facilities	Repaid by private enterprises	Action by issuer's board. May require filing for court validation.
Student Loan Bonds	California Higher Education Loan Authority, Inc.	Funding student loans or purchase of existing loans from private lenders	Loan repayment by student borrowers	State legislature authorizes.

Source: John W. Illyes, "Sorting Out California Credits," (Nuveen Research, March 1989), pp. 4-7.

to provide temporary financing for capital projects until long-term bonds can be marketed (presumably at lower interest rates). In 1986-87, short-term debt represented less than two percent of the outstanding debt of California state and local governments compared with a national average of just over two percent.

In this phase, the key indicators are the level of debt broken down by type and level of government and some general indicator of the trends in the various components of debt over time. Detail on the type of debt and its nature is important because the various types of debt have different implications for the fiscal condition of government, and these differences figure in the measures of debt position discussed in the next section.

## Analysis of Debt Position

The second step in the assessment process focuses on the development of indicators of the extent of debt usage by government. In effect, it is a process of converting the raw debt information developed in the first step of the framework into direct indicators of debt position. The indicators recommended in this segment of the framework are essentially of three types. The first are general measures of debt burden, which relate the outstanding debt figures developed in the first step in the assessment framework to various general measures of ability to pay--in this case, personal income and population. In effect, these introduce economic base-type factors into the analysis and provide indicators of how the *stock* of debt relates to the economic resources of the state.

The second set of indicators of debt position monitor the effects of the debt requirements imposed by this stock on the current fiscal operations of the government--in effect a measure of debt *flows*. In this case, our interest is in the annual debt service requirements and how they relate to the current income of government. Finally, we include two more complex indicators of debt position. One of these measures gauges the maturity structure of government debt, while the second is a statistical approach that estimates future debt capacity given past government fiscal relationships.

It is also important to note that the analysis distinguishes among types of debt. Some indicators deal with the absolute level of debt; however, the analysis should also be taken a step further to examine the level of "tax supported" debt issued by California governments and to examine the level of short-term debt. These special forms are discussed in greater detail below.

**Debt Stock Measures.** The framework includes five measures of general debt burden related to broader economic measures: (1) outstanding debt per capita; (2) debt per \$1,000 of personal income; (3) short-term debt per capita; (4) tax-supported debt per capita; and (4) the trend in debt per capita.

The debt per capita measure is included because it is one of the most common variables used to relate government debt to a broader measure of ability to pay and is routinely used in most studies and by the credit rating agencies. However, it is important to recognize that the measure does have shortcomings as an indicator, since population is not necessarily an appropriate measure of ability to pay. It implies that all citizens of the state have some fixed capacity to pay debt independent of their actual wealth. Nonetheless, the indicator does provide a rough measure of how the government debt burden theoretically is spread among the citizens of the state who presumably are ultimately responsible for it, and the per capita measure is commonly used for interjurisdictional comparisons. It is a useful general indicator of debt condition when viewed over time, hence the inclusion of the trend indicator.

Many of the same points and caveats apply to the per capita measures of short-term debt tax-supported debt. The short-term debt factor is included because the use of short-term debt in government operations is always suspect. If it is used appropriately--to smooth out the irregularities

of revenue flows and expenditure patterns--it presents no real problem. However, some governments have run into difficulties when they have begun using short-term debt to finance current operations, effectively rolling the debt from fiscal period to fiscal period, and while there appears to be only limited use of TANs and similar instruments by governments in California, it is an issue that should be monitored as part of a general assessment process.

Tax-supported debt is a concept used extensively by Moody's Investor Services and includes debt repaid from the general revenue (mainly tax) base of government. Such debt imposes a direct burden on the fiscal capacities of government and has the greatest potential capacity to affect the government's overall fiscal condition. It is the most likely type of debt to affect the ability of government to respond to future needs. It is separated from other, self-supporting forms of debt, such as revenue bonds, because, in theory at least, the issuance of true revenue debt repayable from sources generated by the bonded activity (e.g., industrial development bonds, mortgage revenue bonds) requires no drain on future tax dollars and places less of a direct burden on government fiscal capacity.

The difficulty is in drawing the line between what is tax-supported debt and what is not. This is a particular problem in California because of the range of debt instruments authorized for use by state and local government. For example, there is a trend toward rising use of sales tax bonds by transit authorities and redevelopment agencies. The security for these bonds is sales tax income from the tax levied in the affected area. While these sources do not impose a burden on the general revenue base of local government generally, they do affect the ability of local (and state) government to use the sales tax for additional purposes and so should be included in a conservative definition of tax-supported debt.

Even more unclear are the various "limited obligation" bonds used by many local governments in lieu of general obligation debt. For example, Marks-Roos and local facility district bonds can be secured by any local revenue source already received (e.g., sales or property tax; impact assessments) and may be supported by a general fund pledge to back pledged revenues if these prove insufficient. In both cases, the assumption made here is that these securities should be included in a conservative definition of tax-supported debt because again they impose a burden on the general revenue base of the jurisdiction (and of surrounding jurisdictions).

Even general obligation bonds pose some problems of interpretation, since some general obligation bonds are self-liquidating and impose no direct burden on the tax base (unless, of course, they default). The most familiar example of this type of debt is veterans' farm and home building bonds which are repaid by mortgage payments. These self-liquidating sources of general obligation debt should be excluded from the overall tax-supporting category. (On the other hand, partially self-liquidating debt, like school building aid bonds would be considered tax-supported since the issue in this case is where the tax support is derived--from state government or from local school districts.)

The various forms of debt used in the state and comments on their inclusion or exclusion from the definition of tax-supported debt is shown in Table 8. Again, the per capita approach is used to give the measure scale and to allow interjurisdictional comparisons.

One commonly used measure of the stock of debt outstanding that is not used in this analysis is the relationship of debt to the assessed value of property in the state. This measure is often used in analyzing municipal debt, since it reflects the tax base of the most important source of local funding--the property tax. The indicator is rejected for use in this framework since much of the debt being analyzed here is state debt (roughly a third of the total), and little of this debt is even indirectly supported by the property tax (except perhaps school aid bonds).

Instead, it is recommended that a ratio of outstanding debt to government revenue capacity be used. (The revenue capacity concept was described in the literature review and is discussed in

**TABLE 8**  
**CLASSIFICATION OF CALIFORNIA SECURITIES**  
**AS TAX-SUPPORTED OR NON-TAX SUPPORTED (1)**

<u>Type of Security</u>	<u>Tax-Supported?</u>	<u>Type of Security</u>	<u>Tax-Supported?</u>
General Obligation Bonds	Partial (2)	Commercial Rehabilitation District "Senior Obligation" Bonds	Yes
User-Supported Revenue Bonds	No	Tax Allocation Bonds	Yes
Sales Tax Bonds	Yes (3)	Certificates of Participation	Partial (4)
Marks-Roos Bonds	Yes	Lease Revenue Bonds	Partial (4)
Local Facilities District Bonds	Yes	Mortgage Revenue Bonds	No
Special Assessment Bonds (Various Acts)	Yes	Industrial Development Bonds	No
Mello-Roos Bonds	Yes	Student Loan Bonds	No

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Source: KPMG Peat Marwick, Policy Economics Group.

(1) Tax-supported debt in this instance is broadly defined to be any debt which relies on or constrains (through dedication or special commitment) the general revenue resources of a jurisdiction.

(2) General obligation funds for certain special purposes not directly payable from general fund sources would be excluded--e.g., veterans' farm and home bonds, water development bonds.

(3) Represent a narrow dedication of taxing authority, limited to a portion of the sales tax. These instruments counted as tax-supporting because they effectively limit the use of a portion of the sales tax base by other units of government.

(4) Whether these instruments are counted depends on who is doing the leasing. If government is leasing, they would be counted; otherwise, they would not.

some detail later in this paper.) Revenue capacity is a measure that has been developed by the U.S. Advisory Commission on Intergovernmental Relations (ACIR) and other researchers to assess the full range of capability government has to raise funds from available revenue bases, including sales, property, and income taxes, as well as various miscellaneous taxes and fees. This concept would have only limited applicability for the analysis of individual local governments, for example, because the data simply are not available; however, it is available for the state as a whole (and offers the opportunity for interstate comparisons).

A final debt stock measure included in the indicator list is a comparison of the change in the level of outstanding debt (tax-supported debt again) to the change in total governmental revenues. As a matter of prudence, experts suggest that the growth rate in debt outstanding (e.g., seven percent a year) should not exceed the growth in government revenue (e.g., ten percent a year). There are obviously cases where major new initiatives are being financed where this "rule" would reasonably be violated, but a consistent pattern of debt growth exceeding revenue growth would be a cause for concern.

**Debt Flow Measures.** Moving beyond the general measures of debt burden, the second group of indicators in the debt position component of the framework seek to monitor the relationship between current debt requirements and the overall fiscal operations of government. In effect, rather than monitor the stock of debt, they monitor the flow of debt obligations on a current basis--that is, what burden debt imposes on the government's current fiscal operations.

The debt flow indicators are related to debt service payments on outstanding debt. Debt service includes the principal and interest paid on the types of long-term debt included in the measures of outstanding debt discussed earlier. Self supporting debt, where debt service is totally paid from project revenues, should be excluded. The definition would, however, include amounts paid into sinking funds in the case of term bonds. In general short-term debt, principal payments are would not be included in this measure. The proceeds of a long-term bond sale repay bond anticipation note principal amounts, while tax anticipation notes are mainly a matter of the timing of the revenues and not their use. Interest payments on short-term debt would be included in the debt service amount.

The measures included in this group of indicators are: (1) debt service as a percent of government general revenue; and (2) debt service as a percent of government own-source general revenue. (In reality, debt service is often presented as a percentage of expenditures as well. Either approach is valid; however, the revenue-based approach appears to be more common and is therefore used here. At times the inverse of the debt service/revenue ratio is used and is called the "coverage ratio" because it represents the ability of revenue flows to "cover" debt service.)

In this case, we have selected two flow measures differentiated by the definition of government income used. The first measure uses a Census Bureau definition of general revenue and relates debt service to the broad range of revenue resources available to government. This definition does *not* include general fund revenues alone but covers all normal revenues of government except such special categories as charges received for services from utility operations and liquor store revenues (in state which run liquor enterprises), mainly as a method of facilitating interstate comparisons. It includes such sources as taxes, fees, intergovernmental aid, and various other miscellaneous sources. (Care must be exercised in deriving this definition under the current framework to avoid double counting intergovernmental sources since more than one government is involved. In general, local aid derived from state or local sources would be excluded from the totals for general revenues for this reason.)

The second measure--relating debt service requirements to own-source revenues--begins with a similar revenue definition but excludes intergovernmental revenue. This is normally done as a more conservative approach, since intergovernmental aid--whether from the state, federal, or local

sources--is considered more unreliable than taxes and similar sources from government's own resources. Uniquely, this is one of the few indicators where experts have attempted to identify a rule of thumb indicator of fiscal health. In a 1976 study reviewed in the literature review, Richard Aronson and Eli Schwartz suggested that debt service requirements exceeding 20-25 percent of own-source revenues (40 percent with total short-term debt added to debt service) was a clear danger sign for an individual jurisdiction.<sup>99</sup>

**Other Measures.** Two other measures included in the analysis of debt position attempt to gauge the impact of future commitments. The first of these, labeled average maturity of debt in Figure 3, is designed to reflect the average maturity term (in years) of long-term debt. An average maturity rate of ten and one-half to 15-year range is generally considered a safe area for individual jurisdictions. Shorter average maturity rates would be a sign of possible fiscal problems.<sup>100</sup>

The second indicator in this category is the debt capacity indicator developed by James Ramsey and Merlin Hackbart and discussed in the literature review.<sup>101</sup> The index is based on variables thought to be important in establishing municipal credit ratings and uses econometric techniques to identify the relationship between past levels of debt burden and other fiscal characteristics of government and to project them into the future based on various assumptions about the growth in the state economy and government revenue base. In effect, it allows the analysis of future debt levels based on past conditions and permits analysts to examine how varying economic assumptions would affect the credit capacity of government in the state. While far more speculative than other measures, it introduces a more sophisticated level of analysis to the issue of debt position.

## Economic Base Indicators

Although the indicators in the debt position segment of the framework obviously contain some general economic and fiscal aspects, it is important that the broader issue of the state's economic health be examined as part of the assessment of outstanding debt. There is a wide range of potential economic indicators to choose from, and there probably is no "ideal" set. However, certain economic factors clearly should be included in any analysis, and these were selected for use in the economic base component of the theoretical framework.

Some of these measures were selected because they reflect not only the condition of the economy but also economic trends over time. Three clear examples of this are the growth trends in population, personal income, and employment. These reflect the direction of the the great moving forces in the economy--population, jobs, and income, and they are closely tied to the overall fiscal health and capacity of government. So long as these factors are performing briskly, the fiscal health of governments generally will be strong, and except in exceptional cases, the debt burden on government should remain manageable--assuming it was manageable to begin with and has not been expanded at an unreasonable rate.

Other indicators included in this component measure the sheer size and capacity of the economy at a given point in time. These include the level of personal income per capita, retail sales per capita, and assessed value of property per capita. These general indicators were also selected because they reflect the three major tax bases used by state and local government--income, sales, and property. (It is important to note that while the property value measure is an important indicator,

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<sup>99</sup> J. Richard Aronson and Eli Schwartz, "Determining Debt's Danger Signals," *Management Information Service Report*, Vol. 8, No. 12 (Washington, D.C.: International City Management Association, December 1976), p. 14.

<sup>100</sup> Lennox Moak and Albert M. Hillhouse, *Concepts and Practices in Local Government Finance* (Chicago: Municipal Finance Officers Association, 1975), p. 276.

<sup>101</sup> James R. Ramsey and Merlin M. Hackbart, "State and Local Debt Capacity: An Index Measure," *Municipal Finance Journal*, Vol. 9, No. 1 (Winter 1988), pp. 7-18.

California law makes it a difficult measure to use in practice because certain elements that determine values--new construction, the two-percent increase limitation, and sales reassessment values--cannot be sorted out in practice.)

Finally, three indicators of potential economic difficulty have been included to reflect possible pressure points on government. These include the trend in employment in durable goods manufacturing, the unemployment rate, and the age of the housing stock. The trend in durable goods manufacturing is included because durable goods manufacturing is one of the most cyclical industries and is most highly affected by national economic trends. Thus, changes in employment trends in the industry (and acts as a leading indicator of broader trends in the economy). Viewed over time, the unemployment rate also reflects trends in the economy, rising and falling with the business cycle, while the number of persons below the poverty level indicates the type of social service demands that may face government.

The age of the housing stock is included as an indicator of the overall condition of the state's infrastructure. The measure used here is the percent of the housing stock built before 1940. The assumption is that older jurisdictions frequently are characterized by declining property values, obsolescent manufacturing facilities, and deteriorating public facilities. Increasing needs and declining resources of this type would obviously tax the resources of government. Governments are increasingly acknowledging the importance of infrastructure considerations on their responsibilities for the future, but this clearly is one area where considerable research needs to be directed to develop better indicators of the likely impact of future indicator demands.

### **Fiscal Base Indicators**

The final major component of the theoretical framework contains the measures of the government fiscal base apart from the indicators of debt position already described. As Figure 3 shows, there are essentially three types of these indicators: (1) measures of the government's revenue resources; (2) measures of the governments current and capital expenditure burden; and (3) measures of the government's overall operating position--essentially the balance, positive or negative, between current revenues and current expenditures.

**Revenue Resources.** The ability of government to raise revenues now and in the future is crucial to its overall fiscal health, and it is central to the pledge--whether full faith or limited--that underlies debt financing. In part, this ability is reflected in the economic base measures discussed earlier; however, there are several indicators that deal directly with current and prospective income-raising ability that must be included in this component of the framework. The measures selected reflect the current revenue base and its performance and the revenue capacity of government.

In the framework, the indicators which reflect revenue base and performance are: (1) total revenues per capita; (2) total own-source revenues per capita; (3) total revenues per \$1,000 of personal income; (4) the growth trend in general revenues; and (5) the elasticity of the revenue base.

In this case, the per capita measures give a sense of scale to actual collection figures by relating them to broad measures of ability to pay--population and income. As in the case of the debt indicators discussed earlier, these measures were selected in part because they are familiar and commonly used and partly because they provide useful insight into the relative demands government places on its citizens. They are also a useful point of departure for interjurisdictional comparisons. (Unique features of the revenue mix and shifting composition of the revenue base can be discovered by comparing per capita revenue indicators for the state with other states over time.)

Also as in the case of the debt measures, the focus is one total general revenues--a broader concept that general fund income--and on total own-source revenue, which excludes often volatile

intergovernmental sources. The gap between general revenue and own-source totals is an important feature of the revenue system to be monitored over time. It is important that government not become too reliant on intergovernmental sources, although with reductions in federal programs over the last decade, that has not been a significant problem for most state and local governments.

In addition to these general indicators, the framework also includes two measures designed to assess current revenue performance. One is the growth trend in revenues. Again, it would be useful to chart both general revenue growth and growth in own-source revenues. The other measure tracks the elasticity of the revenue base. Elasticity refers to the rate at which the revenue base grows with growth in the economy, and the measure is essentially created by relating the growth in the revenue base over some period (e.g., 1980-89) with the growth in the state economy--normally represented by growth in personal income--over the same period. For example, if revenues grew by ten percent and income grew by ten percent, the revenue system would have an elasticity of 1.0.

In general, it is desirable for the revenue system to have an elasticity of 1.0 or better, implying that the system grows at or above the rate of growth in the economy. State and local revenue system with a significant income tax component are most likely to have an elasticity at or greater than 1.0. An elasticity value of less than 1.0 implies that the revenue system does not grow with the economy, which can have dangerous results for government fiscal position if the demands place on it are growing more rapidly than the economy. This condition is frequently found in local governments in fiscal distress, as they lose tax base through outmigration of business and individuals at the same time that social service and infrastructure demands are mounting. An elasticity of less than 1.0 may suggest a deteriorating tax base or overreliance on income sources--such as per-gallon fuel taxes or various fees--that do not grow with the economy because of the nature of their bases and rates.

A particular difficulty with using the elasticity and growth trend measures on a statewide level is the need to understand what forces are driving the growth that is observed. After a major tax increase, the "elasticity" of an unadjusted revenue system would appear to rise dramatically, but all that is occurring is the influx of new income. To reflect the actual performance of the revenue system, adjustments need to be made to eliminate the effects of major tax changes in order to produce a consistent base line revenue total over time--that is, a set of figures for revenue collections that reflects a common tax base over time. With aggregate data of this type, making this type of adjustment would pose significant problems. There is likely to be very good data for making base line adjustments in state totals and for major local jurisdictions, but for many local jurisdictions, such information, even if the resources were available to collect it, would most likely simply not exist. In practice, this problem can be dealt with to some degree statistically, but it unlikely to ever be completely resolved.

The second set of revenue measures in the indicator framework are designed to reflect the revenue capacity of government--that is, its ability to raise additional revenues. Revenue or fiscal capacity is the ability of government to use a particular set of revenue sources, normally including major tax and fee sources. To be of use, the measure must take into account the various legal constraints on major state and local sources. Most states have at least some limitations, and California is no exception. Under the state Constitution, the growth in a wide range of state and local appropriations cannot exceed the change in inflation and population.

Once the legal constraints on revenues are understood, there are several approaches to measuring capacity. One of the most familiar has been developed by the U.S. Advisory Commission on Intergovernmental Relations (ACIR), which publishes fiscal capacity analyses on a regular basis.<sup>102</sup> Under the ACIR approach, uniform national average tax rates are applied to appropriate tax

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<sup>102</sup> See, for example, U.S. Advisory Commission on Intergovernmental Relations, *1986 State Fiscal Capacity and Effort* (Washington, D.C., Report M-165, 1989).

bases for each state with appropriate adjustments for legal restrictions on the tax base. The hypothetical revenues generated by this process are then compared to the actual income from the tax in the state (its fiscal effort). Thus, if the state combined state and local sales tax rate is six percent as in California, this rate is compared to the average national rate. The difference between the rates multiplied by the California sales tax base represents California's capacity for using the sales tax. This process is repeated for major revenue sources and combined to provide the overall level of capacity available to the government. (Other analysts have developed statistical techniques for estimating capacity that differ from this process in all but the end intention of identifying how much "play" exists in a government's revenue system.) In combining the ratio of actual revenues to revenue capacity provides a rough measure of the reserves available to government.

One final note on the use of the capacity index are the obvious practical limitations that must be considered in interpreting its meaning. One of the major criticisms of the revenue capacity measure is that it ignores the political realities faced by many governments. While it would try to adjust for legal limits on the use of the property tax, it would not discriminate in cases where there was significant public resistance to a given taxing approach--i.e., opposition to the income tax in states without the tax. In this case, this should not present an insurmountable problem, since California uses virtually all of the major revenue sources included in the ACIR approach.

**Expenditure Measures.** In the theoretical framework, the expenditure measures reflect the demands--other than debt service--that draw on the government's available resources. In this case, the indicators selected can be divided among: (1) those measuring general expenditure levels and growth; (2) those measuring the growth of particular types of expenditures, like capital outlays and fixed (i.e., mandated) expenditures; and (3) measures of the unfunded liabilities of government, primarily in the form of unfunded pension fund liabilities.

Like the revenue measures, it is important on the spending side to select several indicators reflecting the size and growth of expenditures. Thus, the framework includes measures of total general expenditures per capita, expenditure growth trends, and total general expenditures per \$1,000 of personal income. These provide indications of how government expenditures relate to broader economic measures. By relating expenditures to population and personal income, it is also possible to compare expenditure levels with the revenue levels discussed earlier.

This segment of indicators also includes a measure of the "elasticity" of the expenditure base, calculated in the same way as the process described for revenues above. In this case, we are again interested in how expenditures grow in relation to the general economy. Interpretations of the meaning of this elasticity measure may depend on the point of view of the analyst. From a conservative point of view, we would prefer this figure to be at or below 1.0, meaning that expenditures are growing no faster than the economy (indeed, as noted earlier, California has a constitutional requirements based on limiting expenditures to the growth in inflation and population). Others might desire that the growth rate be faster than the economy over some periods when demands were especially great. In any case, it would generally be desirable that the elasticity of the revenue and expenditure systems more or less match, although with the use of debt and various non-revenue measures such as accounting adjustments, there may be periods when the elasticity of the expenditure base will significantly exceed the elasticity of the revenue base. Such instances should be identified and carefully monitored through the assessment framework.

One factor included in the expenditure component that does not track the revenue side of the equation is the measure of real general expenditure growth per capita. This measure adjusts for both population and inflationary growth and seeks to reveal the rate at which government is growing in real terms--that is, growth that shows up in this measure represents the real expansion of government services and cannot be explained by rising prices or a growing service population. Even in California where expenditures are controlled to some extent by constitutional restrictions, this indicator is important because it reflects rising expenditure pressures on government. Instances in

which debt trends and expenditure growth trends were heading up strongly and revenue growth trends were not would signal potential trouble for government.

The second set of expenditure indicators measure particular types of expenditures which have significant implications for government's overall fiscal position. In a debt assessment framework, one important indicator is the level of capital expenditures per capita. It is critical to understand and monitor the government's commitment to longer-term assets.

Another important indicator in this group is the level of fixed expenditures per capita. In this case, fixed expenditures are defined as expenditures required by federal or state mandate or because of statutory or constitutional dedication of revenues to a particular purpose such as education or highways. These expenditures should be closely monitored because they restrict government's flexibility in responding to fiscal crises. In effect, they can act to lock the government into certain types of spending over extended periods.

A final special set of expenditure measures are the level of unfunded pension liabilities per capita and its trend. When governments participate in pension systems, they promise to compensate employees at retirement. Because of a variety of factors such as demographics, inflation, and investment performance, the government's actual future pension liabilities are uncertain. Moreover, governments have considerable discretion in how they fund their pension systems. In combination, these conditions can lead to a situation where the pension funds are not adequately funded, and in fact, most systems have some level of unfunded liabilities. The purpose of these indicators would be to measure the degree to which this situation is occurring. A high or rising level of such liabilities can spell future trouble for government.

The major difficulty in using the unfunded liability totals is that this information is difficult to come by and is not regularly aggregated for the state as a whole.

**Operating Position.** The final component of the fiscal base segment of the framework is operating position. In this case, operating position is a measure of government's ability to balance its budget on a current basis. For these purposes, the indicator is created by comparing revenues to expenditures. If expenditures exceed revenues, the operating position of the government is in a deficit position. If revenues exceed expenditures, the government's operating position is in surplus. An operating deficit is a sign of fiscal trouble if it is either large relative to the size of the revenue base (e.g., more than one or two percent of total income) or if it persists over several years.

It is important to note that this measure does not attempt to sort out the actual cash surplus and deficit of California governments. In many cases, accounting surpluses and deficits are dictated by the availability of existing fund balances or other resources other than current revenues, and their meaning may be lost in a welter of accounting conventions and approaches. The indicator specified for use here is just another way of looking at the relationship between revenues and expenditures and is appropriate to the level of aggregation involved in the framework.

### **Other Components of the Framework**

Given the set of indicators specified above, the next phase of the process outlined in Figure 3 is to put the data together to assess the level of outstanding debt. Again, this primarily would be a matter of analyzing the available indicators for their level and trend over time and possibly for how they compare with similar indicators in other states. The range of indicators should provide a good basis for judging the level of debt and how it affects the overall financial health of government.

The final component of the framework requires the analysis of all trends over time and recycles the process back to the beginning to the determination of the level of outstanding debt for a new year.

Although it is based on many commonly used indicators of government fiscal health and credit condition, the framework presented above has a number of limitations which need to be clearly understood. The most important of these is the availability of data to create the various indicators. In the next section the various technical issues related to the implementation of the indicator framework are discussed in detail.

## TECHNICAL ISSUES

Despite the relatively straightforward nature of the indicator set that is recommended, there are several important technical issues regarding the indicators which should be discussed. Most of these were problems identified in various studies in the literature review and are common in this area of analysis. They include the lack of consistent standards for applying the various indicators, the lack of data to create the indicators, problems with existing data sources, and the question of interstate comparisons. Also discussed in this section is how the indicators selected in this study compare to earlier work prepared for the Commission.

### Lack of Standards for Assessment

Ideally, it would be possible to develop the list of credit indicators for the state as a whole and to compare them to some set of existing standards that would indicate whether current performance is or is not satisfactory. In such a case, the further the condition departed from the standard, the further the condition deviates from a healthy or desirable state. The standard would function much like body temperature--deviations from normal would signal cause for concern and might help point to the problem as well.

Unfortunately, there are few such standards in government fiscal analysis. There are a few benchmarks used by the credit rating industry and cited by Aronson and Schwartz in their study of debt "danger signals" (see Table 5). But for many of the indicators recommended in this study--and indeed for most indicators of fiscal condition generally--there is little formal agreement on what constitutes good performance, what does not, and where the dividing line between good and bad is drawn. As the model framework suggests, the impact of debt load on government is a function of a number of closely interrelated factors, and as such, a weak credit condition would in all likelihood be reflected in several of the indicators deteriorating over time, not to a single boundary crossed or mark exceeded.

One direction for future research might be to attempt to define a set of standards for evaluating California state and local governments. Such standards might be based on the experience in the state and would almost certainly require the input of experts in the field of analyzing California municipal debt. Until such standards are developed--if indeed they can be--the indicators developed in this study will have to be used as one part of a process of analyzing credit condition and not as a single point of reference.

### Data Availability

One of the most difficult problems for any study of this kind is the availability of data to actually create and maintain the indicators specified in the model. In this regard, Table 9 summarizes the indicators and discusses the data currently available to produce them.

**TABLE 9  
AVAILABILITY OF DATA FOR INDICATORS  
FOR STATEWIDE ANALYSIS**

Indicator	Information Readily Available	Partial Information Available	Information Not Currently Available	Source of Available Data
<b>Level of Outstanding Debt</b>				
1. Total Outstanding Public Debt (and Trend)		X		State debt totals are available from the State Treasurer; sources of local information include State Controller financial transactions reports; U.S. Bureau of the Census, Government Finances, various years; and California Municipal Statistics, Inc. All sources have limitations. Example: State Controller data for counties excludes lease obligations under 10 years and is unaudited.
2. Composition of Debt		X		Same as above.
<b>Debt Position Indicators</b>				
1. Outstanding Debt Per Capita		X		Same as above; population data from U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System; U.S. Bureau of the Census; and California Department of Finance (projections).
2. Outstanding Debt Per \$1,000 of Personal Income		X		Same as above; personal income data from U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System.
3. Trend in Debt Per Capita		X		Same as above.
4. Net Tax-Supported Debt Per Capita		X		Same as above. Detail for identifying tax-supported debt may be limited at the local level because of aggregation in reporting.
5. Ratio of Debt Service Requirements to Total General Revenues		X		Information for the State is available from the State Treasurer; sources of local information include the Census Bureau and the Controller's transaction information. (There are limitations to Controller's published data. City debt service amounts are included in operating expense totals; county data reports debt service amounts. Revenue information appears well defined and generally available.)
6. Ratio of Debt Service Requirements to Own-Source Revenues		X		Same as 5, except revenue totals would exclude all sources identified as Intergovernmental by state and local governments. For the State, this includes all income derived from the federal government or from local sources. For local governments, this would include state and federal aid, shared state taxes, and income from other units of local government.

**TABLE 9**  
**AVAILABILITY OF DATA FOR INDICATORS**  
**(Continued)**

Indicator	Information Readily Available	Partial Information Available	Information Not Currently Available	Source of Available Data
<b>Measures of Debt Position--Continued</b>				
7. Short-Term Debt Per Capita		X		Information for the State would be available from the State treasurer; sources of local governments does not appear to be specifically collected by the State but may be available in aggregated form from California Municipal Statistics.
8. Ratio of Short-Term Debt to Total General Revenues		X		Same as above.
9. Average Maturity of Debt		X		Information for the State would be available from the State treasurer; data for local governments are not available from State sources but are maintained by California Municipal Statistics for most individual units.
10. Growth in Debt Relative to Growth in Revenues		X		Extensive data on State; Controller and Municipal Statistics data for local units.
11. Debt Capacity Index		X		Same as above.
12. Ratio of Debt to Revenue Capacity		X		Debt information same as items above; revenue capacity estimates from the U.S. Advisory Commission on Intergovernmental Relations.
<b>Economic Base Measures</b>				
1. Population Growth Trend	X			U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System; U.S. Bureau of the Census
2. Employment Growth Trend	X			U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System; California Employment Development Department, Labor Market Information Division.
3. Total Personal Income Per Capita	X			U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System.
4. Per Capita Income Growth Trend	X			Same as above.
5. Assessed Value of Property Per Capita	X			Data available from State Controller and from California Municipal Statistics.
6. Retail Sales Per Capita	X			Department of Finance, sales tax records, sales by major industry code.

**TABLE 9**  
**AVAILABILITY OF DATA FOR INDICATORS**  
(Continued)

Indicator	Information Readily Available	Partial Information Available	Information Not Currently Available	Source of Available Data
<b>Economic Base Indicators--Continued</b>				
7. Trend in Employment in Durable Goods Manufacturing	X			U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System; State Employment Development Department
8. Unemployment Rate	X			U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System; California Employment Development Department, Labor Market Information Division.
9. Percent of Housing Stock Over 40 Years Old		X		U.S. Department of Commerce, Census Bureau, U.S. Census of Housing and Annual Housing Survey.
<b>Revenue and Operating Position Measures</b>				
1. Total General Revenues Per Capita	X			Information for the State is available from the State Treasurer; sources of local information include the Census Bureau and the Controller's transaction information. Population data from U.S. Department of Commerce sources.
2. Tax Income Per Capita	X			Same as above.
3. Total General Revenues Per \$1,000 of State Personal Income	X			Same as above.
4. Revenue Growth Trend	X			Same as above.
5. Elasticity of the Revenue Base		X		Revenue data are readily available (see above). Information on legislative changes is readily available for State sources but is unavailable for local sources.
6. Fiscal Capacity and Effort	X			Statewide information for California is available from the U.S. Advisory Commission on Intergovernmental Relations. Estimates for most local governments is not available. Data are only available through 1986.
7. Operating Position (Trend) [Excess (Deficiency) of General Revenues Over Net Expenditures]		X		State information is available in state annual financial reports; local fund balance information is collected but not reported by the State Controller.

**TABLE 9**  
**AVAILABILITY OF DATA FOR INDICATORS**  
(Continued)

Indicator	Information Readily Available	Partial Information Available	Information Not Currently Available	Source of Available Data
<b>Expenditure Measures</b>				
1. Total General Expenditures Per Capita	X			Information for the State is available from the State Treasurer; sources of local information include the Census Bureau and the Controller's transaction information. Population data from U.S. Department of Commerce sources.
2. Expenditure Growth Trend				Same as above.
3. Real General Expenditures Per Capita Growth Trend	X			Same as above. Inflation adjustment would use the Implicit Price Deflation for Purchases of Government Goods and Services (state and local government component), calculated by the U.S. Department of Commerce, Bureau of Economic Analysis.
4. Total General Expenditures Per \$1,000 of State Personal Income	X			Same as above. Personal income information from U.S. Department of Commerce sources.
5. Elasticity of Expenditures		X		Same as above.
6. Ratio of Fixed Expenditures to Total General Expenditures			X	No source of this information was found. State information would be available through the Legislative Analyst. That is, the agency should maintain information on expenditures by type that could be used to make the distinction between fixed and total general expenditures. There is no specific source of the data. No source of local data could be identified.
7. Capital Expenditures Per Capita		X		State information is available through the annual financial report; local data are available through the Controller's transactions for total capital outlay, which would include all fixed assets (including furniture and fixtures).
8. Unfunded Pension Liability (Trend)			X	State totals would be available from state pension agencies; local amounts are not available on an aggregated basis.
9. Unfunded Pension Liability Per Capita				Same as above. Population information available from U.S. Department of Commerce sources.

Source: KPMG Peat Marwick, Policy Economics Group, November 1989.

In general, the economic base indicators--such as population, employment, and income--are readily available on a timely basis at the state level and are generally available for many of the larger cities and counties in the state. None of the nine recommended economic base indicators appear to pose serious data problems, and in virtually all cases, the data that can be obtained will have relatively little time lag and will come from central sources (e.g., the federal government) from which interstate comparisons can be drawn.

Easy data availability is less certain among the fiscal base and debt position measures. In general, the information needed to create these indicators is available now in California in some form, although considerable work would be needed to assemble it into a central data file for analytical purposes. In this regard, it is fortunate that state law requires the various units of local government to file summary financial information reports with the State Controller, who maintains this information in a computer file and publishes the information on an annual basis, with a lag of about a year and a half.<sup>103</sup> (For example, the 1987-88 publication for California cities became available at the end, which would be less than 18 months after the close of most cities' 1988 fiscal years.)

Because the information in the Controller's reports is self-reported by local governments on a standardized form, there has been some question as to the reliability of the information compared with more widely known sources. Although there is always concern about the quality of data collected from so many sources with such a wide range of capabilities, there is no reason based on cursory examination to believe that the data is inferior to other available sources.

In fact, the other sources available are fairly limited. The U.S. Census Bureau publishes aggregate data on debt along with other financial information on state and local government, but it draws on many of the same sources as the Controller's data. California Municipal Statistics, Inc. (CMS), a private San Francisco firm, maintains an extensive data base on government fiscal and debt statistics, but it is difficult to assess the value of this information without an extensive examination of it. In a 1982 report, the Legislative Analyst Office did review the CMS data and pronounced it "relatively comprehensive."<sup>104</sup>

There are, for example, several limitations on the usefulness of Census Bureau data on local government finances. To begin with, the time lag is longer than the Controller's data--with a lag of about two years between the end of a fiscal year and publication of a report drawn from it. The data are also much less detailed than the Controller's report, particularly for debt measures, where the only measures calculated within each government category are total (i.e., statewide) outstanding debt, total long-term debt, which in turn is subdivided into "general obligation" and "non-general obligation" categories. The Controller's data contain more detail for individual jurisdictions, including some information on the type of debt outstanding and its maturity schedule.

Also, it is important to note that the Census Bureau does not collect data from every governmental unit, but instead extrapolates statewide totals from a sample of jurisdictions. Since it is unlikely that the extrapolation is perfect, it is also unlikely that the data actually reported by the Census are an exact reflection of true fiscal conditions in a given state.

In addition to the annual *Government Finances* (and the accompanying *City Government Finances* and *County Government Finances*), the Census Bureau also publishes a Census of Governments every five years. This census is based on a 100 percent sample of governments, much

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<sup>103</sup> See, for example, State Controller, *Annual Report of Transactions Concerning Cities of California* (Sacramento, various years); *Annual Report of Transactions Concerning Special Districts of California* (Sacramento, various years); *Annual Report of Transactions Concerning School Districts of California* (Sacramento, various years) and *Counties of California--Financial Transactions* (Sacramento, various years).

<sup>104</sup> Legislative Analyst, "The Use of Tax-Exempt Bonds in California," p. 155.

as the Controller's data are. This helps reduce the sampling error problems inherent in this type of data. It has somewhat more detailed financial information than *Government Finances*, but the time lag would appear to make it even less useful for timely analysis of credit condition. For example, the 1987 census is expected to be published by the end of 1989, meaning a new census will not be conducted until 1992 and will not be published until 1994.

CMS primarily produces credit reports on government debt issues for clients. Thus, its primary efforts are not directed at maintaining and presenting centralized information. The question would be how comprehensive the information is and how reliable the updating process is.

There are two final important points about data to be drawn from this discussion. First, if the reliability of state level data from state sources is a question, it would be possible to study a sample of California local governments to identify where the problems lie. Presumably, it might then be possible to refine and improve the data collection process to reduce the data problems.

Second, it would be possible for the Commission to seek legislation to require local jurisdictions to report more extensively to them. This probably will not be one of our recommendations because it would place an undue burden on local governments and might easily suffer from the same problems of reliability that plague other attempts to gather complex financial data from hundreds of local governments. Better for the Commission to work through the Controller to improve the data.

### **Interstate Comparisons**

Using this basic set of indicators, it appears that a valid (though possibly not complete) set of interstate comparisons could be developed. At the statewide level, this would be a useful addition to the indicator process and would help to provide another frame of reference for the analysis. Based on the findings in the literature review, the usefulness of extending this interstate comparative analysis below the state level may be questionable. Although comparisons clearly could be made among major jurisdictions, there simply is too much variability among state and local responsibilities nationally to allow easy comparisons to be made at a more detailed level without significant data development and analysis. They would also require a significant amount of work to maintain over time.

Development of interstate comparisons is an area where data available from the Census Bureau is likely to be important. Few states will match the level of data collected from local governments in California, and even if the data were available, it would be a huge burden to reconcile state-by-state. For these reasons, valid interstate comparisons are likely to be drawn from *Government Finances* and other federal publications.

### **Comparison with the *Handbook***

One important final issue is how the indicators in this report compare to those in the *Handbook* for use by local governments that is being developed by the Commission.<sup>105</sup> A comparison of the indicators used in the two studies is shown in Table 10. A total of 52 separate indicators are used in the two studies, with the two matching on only six indicators: debt outstanding, debt outstanding (trend), per capita income, per capita revenue, per capita expenditures, and fund balance (similar though slightly different concepts used).

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<sup>105</sup> "Indicators for Evaluating the Debt Condition of California Local Governments," cited earlier, draft version, December 1988.

TABLE 10  
COMPARISON OF INDICATORS USED TO EVALUATE DEBT CONDITION

Indicator	Handbook	Peat Marwick	Indicator	Handbook	Peat Marwick
<b>Debt Position Indicators</b>			<b>Economic Base Indicators-Cont'd.</b>		
1. Debt Outstanding (Total)	•	•	3. Per Capita Income	•	•
2. Debt Outstanding (Trend)	•	•	4. Per Capita Income Growth		•
3. Composition of Debt	•	•	5. Population	•	
4. Debt Per Capita		•	6. Population Growth Trend		•
5. Trend in Debt Per Capita		•	7. Property Values	•	
6. Average Maturity Date of Debt		•	8. Property Values Per Capita		•
7. Net Direct Debt Maturity	•		9. Retail Sales Per Capita		•
8. Net Overlapping Debt	•		10. Unemployment Rate		•
9. Debt Per \$1,000 of Personal Income		•	11. Percent of Housing Over 40 Years		•
9. Short-Term Debt	•		<b>Fiscal Base Indicators</b>		
10. Short-Term Debt Per Capita		•	1. Revenue Collections	•	
11. Short-Term Debt as a Percent of Total Revenue		•	2. Revenue Growth Trends		•
12. Growth in Debt Relative to Growth in Revenues		•	3. Revenues Per Capita	•	•
13. Tax-Supported Debt Per Capita		•	4. Own-Source Revenues Per Capita		•
14. Enterprise Debt Ratio	•		5. Revenues Per \$1,000 of Income		•
15. Enterprise Debt Service Coverage	•		6. Elasticity of Revenue Base		•
16. Enterprise Debt Service Reserve	•		7. Revenue Capacity and Effort		•
17. Direct Debt Service	•		8. Expenditures Per Capita	•	•
18. Debt Service as a Share of General Revenue		•	9. Expenditure Growth Trends		•
19. Debt Service as a Share of Own-Source Revenue		•	10. Real Expenditures Per Capita		•
20. Debt Capacity Index		•	11. Expenditures Per \$1,000 of Income		•
21. Ratio of Debt to Revenue Capacity		•	12. Ratio of Fixed Expenditures to Total Expenditures		•
<b>Economic Base Indicators</b>			13. Capital Expenditures Per Capita		•
1. Employment Growth Trends		•	14. Intergovernmental Transfers	•	
2. Employment in Durable Goods Manufacturing		•	15. Elasticity of Expenditures		•
			16. Unfunded Liabilities Per Capita		•
			17. Unfunded Liabilities (Trend)		•
			18. Fund Balance	•	•
			19. Balance Sheet Position	•	
			20. Management Practices and Legislative Policies Checklist	•	

Source: KPMG Peat Marwick, Policy Economics Group; California Debt Advisory Commission, "Indicators for Evaluating the Debt Condition of California Local Governments," (Draft Report by Boyer, Bennett, & Shaw Management Consultants, December 1988).

This is not to imply that the two reports come to dissimilar conclusions, though. Many of the indicators used in the two reports are only variations on the same general concepts. For example, the *Handbook* uses population, while our recommendations examine population change. Similarly, both set of indicators feature indicators for property value, debt service requirements, and short-term debt. In general, the *Handbook* deals with more direct government operational issues, while the indicators in this report deal with broader economic and fiscal concepts.

These major differences appear to result primarily from the different emphasis of the two reports, rather than theoretical differences. As might be expected, the *Handbook* focuses to a greater extent on individual local government indicators, using more complex and detailed indicators of local fiscal condition than would appear to be feasible or useful for the current analysis whose primary thrust is the development of aggregate state-level indicators. The current analysis emphasizes statewide factors, the economy and the ability to make comparisons among jurisdictions and states. There are also differences in orientation. Our approach, based on recent directions in the literature and the background of our project team, has been to emphasize the factors underlying debt condition and fiscal health, as well as specific measures of financial condition.

There does not appear to be anything inherently contradictory about the two studies or the indicator sets they create. In fact, it would be possible to merge the two sets with minimal problems. The two studies simply approach the same general issue from different directions, and as the literature review showed, different approaches in this area almost always yield significantly different indicator sets.

## CONCLUSIONS AND RECOMMENDATIONS

In this phase of the study, a theoretical framework was developed for potential use in assessing the level of outstanding debt of California state and local governments. As described in the report, this assessment process would be accomplished through a set of statistical indicators, which are specified in the study. These indicators reflect various aspects of the economic and fiscal conditions under which units of government operate. The study reviews more than 150 different indicators used in earlier studies of government fiscal health and credit condition and identifies 40 measures to make up a list of recommended indicators.<sup>106</sup>

The research conducted in the course of the study clearly indicates that it is possible to develop a set of indicators for use in the assessment of the level of debt of individual units of government or groups of governments (e.g., counties, cities). This type of analysis has been accomplished in earlier studies, and the data needed to do it are either generally available from central sources or could, with some exceptions, be developed from state and local sources.

It is important to underscore, however, that even if they were developed, the indicators would not provide definitive answers to the questions of what the appropriate level of debt is and whether a government has reached its capacity. Except at the extremes, the answers to these questions will vary from government to government. At best, the indicator framework should be viewed as a possible method for gathering and analyzing data on governmental debt, based on the assumption that an organized process of analysis is preferable to no process at all.

Somewhat more problematic is the issue of whether this analytical approach could be extended to an assessment of the level of debt outstanding among all California units of government. With the exception of a few indicators, it appears possible to develop such a set of financial and economic indicators; however, much of the analytical power of the statistical measures would be lost

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<sup>106</sup> Many of the issues discussed in Parts 1 and 2 of this report have been summarized in response to specific questions raised by the Commission. These questions and the responses to them are shown in Appendix C.

in the process of aggregation. The value of maintaining such an indicator set, with its limited applications, should be weighed against the resources needed for its creation and maintenance.

With these general conclusions in mind, a set of recommendations for further work in this area has been developed and is outlined below. The recommendations are divided into: (1) general conclusions and recommendations for further research; (2) recommendations relating to information resources; and (3) recommendations relating to various indicators and their uses.

## General Conclusions and Recommendations

(1) *It is possible to construct a basic set of measures to aid in the evaluation of the credit condition of California state and local governments. These measures would work best if applied to individual units of government or to homogeneous groups of governments (e.g., the State, counties, cities). The application of an indicator set to the task of assessing the overall level of debt in the State would provide government analysts and decisions makers with useful information, but as a broad, free-standing analytical tool, the indicator approach alone would be problematic for several reasons.* First, some of the data simply are not available to create needed indicators for all of the diverse types of government in California. The report indicates that data do not exist for a number of the variables in the ideal indicator list. Second, even if data for individual governments are available for a given indicator, its analytical powers are likely to be weakened by the process of aggregation. Moreover, there also would be significant problems with the aggregation of data from dissimilar units of government in any case. Third--and most importantly--by themselves, indicators can tell only part of the story of government credit condition. To be most useful, they should be related to the capital spending demands likely to face government--that is, it is necessary not only to evaluate government's debt capacity and its current utilization of debt but also what forces may affect its use of debt over time. While most governments in California have capital planning processes, there needs to be further development of information in this area.

(2) *Because of the limitations on the use of an indicator system as an isolated analytical tool, one important alternative application of the indicators would be as one analytical tool in a comprehensive capital budgeting process for individual units of government.* In this context, the indicator set would not be expected to provide definitive answers concerning credit condition but could provide insights into the trends and composition of debt for use by policy makers and analysts in managing and planning capital expenditure programs. The process would provide a consistent, orderly method of maintaining and analyzing economic and financial information relevant to the credit condition of state and local government. Used in this way, the indicator system would be valuable both to local governments and to the State, which is currently considering the creation of its own formal capital budgeting process.

(3) *At the State government level, the indicators by themselves could also play an important role in the ongoing monitoring and analysis of government debt in California that is part of CDAC's basic mission. In this regard, we recommend that the Commission, if it does develop this process, prepare for the Treasurer and publish an annual status report on the condition of outstanding debt in California, using information currently available to it and information developed through the indicator process.* Several valuable reports have been prepared on this topic for the Commission and the General Assembly in the past, but they quickly become dated. These data should be routinely available, and an annual report would appear to offer the appropriate vehicle for the presentation of this information.

(4) *At the local government level, it is recommended that the Commission continue to pursue its plans to provide training to local governments in the use of indicators.* Taking into account points (1) and (2) above, this training might profitably be combined with training for local governments on

capital budgeting and the use of indicators in a comprehensive capital budgeting process of the government or governments.

(5) *However, it should clearly be recognized that the development of this information system would require considerable resources to accumulate data, to develop new sources of data where necessary, to maintain the data once created, and to produce on-going analysis.* From the standpoint of the Commission, these costs should certainly be weighed carefully against other programmatic commitments.

(6) *It should be carefully delineated that the purpose of this process would not be to attempt to establish limits on the use of debt by state or local governments. Rather, its purpose should be to provide a central source of information on debt issued and outstanding that can be studied by policy makers, and which can help guide their decisions on future policies regarding the use of debt financing.* Governments issue annual financial reports not as a means of limiting expenditures but because the collection and presentation of financial information is a key to understanding how government is functioning. This same spirit should guide this process.

### Data Base Issues

(1) While the assessment process outlined in this report should not be expected to provide definitive answers to the complex issues of credit condition and fiscal health, it can provide important benchmarks that will point to the deterioration of key factors influencing the credit condition of California governments. In this regard, the indicator list developed for this study represents a reasonable starting place for any analysis of this type; however, *if the Commission elected to go forward with the development of an assessment framework, it should do so with the understanding that significant further work needs to be done on the identification of data to be used in the analysis.*

(2) *In this regard, we recommend that a further step in the current evaluation process should be an assessment of the information currently available on local government finances.* This could be done through an evaluation of a sample of local reports submitted to the Controller. This sample would be drawn from all types of local governments reporting to the Controller, since there are important differences in the forms on which information is collected for the various units of government. Information reported to the Controller should be compared with actual financial report data and internal information on the sample jurisdictions. Sources of problems should be identified and procedures developed for eliminating all but simple errors. *It should be recognized that it is unlikely that data for several thousand governments will be completely pure, but major problems could clearly be eliminated with the cooperation of the Controller.*

(3) *It is recommend that attention be given as well to data available through other sources, although a survey of potential sources indicates that these alternatives are likely to be limited.* One possible source of such data is California Municipal Statistics (CMS), a private firm which maintains a data base of debt information on California units of government. Exploration of this issue could be part of the evaluation process recommended in this section's recommendation (2) above.

(4) *Because improvements in existing data sources seem workable--and again assuming the Commission wants to pursue this process--we would recommend against the Commission seeking authority to develop its own information requirements for state and local government.* This is true because such an effort would be likely to share many of the same problems as the current data sources and would impose an unwelcome new reporting requirement on local governments. In fact, given constitutional requirements dealing with state mandates, it might involve local costs that might require State reimbursement.

(5) *Although the Commission should not undertake its own, separate data gathering effort, the Commission should develop its own data base if it pursues the indicator process. The Commission already maintains information on new debt issues and related information, so this would be a natural extension of that data collections process. It is further recommended that the Commission work with the Controller and other sources to get information prior to its formal publication to insure the timeliness of information available for assessment.*

(6) *If this data base is developed, consideration should be given to possible other uses for it in addition to the assessment of outstanding debt. For example, it could eventually be used to maintain detailed information on par values, interest coupons, "true" and "net" interest costs, call provisions, refunding provisions, and other features of the California credit market that would be useful to government policy makers and analysts alike. Clearly, a plan would be needed for the overall design of the data base to accommodate a logical, efficient expansion of its use.*

## Indicators

(1) *It should be clearly recognized that the model indicators in this study are only a starting point in the range of analytical approaches given a consolidated data base of debt and other financial information. Other indicators along the same lines clearly are possible and would be relevant to various types of analysis.*

(2) *In this regard, an important step once a data base is developed would be to apply statistical techniques to the indicators in the framework and other potential indicators to test their usefulness. This testing procedure should be an continuing part of the assessment process. A first step in this direction would be to conduct correlation analysis on the indicators to determine the interrelationships among them. Another statistical approach would be to use factor analysis to explore the interrelationships among sets of indicators. (Factor analysis is designed to group large number of variables into "factors" representing similar or like behavior. In this case, it can be used to systematically sort through the variables, select the variances that are quantitatively important.) Finally, for time series, regression analysis could be used to analyze the statistical relationships between the various indicators and a single dependent variable--such as the level of aggregate debt in the state. The issue in this final analysis would be the degree to which the various indicators "explain" a given level of debt outstanding statewide (or alternately, for an individual government).*

(3) *We recommend that the Commission--if it decides to continue developing an indicator process--should eventually work toward the development of data for substate jurisdictions or aggregations as well as for the statewide aggregate. While the emphasis clearly should be on developing aggregate indicators, some time and analysis should be taken to understand the detail underlying the statewide trends. This means distinguishing among governments of various sizes and types. This need not be an immediate goal of the process, but it clearly is important to work toward disaggregation as an important resource for government policy makers.*

(4) *It is also important that any indicators developed by the Commission in the future focus on time trends, as well as static indicators of credit condition at a given point in time. This is especially important since there are few standards for measuring performance. Thus, trends over time--deterioration or improvement--are particularly important.*

(5) *In this regard, we recommend that over time the Commission consider developing an economic model to project indicators into the future based on different assumptions about the general condition of the state and national economies. Not only will this help better explain how and why credit conditions change, but it will allow sensitivity analysis to see how California government's credit strength would hold up assuming various paths for the economy. This same sort of analytical treatment should also be applied to the capital planning process described in earlier conclusions.*

(6) Finally, we would recommend that a part of the indicator effort be the development of interstate comparisons for state-level data, probably using Census data as a base. (The development of interstate comparisons for substate data is possible but is considerably more problematic and expensive for potentially very limited results.) The value of state-level comparisons is to provide decision makers with a frame of reference for evaluating the level of debt. It is perhaps not the best available standard of measure. However, it is a familiar one, and one in which decision makers often have an interest. Given the availability of resources, it is preferable to do interstate comparisons for all 50 states. Obviously, not all states mirror the size and complexity of California, but it is often difficult to gauge which subset of states is most important (e.g., 10 largest, 10 industrial, Sunbelt states, Western states), and a complete data set for all states would insure that the Commission would have the information to meet changing needs.

\* \* \* \* \*

For the most part, state and local governments in the United States have enjoyed a number of years of relative fiscal ease; however, there is no guarantee that economic conditions will continue to perform well, and in fact, history suggests that any economic expansion is eventually followed by a slowdown. The State of California has an opportunity to begin to put into place a process for analyzing and detecting changes in the credit and general fiscal conditions of its governments. This is an appropriate time to begin such an undertaking.

**APPENDIX A**

**INDICATORS USED IN SELECTED STUDIES OF CREDIT  
CONDITION AND FISCAL HEALTH  
AND PRELIMINARY EVALUATION CRITERIA**

**APPENDIX A**  
**INDICATORS USED IN SELECTED STUDIES OF CREDIT**  
**CONDITION AND FISCAL HEALTH**  
**AND PRELIMINARY EVALUATION CRITERIA**

Factor	Consis- tency	Scope	Simplicity	Compar- ability
<b>Debt Position Indicators</b>				
1.1. Net Tax-Supported Debt Per Capita	+	+	-	-
1.2. Average Debt Service Costs as a Percent of Total Revenue (Trend)	+	+	+	+
1.3. Average Short-Term Debt as a Percent of Total Revenues (Trend)	+	+	+	+
1.4. Composition of Debt	+	+	+	+
1.5. Debt Capacity Index (1)	+	+	-	+
1.6. Debt Outstanding (+ Trend)	+	+	+	+
1.7. Debt Per Capita	+	+	+	+
1.8. Debt as a Percent of Assessed Value	+	-	+	-
1.9. Debt Per \$1,000 of Personal Income	+	+	+	+
1.10. Debt as a Percent of Property Tax Base	+	-	+	-
1.11. Debt as a Percent of True Property Value	+	-	+	-
1.12. Debt Service as a Percent of Revenue	+	+	+	+
1.13. Debt Service as a Percent of Revenue Capacity	+	+	-	+
1.14. Debt Service as a Percent of Total Taxes Collected	+	+	+	+
1.15. Debt Service Reserves as a Percent of Annual Debt Service	+	+	-	-
1.16. Debt/Wealth Index	+	+	-	-
1.17. Default History	-	-	+	-
1.18. Federal and State Aid as a Percent of Debt Service	-	-	-	-
1.19. Liquid Assets as a Percent of Short-Term Debt	-	-	-	-
1.20. Maturity Term of Outstanding Debt	-	-	-	-
1.21. Overlapping Debt as a Percent of Assessed Value of Property	+	+	-	-
1.22. Overlapping Debt as a Percent of Full Value of Property	+	+	-	0
1.23. Overlapping Debt as a Percent of Personal Income	+	+	-	+
1.24. Overlapping Debt Per Capita	+	+	-	+
1.25. Past Credit Ratings	-	-	+	-
1.26. Ratio of Change in Long-Term Debt Outstanding to Change in Per Capita Income	+	+	+	+
1.27. Ratio of Debt Outstanding to Be Paid in 5 Years to Total Debt	+	+	-	-
1.28. Ratio of Debt Outstanding to Be Paid in 10 Years to Total Debt	+	+	-	-
1.29. Ratio of Debt Per Capita to Income Per Capita	+	+	+	+
1.30. Ratio of Debt to Assessed Value	+	-	+	-
1.31. Ratio of Debt to True Property Value	+	-	+	0
1.32. Ratio of Long-Term Debt Retired Plus Annual Interest Payments to Own-Source Revenue (Trend)	+	+	-	+

\* See footnotes at the end of this table.

APPENDIX A  
INDICATORS USED IN VARIOUS STUDIES  
(Continued)

Factor	Consis- tency	Scope	Simplicity	Compar- ability
<b>Debt Position Indicators--Continued</b>				
1.33. Ratio of Long-Term Debt Retired Plus Short-Term Debt Outstanding Plus Annual Interest Payments to Own-Source Revenue (Trend)	+	+	-	+
1.34. Ratio of Long-Term Debt Retired Plus Annual Interest Payments to State Personal Income (Trend)	+	+	-	+
1.35. Ratio of Long--Term Debt Retired Plus Short-Term Debt Outstanding Plus Annual Interest Payments to State Personal Income (Trend)	+	+	-	+
1.36. Ratio of Long-Term Debt Retired Plus Annual Interest Payments to Total Revenue (Trend)	+	+	-	+
1.37. Ratio of Long-Term Debt Retired Plus Short-Term Debt Outstanding Plus Annual Interest Payments to Total Revenue (Trend)	+	+	-	+
1.38. Average Maturity Date of Debt	+	+	-	-
1.39. Ratio of Debt Service Payments to General Revenue	+	+	-	+
1.40. Ratio of Debt Service Payments to Own-Source Revenues	+	+	-	+
1.41. Short-Term Debt as a Percent of Total General Revenue	+	+	+	+
1.42. Short-Term Debt Per Capita	+	+	+	+
1.43. Tax-Supported Debt Per Capita	+	+	0	+
1.44. Trend in Appropriation-Supported Debt Outstanding	+	+	0	+
1.45. Trend in Per Capita Debt	+	+	+	+
1.46. Ratio of Growth in Debt to Growth in General Revenues	+	+	+	+
<b>Economic Base Indicators</b>				
<i>1. Employment</i>				
1.1. Employment in Durable Goods Manufacturing (Trend)	+	+	+	+
1.2. Employment Growth Trend	+	+	+	+
1.3. Industrial Diversification (2)	+	+	-	-
1.4. Manufacturing Employment as a Percent of Total Employment	+	+	+	+
1.5. Ratio of Full-Time Equivalent Gov- ernment Employment to Total Employment	-	0	-	+
1.6. Unemployment Rate	+	+	+	+
<i>2. Income</i>				
2.1. Change in Income (Trend)	+	+	+	+
2.2. Farm Income	-	-	-	-
2.3. Median Family Income	+	+	0	+
2.4. Personal Income	+	+	+	-
2.5. Total Per Capita Personal Income	+	+	+	+
2.6. Per Capita Income Growth Trend	+	+	+	+
2.7. Real (Inflation-Adjusted) Per Capita Income	+	+	-	+

APPENDIX A  
INDICATORS USED IN VARIOUS STUDIES  
(Continued)

Factor	Consistency	Scope	Simplicity	Comparability
<b>Economic Base Indicators-Cont'd.</b>				
<i>3. Population</i>				
3.1. Median Age	o	o	+	o
3.2. Percent Change in Black Population	-	-	-	+
3.3. Percent of Population College Students	-	-	-	-
3.4. Percent of Population Non-White	-	-	-	+
3.5. Percent of Population Below Poverty Level	+	+	+	o
3.6. Percent of Population Under 21 and/or Over 65 Years of Age (Dependency Rate)	-	-	-	+
3.7. Percent of Population with Less Than Five Years of Schooling	-	-	-	+
3.8. Population	+	+	+	-
3.9. Population Growth Trend	+	+	+	+
3.10. Population Density	-	-	-	-
<i>4. Economic Performance/Infrastructure</i>				
4.1. Assessed Value of Property Per Capita	+	+	+	+
4.2. Business License Trends (Number and Value)	-	-	-	-
4.3. Housing Permit Trends (Number and Value)	-	-	-	-
4.4. Market Value New Residential Development/Total New Development	-	-	-	-
4.5. Percent of Residences that Are Owner-Occupied	-	-	-	-
4.6. Percent of Substandard Housing	-	-	-	-
4.7. Retail Sales Per Capita	+	+	+	+
4.8. Age of Housing Stock	+	+	-	-
<i>5. Other Factors</i>				
5.1. "Better" or "Poorer" State	-	-	-	-
5.2. Climate	-	-	-	-
5.3. Land Area	-	-	-	-
5.4. Median Years of Education	+	+	o	-
5.5. Political Party in Power	-	-	-	-
5.6. Political Fragmentation	-	-	-	-
5.7. State of Origin	-	-	+	-
5.8. Tourist Orientation of Economy	-	-	-	-
5.9. Vacancy Rates	+	-	o	-
5.10. Value of Mineral Production	-	-	+	+
<b>Fiscal Base Indicators</b>				
<i>1. Revenue Resources and Reserves</i>				
1.1. Average Current Tax Collection Rate (Tax Collections/Tax Levy)	+	-	-	-
1.2. Change in Intergovernmental Revenue as a Percent of Total Revenue	+	-	+	+
1.3. Change in Property Value from Value in Prior Period	+	+	-	-

APPENDIX A  
INDICATORS USED IN VARIOUS STUDIES  
(Continued)

Factor	Consis- tency	Scope	Simplicity	Compar- ability
<b>Fiscal Base Indicators-Cont'd.</b>				
1.4. Change in Property Values Per Capita	+	+	-	-
1.5. Elasticity of Revenue Base	+	+	-	+
1.6. Fiscal (Revenue) Capacity	+	+	-	+
1.7. Fiscal (Revenue) Effort	+	+	-	+
1.8. Largest Taxpayers as a Percent of Tax Base	-	-	-	-
1.9. Own-Source Revenues Per Capita	+	+	+	-
1.10. Property Taxes as a Percent of Local Government Revenues	+	-	+	-
1.11. Ratio of Assessed Value to True Market Value	+	-	-	-
1.12. Ratio of Legal Tax Rates to Current Tax Rates	+	-	-	-
1.13. Ratio of One-Time Revenues to Total Revenues	+	-	-	-
1.14. Ratio of Property Taxes to Total Own-Source Revenues	+	+	o	-
1.15. Ratio of Restricted Revenues to Net Operating Revenues	+	+	-	-
1.16. Ratio of State Shared Revenue to Total Revenue	+	-	-	-
1.17. Ratio of Tax Revenues to Index of Resources	+	-	-	-
1.18. Revenue Growth Trends	+	+	+	+
1.19. Revenue as a Percent of Personal Income	+	+	+	+
1.20. Revenues Per Capita	+	+	+	+
1.21. Revenue Raising Capacity	+	+	-	+
1.22. Tax Capacity	+	+	-	+
1.23. Tax Effort	+	+	-	+
1.24. Tax Income Per Capita	+	o	+	+
1.25. General Revenue Per \$1,000 of Income	+	+	+	+
1.26. Tax Rates	-	-	+	-
1.27. Ten Largest Taxpayers as a Percent of Total Tax Base	-	-	-	-
1.28. Total Tax Levy	-	-	-	-
1.29. Trend in Own-Source Revenues Used to Meet Matching Requirements	+	-	-	-
<b>2. Current and Capital Expenditure Pressures</b>				
2.1. Capital Expenditures Per Capita	+	+	+	o
2.2. Capital Expenditures Per Capita (Trend)	+	+	+	o
2.3. Current Operating Expenditures Per Capita	+	+	+	o
2.4. Education Expenditures Per Capita	-	-	+	+
2.5. Expenditures for Personal Services as a Percent of Total Revenues	+	-	-	-
2.6. Expenditures by Type	+	+	+	-
2.7. Expenditure Growth Trends	+	+	+	+
2.8. Total General Expenditures Per Capita	+	+	+	+
2.9. Fire Expenditures Per Capita	-	-	+	o
2.10. Health Expenditures Per Capita	-	-	+	o
2.11. Growth in Government Enterprises Incurring Operating Losses	-	-	-	-
2.12. General Expenditures Per \$1,000 of Income	+	+	+	+

APPENDIX A  
INDICATORS USED IN VARIOUS STUDIES  
(Continued)

Factor	Consistency	Scope	Simplicity	Comparability
<b>Fiscal Base Indicators-Cont'd.</b>				
2.12. Percent of Current Expenditures on Interest	+	+	+	+
2.13. Percent of Local Schools Expenditures by the State Government	-	-	+	+
2.14. Percent of Welfare Payments by State Government	-	-	+	+
2.15. Police Expenditures Per Capita	-	-	+	o
2.16. Ratio of Actual Expenditures to Index of Service Responsibilities	+	+	-	-
2.17. Ratio of Fixed Expenditures to Total Expenditures	+	+	-	+
2.18. Ratio of Government Expenditures to True Property Values	+	-	-	-
2.19. Ratio of Mandated Expenditures to Total Expenditures (Trend)	+	+	-	-
2.20. Ratio of Real Expenditures Per Capita to Index of Community Needs	+	+	-	-
2.21. Ratio of Year-End Expenditures to Original Budget (Trend)	+	+	-	-
2.22. Real Expenditures Per Capita (Growth)	+	+	-	+
2.23. Revenue from User Fees as a Percent of Expenditures for Related Services	-	-	-	-
2.24. Total Expenditures	+	+	+	-
2.25. Trend in Capital Outlay Expenditures	+	+	+	-
2.26. Welfare Payments as a Percent of Total Expenditures	-	-	+	o
<b>3. Pension Funds/Unfunded Liabilities</b>				
3.1. Pension Fund Obligations as a Percent of Total Assets	-	-	-	-
3.2. Pension Fund Obligations as a Percent of Total Revenue	-	-	-	-
3.3. Unfunded Pension Liabilities (Trend)	+	+	-	-
3.4. Unfunded Pension Liabilities Per Capita	+	+	-	-
<b>4. Overall Operating Position</b>				
4.1. Current Assets Less Current Liabilities	+	+	-	-
4.2. General Fund Balance Per Capita	+	+	-	-
4.3. Ratio of Current Assets to Current Liabilities	+	+	-	-
4.4. Ratio of General Fund Balance to Reserves	+	+	-	-
4.5. Ratio of Surplus to Current Operating Expenses	+	+	-	-
4.6. Operating Position (Surplus/Deficit) (Trend)	+	+	-	+

Source: Compiled by KPMG Peat Marwick, based on indicators in studies discussed in the literature review part of the study.

Note: The evaluation process used in this table is straightforward. If the indicator meets a particular criterion, it receives a plus (+). If it does not meet the criterion, it receives a minus (-). If it is unclear how well it fits a given criterion (perhaps because of uncertainties about the availability of data), it receives a zero (o).

(1) The debt capacity index is drawn from James R. Ramsey and Merlin M. Hackbart, "State and Local Debt Capacity: An Index Measure," *Municipal Finance Journal*, Vol. 9, No. 1 (Winter 1988), pp. 7-18. The measure combines measures of appropriation (or tax-supported) debt and debt service to state income, population, population, and property value.

(2) Industrial diversification is a complex statistical measure of the degree of specialization in an economy.

**APPENDIX B**  
**INDICATOR DEFINITIONS**

**APPENDIX B  
INDICATOR DEFINITIONS**

Indicator	Definition
<b>Level of Outstanding Debt</b>	
1. Total Outstanding Public Debt	All long-term credit obligations of California governments whether backed by full faith and credit or nonguaranteed, and all interest bearing short-term credit obligations. Would include all state and local general obligation bonds, user-supported revenue bonds, sales tax revenue bonds, limited obligation bonds (e.g., Mello-Roos, Special Assessment), tax allocation bonds, lease-backed securities, mortgage revenue bonds, industrial development bonds, and similar obligations of California units of government.
2. Total Outstanding Debt (Trend)	The annual percent change in the level of total outstanding public debt.
3. Composition of Debt	Debt totals disaggregated according to type of debt, type of government, and term (short-term, long-term).
<b>Measures of Debt Position</b>	
1. Outstanding Debt Per Capita	Total outstanding debt divided by state population.
2. Outstanding Debt Per \$1,000 of Personal Income	Total outstanding debt divided by state personal income (in thousands).
3. Trend in Debt Per Capita	The annual percent change in the level of outstanding debt per capita.
4. Net Tax-Supported Debt Per Capita	Derived by dividing net tax-supported debt by total state population. Tax-supported debt equals total outstanding debt less any debt which is self-supporting from enterprise revenues, sinking fund reserves for term debt, and short-term operating debt.
5. Ratio of Debt Service Requirements to Total General Revenues	The amount of money needed in a given year to pay principal and interest on outstanding debt and required contributions to bond sinking funds divided by the total of all government revenue except trust and utility revenue.
6. Ratio of Debt Service Requirements to Own-Source Revenues	Same as factor 5. except that it excludes intergovernmental revenues.
7. Short-Term Debt Per Capita	Interest-bearing debt payable within one year from date of issue, such as bond and tax anticipation notes, divided by state population.
8. Ratio of Short-Term Debt to Total General Revenues	Short-term debt issues divided by all state and local revenues except trust and utility revenues.
9. Average Maturity of Outstanding Long-Term Debt	Average maturity date (in years) for outstanding tax-supported debt of the government.
<b>Economic Base Measures</b>	
1. Population Growth Trend	The annual percentage change in total state population.
2. Employment Growth Trend	The annual percentage change in total employment in the state.
3. Total Personal Income Per Capita	State personal income, including income from salaries, wages, business income, and other sources divided by state population.
4. Per Capita Income Growth Trend	The annual percentage change in state personal income per capita (divided by state population).
5. Assessed Value of Property Per Capita	The total taxable value of property in the state (excluding exempt properties) divided by state population. (Taxable value should include the redevelopment tax allocation increment.)

**APPENDIX B  
INDICATOR DEFINITIONS  
(Continued)**

Indicator	Definition
<b>Economic Base Indicators--Continued</b>	
6. Retail Sales Per Capita	Total volume of sales by retail establishments in the state divided by state population.
7. Trend in Employment in Durable Goods Manufacturing	The annual percentage change in total employment in durable goods manufacturing industries (SIC Major Groups 32-39).
8. Unemployment Rate	Civilian unemployment rate.
9. Persons Below the Poverty Level	Percentage of total population below government-established poverty-level incomes.
10. Age of Housing Stock	Percentage of housingstock built before 1940.
<b>Measures of Revenue Resources and Reserves</b>	
1. Total General Revenues Per Capita	The total of all government revenues, including taxes, fees, and other receipts, except trust and utility revenues divided by state population.
2. Total Own-Source Revenue Per Capita	Total of income from all sources used by government to finance general expenditures with the exception of intergovernmental revenue sources. Includes taxes, fees, interest and dividend income, leases, rents, royalties, and other income generated by government from its own resources.
3. Total General Revenues Per \$1,000 of State Personal Income	Total general revenues divided by state personal income (in thousands).
4. Revenue Growth Trend	The annual percentage change in total general revenues.
5. Elasticity of the Revenue Base	Change in total general revenues adjusted for tax increases divided by change in state personal income. (Ratio greater than 1.0 implies the revenue system grows more rapidly than state personal income.) Example: 1980-89.
6. Revenue Capacity and Effort	Measures of the revenue-raising capacity and actual effort of California governments. Capacity is defined as how much money could be raised in the state from a uniformly applied set of revenue sources adjusted for legal limitations and compared with national average rates. Effort is the actual amount of revenue raised from the tax sources compared with capacity.
<b>Measures of Current and Capital Expenditure Pressures</b>	
1. Total General Expenditures Per Capita	All government expenditures other than trust and utility expenditures divided by state population.
2. Expenditure Growth Trend	The annual percentage change in total general expenditures.
3. Real General Expenditures Per Capita Growth Trend	The annual percentage change in total general expenditures adjusted to remove the effects of inflation divided by state population.
4. Total General Expenditures Per \$1,000 of State Personal Income	Total general revenues divided by state personal income (in thousands).
5. Expenditure Elasticity	Change in total general expenditures divided by change in state personal income. (Ratio greater than 1.0 implies the revenue system grows more rapidly than income.)
6. Ratio of Fixed Expenditures to Total General Expenditures	Total expenditures required by state or federal mandate or because of statutory or constitutional dedication of funds as a percentage of total general expenditures of state and local government.

**APPENDIX B  
INDICATOR DEFINITIONS  
(Continued)**

<b>Indicator</b>	<b>Definition</b>
<b>Measures of Current and Capital Expenditure Pressures--Continued</b>	
7. Capital Expenditures Per Capita	Direct expenditures for construction of buildings, roads, and other improvements and for the purchase of equipment, land, and existing structures divided by state population.
8. Unfunded Pension Liability (Trend)	The difference between the present value of all future pension benefits and the present value of all financial assets, including the assets expected as a result of normal contributions.
9. Unfunded Pension Liability Per Capita	Unfunded pension liability divided by state population.
<b>Measures of Operating Position</b>	
1. Operating Position (Trend)	The relationship of annual general revenues to annual expenditures. If revenues exceed expenditures, the operating position under this definition is in surplus; if expenditures exceed revenues, the operating position is in deficit. (Must be distinguished from true accounting fund surplus and deficit concept.)

Source: KPMG Peat Marwick, Policy Economics Group.

**APPENDIX C**

**COMMENTS ON DETAILED QUESTIONS POSED BY THE COMMISSION STAFF  
CONCERNING THE STUDY AND ITS FINDINGS**

**APPENDIX C**  
**COMMENTS ON DETAILED QUESTIONS**  
**POSED BY THE COMMISSION STAFF**  
**CONCERNING THE STUDY AND ITS FINDINGS**

The following questions and answers correspond to the detailed set of questions in Attachment I of the Request for Proposal for this study. They are based on the information contained in Part 1 and Part 2 of the study.

**I. INTRODUCTION**

There were no specific questions in this section of the outline.

**II. LITERATURE REVIEW**

**A. Early History**

**1. When did research in this field begin and why?**

The origins appear to have been in 1919 when Moody's began rating municipal securities as a supplement to the corporate ratings it began in 1909. The practice grew much more sophisticated in the 1940s following a series of major defaults by municipalities during the Depression. The earliest academic-based studies of government debt begin to appear in the 1930s, with major studies in 1930 by Paul Studensky and in 1936 by Albert Hillhouse. The first major alternative bond rating system found in the literature (as an alternative to Moody's ratings in this case) was developed by James McCabe at the Maxwell School of Syracuse University in 1941.

**2. What were the early contributions?**

The main accomplishment of the early studies appears to have been beginning to organize data on state and local finances. The ratings themselves were fairly cursory, based mainly on the perceived size and economic strength of the locality (measured by such factors as the number of rail lines, etc.). The main contribution of the period was in laying the framework for the more sophisticated bond rating system developed by Moody's and Standard and Poor's since then and particularly since the 1940s.

With regard to the analysis of government fiscal health, there were studies of local economic bases dating at least as far back as 1927, when Robert Haig and R.C. McCrea produced a regional economic survey of New York and its surrounding areas. Harvey Brazer wrote about fiscal disparities in metropolitan areas (a precursor of the study of fiscal stress) in 1957. The "father" of the modern study of fiscal condition was the U.S. Advisory Commission on Intergovernmental Relations report, *City Financial Emergencies*, published in 1973. Much of the work assessing fiscal condition was spurred by the New York City fiscal crisis in the mid-1970s.

## B. Subsequent Major Developments

### 1. For what reasons did research efforts grow in this field?

Two primary reasons. First, in the case of the bond rating process, research was spurred by the efforts of Moodys and Standard and Poors and by a large number of academic and government researchers who conducted studies to replicate the rating agencies' analyses. This latter effort was probably at least in part a result of the fact that the rating agencies were (and are) vague about what factors they used to rate municipal credits and how they are weighted in the final rating assignments.

Second, work on analyses of financial condition was primarily spurred by the fiscal problems of major U.S. cities. These problems began to be apparent in the 1960s, but the galvanizing event in this area was the near default of New York City in 1975. The majority of work done on fiscal indicators really dates from 1975.

### 2. How does this research differ from earlier efforts?

Work in the area has become more sophisticated as time has passed. Clearly data sources have improved with improvements in state and (particularly) local government financial reporting. The development of fiscal indicators has also become more sophisticated and organized, largely as new analysts have built on earlier work and added new statistical wrinkles of their own.

### 3. What major techniques were used and what were the findings?

The primary development of recent research has been the fiscal indicator. Indicators are measures which can be used to monitor the health of the government. A major innovation has been to expand the analysis to the economic base in which the government operates. Analysts began to realize that the outlook for the economy often told as much (or more) about the probability of future fiscal problems as a jurisdiction's current financial balance sheet information did.

There have been a number of major contributors in this area. J. Richard Aronson, in particular, has published extensively on municipal indicators, including preparation of a major overview of work in the area for the U.S. Department of Housing and Urban Development. He also (along with Arthur King) published one of the first post-New York studies to look at aggregate fiscal health of state and local governments in a state, a key to the current study, and (with Eli Schwartz) he published one of the first guidebook-style studies to help local officials assess the fiscal condition of their own jurisdictions. More recently, Katherine Bradbury, Helen Ladd, and John Yinger have published on the fiscal condition of cities, and their work represents some of the best recent work in this area. In addition to Aronson and Schwartz, much of the work on fiscal condition guidebooks has come from Sanford Groves and Maureen Godsey Valente.

## C. Contemporary Frontiers

### 1. What are their foundation?

Most of the current work in this area stems from the studies of municipal fiscal condition and fiscal stress from the 1970s. The primary concern in these studies is less with the issue of debt burden than with fiscal condition generally. It is probably not accurate to say that earlier concerns have fallen by the wayside. The interest in municipal bond ratings, for example, is not as intense today as it was in the 1950s and 1960s, but it continues to be researched sporadically. All of these studies seek to examine some aspect of the ability of government to provide services without falling into fiscal difficulty. Despite recent relative

stability in economic conditions, this continues to be a major and legitimate concern.

2. Who, what, when, where, why, and how?

Most of the current research in this area is being done through one of three venues-- (1) academia; (2) municipal credit research; and (3) in the context of municipal financial management. The major academic analysts working in this area at this time are, again, Katherine Bradbury, John Yinger, and Helen Ladd. Their work has been directed toward understanding and predicting the fiscal health of major U.S. cities. The University of Oregon, Bureau of Government Research and Service also produced a useful indicator study for Oregon cities in 1983 which showed the practical application of the indicator methodology to smaller jurisdictions. Unfortunately, the data in that study were taken from Census Bureau information collected for the Revenue Sharing program and are not currently available.

The most extensive municipal credit work is done by Moody's and Standard and Poors. Other than indicating what elements they consider of consequence, they do not make much of this information available. There have been very few recent works on the analysis of credit ratings alone. Most of this work was done in the 1960s and 1970s. A major exception is the article, discussed in the literature review, by James Ramsey and Merlin Hackbart, which develops a debt capacity index.

The most recent work done to provide a detailed set of municipal financial management indicators was developed in 1986 by Sanford Groves and Maureen Godsey Valente for the International City Management Association (ICMA). The ICMA system is characterized by the specification of an indicator package that can be developed and used by individual governments. Obviously, the Commission's own *Handbook* would be a further extension of this work and also involved Valente.

The work is preceding in these veins because there continues to be concerns in many quarters about the fiscal health of state and local governments. This concern, in particular, focuses on major cities--thus, probably the most widely known recent work--by Yinger and Ladd--uses indicators as a means of analyzing and discussing the larger public policy issue of what is ailing American cities.

It is clear from the literature review that researchers are *not* getting closer to the definition of a specific set of indicators that reflects either credit condition or overall government fiscal condition. In this respect, most of the work being done in the area is a matter of selecting a set of indicators that meets general criteria for providing a broad overall picture of governmental fiscal health and then aggregating data. Most often, these data are compared among jurisdictions or against averages. That appears to be the best approach to providing a frame of reference.

It would appear that there will continue to be interest in this analytical area among academics, the credit analysis community, and governmental agencies (or, in the case of the Municipal Finance Officers Association and the International City Management Association, organizations representing governmental entities). A surge in interest in indicators is most likely to arise if there are major fiscal problems with a state--or more likely--a well-known local government. It would appear that this work is almost always going to concentrate on local government because the data are more homogeneous and trends are more easily explained by discrete economic and fiscal events. The larger the economy, the less likely fiscal indicators are to reveal telling nuances about financial position. Unless the health of the cities becomes a major issue of national concern, it is unlikely that the federal government will be heavily involved in this area, since much of the work done on fiscal indicators by federal researchers

in the late 1970s and early 1980s was related to the distribution of federal assistance, much of which has since been curtailed.

3. What are the most recent findings and results?

Most of the recent findings in this area, as indicated above, deal with fiscal condition of local jurisdictions. Much of the disagreement in the area is related to the indicators used and not specific methodological or philosophical differences. There clearly are some differences in the degree to which various analysts feel indicators are useful in the analysis of government fiscal condition. For example, Stonecash and McAfee point to several limitations on the use of fiscal strain indicators in a 1981 article, the most important of which was an objection to the use of interjurisdictional comparisons.

4. What is the likely direction of future research efforts in this field?

This question is covered in C.2. above. The future in this area is to continue to develop data and refine methodologies. A major hurdle from the standpoint of policy makers is the lack of very current data. This may not be resolved until a state actually develops a data base that is updated routinely and on a more current basis than information now available is updated. At the local level, there would appear to be a great need for some form of municipal indicators among smaller jurisdictions which lack sophisticated analytical capabilities at present. In the future, the current municipal fiscal indicator handbooks (including CDAC's *Handbook*) might be converted to computer programs that would allow local government to enter relevant data and see results on a personal computer. This approach is already in place for some financial management areas, such as business and personal finances.

### III. THEORETICAL FOUNDATION

#### A. Basis of the Model

1. What primary references were consulted for building this model?

The basic structure of the model, dividing the indicators selection among, economic, debt, and other government financial factors is commonly used throughout the literature. Versions of it can be found in the University of Oregon study, the Groves and Valente handbook, and the Commission's own *Handbook*. Much of the basic thinking about the relevant issues in the model come from Roy Bahl's 1971 article on measuring the creditworthiness of governments (see the Bibliography). These references were used because they represent a strong theoretical underpinning that has been used in a practical application. They also deal generically with the fiscal health or credit condition of governments generally and not with large cities in particular as many of the other studies do.

2. What is the rationale for this model?

Since no definitive set of indicators can be specified, the model in this study was designed to select and array data for the major areas--economic and financial--that experts have agreed have a direct bearing on creditworthiness or the overall fiscal health of a government or group of governments. Probably the major shortcomings of some past work that the current model seeks to address are: (1) the lack of attention to trends over time; and (2) the need to be conscious of how trends may change in the future. Because of data limitations, many of the earlier studies are static in the sense that they look at one year of data. The model components specified in this model are designed to capture changes over time as well.

This approach makes sense from the standpoint of outlining an approach that could ultimately be made operational by CDAC or some other governmental body. Most of the indicator studies reviewed in the literature review had a particular analytical goal. There was no study, except the Oregon analysis, which was in the same vein as the analytical goals envisioned by CDAC in this study--that is, the development of indicators for statewide assessment of the level of outstanding debt (or credit condition or general fiscal condition for that matter).

3. How does the rationale for this model compare to that of the model developed in Phase I?

The models have many similar features and the recommended indicators overlap conceptually. Both specify indicator sets reflecting economic, financial and debt condition. The major difference is one of orientation. The Phase I model and indicators are designed for local use. This model is intended for broader statewide use. Ultimately, though, they attempt to provide a framework for monitoring many of the same aspects of fiscal condition.

B. The Model

1. What is the structure of the model?

The revised model (see Part 2 of the study) has a number of components reflecting economic, fiscal base and debt position factors believed to affect government financial position. The model is not a statistical model but is a framework for assessing the level of debt outstanding, with the various factors and their component indicators representing touchstones for the analysis of the major aspects of credit condition. Indicators for two sets of factors which unquestionably affect the level of debt outstanding--environmental factors (such as natural disasters or the political culture of the jurisdiction(s) under study) and organizational factors (such as management practices and legal constraints) have not been developed in either the literature or in this study. Thus, they are viewed as exogenous to the model framework. Their effects are best analyzed by individuals knowledgeable of the political, institutional, etc. setting in which government must operate.

The model is set up as a series of analytical steps beginning with the determination of the total level of debt outstanding, calculation of debt position, a series of evaluative steps, and a monitoring process. The model then feeds back to the first step, creating a monitoring and analysis cycle.

The model clearly simplifies the real-world relationships that determine the consequences of the level of debt outstanding. This simplification is partly a necessity in attempting to specify a process for assessing the level of outstanding debt for the large number of California state and local entities in aggregate. However, it would be just as necessary for a process assessing individual governments. In this respect, the model hampers actual analysis of the effects of outstanding debt because it aggregates information upward. It is extremely unlikely that enough California governments would have problems with their debt level to show up in the aggregate numbers. Ultimately, it will be necessary to examine individual governments--or at least groups of governments (e.g., counties, cities, etc.)--to get a more complete assessment of the effect of the level of debt outstanding. The aggregate figures provide a useful starting point for the analysis, but their limitations should be clearly recognized in all cases.

The model in this phase of the project is similar in many regards to the model in Phase I. Both incorporate debt position, economic, and fiscal condition elements. The approach in this phase is more oriented to an assessment cycle than the model in Phase I which primarily showed hypothesized relationships among major financial elements.

2. How is this model to be used for the Commission's purposes?

If resources were available, the model would serve as a framework for the Commission to gather information and produce periodic analyses of the level of outstanding debt in the State and its implications. As the text of the study describes, the model can be used to develop a set of indicators using a broad list of possibilities. The model provides a method of grouping and organizing the indicators and an overall analytical process.

#### IV. INDICATORS

##### A. Indicators Created by Credit Rating Agencies

1. What measures are currently used by the major municipal credit rating agencies?

Moody's and Standard and Poor's both claim to use a wide range of indicators, many (if not most) similar to those discussed in the report. In general, these indicators breakdown into economic factors, management factors, fiscal factors, and administrative factors. Both rating agencies also use special indicators for specialized types of debt, such as revenue bonds or enterprise debt. For example, Moody's keys on indicators such as net debt per capita, net debt to full market value of all taxable property, and similar indicators for general obligation debt. For enterprise debt, the firm's analysts will focus on operating issues, such as net take-down (net revenues divided by gross revenue and income) and operating ratio (operating and maintenance expenses divided by total operating revenues). On the other hand, the analysis of hospital enterprise debt might focus on the percentage of bed occupancy, average stay, percent of revenues from Medicare or Medicaid, as well as such other "normal" operating statistics as accounts receivable. Because of the range of types of municipal debt and the range of indicators used by the two credit rating agencies, a list of indicators is not provided here.

With regard to sources of data for compiling these indicators, both agencies make use of a wide range of sources, but the most important single source is the jurisdiction being rated. For example, Standard and Poor's prefers that a jurisdiction requesting a rating provide the following information:

- Last three annual audit reports
- Current budget document
- Current capital improvements program
- Official statements for new financing
- Planning document
- Zoning or land use map
- In the case of interim borrowing, cash flow statements
- Statement of long and short term debt with annual and monthly maturity dates as appropriate
- An indication of appropriate authority for debt issuance (statutes, etc.)
- Statement concerning borrowing capacity plus tax rate and levy capacity
- Statement regarding sources and allocation of funds for the project being financed
- Description of the project to be financed
- The nature and security of the debt should be concisely defined

Also required are current economic information, engineering studies description of the facilities, customer projections (for enterprise financing), and many other factors.

Other important sources of information are the Bureau of the Census, the Departments of Labor, Commerce, and Agriculture, state labor departments, and such publications as *Sales Management and Marketing Magazine*. Both firms also maintain in-house data banks

containing historical data on debt issuances and other information pertinent to the credit rating.

Presumably, these indicators could be updated at least annually--if not more often in some cases--however, actual updating, from what is generally known about the agencies practices, appears to be primarily a function of how often the jurisdiction is in need of ratings. Many governments actively seek to maintain an on-going relationship with the agencies and provide quarterly and/or annual presentations to the agencies.

2. To what extent may ratings themselves be used as indicators of changing debt conditions; i.e., either improving or deteriorating?

As measures of the overall level of debt outstanding--for California in aggregate, the point of this project--ratings would be virtually valueless, since they could not be aggregated in any meaningful way. Based on the assumption that the rating agencies spend more time and are more expert at debt analysis than most other sources, their findings should be one reasonable indicator of credit condition. However, it is important to recognize that the raters would be looking at many of the same statistics as anyone else developing a indicator system. Therefore, the ratings would not conceptually be a leading indicator of developing problems, assuming both sets of analysts (rating agency and indicator developers) were equally adept.

As to the relationship between ratings and the likelihood of default, there is presumed to be a strong correlation. However, there have been so few municipal defaults since World War II, there is no clear statistical method of proving the point.

#### B. Indicators Devised by Others

1. Do investment bankers, financial advisors, and bond traders typically use certain standards or indicators other than those used by rating agencies to compare debt?

The best available information indicates that, with the usual variations on the theme, financial advisors and those in the profession use very similar indicators to those used by the rating agencies. Articles in this area seem to suggest that there is a range of factors that various analysts favor, but there does not appear a fundamentally different way of thinking about financial condition.

2. Did the review of the literature reveal indicators similar to and/or different from those used by rating agencies, underwriters, and other practitioners?

Given the range of studies across the years and the range of indicators summarized in Part 2 of the report, indicators clearly have been used which are different from those used by underwriters and rating agencies. Most, as noted above, are primarily variations on the same theme--measuring various aspects of economic condition, financial condition, and debt condition. The most novel approaches identified in the literature review were the debt capacity index and the various measures of revenue and fiscal capacity developed by Bradbury, Yinger, and Ladd.

#### C. California and the Nation

1. What standards would be optimal for comparing California to other states?

Interstate comparisons are possible, although they clearly are limited in range by inconsistent data and differences in the roles, responsibilities, and resources available to governments in different states. We feel strongly that they should be developed for the simple reason that they are always a matter of interest and concern to policy makers, and even given differences, they can provide some useful insights in the analysis of a particular state.

With respect to the group of states to be included in such a comparison, we would recommend comparisons based on all states as preferred. Trying to artificially limit the number of states in the comparison to other AAA states or similar categories can only cause consistency problems over time, since most such categories change over time. In any case, it is less certain that California is best compared to other AAA states, but might better be compared to other major industrial states, many of which are not AAA states.

In summary, the pros for making the comparisons is that it is difficult to track performance in this area without some set of standards which interstate comparisons and national averages provide. These comparisons are also of general interest to policy makers, regardless of the most carefully reasoned staff arguments about the problems they pose. On the other hand, they do have serious limitations since the states are not all structured the same. Interstate comparisons some be used, but care should be exercised in the conclusions drawn from them.

2. Is a comparison between California and national averages and other nationwide benchmarks worthwhile?

Yes, for the same reasons given above.

#### D. Recommended Indicators

1. Assuming that data acquisition is not a problem, what would be an "ideal" set of indicators for the Commission's purpose of evaluating the total outstanding public debt of California state and local entities? (If necessary, this recommendation should include newly developed indicators or, at least, suggest state-specific indicators to be developed in the future if the theoretical model so indicates.)

The indicators recommended in the study are described in detail in the project report, Part 2. They include a range of indicators, many of which can be used to gauge the trend in economic or financial performance over time.

##### *Debt Indicators:*

These indicators clearly should include trend measures, and the recommended indicators set does just that. As the literature review shows, there have been so few defaults in the last 40 years that it is difficult--if not impossible--to specify a "profile" of when a government's or group of governments' debt burden has become too large. It is important, if analysis is to be done, to examine trends over time. Cross-sectional data would also be useful since we know that there are not only differences over time but also among types of governmental units and sizes of governmental units.

##### *Revenue-based Indicators:*

The indicator set that is recommended in the report does not include such locally oriented measures as tax rate, delinquent taxes, building permits issued, and so on. These are useful indicators of local performance and might rightfully fit into an indicator list designed to monitor the performance of individual local government units, but the purpose of this analysis was to assess the total outstanding debt of all California governments. There is not practical way to combine data on the thousands of governmental units in California to arrive at a meaningful measure of the variables mentioned in this question. This is not a matter of suggesting that they would be "ideal" if an indicator could be derived; instead, they would, even under ideal circumstances, present indicators complicated by hundreds of interpretative problems in sorting among the types of governments in the composite.

The recommended indicator set includes very few indicators--with the possible exception of the age of the housing stock--that do not particularly gain in value through trend analysis; however, for the most part, the recommended indicators should be looked at over time to present perspective on the changing condition of government revenue position as well as its current position.

*Expenditure-based Indicators:*

The indicators recommended in the study provide measures of most of the points mentioned in this question--current expenditures over current revenues, expenditures in excess of inflation, and incidence of actual expenditures in excess of the approved budget. Only the last of these is a potentially difficult concept in an aggregate level analysis.

With respect to maintenance of indicators other than those subject to trend analysis, the recommended indicators are all measures that can be tracked over time, and again, the recommendations indicate the need for time series analysis.

*Cash Management Indicators:*

The indicators include measures of short-term debt (i.e., less than one year) outstanding. In an aggregate analysis, information on these measures may be extremely difficult to develop and interpret as a practical matter. However, measures of investment policy would be even more difficult to develop, and by the time it could be developed, it would almost certainly be out of date.

*Economic Indicators:*

The question enumerates a number of statewide economic indicators, including personal income, retail sales, and so on--and asks if they should be included in the indicator list. The answer clearly is yes, and in fact, the recommended list includes most of the indicators mentioned in the list with the exception of individuals receiving public assistance. That measure depends so heavily on the location of the individuals that it does not appear to have much value in an aggregate analysis of the type described in this report.

Most economic indicators can be measured by time trend; however, the measures included in the recommended set include some, like the unemployment rate and the age of the housing stock, that are less usefully viewed over time.

*Other Indicators:*

Managerial and organizational indicators are, again, problematic in a statewide aggregate set of indicators and are not included in the recommended indicator set. In the first instance, no very good measures of these factors have been developed in the literature--they are mainly assessed indirectly through a government's ability to balance its budget and maintain a sound credit rating. Moreover, these problems are compounded in trying to aggregate for statewide analysis. If a local indicator of organizational competence existed, for example, how would this measure be aggregated upward? How would different levels of competence be weighed statewide?

It is a recommendation of the report that, should the Commission decide to move forward with debt indicators, that it consider developing measures at least for individual groupings of governments (such as school districts, counties, etc.). As a beginning, aggregate measures are preferable to no monitoring of government credit condition, but to develop any useful information, some level of disaggregation ultimately appears critical.

2. What, exactly, could the Commission hope to learn from an application of the full, "ideal" set of indicators?

Presumably, the application of the ideal set of indicators would provide a clear overview of the level and burden of debt among California state and local governments. It would help clarify what is apparently an on-going concern among some state elected officials about the level of government debt in California and its implications. No indicator set can be expected to provide definitive answers to questions about credit condition and the fiscal health of government, but the indicators set can provide indications, departure points for analysis, a consistent framework for organizing and reviewing existing data on credit condition, and a guide to new types of data and analysis that should evolve.

The chief policy implication beyond better insight into the fiscal condition of California governments that is sure to enter the equation is whether such an indicator set would be used to monitor and control the issuance of debt by California governments. Clearly, the ideal indicator set--and indeed no indicator set yet developed anywhere--could function in a way to allow this type of regulation. The orientation of this project, moreover, does not lead to the application of the analysis to individual *groups* of governments, much less to individual units. Certainly, this was not a design consideration of the Commission nor an operating assumption of the consultant in the project.

3. How often should these indicators be updated?

The indicators recommended in the study would generally be updated annually, although some measures--such as the unemployment rate--could be updated as often as monthly. Given limited resources, annual updates accompanied by a regular annual report on the level of debt in the State (as is discussed in the recommendations) would probably be a good initial goal for the development of this system should it proceed in the future. Certainly, any debt or other data that is reasonably maintained more often than annually now would be maintained.

With respect to the business cycle and how it should be accounted for in the indicator process, it would appear to be more a phenomenon helping to explain a given level of performance more than it is a factor which should somehow be corrected for in the indicator analysis itself. Clearly, it is necessary to be aware of how the overall economy is performing, which is one reason that a number of economic factors are included.

Inflation should be removed from at least some of the measures so that it is possible to get a sense of real (inflation-adjusted) performance. In the recommended list, measure of real expenditures per capita have been included as a check against growing governmental commitments. Other inflation-adjusted factors could profitably be included but are not in the recommended list to maintain a group of indicators that are of a manageable size.

## V. DATA DISCUSSION

### A. Data Requirements

1. What types of data would be required to develop the "ideal" set of indicators for the Commission?

The sub-parts to this question list a number of different sources and types of data. Virtually all would be important in any ideal indicator set. Under ideal circumstances, data would be readily available from various governments on a timely and consistent basis.

2. What quantity of data would be required to develop the "ideal" set of indicators for the Commission?

Ideally, a data base containing a minimum of 10 years of data should be developed. This would provide the degrees of freedom necessary for statistical analysis. It would also show the evolution of government performance through a range of economic conditions. Focusing on a shorter time period, though certainly possible given realistic limitations on time and resources, would be of more limited value because it encompasses a period of relative growth in the State and would provide less insight into how government performs under a range of conditions.

Data should be updated at least annually and as quickly as possible after the end of the normal government fiscal period. Clearly, the information will be of greatest use if it could be assembled within three to six months after the end of a fiscal year. Currently, much of the data available at the local level only becomes available after lags of 18 months, with a resulting sacrifice of analytical value.

#### B. Data Sources

1. Where did the researchers mentioned in the literature review, above, find their data?

That is a fairly wide ranging question given the number of studies reviewed. For the most part, however, the main sources were: (a) local fiscal data; and (b) information collected by the federal government. As a result, almost all of the analyses in the literature suffer from the problem of lags in time between the end of a government or governments fiscal period and the ability of the analyst to acquire data.

In no case in the literature review did the researchers actually go to individual local governments and collect their own data. Many of the studies acknowledge the limitations presented by the available data, but the point of the analyses is to attempt to draw inferences and useful conclusions from the available data, not to specify impossibly high standards of consistency and comparability. In most cases, the researchers simply lack the resources to make major improvements in the generally available information on their own and simply use what is there to be used.

2. Did any of the researchers mentioned in the literature review point out particular problems in using data from public and commercial sources?

Other than obvious problems like the lack of consistent responsibilities among governments, the main data problem is timeliness of available information. Given that the purpose of many of the analyses is to monitor credit condition or general fiscal health, there is a major problem with examining information that is months or years old. Unfortunately, much of the analysis in the literature review is based on data with just this sort of problem.

A second problem mentioned by analysts is the lack of detailed data on certain important fiscal issues. There is, for example, virtually no consistent aggregate information on unfunded pension liabilities of governmental units, although there appears to be broad agreement among analysts that that is a critical factor in determining the financial strength of a jurisdiction.

A third problem mentioned is the lack of consistency in data. This often is a problem when comparisons are being made of jurisdictions in more than one state. Some analysts attempt to adjust for these differences, and an important vein of future research is likely to be efforts to define a "representative" set of fiscal measures with definitions that can cut across jurisdictions. However, it is also a problem in attempting to aggregate various types of jurisdictions in the same state. Counties, cities, special districts, and the State simply do not

all maintain records in a consistent manner and differences in size and legal responsibilities is likely to preclude uniformity from ever being the rule.

All of these problems would arise if the Commission attempted to develop and maintain its own indicators system. The advantage that the Commission has is that California state and local governments report an exceptionally large amount of information at the state level, and while it is far from perfect, it could provide a very good beginning point for an indicator analysis.

3. Assuming that--as a by-product of Phase I of the project--it were possible for some entity (other than the Commission) to create a database for the purpose of establishing reference groups against which individual local entities could compare their own indicator values and, assuming further, that the content of that database encompasses information on the entire set of indicators from Phase I, would any of that data be useful in testing and/or using the Commission's model developed in Phase II?

Yes, almost any of the data developed would be useful since the indicators in the two phases overlap to some degree. The problem I have in envisioning this--which is eluded to indirectly in the sub-parts to the question--is who would gather this information to begin with if it were not the Commission.

4. Are there existing sources--other than those already considered--for all or part of the data needed? If not, what are recommended options for obtaining that data?

Most of the data needed for the recommended indicator set is available at some level of consistency from state and federal sources, primarily from the Census Bureau and the California Controller's office. Additional information might profitably be developed from private sources, such as California Municipal Statistics. If these sources were inadequate, the best apparent alternative would be to negotiate with those collecting the data to modify their current procedures. Absent that, it is possible that the Commission could seek authority to collect its own information. However, that would be an exceptionally costly exercise, would inevitably be redundant of current efforts, and would produce its own set of problems.

#### C. Data Collections

1. Are any of the data currently being collected by the Commission suitable for indicator development?

The information collected by CDAC at present would be a useful addition to any database on state and local debt, but it lacks integration that would allow it to be put into a useful analytical framework. Certainly, it is important to know how much debt was issued in a given year, but for the analysis contemplated in this study, new issues would have to be consolidated with other sources of information to determine trends in total outstanding debt.

2. Assuming it could be obtained, what additional public debt-related data should be collected?

The main indicator that should be developed is the total level of debt outstanding broken down by level of government and type of debt. It would also be important to have data on debt service requirements. All of the data elements listed in the sub-part to the question--short-term debt, lease obligations, moral obligations, unfunded pension liabilities--are part of the indicators in the recommended indicator set in the report.

If this had to be a piecemeal effort, the focus should be on the overall level of debt by level of government since this is the central issue being analyzed. This is also the starting point for much

of the analysis implied by the development of an indicator set like the one described in the report.

3. What data from outside sources will the Commission always have to depend on?

Economic and demographic, almost certainly. Given limitations on the resources of the Commission, it may also be necessary to rely on outside sources for most of the other sources of data as well. This dependence does not present a particular problem as long as the sources are more or less consistent over time, maintain and report their data on a regular (monthly, annual) basis, and are fully understood by CDAC analysts. In general, I favor the use of available data, with its obvious limitations since it is a more efficient use of public funds and is probably suitable for the level of analysis that would be possible with any aggregate indicator set for the State as a whole.

The major problems with Census Bureau data are timeliness and coverage. The information available from this source lags the end of state and local government fiscal years by 18 months, which reduces the usefulness of the data as an "early warning" system to a large degree. Moreover, the data developed by the Census for local governments is based on sample information. Since it is taken in part from the Controller's data in California, this is less of a problem than in other states, but it clearly lacks statistical precision. However, it is the best available source for some types of information and is the only available source for developing interstate comparisons.

## VI. RECOMMENDATIONS FOR APPLICATIONS

### A. Indicators for the Evaluation of Total Outstanding State and Local Public Debt

1. Should the Commission wait with any application, such as the development of a *Manual*, until a full set of "ideal" indicators can be developed?

The decision to go forward--or to not go forward--with the development of a set of indicators is probably best determined by an assessment of the Commission's desired role in assessing debt position and providing information to policy makers and by the availability of resources to conduct data collection and on-going analysis. If the Commission delays action until the "ideal" indicator set can be developed, no indicator set will ever be developed because the ideal set of data will never be available.

2. Given current data restrictions, would it be useful and feasible for the Commission to develop and apply a select number of indicators; i.e., a subset of the "ideal" set?

Given the availability of resources--which could pose a major obstacle--this would be a highly desirable step. Clearly, the consistent and routine aggregation and analysis of information on government debt position would be a useful step for the State. The existence of a pure, ideal set of indicators is irrelevant to the usefulness of this function; however, it would pose a number of costs, and given the inherent weakness of aggregate statewide data, Commission resources might best be spent elsewhere.

3. If the feasibility of developing a *Manual* is indicated by the findings of this study, what should be included in the definition of total debt?

Total debt should be defined to include all debt obligations of government in their many forms, including self-supporting debt. As the indicator set outlined in the study makes clear, however, this total should be subdivided into segments for analytical purposes. The various types of debt should not be treated equally but for purposes of analysis, they should be collected for analysis.

The reasons for this is comprehensiveness. It is never possible to predict where future policy issues will arise; thus, it is best to maintain a complete set of information on all forms of debt--given the option.

B. Regarding the Set of Indicators from Phase I

1. Are there sufficient similarities between the indicators recommended for inclusion in a future state *Manual* and those included in the local *Handbook* to suggest that the Commission develop "reference groups" that may be used by local users of the *Handbook* for comparison purposes?

This would be a useful development if it were feasible--a sort of state specific set of medians like those produced nationally by Moody's. However, this would appear to be a later stage of the development of CDAC's state and local indicators. This information would be useful to the Commission to the degree that it attempts to analyze sub-state data.

2. Are there other reasons why the Commission should develop "reference groups" for local *Handbook* users.

The most obvious reason for developing reference groups is the lack of concrete standards with which governments can compare their situations. Like interstate comparisons, the development of reference groups, while far from perfect, would provide a framework into which local decision makers could fit their own experience. Without this sort of framework, the *Handbook* probably would be much more limited in its usefulness.

A sub-part of this question asks about voluntary submission of data. In general, the voluntary submission of data would not be expected to accomplish the Commission's goals. CDAC sets very high standards for data. That much is clear by the concerns about the Controller's data, which appears very good in comparison with local data available in most states. Data gathered through voluntary submission would almost certainly be less rigorous and more uncertain than the Controller's data. Even with cooperation from major local government fiscal management groups, a process founded on voluntary information would be highly unlikely to survive for more than one or two cycles of information gathering.

3. Assuming that the Commission were able to collection additional data, should the Commission develop and maintain a database in relation to the "reference groups" for local users of the *Handbook* or are there reasons that would suggest that another agency or professional group should assume this task?

Given the availability of resources to perform this service, CDAC should maintain the database and furnish reference group information in conjunction with its training on the use fo the *Handbook*. Certainly, this database should, to the degree possible, be developed from existing sources. In this way, it would largely be a matter of gathering (by computer tape) available information from the Controller and other sources and manipulating it to meet the Commission's particular needs.

Such a database might reasonably be viewed with suspicion by local governments, possibly fearing state interference with their debt issuance powers. However, if the Commission worked through local government fiscal groups and clearly stated its purpose as supporting the use of the *Handbook*, there is no reason that the process could not work. Again, a major limitation would be in terms of the resources that such an effort would require.

## VII. RECOMMENDATIONS FOR FUTURE RESEARCH

### A. Indicators for the Evaluation of Total Outstanding State and Local Public Debt

1. Should the Commission do or commission additional research related to state indicators?

The list of indicators in the report appears to represent a sound basis for creating a statewide indicator system. It is not clear that additional research would significantly improve this basic list. Given the resources and the decision of the Commission to continue with this process, the reasonable next step would be to attempt to assemble all or part of the recommended indicators. This would probably be a better learning process than further research.

The policy implication of this recommendation is that the Commission would commit to the creation of a state level data base for creating the indicators. Clearly, this would require a substantial commitment of time and resources and should be carefully weighed prior to being undertaken.

2. Should the Commission do or commission addition work related to data requirements for state indicator development?

It is clear from this study that all desirable data are not available for the creation of an "ideal" indicator set. However, the available sources of information are generally well known. The major recommendation from the report is to possibly sample Controller data to check on its validity and to examine the information available from private sources--notably California Municipal Statistics. These could be performed separately or as part of an effort to create a state level indicator data base.

### B. Regarding the Set of Indicators from Phase I

1. Should the Commission do or commission additional research related to local indicators?

The Phase I portion of the project appears to have defined a reasonable set of indicators for use in the *Handbook*. For any subsequent phases of this process, this list could be combined with or supplemented with indicators from the current study. There does not appear to be a compelling reason to do further research in this area at this time.

2. Should the Commission do or commission additional research related to data requirements for local indicator development?

The answer to this question is essentially the same as the answer to question A.2.

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