Urban Infrastructure: The Role of Long-term Municipal Borrowing

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ABSTRACT

This dissertation is concerned with developing a theoretical understanding of the role that municipal borrowing plays in the financing of urban infrastructure. Historically, the growth of long-term debt has paralleled the growth of cities. Although the municipal bond market has been the main source of financing for large scale capital projects, recent evidence suggests that many large cities face an infrastructure crisis—a growing gap between capital needs and the ability to finance them. The reduction of federal aid directed towards infrastructure has served to compound the financial hardships faced by many large American cities.

Large municipalities, therefore, face a double-edged sword. On the one hand, cities need to invest in their capital plant to ensure continued growth and economic viability. On the other hand, raising the necessary capital, through the two traditional sources of funding—the bond market and the federal government—has become more difficult than ever before.

By examining the structure and operation of the market, the history of municipal borrowing, and reviewing the related developments in infrastructure research, public finance, and organizational theory, this dissertation sets out to explain why borrowing practices differ so widely between municipalities.

The research is based upon financial data on the 37 largest U.S. cities over the period, 1965-82. The first part of the empirical analysis involves a cross-sectional analysis of borrowing and investment patterns. The results of several different statistical analyses measuring the relationship between attributes (size, density, growth, etc.) and levels of capital spending and borrowing are included.

While some significant results emerged from the cross-sectional analyses, it is argued that an approach focusing on the decision-making process of financial officers is likely to yield a better understanding of municipal borrowing. Different behavioral models are developed which illustrate how the process and outcome of borrowing can vary under different assumptions. Two regression models are formulated and tested on the largest cities over time. The results suggest that in over one-half of the cities examined, capital spending could be accurately predicted on the basis of two independent variables: long-term debt and federal aid. The existence of different behavioral patterns is confirmed by interpretation and analysis of 18 year time series data on municipal debt, capital outlays, and intergovernmental aid.

The overall results suggest that the further development of behavioral models holds great promise, not only for explaining capital investment and borrowing, but other activities of municipal government as well.

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INTRODUCTION
Chapter 1
Why Do Cities Need to Borrow?

In order to function effectively as centers of social, economic, and political activity, our cities must make large investments in public works. We have come to expect our cities to have adequate roads, streets, bridges, sewers, water mains, public buildings, and other forms of infrastructure. Although infrastructure is essential to our existence, we tend to take it for granted. We assume that the water we drink is safe, that the bridges won't fall, and that somehow, the infrastructure will continue to work. The expression, "out of sight, out of mind," captures quite nicely the prevailing attitudes towards urban infrastructure.

To then embark upon a study of infrastructure, one is immediately impressed by several obvious concerns. The study of infrastructure is, potentially, one of the more soporific topics that one could choose in the field of urban planning. Certainly there are more glamorous topics to delve into than the financing, construction, and maintenance of infrastructure. For whatever reasons, urban scholars have tended to steer away from the study of infrastructure; there is relatively little formal academic literature on infrastructure planning. There is no rich tradition of research on infrastructure, nor many who claim status as infrastructure illuminati, and certainly there is little, if any, heated political debate over the need for infrastructure.

Compare the topic of providing infrastructure to the topic of providing virtually any other public service. Public education, health care, and public safety are topics which are typically endowed with a strong
ideological or philosophical heritage. In contrast, the topic of urban infrastructure is striking in the sense that such readily identifiable markings have not yet evolved. Virtually all would agree that infrastructure is necessary, that it acts as a foundation for further economic and social development, and that the public sector, rather than the private sector should play the dominant role in financing, building, and maintaining most forms of large scale infrastructure.

Radicals and conservatives alike share in the belief that infrastructure is an important, essential public sector activity. Although as expected, there is considerable disagreement over who should shoulder the costs of infrastructure and who should benefit most from it, there is at the same time, a general consensus that most forms of infrastructure quite closely approximate a "pure public good." As such, many would argue that infrastructure is government's first or even its only responsibility. Clean water, clean air, the removal of noxious wastes, and other benefits of infrastructure are universally desired ends. More to the point: both radicals and conservatives need properly functioning toilets.

The traditional means of financing infrastructure has been through the use of borrowed funds. Long-term debt has played and will continue to play an important role in infrastructure finance.

Not until recently has the topic of infrastructure finance become an subject of some concern within the field of urban planning. In the past, problems associated with the financing of capital expenditures have generally been treated as part of larger concerns with the allocation of public expenditures. In spite of differences between operating and capital expenditures, researchers either lumped both together, or, more often,
ignored capital spending altogether. Even less can be said about the empirical research on municipal borrowing. Although there have been numerous studies conducted from the perspective of the investment community, there has been very little empirical or theoretical work from the perspective of municipal governments.

Infrastructure finance and long-term borrowing practices, therefore, stand out as pristine areas for inquiry and theory building within the field of urban planning. There is ample room for exploration and the testing of new ideas and paradigms. Because of developments in related areas (i.e., determinants of municipal expenditures, state and local tax policy, and public sector decision-making) there are some intellectual foundations which this study can draw upon to better direct this inquiry into infrastructure finance.

The Field of Infrastructure Finance

The topic of infrastructure finance is, by nature, an interdisciplinary subject. When we speak of infrastructure, we are referring to physical, in-ground, public investments which retain value and provide service for many years, perhaps decades. It is convenient to think of at least three basic intellectual foundations which support this field: engineering, public finance, and organizational theory.

Engineering standards help to establish minimum levels of acceptable performance for infrastructure systems. Standards are not without problems. There are difficulties associated with the translation of environmental constraints (population dynamics, land use, composition of industrial base, etc.) into realistic standards which are usable both today and in the future. The determination of appropriate engineering standards,
therefore, stands out as a particularly important component of infrastructure finance.

Once acceptable standards can be identified, an estimate of infrastructure costs can be derived. Financing infrastructure raises a set of issues which are, perhaps, best dealt with from a public finance perspective. First, what is the public's willingness to pay for additional infrastructure? Second, how can the costs be handled in the most equitable and efficient manner? Financing infrastructure involves the pooling of available debt and non-debt resources and the subsequent allocation of these funds to complete the project. Because of the magnitude of infrastructure costs and because of the fact that most infrastructure systems last for many years, cities often resort to the use of borrowed funds. Borrowing enables a city to raise the necessary funds when needed and then by spreading the repayment of debt over time, to ensure that future generations benefiting from the facility, share in its costs.

Perhaps the best way in which to envision the integration of engineering standards, the public's willingness to pay, and the allocation of infrastructure costs and benefits, is from within an organizational context. Given engineering standards and economic criteria, how are decisions reached? What are the main factors which influence decision-making regarding infrastructure and debt? Can borrowing decisions be interpreted in light of recent developments in organizational theory? How can the analysis of capital spending and debt contribute to the overall understanding of municipal government decision-making.

The Municipal Government Context
There are many different types of local governments (cities, villages, towns, special districts, school districts, and various authorities). While there are only 50 state governments, and one federal government, there are over 70,000 units of local government. Local government's primary function involves the allocation and provision of public goods. Higher levels of government (state and federal) are responsible for other functions of the public sector. The system of government in the U.S. requires that local governments play a strong role in the planning, financing, and delivery of infrastructure services.

This research focuses on municipalities, those general-purpose governments responsible for providing a full array of public services. According to the 1982 Census of Government figures, there are 19,076 municipal governments. The majority (18,657) of these have a 1980 population of less than 50,000. In this study, I will draw particular attention to the largest cities in the nation, each with a 1980 population of at least 300,000. Altogether, about 39 million people live in these municipalities. This amounts to about 28 percent of the 141 million people living in municipalities and 18 percent of the total U.S. population. This group of cities was chosen for several reasons. First, these cities provide the widest array of public services, suggesting that trade-offs between current and capital spending, and, between beneficiaries of services and bearers of cost, are most complicated. Second, as a group, these cities have the highest per capita expenditures, capital outlays, and debt of all municipalities. As such, these cities have the most advanced infrastructure systems as well as the most elaborate systems for financing and delivering public services. Third, it is conventional wisdom that the largest cities face numerous problems (e.g., crime, congestion, poverty, and
other social problems) which have proved, over time, to be quite resilient to remedy. Tinkering with the planning, delivery, and management of urban services stands out as an opportunity to contribute to the betterment of these areas.

The intent of this work, therefore, is to contribute to the general theoretical knowledge of how decision-making pertinent to long-term borrowing occurs in the public sector. Other secondary and tertiary objectives of this study include the description, analysis, and discussion of problems associated with the financing and delivery of infrastructure in the largest American cities. To the extent possible, this study will attempt to strengthen the linkages between theory and practice.

**Why Do Municipalities Borrow?**

The most important reason why municipalities borrow is to finance capital expenditures. There are, however, other reasons why a city may resort to the use of borrowed funds. Cities borrow to balance their budgets. Municipal governments are required by law to show a balance between expenditures and receipts at the end of each fiscal year. The general practice is to use short-term debt to bridge gaps between revenues and expenditures on an annual basis. Short term debt is classified as debt which remains outstanding for less than one year. It is retired upon receipt of sufficient general revenues and as such is a form of general obligation debt. There are a variety of different short term notes such as TANs (tax anticipation notes), RANs (revenue anticipation notes), BANs (bond anticipation notes), and other types of short term debt (e.g., construction notes, etc.) which municipalities use to bridge gaps between initiation of projects and receipt of funds.
The need to use borrowed funds, therefore, can result from a variety of factors. An increase in tax delinquencies, or other unforeseen events (e.g., abnormally high snow removal costs) leading to unexpectedly large expenditures may foster the need to borrow.

Another reason why municipalities may be inclined to borrow is to hedge against inflation. Rational economic behavior suggests that to the extent possible, municipalities should borrow more when interest rates are low and defer borrowing during periods of high interest rates. Although it is unlikely that municipalities would accumulate large surpluses during periods of low interest rates, there is some evidence to suggest that high interest costs can lead to the postponement of borrowing and delays in the completion of capital projects.

Arbitrage is the practice of taking borrowed funds and putting the proceeds into another investment paying a higher rate of interest. Since the interest costs on municipal debt range between several hundred basis points (a basis point is equal to 1/100th of a percentage point) below the costs of corporate securities, cities would be tempted to practice arbitrage, were it not for the Internal Revenue Code, which imposes controls over the re-investment of municipal bond funds. Basically, IRS regulations cap the allowable interest spread that is permitted on reinvested borrowed
funds to 12.5 basis points. This is such a small spread that it would be hardly worth the while of municipal issuers to engage in arbitrage.¹

In summary, municipalities borrow for reasons other than financing capital expenditures. Short term debt (TANs, RANs, BANs, etc.) is used to balance revenues and expenditures. To the extent possible, municipalities will also hedge against inflation, borrowing more when interest rates are low and less when rates increase. Although constrained by IRS restrictions, municipalities will engage in arbitrage, placing the proceeds from borrowing in high yielding investments or retiring old debt carrying higher interest costs.

Capital Expenditures and Municipal Borrowing

While borrowed funds may be used for purposes other than financing public works projects, this research focuses exclusively on the relationship between capital expenditures and debt. We begin with the premise that municipal governments are responsible for the provision and financing of infrastructure.

¹A general exception to these arbitrage rules occurs when borrowed funds are used to make loans to the general public for housing, education, or charitable organizations. With this type of funding arrangement, cities are allowed to earn a spread of up to 150 basis points. Arbitrage is justified here on the grounds that such loan programs impose administrative costs to the issuer. Another exception to IRS arbitrage rules involves the use of debt service funds. Upon borrowing funds, a municipality may invest a maximum of 15 percent of the total borrowed amount, without yield restrictions, if it is part of a reserve or replacement fund. This 15 percent amount, though specified, in Section 103c of the Internal Revenue Code, has been re-interpreted to mean a deposit equal to the maximum amount of combined interest and principal paid in any one year. Similarly, restrictions apply to the potential earnings from advanced refundings. Advanced refunding occurs when a municipality borrows for the purpose of retiring outstanding debt.
Although there are non-debt sources of revenue which can be applied to financing infrastructure, these resources are less reliable and less appropriate than debt financing. Traditionally, municipalities use current revenues (e.g., income from taxes and fees and charges) to finance operating expenses. In order to use current revenues to finance capital expenditures, cities must either cut operating expenses (e.g., salaries and wages), or, raise taxes or fee schedules. Both of these options are politically unpopular. State and federal grants represent another potential non-debt source of financing for infrastructure. The use of grants, however, may be subject to conditions or limitations imposed by outside agencies. Moreover, changes in funding criteria may lead to abrupt loss of support, making them, in general, a less predictable and stable source of financing for infrastructure.

Operating expenses tend to claim the "lion's share" of current revenues and non-debt resources. Debt financing provides a means of earmarking a share of these current revenues, over time, for capital investment. Debt financing also provides a means of raising a large amount of capital in a short period of time. Given the nature of budgetary decisions which tend to be incremental, raising the necessary funds for capital investment in the absence of borrowing privileges would be virtually impossible. Finally, debt financing provides a means of spreading the costs of a capital facility over time, ensuring that future beneficiaries share in its costs. By matching the repayment schedule to the life expectancy of the infrastructure system, debt financing provides a built-in mechanism for cost-sharing.

Municipal borrowing, therefore, has become an important component of public sector decision-making. Over the past 50 years, municipal debt
has increased greatly. In 1932, total outstanding municipal debt was only $9.8 billion, approximately one-tenth its present size. In 1982 alone, municipalities issued over $11.4 billion in long-term debt. During that year, municipalities with population greater than 300,000 issued more than $4.1 billion in long-term debt.

In 1982, municipalities collected $138 per capita in property taxes, $44 in per capita general sales taxes, and $78 per capita in federal aid. Municipalities issued more than $81 per capita in long-term debt, making debt a greater revenue source than either general sales or federal aid.

In 1982, cities such as Dallas, Houston, Minneapolis, Philadelphia, San Antonio, Baltimore, and Washington, D.C. each issued more than $100 million in long-term debt. New York City issued over $1.3 billion in long-term debt.

In 1982, the total amount of long-term debt issued by state and local governments exceeded $87.5 billion. Long-term borrowing by municipalities accounted for about 13 percent of this amount. Non-federal governments have issued debt to finance a broad array of capital projects (See Figure I-1). For example, in 1982, state and local government entities issued some $4.7 billion for education, $6.2 billion for transportation, $5.0 billion for water and sewer, and $7.1 billion for public power projects. These governments also borrowed $14.3 billion for housing programs, $12.7 billion for industrial development projects, $5.3 billion for pollution control, and $9.5 billion for hospitals.

While state and local governments borrowed an estimated $87.5 million in 1982, they made only $66.8 billion in total capital outlays. These governments made capital outlays of $10.8 billion for education, $18.1 for transportation, $12.6 billion for environment and housing, and $2.2
billion for public safety. Differences between annual amounts of debt issuance and annual capital outlays are to be expected; cities generally borrow in anticipation of making actual capital outlays. In order to specify the nature of the relationship between capital outlays and borrowing, a multiple year time frame needs to be constructed.

The Organization of This Study

The starting point of this analysis is that the primary reason why municipalities incur debt is to raise the necessary capital to build or refurbish roads, sewers, water systems, public buildings, and other forms of infrastructure.

The next chapter (Chapter 2) describes the municipal bond market. The purpose of this chapter is not only to describe the mechanics of issuing and selling municipal bonds, but also to identify the wide range of participants in the municipal bond market. It is argued that there are very diverse groups which all hold different stakes in the outcomes of municipal borrowing decisions. Chapter 3 contains a historical overview of municipal borrowing in the United States. In this chapter, the evolution of borrowing is describe. The connections between debt and development are traced. Over time, a logic of borrowing, which, as it is argued in this chapter, is inexplicably linked to the history of municipal governments.

The purpose of the fourth chapter, is to identify key issues in municipal borrowing as they relate to infrastructure. This chapter describes the so-called "infrastructure crisis" as well as some of the most recent studies on infrastructure. In addition to evaluating the existing research, this chapter specifies research needs and points explicitly to need to better understand borrowing decisions. In a sense, Chapter 4 contains the raison d'être for the future chapters. The next chapter (Chapter 5) contains a discussion
of theories relevant to municipal borrowing. Numerous theoretical approaches could be employed to explain borrowing: some would treat borrowing as strictly economic activity, while others would focus more on the political dimensions of the debt issuing process. This chapter puts research on debt and infrastructure into a theoretical perspective. Chapter 6 contains a cross-sectional analysis of debt and capital outlays. In this chapter particular attention is paid to the ways in which municipal attributes (size, density, growth, etc.) affect borrowing and capital spending. In addition to examining the statistical relationship between attributes, debt, and outlays, Chapter 6 concludes by suggesting that conventional, cross-sectional analyses are of limited value. In Chapter 7, a theoretical approach to understanding the financial behavior of large American cities over time is developed. The emphasis in this chapter is on developing an understanding of the rationale used by decision-makers in the issuance of debt. Behavioral approaches are superior to other alternatives because of their flexibility, their intimate connections with human thought and decision-making, and the extent to which such models can be used to inform or alter patterns of decision-making. In Chapter 8, the theory is tested on the 37 largest cities. In this chapter, each city is treated as an independent entity, and patterns of decision-making pertinent to capital outlays and debt are described. The central feature of Chapter 8 is a set of case histories on all 37 cities. In addition to describing each city's pattern of outlays and debt, this chapter contains the results of two models for explaining the relationship between outlays, debt, and federal aid. Chapter 9 contains an evaluation of this study as well as some conclusions which can be drawn from the analysis. The conclusions suggest a need for more research, particularly in terms of formulating behavioral models for
predicting municipal borrowing. The significant empirical findings are also reviewed and the implications of this study (beyond the academic community) are discussed. It is suggested that through a deeper understanding of decision-making, cities can better plan for infrastructure in the years ahead. At the same time, increased attention to infrastructure as a subject of scholarly research stands out as one of the more potent topics in the field of urban planning.
Chapter 2
The Municipal Bond Market

Basic Concepts and Terminology

The municipal bond market channels funds from investors to governments in need of resources. Investors have surplus funds. Governments, on the other hand, need capital to finance their programs and projects. The bond market helps to ensure smooth transactions between borrowers (issuers) and lenders (investors). A bond, moreover, means one thing to an issuer and something else to an investor. To an issuer, a bond is a type of loan, a promise to pay interest and principal according to a fixed schedule. In other words, to an issuer, a bond is a liability, a claim on future assets, and a financial obligation. To the holder of a municipal bond, however, it is an opportunity for earning additional income, similar to any other investment. In exchange for relinquishing funds, an investor receives a claim to a stream of interest income, as well as eventual repayment of principal.

When the bond market works efficiently, governments can raise the necessary funds for their endeavors. Investors receive compensation for use of their surplus assets, as well as some rate of return on their investment. The critical juncture for issuer and investor is, therefore, the interest on the bond. To issuers, this represents the costs of borrowing.

1The traditional perspective views investors as providing the “supply” of funds, and state-local governments as comprising the “demand” for funds; Light, J. and W. White (1979) The Financial System. Richard D. Irwin, Inc. Homewood, Illinois. p. 433. point out that a financial market performs two critical functions: 1) channel funds between suppliers and demanders; and, 2) establish “fair” market prices for securities by continuously assessing risks and establishing the expected rates of return.
To investors, interest represent yield on their investment. Issuers hope to lower interest costs, whereas investors hope to increase yields, as well as ensure the security of their investment.

**Default** is the term used to describe the failure on the part of borrowers to meet either interest or principal payments on schedule. A technical default occurs whenever there is a delay, but eventual payment. Both investors and issuers seek to minimize the likelihood of default. By doing so, the market will operate efficiently. Investors will be willing to provide funds for government. At the same time, interest costs will remain low enough so that issuers can afford to borrow the funds necessary to finance their projects.

The term municipal bond has come to include all of the publicly offered debts of state and local government. There are several reasons why state securities are included under the term "municipal." At times, the entire sub-national government debt market has been dominated by municipal issuers (e.g., following the Depression of the 1840s). Moreover, while there are only 50 state governments, there are, literally, tens of thousands of local government entities authorized to issued bonds. Finally, all local units of government derive their powers, including the ability to issue debt from state governments. As such, it seems appropriate to use

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2In 1978, Congress adopted Chapter 9 of the Bankruptcy Reform Act of 1978 which provided a more flexible legal procedure for municipalities to seek protection from bondholders under bankruptcy laws.
3Includes Washington D.C., Puerto Rico, Guam, and the Virgin Islands.
4According to Dillon's Rule (named an Iowa state judge), if a function is not expressly granted or specified in the charter, a municipality is forbidden to do it out; in other words, in all activities, including the issuance of debt, the municipality derives its authority from the state government.
one term—municipal bond—to refer to the collective lot of state and local securities.

Traditionally, municipal bonds are categorized into general obligations and revenue (non-guaranteed) debt. General obligations are backed by the full taxing power of the issuer; all sources of revenue will be used to pay off the debt. In recent years, a number of states\(^5\) have enacted restrictions on state and local taxation. In these states, governments have fewer revenues with which to back their general obligations. The bonds issued by these governments, are called "limited tax" bonds. When no limits on taxing authority exists, general obligations may be termed "unlimited tax" bonds.

Project revenues rather than tax sources, are used to pay interest and principal on revenue bonds. In other words, self-liquidating enterprises (highways, bridges, parking lots, convention halls, stadiums, and housing developments) generate the funds necessary to retire revenue bonds. Double-barreled bonds\(^6\) are those backed by both project revenues and tax revenues. Technically, however, these are considered as revenue bonds. Other hybrid bonds\(^7\) (combining characteristics of both general obligations and revenue bonds) include: 1) special tax bonds - bonds backed by a single ear-marked tax source (e.g., highway bonds backed by gasoline taxes);

\(^5\)Limitations on taxing authority include California’s Proposition 13, Michigan’s Headlee Amendment, and Massachusetts’ Proposition 2-1/2.
\(^7\)Ibid. p. 17
and, 2) **moral obligation bonds** - similar to general obligations, yet these bonds carry only a "moral" rather than a legally-binding pledge to use all tax sources to pay interest and principal.

The most important characteristic of all municipal bonds is their **tax-exempt status**. Interest income on municipals has always been exempt from the federal income tax. This exemption is based upon the "Doctrine of Reciprocal Immunity" contained in the U.S. Constitution. This doctrine holds that states cannot interfere in the operations of the federal government and vice-versa. The taxation of municipal securities, it is argued, would impair the ability of states to finance and carry out its operations. While this exemption is contained in **Section 103(a)** of the

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\(^8\)Glastris, P. (1985) "The Government Debt Racket" The Washington Monthly. February. pp. 12-22. describes how Nelson Rockefeller, as Governor of New York state introduced the moral obligation bond. "Almost in desperation, Rockefeller turned to a bond attorney with a venerable New York firm who had made his name in the thirties as an innovator in this very field—housing revenue bonds. The lawyer's name was John Mitchell, and he brought to the governor's dilemma the same crafty pragmatism that he would later show as Richard Nixon's attorney general. In 1960, Mitchell's sly deed was the invention, for Nelson Rockefeller, of the moral obligation bond...Under the terms of Mitchell's moral obligation, the governor was to notify the legislature when and if the revenues from the public housing were insufficient to meet the payments on the bonds. The legislature was not obligated in any way to pay the bondholders a dime; it merely had to consider doing so. The devious brilliance of Mitchell's scheme was that it made everyone think they had what they wanted..."
Internal Revenue Code of 1954, some have argued that this tax exemption is based more on political rather than constitutional grounds.\textsuperscript{9}

Congress has on several occasions amended the Internal Revenue Code of 1954 to restrict the statutory exemption of interest income. This happened in 1969, as well as in 1982 and 1983. These revisions have limited the uses of tax-exempt financing, put ceilings on the size of tax-exempt issues, and have added additional reporting and public approval requirements. As recently as the 1985 Congressional session, efforts to eliminate the tax exemption on state and local securities were not successful.

In addition to exemption from Federal income taxes, many state governments exempt interest income from state taxation, particularly on bonds issued within the state.\textsuperscript{10} Some states, however, tax income earned on out-of-state bonds. Municipalities generally exempt interest income from local income taxes as well. The attractiveness of a municipal bond, relative to a corporate bond is obviously greater for those investors facing high federal, state, and local income taxes.

\textsuperscript{9}Fabozzi, F. (1983) Federal Income Tax Treatment of Municipal Bonds in S. Feldstein, et. al. eds., The Municipal Bond Handbook. Dow Jones Irwin, Homewood, Illinois. p 31, points out that several proposals in Congress would terminate or modify this statutory exemption. Among the proposals include the formation of an Urban Development Bank which would lend funds to states and localities at rates lower than those prevailing on taxable securities. The Urban Development Bank would procure its funds by issuing taxable securities. Another proposal calls for states and localities to issue taxable securities. The higher costs to issuers would be offset by an interest subsidy provided by the Federal government.

\textsuperscript{10}Interest income from securities issued by the territories of the United States (Guam, Puerto Rico, etc.) and, Washington D.C., as well as certain local and urban agencies operating under the auspices of the Department of Housing and Urban Development are exempt from all federal and all state and local taxes.
There is some historical evidence that the tax exempt status of municipals helped to reduce interest costs for municipal borrowers. In 1913, the 16th Amendment to Constitution was adopted. This amendment which created the Federal income tax, provided for the tax exempt status of municipal bonds. Prior to the adoption of the Federal income tax, interest rates on municipal bonds was roughly equivalent to rates on corporate bonds. After 1913, however, interest rates on municipals fell in relation to corporate bonds and have remained lower. Over the past decade, interest rates for municipals ranged between 61 and 75 percent of corporate rates.

The reason that investors are willing to receive lower yields on municipal bonds is because of their tax exempt status. The after-tax income from municipals may, for some investors, be greater than the after-tax income coming from taxable securities. Generally speaking, the tax advantages of municipals materialize for those investors in at least a 30 percent tax bracket (meaning each additional dollar of income is taxed at a rate of approximately 30 percent or more). According to Federal income tax tables, the rate approaches 30 percent when taxable income on joint return exceeds $30,000, and for single taxpayers in the mid $20s. Generally, the difference between taxable and tax-exempt yields is about 30

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11Public Securities Association, (1981) op. cit. p. 135-136 reports that "in 1980, long term municipal rates averaged approximately 65 percent of rates on equivalent corporate securities. At the end of World War II, rates on municipals were as low as 41 percent of corporate rates. The gap slowly began to narrow..."

12GAO (1983) op. cit. p. 9 "In 1969, the ratio reached 87.2 percent because Congress was actively attempting to eliminate the tax-exemption for municipal bonds. When that effort failed, the market returned to its normal trends. However for 11 of the past 20 years, the ratio was below the 70 percent mark and between 1977 and 1980 was under 65.5 percent due to a heavy demand for tax-exempts by institutional buyers."

13effective July 1, 1983
percent. Therefore, if taxable bonds are yielding about 12-1/2 percent, similar municipals should yield about 8.75 percent (30 percent less). Obviously, an investor in less than a 30 percent tax bracket would be better off purchasing the higher yielding taxable security. A simple calculation, known as taxable yield equivalent enables investors to calculate the yield that a taxable security must pay in order to match the yield of a tax-exempt security:

\[ \text{TYE} = \frac{\text{TFY}}{(100\% - \text{MTB})} \]

where,

- TYE = taxable yield equivalent
- TFY = tax free yield
- MTB = marginal tax bracket

From this formula, it is easy to see that as the tax bracket (MTB) increases, so too do the tax advantages of municipals. Using the formula, an investor in the 34 percent tax bracket purchasing a municipal bond yielding 10-1/2 would require that a taxable return of approximately 15.9 for an equivalent after-tax return. An investor in a higher income tax bracket, say, 48 percent bracket, buying the same municipal bond, would need to find a taxable security paying a yield of at least 20.2 percent.

**Participants in the Municipal Bond Market**

The participants of the municipal bond market can be divided into two groups—the *inner* circle and the *outer* circle. The inner circle consists of the issuer and those called upon in the preparation and sale of a

\[^{14}\text{This is a perspective employed by Standard and Poors.}\]
bond (bond counsel, financial advisor, and underwriter). Investors, portfolio managers, fiduciaries, and others in the investment community who purchase, trade, and deal in municipal bonds stand in the outer circle. Included in this group of "outsiders" are the rating agencies, bond insurers, and the financial publishers. (See Figure 11-1).

There are approximately 80,000 units of state and local government in the United States. Of these, some 50,000 have issued municipal bonds. Unlike the market for corporate securities, the municipal bond market consists largely of smaller issues. Approximately 44 percent of the municipal bonds issued over the past decade have been for $1 million or less and 81 percent of all issues have been for $5 million or less.

It is on the basis of their tax-exempt status that various issuers, through their financial intermediaries (underwriters and dealers), attempt to lure investors to purchase, trade, and hold municipal bonds. The result is a pattern of savings and investment made possible by the bond market.

Three types of investors are attracted to tax exempt securities: commercial banks, property and casualty insurance companies, and high income households. In 1982, these three groups held almost 90 percent of all outstanding municipals. Although some non-profits, state-local governments, public pensions funds, etc., may hold municipals, these groups are generally exempt from income taxation, and, as such, the advantages of holding municipals are relatively fewer.

Throughout the 1960s, commercial banks held the largest share of the market, which amounted to over two-thirds of all new issues. In the 1970s,

15Public Securities Association (1982) op. cit. p. 47
16Ibid.
Participants in the Municipal Bond Market

**Outer Circle**
- Investors
- Commercial Banks
- Insurance Companies
- Individuals
- Dealers
- Brokers
- Rating Agencies
- Municipal Bond Insurers
- Financial Publishers

**Inner Circle**
- Issuer
- Bond Counsel
- Financial Adviser
- Underwriter
however, insurance companies and individuals increased their holdings to more than two-thirds of the market, leaving less than a third for commercial banks and others. Individuals have become increasingly important to the municipal bond market. They have not, however, attained the level of importance as they have in the corporate securities market, where individuals own two-thirds of all outstanding corporate stock.

Commercial banks tend to be heavy investors in municipal bonds\(^{18}\) when loan demand is weak and credit is readily available. In addition, to taking advantage of the tax exempt feature, municipal bonds, can also be counted as part of reserve requirements for public deposits and used as collateral at the Federal Reserve discount window. When the economy is slack and interest rates are low, banks purchase municipals with their surplus funds. Bank purchases of municipal bonds are generally related the "business cycle." As the economy moves further into the next business cycle, demand for loans gradually picks up. Credit begins to tighten and banks, therefore, slow their acquisition of municipal bonds. This pattern has been consistent since the end of World War II.\(^{19}\) Commercial banks increased their holdings of municipal bonds following the creation of certificates of deposit (CDs) in 1961.\(^{20}\) This gave banks greater flexibility in terms of the management of their assets and liabilities. When banks needed new funds, they could issue more CDs. This additional liquidity enabled them to invest more heavily in municipal bonds. Municipal bonds, moreover, were particularly attractive because of their high after-tax returns.

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\(^{18}\) Commercial banks like to invest in short and medium term securities to provide a reasonably liquid, yet high yielding investment portfolio.

\(^{19}\) Public Securities Association (1982) op. cit. p. 96

\(^{20}\) Ibid.
In the 1970s, however, banks found other, more lucrative methods to reduce their tax liabilities than by purchasing municipals. Through leasing operations they could take advantage of the investment tax credit. Foreign tax credits were also popular among some banks during this period. Another explanation for decreased bank purchases of municipals is that in general, profits for banks were much lower in the 1970s. When their profits decreased, so too did their tax liabilities, making tax exemption less necessary and attractive.

Like commercial banks, casualty insurance companies view municipal bonds as a means for counteracting high tax rates. Insurance companies tend to invest most heavily in municipals when their profits are the greatest. Influenced by factors such as inflation and government regulatory actions, their profits tend to be cyclical. In the mid-1970s, state insurance regulators granted rate increases. As profits increased, so too did bond purchases. Inflation, during later years, cut into profits largely because the costs of claims increased. Because of declining profits, municipal bond purchases also decreased.

Another reason why insurance companies find municipal bonds attractive is that unlike corporate stock, bonds are recorded on their financial statements at cost rather than at market value. Insurance companies must record stock at their market value rather than at cost. These assets figure into the amount of insurance a company can write.

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21Ibid.
22In terms of bond selection, insurance companies tend to favor long term maturities because they produce the highest yields. At the same time, they tend to be risk averse—selecting high quality bonds for their portfolios. Insurance companies have also shown a general preference for revenue bonds which on the average produce greater returns than general obligations.
23Ibid. p. 98
With municipal bonds, the insurance company not only gains the advantages of tax exemption, but also is not penalized by fluctuations in market price as they are with corporate stock.

Individuals constitute the third major group of investors in the municipal bond market. They tend to be most sensitive to interest rate fluctuations, so that when bond rates are near their highest peaks, individual investors are likely to be drawn to the market. In 1969 when municipal interest rates peaked, individuals purchased almost 97 percent24 of all new municipals. Individuals expressed similar levels of enthusiasm in 1974 and 1975 when municipal bond rates climbed to unusual high levels.

Another factor important to the behavior of individuals investing in municipal bonds is the effect of inflation. "Bracket creep" pushes the entire tax paying population into higher income tax brackets, thereby increasing the number of individuals who can take advantage of the tax exemption on municipal bonds. As incomes and tax liabilities increase, so too does the relative advantage of municipals over other forms of investment.

Issuers derive their legitimacy from state constitutions or statutes. There are, moreover, numerous state laws that regulate borrowing. These regulations may be in the form of limits or ceilings on the size debt, restrictions as to purposes for which governments may issue debt, and stipulations regarding the type of public approval necessary to authorize a bond sale.

Virtually all municipal bonds are accompanied by a legal opinion prepared by a nationally recognized bond counsel. This opinion provides

24Ibid. p. 99
assurance to the investor as to the validity, security, and tax-exempt nature of the bonds. The legal opinion states that:

the bonds are valid and binding obligations of the issuer enforceable in accordance with their terms and that the interest income on the bonds is exempt from federal income taxes. The assurance provided by the legal opinion stays with bonds as long as they remain outstanding, passing from one owner to another. The owner of a municipal bond cannot expect to sell it unless he delivers with it a copy of the bond counsel's approving legal opinion. For this reason, a copy of the bond counsel's opinion is often printed on the back of the bonds themselves...

The profession of bond counsel emerged in the late 1800s, when local governments were busy financing the railroad industry and other internal improvements. When many of these bonds went into default, bondholders brought suit against the issuers. In order to avoid payment, issuers cited technical defects in the procedures for the authorization and sale of the bonds. They argued that because of these defects, they were not obligated to pay for the defaulted bonds. In order to remedy this situation, underwriters developed the practice of hiring an attorney of their choice, independent of the issuer, to review the procedures followed by the government unit. If the bond counsel found any technical defects, he would not render an opinion.

The role of the bond counsel has changed considerably. Initially, the bond counsel was independent of the issuer. As the restrictions on borrowing increased, issuers began to seek the advice of bond attorneys to guide them through the legal maze. Bond counsels began to play a much more central role, standing in the “inner” circle, providing advice directly to

issuers. A recent event which helped make the role of bond counsel even more important was the New York City fiscal crisis in 1975. Following defaults on general obligation bonds, the SEC issued a report criticizing the bond counsel's activities, particularly in the areas of financial disclosure.28 Another reason why the responsibilities of the bond counsel have increased is the proliferation of revenue bonds and non-traditional home bonds grew from a total of $1.6 billion to $14.3 billion.29 The Mortgage Subsidy Bond Tax Act of 1980 placed state by state limits on aggregate bond sales, required that most eligible home buyers be first time homeowners, and limited the purchase price of houses. The Act also eliminated the tax exemption on these bonds for all single family housing bonds issued after December 31, 1983. Over the past decade there

26 Congress created the Municipal Securities Rulemaking Board in 1975 an organ of the Securities Exchange Commission responsible for regulating the municipal bond industry.
27 New York City defaulted on short term notes (which are considered general obligations) and had "near defaults" on several other general obligations.
28 Many different authors have documented the causes of New York City's fiscal crises. The overuse of short term debt (BANs, TANs, and RANs), unusual and improper budgeting practices, utilizing debt to finance current operations, and many other improprieties have been cited as factors contributing to a hidden deficit of at least $600 million.
30 Ibid.
has been significant growth in tax exempt financing for pollution control,\textsuperscript{31} hospital facilities,\textsuperscript{32} and student loans.\textsuperscript{33} While Congress has been slower to clamp on new restrictions on these areas, such legislation is impending. Increasingly, the bond counsel is called upon to certify that a particular issue is in compliance with federal laws and that the interest income is, indeed, exempt from federal income taxation. Other new duties of bond counsel include a re-assessment of the security backing bonds because of the passage of tax limitations\textsuperscript{34} such as Proposition 13 in California and Proposition 2-1/2 in Massachusetts. These limitations have altered the concept of unlimited ability to tax—which in the past helped to make municipal bonds a secure and attractive investment.

**Financial advisors**, like bond counsels provide technical information to state and local governmental units involved in the issuance of debt. They too, stand in the inner circle. Moak states:\textsuperscript{35}

\begin{itemize}
\item [\textsuperscript{31}]Although pollution control bonds are a type of IDB, they are generally exempt from the dollar restrictions placed on IDBs. They are the largest category of IDB now being issued. The Water Pollution Control and Clear Air Acts of the early 1970s mandated large scale investments by industry. States and localities used their tax exempt status to provide low cost loans to the private sector. In 1982, approximately $5.3 billion in pollution control bonds was issued. See also, Peterson, G. and H. Galper (1975) "Tax Exempt Financing of Private Industry's Pollution Control Investment. Public Policy. Spring.
\item [\textsuperscript{32}]The Bureau of Economic Analysis estimates that over 80 percent of the state-local debt issued for hospital financing is issued on behalf of private, non-profit facilities.
\item [\textsuperscript{33}]Tax exempt financing for student loans started in 1976. Presently some 12 states operate loan programs for state residents. Another five states have special authorities which permit colleges to issue their own tax exempt debt. Dartmouth College, in 1982, was the first private university to issue tax exempt debt for its students.
\item [\textsuperscript{34}]Beebe, J. (1979) Proposition 13 and the Cost of California Debt. National Tax Journal. add date here...
\item [\textsuperscript{35}]Moak, L. (1982) op. cit. p. 135
\end{itemize}
There is a danger that the issuer will view the issuance of debt as merely a series of routinized steps that can be easily mastered through limited experience. Few assumptions are likely to be more erroneous. The more frequent and the more complex the fundings, the greater the need for competent staff and usually for consulting assistance. To proceed without the benefit of competent financial services is to invite development of an unwise plan that would prove faulty in execution...

Financial advisors are called upon during the early planning stages of a bond issue. They ascertain whether or not borrowing is appropriate or necessary. Once a decision to float a bond has been made, the financial advisors can help design the structure and terms of the issue, help with the selection of an underwriter, and provide advice on matters such as requesting a bond rating. Financial advisors act as an extension of governmental units, and like engineers, architects, and other consultants which may brought in from the private sector, they add expertise and specialized skills which the issuer may lack.36

**Underwriters** 37 also stand in the “inner” circle. They play a critical role.38 They purchase the issuer's bonds and then resell them to investors.

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36 Following the New York City fiscal crisis and similar events, financial advisors have moved more towards the center of the “inner circle.” Changes in federal policy shifting additional financial responsibilities to localities have also increased the importance of financial advisors.

37 Prior to the Civil War, bankers often served as middlemen, acting as either a “loan contractor” or “loan negotiator.” The negotiators set up the deals between the issuers and loan contractors who would subscribe to the bond issues, hoping to sell them at a profit.

38 A recent article in Investment Dealer's Digest, “Volume Impressive” March 1, 1983, p. 13 reported that most of the underwriting is handled by the nation’s top 15 underwriters, listed in order as, Merrill Lynch, Salmon Borthers, E.F. Hutton, Byth Easton, Goldman Sacks, Smith Barney, Shearson, Kidder Peabody, Dean Witters, Bear Stearns, Prudential Bache, Lehman Kuhn Loeb, Dillon Reed, and L. F. Rothschild.
The underwriter's profit is called the **spread**. The spread is the difference between what they pay for the bonds and the amount they receive upon selling them. There are two\(^{39}\) different methods of underwriting. With **competitive sales**, underwriters bid against each other and the issuers selects the underwriter on the basis of the lowest bid. The underwriter offering the lowest interest cost (highest price) to the issuer wins. With the **negotiated sales** method, there is no bidding. The underwriter is selected prior to the sale of the bonds. The issuer accepts the interest cost and price negotiated prior to sale of the bonds. With both methods of underwriting, the underwriter assumes complete risk for marketing and reselling the bonds upon delivery from the issuing government.

There has been a substantial increase in the volume of bonds sold through negotiated sales. Often an issuer may have no choice as to the method of underwriting.\(^ {40}\) Local laws may require the sale of general obligations through competitive bidding.\(^ {41}\) The proportion of bonds sold by negotiated sales has increased greatly, rising from 17 percent in 1970 to 68 percent in 1982.\(^ {42}\) Revenue bonds are generally sold through the negotiated sales approach. Because of the increase in revenue bonds,\(^ {43}\) the proportion of bonds sold through negotiated sales has also increased. Evidence can be

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\(^{39}\)A third method of sale is through private placement; these are bond sales which involve transactions directly between issuer and investor.

\(^{40}\)Each bond issue must have specific authorization; the instrument authorizing the bonds is referred to as the bond resolution.

\(^{41}\)Competitive bids are required in virtually every state (except Pennsylvania for the sale of general obligation bonds. In some states, general obligations can be sold through negotiated sales if the issuers fail to receive two or more bids for issues that have been competitively offered.

\(^{42}\)General Accounting Office (1983) op. cit. p. 17

\(^{43}\)As pointed out earlier, the revenue bonds now account for more than two-thirds of the volume of new bond sales. In 1970 general obligation bonds accounted for two-thirds of the volume of new bond sales.
drawn from the fact in 1982, only 12 percent of general obligations were sold through negotiated sales, while 76 percent of the revenue bonds were sold through negotiated arrangements.\textsuperscript{44}

There are important differences between the two methods\textsuperscript{45} of sale. With competitive sales, underwriters become involved in a much later stage of the debt issuing process than do underwriters engaged in negotiated sales. With competitive sales, much of the work pertaining to the nature and structure of the bond has been completed by financial advisors and others prior to the scheduled date of sale. The issue is prepared without assistance from any bidding underwriter. Several weeks prior to sale, a notice of sale appears in a publication such as the \textit{Daily Bond Buyer}. Aggressive issuers may also contact prospective underwriters directly to alert them of the impending sale. The underwriter then prepares a bid. The decision as to whether or not to prepare a bid depends on factors such as overall market conditions, the issuer's reputation, and the firm's capacity to carry additional debt. The underwriter in a competitive sale has little time to make a decision as to whether or not to offer a bid, since there are only a few weeks between the notice of the sale and the date of the sale.

If the underwriter decides to enter a bid, additional work must be completed. The underwriter must estimate the yields required to attract potential investors and prepare a bid with some chance of coming in lower.

\textsuperscript{44}ibid.

than all of the competing underwriters. The winner underwriter then tries to resell the bonds at a price high enough to cover the costs of researching the market, preparing the bid, as well as make a profit. Losing underwriters, on the other hand, must charge off all of their costs on to other issues for which they are the winning bidders.

The underwriter plans to resell the bonds in a matter of days following the sale. The bonds are physically transported by the issuer to the underwriter 30 to 60 days from the date of the sale. The underwriter must pay the issuer upon delivery. Generally, underwriters have few funds tied up in the issue prior to delivery, except for a small "good faith" check to the issuer. By the time of the delivery, the underwriter should have already resold the bonds, making either a profit or loss on the deal.

With negotiated sales, the underwriter enters the debt issuing process at a much earlier stage. Issuers opting for this method solicit an underwriter, perhaps the same one used on previous issuances. Underwriters in negotiated sales act much like financial advisors, assisting with the design of the bond's terms and structure, contacting rating agencies, and providing other services to the issuer. The negotiated underwriter may restructure the bond to make it more attractive or even postpone the date of sale because of poor market conditions.

On the average, bonds sold by competitive bid tend to have lower interest costs than those sold by negotiated sales.  

There are, however, some advantages of negotiated sales over competitive sales, particularly for small units of government, with little experience in the bond market. The municipal bond market is a national market, putting investors across the country in touch with many different and diverse issuers. For many issuers, a negotiated underwriter can help inspire investor confidence and drum up additional support for a bond sale. The underwriter, therefore, can serve as an important bridge between the public sector and the investment community.

With competitive sales, the issuer determines the winning underwriter on the basis of **lowest interest costs.** This is a simple computation if **term bonds** have been issued. It is more complicated with **serial maturities.** To simplify this problem the bond industry has developed a quick formula which ignores the time value of money, yet gives a measure for comparing total interest costs among competing bids. The computation, known as **Net Interest Cost (NIC)** is found by adding the total of interest payments for issue (adding discounts or subtracting

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49 With term bonds, the entire principal matures on one date. With serial bonds, the principal is repaid over a series of periodic payments over the life of the issue.
(premiums) and dividing by the amount of bonds times years outstanding (bond year dollars):

\[
\text{NIC} = \frac{\text{total interest payment} + \text{discount (or. - premium)}}{\text{bond year dollars}}^{50}
\]

Critics of the net interest cost argue that the method ignores the time value of money because the formula accounts for the total amount of interest regardless of when interest payments are due. An alternative calculation, true interest cost (TIC) does account for the time value of money. It is the yearly interest rate an issuer would be paying if all future cash payments discounted so that the sum of their present values equals the bond payments. There is no single algebraic formula for calculating total interest costs--present value tables or computers can be used to calculate this interest rate.\(^{51}\)

The difference between net and true interest cost is that the net interest calculation ignores the time value of interest payments. The Center for Capital Market Research (University of Oregon) has conducted extensive research on the problems associated with the use of net interest

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\(^{50}\) bond year dollars equals the par value of issue multiplied by the average life.

\(^{51}\) the function of TIC is to determine a rate of discount which, when applied to each dollar payment of debt service, will produce an aggregate amount equal to the money delivered to the issuer at settlement. The formula for discount of each amount is the basic present value formula: 

\[
\text{pv} = \frac{1}{(1 + i)^n} \times A,
\]

where \(i\) = semi-annual interest rate used for discounting; \(n\)=number of semi-annual periods from issue date to payment date for the amount; and, \(A\)=amount of debt service payable at the end of \(n\) semi-annual periods.
cost as a basis for awarding underwriters. With NIC, there is no difference between an issue structured such that all interest payments are due in the first year and an issue structured such that all interest payments are due in the last year. It would be possible, therefore, to design an issue with very high interest costs in the early years of the maturity and low interest costs in later years, while still maintaining a relatively low net interest cost. This "high-low" technique penalizes issuers by forcing them to pay out heavy interest costs sooner than would otherwise be necessary. True interest cost adjusts for these variations in when interest is due. True interest costs would increase if payments are high in early years and decreases if the interest payments are spread out over a longer time period.

There are a number of strategies to help bring NIC and TIC closer together. The issuer can, for example, place a limit on the coupon rate to prevent bonds in earlier years from having excessive interest costs. Limits can also be placed on the size of allowable discounts, since they can also raise interest costs. Another tactic is to require interest costs on succeeding maturities equal or surpass the rate on preceding maturities. This will minimize the "high-low" problem.

Once an underwriter's bid wins, it becomes the underwriters responsibility to resell the bonds. There are several different financial intermediaries which help to facilitate the bond market. Underwriters are classified as investment banks, because they do not provide many of the conventional banking services that commercial banks provide. Commercial


\[\text{footnote}{\text{53}\text{ibid.}}\]
banks, however, sometimes engage in underwriting as well as trading of municipal bonds. The term "dealer" is used to describe either commercial banks or investment banks which both underwrite new issues in the primary market and trade bonds in the secondary market. In 1980, there were about 1,800 dealers and dealer banks registered with the SEC.\textsuperscript{54} Perhaps one-third of these are active. Many dealers are small local underwriters who handle only their community's business. As issues become larger and more complex, the major dealers in New York, Chicago, and San Francisco have come to take an increasingly larger share of the bond business. The largest 25 firms, for example, managed more than half of the total volume of new issues in 1980.\textsuperscript{55}

"Traders" are those actively involved in the buying and selling of bonds.\textsuperscript{56} They may specialize in a certain type of bond, for example, general obligations, short term notes, sinking funds, and others. A trader\textsuperscript{57} can be employed by an investment firm, or, perhaps, may work for a large institution, such as a commercial bank, insurance company, or bond fund. A "bond broker," on the other hand, is an agent who works between two traders or dealers for a commission. They specialize in bonds that are difficult to sell. A syndicate or underwriter experiencing difficulty in selling bonds

\textsuperscript{54}Public Securities Association (1982) op. cit. p. 65
\textsuperscript{55}ibid.
\textsuperscript{57}A New York University anthropologist, Janet Marks, who has studied the behavior of traders compares them to the Yanomamo, a primitive people living in South America.
may contact a broker. The broker then finds a willing buyer and receives a
commission, generally equal to 1/8 of a point ($1.25 per bond) on the
transaction. There are relatively few bond brokers.58

Moving further outside the "inner circle," the perspective of
participants in the bond market changes from issuer to investor. The
secondary market becomes increasingly important. The secondary
market, larger and more diverse than the primary market, represents the
entire stock of outstanding bonds. In this market, there are many bonds to
choose from and a range of different investment opportunities.

In deciding whether or not to invest in particular bonds an investor
may opt to examine bond ratings. A rating is essentially an opinion as to
the quality of the bond. It measures the likelihood that the issuer will
make all interest and principal payments on time. The agencies which
provide these ratings play an important role because of the large number of
different government entities bringing their bonds to market. Ratings have
become virtually obligatory for the sale of all major bond issues.59

58 The most well known bond broker is J.J. Kenny's. Bond brokers have
earned almost a "mystical" position in the market, Delahanty, D. and A.
Goldstein, (1982) op. cit., describe it, "For example, we had been looking for
a large block of turnpike bonds one day; simultaneously a broker rang our
wire and showed us a block of $10 million of these, which we promptly
bought. Lucky? Smart? We have always asked ourselves how he knew. We
probably will never find out, but it doesn't matter. The fact remains that he
was there at the right time with the right bonds..."
York. p. 51 "Despite the faith of most institutions and individual investors
in ratings, many other observers of the municipal bond business, especially
in government, are by no means as positive in their appraisal of the rating
agencies. One critic went so far as to argue that given the number of
municipal bonds and the number of rating analysts, the average bond rating
would only take 20 seconds..."
Moody's began rating municipal bonds in 1918. Standard & Poor's, the other major rating agency, began rating municipal bonds in the 1940s. Moody's, considered the older and more established agency, rates approximately 4,500 issues per year. Standard & Poor's rates about 1,500 issues annually. Unlike Moody's, Standard & Poor's will not rate most short term notes nor certain types of revenue bonds.

Both agencies charge a fee for their services. The fee depends on the size of the issue and the amount of analysis necessary to conduct a rating. Generally, the issuer requests the rating, and the agency maintains and updates the rating until the bond has been redeemed. In the late 1960s and early 1970s, these services were provided free of charge. The agencies supported themselves through the sale of publications to investors and others in the financial community. The growing volume and increased complexity of conducting ratings led the agencies to impose fees for their services.

The rating agencies enter the picture soon after a decision has been made to sell an issue. They are not involved in the actual structuring or planning of the bonds. The terms, maturities, and other provisions are decided upon by the issuer, financial advisor, bond counsel, underwriter, and others who stand in the "inner circle." Rating agencies occupy a position that in the "outer circle." Investors and others standing in the "outer circle" depend upon the rating agencies to provide an independent and unbiased judgement as to the quality of municipal bonds.
Bond ratings are based on a combination of in-house data and information relevant to the specific bond issue. Upon receiving a rating request, the agency conducts a preliminary analysis. Next, a meeting is set up between the issuer and the agency's analytical team. The issuer generally makes a presentation to the agency. At this time specific questions as to the issue and issuer's financial condition can be addressed. Following this meeting, the agencies rating committee examines all the relevant information and issues a rating. Once a rating decision has been reached, then issuer is notified and given an opportunity to appeal the decision. At this point, the rating may be modified. Once a final decision is reached, the issuer is notified, the rating becomes public and is entered into the agency's database. Once established, a rating will stay in effect for the life of the bond, and as long as the issuer continues to furnish financial information. For general obligations, the agencies require periodic information such as audits, budgetary documents, and annual reports. For revenue bonds, the agencies may also request quarterly progress reports on the project itself. The failure to provide this information could result in either a suspension or withdrawal of the rating.

Both Moody's and Standard & Poor's are thought to be remarkably similar. They emphasize "independence, objectivity, and disinterestedness." They attempt to remain sheltered away from corporate or government influence. At the same time, both agencies

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61Lamb, R. and S. Rappaport (1980) op. cit. p. 54
maintain that their ratings do not serve as a recommendation to purchase, sell, or hold a security. Although a rating may have an effect on yields and prices, these are not considered when ratings are assigned. Moreover, the agencies maintain that the presence of a rating does not mean that the agency has conducted an audit, nor does it attest to the authenticity of the data provided by the issuer. Ratings, moreover, can be changed, withdrawn, or suspended, as the agencies deem necessary. The bond rating is a static measure and the agencies are very much aware of its limitations.

The extent to which Moody’s and Standard & Poor’s are similar becomes even more apparent when their rating symbols and definitions are examined.

<table>
<thead>
<tr>
<th>Moody's</th>
<th>Standard &amp; Poor's</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aaa</td>
<td>AAA</td>
<td>Highest rating, Extremely likely to meet all debt service requirements;</td>
</tr>
<tr>
<td>Aa</td>
<td>AA</td>
<td>Very strong capacity to pay interest and principal;</td>
</tr>
<tr>
<td>A</td>
<td>A</td>
<td>Strong capacity to pay</td>
</tr>
</tbody>
</table>


63Ibid. p. 55.
In addition to the similarity between rating symbols and their meanings, both agencies base their ratings on similar types of data. There are four types of information that both agencies collect: 1) debt structure and debt history; 2) budgetary operations; 3) tax and revenue sources; and, 4) socio-economic data. Information regarding debt is particularly important. The rating agencies collect data such as debt per capita, debt as a percentage of real estate valuations, debt as a percentage of personal income, and debt of overlapping debt issuing entities. The rating agencies examine these data over time, looking for trends and patterns in the issuance of debt. They also examine budgetary operations, checking that the issuer has maintained balanced budgets as well as control over expenditures. The rating agencies also examine tax and revenue sources to see that they are stable and predictable. Issuers with patterns of unstable revenue collection or excessive dependence on outside sources will not fare well under the scrutiny of the rating agencies. Finally, both rating agencies examine the socio-economic base of the community issuing debt. They examine trends
in population, employment, income, and other variables to determine the overall financial position of the issuer.

Although Moody's and Standard & Poor's use the same general criteria in assigning ratings, they differ in terms of the emphasis that they place on the various criteria. The main difference between the two is that Moody's emphasizes debt variables, while Standard & Poor's emphasizes those variables which describe the economic base of the issuer. The emphasis that Moody's places on debt and debt burden is reflected in the following statement:64

The analyst is concerned with the total impact of all debt obligations on the reasonable ability of the taxpayers of the issuing unit to meet them. To this end, his central and first task is to derive a measure of the debt burden. In simplest terms this is the relationship between the total debt burden on the tax base in the governmental unit and wealth located there...

In contrast, the Standard & Poor's philosophy regarding credit analysis focuses on the economic base of the issuer:65

We consider an issuer's economic base as the most critical element in our determination of municipal bond ratings. It is axiomatic that a community's fiscal health derives from its economic health. Virtually all revenue sources, from sales and income taxes, to permits and property taxes are affected by economic conditions...

64Moody's Investors Services (1977) op. cit. p. 16.

There are other ways in which Moody's and Standard & Poor's differ. For example, Standard & Poor's is inclined to give state government general obligation bonds higher ratings than municipal corporations because states, in general, have broader powers of taxation and are not subject to the same restrictions applicable to local government (e.g., home rule). Moody's tends to treat a state issuer just as it would treat a local government unit. Another difference is that Standard & Poor's regards a "moral obligation" backing as almost as good as a "full faith and credit" backing. Moody's does not have the same faith in "moral obligation" bonds. Consequently, the Non-Profit Housing Project Bonds of the New York State Housing Finance Agency, the General Purpose Bonds of the New York State Urban Development Corporation, which had "moral obligation" backing by the state government, received a speculative investment rating (Ba) from Moody's and a strong investment grade rating (A-) from Standard & Poor's.

There are other cases where Moody's and Standard & Poor's depart. Standard & Poor's is inclined to view as a positive credit feature the automatic withholding and use of state aid to pay defaulted debt service. A number of states including New York, New Jersey, Pennsylvania, Kentucky, Indiana, South Carolina, and West Virginia have enacted legislative measures which allow bondholders to collect defaulted local government debt service payments from state government. Standard & Poor's rates the bonds of local entities in these states, at most, one or two notches below the ratings assigned to the state itself. Moody's, on the other hand, is

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67Ibid. p. 146
inclined to view the rating as a measure of the issuer's ability to avoid default, regardless of any protections for bondholders set up by the state.

Another difference between the two agencies is in terms of how they view the accounting practices employed by the issuer. Standard & Poor's has stated that it will view issuers that do not prepare its financial statements in accordance with generally accepted accounting principles (GAAP), negatively in its rating process. Moody's tends to place greater emphasis on the historical performance of an issuer (3-5 years), and does not regard GAAP as essential to high ratings.

A final difference between the two agencies is how they regard municipal bond insurance. Moody's bases its rating on the merits of the issuer alone and its ratings do not reflect the existence of insurance. Standard & Poor's considers bond insurance as a positive factor in assigning its ratings. In rating bonds covered by insurance, Standard & Poor's examines the creditworthiness of the underlying insurance companies. It has given automatic AAA or AA ratings to insured bonds.

While there are a number of differences between the two agencies, in most cases, the differences only occasionally show up in terms of differences in the actual ratings. Since both agencies are explicit about the factors they consider to be important, the way to view differences is perhaps in terms of their complimentary nature. That is, when both agencies provide ratings, a more comprehensive picture emerges because of their analytical differences.

The question as to whether or not insurance affects bond ratings introduces yet another participant standing in the "outer circle." Insurance

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68 The SEC and several other agencies recommend that an issuer solicit at least two ratings for each new bond issue.
for municipal bonds has been available since 1971 and has continued to
grow. Bond insurance is an unconditional contractual guaranty by a
property and casualty insurance company to pay bondholders any debt
service payments which for whatever reason has not paid by the bond issuer.
There are two principal insurers—the American Municipal Bond
Assurance Corporation (AMBAC) and the Municipal Bond Insurance
Association (MBIA). As of June 30, 1981, they over 3,000 policies
providing coverage to some $23 billion in total interest and principal
payments. Both of these insurers exist as conglomerate corporate
entities, formed out of the alliance of many separate insurance companies.
For example, the insurance companies holding at least a 5 percent share in
AMBAC include Allstate Insurance Company, Continental Casualty Company,
Fremont Indemnity Company, Home Insurance Company, INA Reinsurance
Company, Travelers Indemnity, and Unigard Mutual Insurance. Bond
insurance can improve ratings for issuers, particularly, those who receive
ratings from Standard & Poor's.

In addition to rating agencies and bond insurers, there other
participants in the municipal bond market. Several organizations provide
information on bond offerings and financial transactions. These
publications and wire services help ensure that there is an adequate amount
of information available to underwriters, dealers, traders, investors, and

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69 A third, smaller municipal bond issuer is Finance Guarantee Insurance
Corporation.
405-406.
71 A recent General Accounting Office study determined that municipal bond
insurance premiums are dangerously low and that "insurance companies
themselves have admitted that they don't have a good method of pricing.”
others interested in municipal bonds. The Blue List, Bond Buyer, and publications issued by Moody's and Standard & Poor's provide up-to-date information on market conditions. Advances in telecommunications technology have helped to create services such as the Munifacts Wire, Dow Jones Capital Market Wire, and Telerate which provide on-line data retrieval and analysis capabilities. In addition, conventional new services, such as the Wall Street Journal, numerous magazines and trade journals, provide information to those concerned with municipal bonds. These information services play a critical role in the municipal bond market. Unlike the stock market, there is no central exchange. The entire market for municipal bonds operates largely over a nationwide network of underwriters, dealers, and investors. Virtually all transactions occur through communication systems (telephone lines, satellite transmissions, and other means of telecommunications), where the expression "dictum meum pactum" (my word is my bond) still dominates.

The final set of participants are those involved with the regulation of the municipal bond market. In 1975, the federal government passed legislation creating a Municipal Securities Rulemaking Board (MSRB). This is largely a self-regulating body, drawing membership primarily from the municipal bond industry, but also subject to the jurisdiction of the federal Securities and Exchange Commission (SEC). It is interesting to note that municipal bonds are exempt from many of the requirements of the Securities Act of 1933 and the Securities Exchange Act of 1934. This legislation requires strict registration and reporting for

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corporate securities. The 1975 legislation coincided with the development of full disclosure standards\textsuperscript{73} which the municipal bond industry voluntarily agreed to adopt. Full disclosure is the provision by a governmental issuer of all pertinent facts regarding its financial condition, the security pledged to meet all debt service requirements, projected uses of bond funds, and other facts relevant to issuers. Groups such as the National Committee on Governmental Accounting (NCGA) and the American Institute of Certified Public Accountants (AICPA) have contributed to the development of uniform standards of public sector accounting.

Prior to enactment of the Securities Acts Amendments of 1975,\textsuperscript{74} many of the activities of those in municipal bond market were largely unregulated. The most important aspects of the 1975 legislation include:

- organizations involved in the sale and purchase of municipal bonds were required to register with the SEC;
- a rule-making body (MSRB) was created and charged with developing a set of rules for the entire industry;
- the SEC, the National Association of Security Dealers, Inc. (NASD), and federal bank regulatory agencies (Comptroller of the Currency, the Board of Governors of the Federal Reserve, and the Federal Deposit Insurance Corporation) were given additional authority to examine and discipline municipal securities brokers, dealers, and others in the municipal bond industry for violation of board rules;

Under this legislation, however, the Municipal Securities Rulemaking Board has no powers of inspection nor enforcement; its role is to develop and maintain an appropriate set of industry standards. The board has organized

\textsuperscript{73}The Municipal Finance Officer's Association is responsible for spearheading the movement to develop full disclosure standards.

\textsuperscript{74}In April, 1975, the Senate Committee on Banking, Housing, and Urban Affairs sent the 1975 Amendments to the Senate. These amendments were signed into law on June 4, 1975.
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Prior to enactment of the Securities Acts Amendments of 1975,\(^7^4\) many of the activities of those in municipal bond market were largely unregulated. The most important aspects of the 1975 legislation include:

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its rules into: 1) administrative; 2) definitional; and 3) general. Administrative rules pertain to the operations of the MSRB itself, specifying procedures for election of board members, rulemaking procedures, fees for membership, and other internal matters. Definitional rules define the terms used in Board rules. General rules contain the substantive regulation developed by the Board. They include:

- qualifications and examinations for all brokers, dealers, and others involved in the municipal bond industry;
- procedures for record-keeping, processing, and settlement of transactions in the municipal bond market;
- rules for syndicate operations;
- fair practice and standards of ethical conduct in municipal bond transactions;

In short, the rules serve as guidelines for most of the individuals who work in the municipal bond industry.

In summary, the municipal bond market draws together a wide range of participants. Local governments are primarily interested in debt as means of financing large capital expenditures. The bond counsel and underwriter assist in the design and sale of debt in the primary market. Outstanding issues are traded by brokers and dealers in the secondary market. The rating agencies are essential to a smoothly functioning national market because they provide information to prospective investors. Equally important is the role of financial publications. Although the Municipal Securities Rule-making Board has established some basic ground rules, the municipal bond market is largely self-regulated.

The preceding description of the municipal bond market serves to illustrate some of the complexities associated with floating a bond issue. In addition to the selection of bond counsel and underwriter, municipal governments must consider a variety of new debt instruments, as well as
factors such as bond ratings and bond insurance. The municipal government which decides to enter the long-term bond market must rely upon a variety of actors (investors, underwriters, brokers, and others) outside their traditional domain. It is, moreover, incumbent upon local officials to develop the necessary relationships with key participants outside of government in order to ensure that process of borrowing occurs in a timely manner, at the lowest possible cost to the city. Relationships between city officials and members of investment community, while an important topic of inquiry, is beyond the scope of this present study.
Chapter 3  
A Historical Overview of Municipal Borrowing

Historically, cities have used municipal bonds to finance infrastructure. While the exact date of the first municipal bond is not known, New York City sold securities as early as 1812 and issued its first water supply bonds in the late 1800s. Boston's bonded debt grew from about $100,000 in 1822 to over $1.5 million in 1840.\(^1\) By most accounts, the decades of 1820 to 1840 mark the "real beginnings of municipal bonded indebtedness in the United States."\(^2\)

Although cities used bonds to finance war-related expenditures\(^3\), or financial emergencies created by natural disasters (fires, plagues, hurricanes, etc.), the major purposes for local debt were urban infrastructure, transportation systems (canals, railroads, highways), and other large scale public works projects.

Water systems were among the first public works projects to be financed with debt. As urban populations grew and densities increased, the needs for water increased, to ensure cleanliness, to combat disease, and to extinguish fires. At first, a system of private provision emerged, but these systems were inadequate. In the 1830s, New York began construction of the great Croton Aqueduct. Some years later, Boston started construction on the Cochuitate Waterworks. By the 1860s, there were some 68 public water

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\(^3\)Studenski described how New York City borrowed to construct fortifications, jails, and to purchase arms during the Revolutionary War.
Debt financing proved to be a successful way in which cities could generate the necessary revenues to finance construction and then spread repayment of debt over the life of the project. Cities were able to provide what the private market could not—plentiful, affordable water.

Cities began to use debt financing for ambitious projects, such as the construction of water filtration systems in Patterson, New Jersey, and Lawrence, Massachusetts. Chicago, which drew its water from Lake Michigan, reversed the flow of the Chicago River, so that its sewage emptied into the Mississippi River instead of into Lake Michigan. The Burnham Plan for Chicago called for major public works investment, the construction of railway stations, parks, boulevards, civic centers, and other forms of infrastructure. His plan also detailed how bond issues would be required to finance the vast public works proposals. One historian has estimated that Chicago built about $300 million ($2 billion in 1980 dollars) of public improvements during the first fifteen years of plan implementation.\(^5\)

Cities began to borrow when their need for public works began to exceed their abilities to finance such infrastructure using current revenues. In the past, "modest capital expenditures were made from loans, sales of public land, donations, subscriptions, lotteries, or current taxation."\(^6\) The use of borrowed funds represents a major transformation in city finances, a


\(^6\) Hillhouse, A. M. (1936) op. cit. p.31
shift from a "pay-as-you-go" financing scheme to a "pay-as-you-use" orientation. "Pay-as-you-use" meant that future generations would be obliged to support interest and principal payments, through the tax system for projects planned and constructed in the present. This provides a means for spreading the large, "lumpy," costs of construction over the useful, expected life of the project, ensuring that beneficiaries share in its costs.

The growth of debt, therefore, paralleled the growth of cities. Just as urban public works (roads, sewers, buildings, etc.) took on increased scale and magnitude, so too did the levels of outstanding municipal debt. As cities grew into major centers of social and economic activity, cities themselves became major financial actors, issuing larger and larger amounts of debt. By the turn of the century, cities had expanded their repertoire of municipal services to include power plants, gas works, police stations, fire stations, hospitals, asylums, libraries, school buildings, museums, and other services. Some of the more unusual municipal owned projects included slaughter houses, printing plants, ice plants, asphalt plants, bath houses, laundries, coal yards, milk pasteurization plants, and ferries. The advent of borrowing certainly opened up a wide realm of new possibilities for America's cities.

**The Connections Between Debt and Development**

Debt financing helped to expand the purview of municipal services, and, arguably, helped to broaden the definition of public goods. The relationship between private enterprise and local government took on new

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7Hillhouse reported that "bonds for elaborate boulevards took the place of bonds for plank streets." p. 36
dimensions when municipal bonds were used to finance railroads and speculative development. The use of bond funds was justified in that "public purposes" were being served--canals and railroads connected cities together, new developments generated population, housing, and jobs.

Perhaps, local government should never have been in the business of financing the railroads, communication lines, and other forms of speculative development. Initially, states\textsuperscript{9} were actively involved in the construction of "internal improvements." The Erie Canal, completed in 1817, was one of the first public projects to be financed with debt. Its construction costs were approximately $7 million; before work was completed, the tolls exceeded the interest charges, and within ten years, the bonds issued for its construction were selling at a premium.\textsuperscript{10} The success of New York State's Erie Canal prompted many states across the nation to undertake similar projects, financed with debt. Canals began to appear in Ohio, Indiana, Pennsylvania, Illinois, Michigan, and other states. Within a period of 20 years, from 1820 to 1840, state debt grew from $12.8 million to over $170 million. As one observer\textsuperscript{11} noted:

This frightful career of debt involved in its course even the youngest and weakest states and some of the territories, and the result of the whole was a larger debt contracted in that brief period by about one-half of the states than the whole Union owed at the highest point in our national debt for all its wars and acquisition of territory--The Revolutionary War, the Louisiana and Florida purchases, all inclusive....

\textsuperscript{9}For detailed discussion of state borrowing, see Ratchford, B. (1941) American State Debts. Duke University Press. Durham, N. C.
\textsuperscript{11}speech by Senator Thomas Benton before United States Senate, January, 1840, quoted in Tenth Census, Vol VII. p. 530.
Many states (Pennsylvania, Maryland, Indiana, Illinois, Florida, Mississippi, and Arkansas) began to default during and after the Panic of 1837. In state after state, disgruntled investors passed strict limitations or outright prohibitions of state borrowing. Rhode Island, although free of debt at that time, limited total outstanding state debts to $50,000. New Jersey put a $100,000 ceiling on state debt, a mandatory 35 year period of retirement, and the requirement of majority rule among the electorate to authorize any new state bond issue. New Jersey's legislation became the model upon which many other states patterned their limitations.

By the beginning of the Civil War, restrictions or prohibitions against such aid had been written into practically all the constitutions...with state aid for internal improvements checked, municipal aid filled the gap.\(^\text{12}\)

Earlier, it was noted that 1840 to 1860 marked the beginnings of municipal indebtedness. This period also marked the end of state borrowing.

The extent to which municipalities and local government picked up the slack created by the exodus of state government borrowers is striking. See Figure III-1, which shows how municipal debt overtook state debt in the 1860s. One observer noted\(^\text{13}\):

Local subsidies have been granted in all sections of the country to an extent which is practically impossible of determination. All communities wished to share in the business prosperity which followed the opening of new railroad connections, and cities and towns which needed little urging upon the part of promoters to induce them to become financially interested in their projects. They have endorsed the bonds of railroad companies, and exchanged their bonds for railroad shares.

\(^\text{12}\)Hillhouse, A.M. (1936) op. cit.
\(^\text{13}\)Ibid.
Figure III-1

State and Municipal Debt Outstanding
1840-1902

YRS
1840 1850 1860 1870 1880 1890 1902

$ billions outstanding
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7

State Debt
Municipal Debt
Local subsidies have also been given in the form of donations of money, bonds, and lands.

Here, the logic of public purpose appears twisted. Because states were prohibited from issuing debt, the business of financing internal improvements was turned over to municipalities. In order to secure public financing, railroad promoters convinced the public that railroads would bring prosperity and development.\textsuperscript{14} Local officials then issued debt on behalf of private railroad companies, turning over the proceeds for railroad stock. Some of these officials expected these stock dividends to not only cover debt service, but also to fund a portion of local expenditures, as well. Many municipalities experienced what happened to those state governments which were led down a similar course of borrowing to support "internal improvements," some decades earlier. In the 1870s, following numerous defaults by municipalities, limitations on local debt were enacted.\textsuperscript{15} These laws limited the size of debt, purposes for borrowing, the maturity of debt

\textsuperscript{14}for a detailed description of railroad bonds, see Hillhouse, A. M. (1936) Municipal Bonds--A Century of Experience. Chapter VII. Prentice Hall, New York. pp. 143-199. It is clear from this description that the issuance of railroad aid bonds was characterized by corruption, incompetence, and profiteering.

\textsuperscript{15}The first state to enact legislation limiting municipal borrowing, Iowa, did so in 1857, and put a 5 percent of valuation limitation on debt. The majority of legislation came during and immediately after the Depression of 1873.
instruments, and required that popular referendum be held on bond issues. For a summary of the various limitations on local debt imposed by state governments, see Table III-1. Given the experience of state governments and their default problems several decades earlier, history had a knack for repeating itself.

The Evolution of New Debt Instruments

In spite of these limitations on local debt, debt financing proliferated in the 20th century. From 1902 to 1932, outstanding municipal debt grew from $1.63 million to over $15.21 million. In addition to issuing greater amounts of debt, cities introduced new debt mechanisms. The first bonds to appear were general obligations - bonds supported by the full faith and credit of the taxing district. Another type of bond, general-special bonds, were first supported by special assessment levies, but if these proved inadequate, the bonds became general obligations of the municipality. Special-special bonds were bonds supported entirely by special assessment levies.

16Debt limits established during the 1870s were generally expressed as some percentage of assessed valuation. The laws often exempted debt issued for self-liquidating projects (e.g., municipal power plants, and, waterworks). Many of the debt laws (e.g., New York, Ohio, Pennsylvania, Virginia, Texas, Utah, etc.) enacted specified that the funds could not be loaned to any individual, corporation, or non-government entity. Massachusetts, New Jersey, Ohio, Michigan, and Minnesota have attempted to have the life of the bond issue correspond to the probably life of the public facility built with the borrowed funds. The more general pattern was to set the maturity at some arbitrary length, perhaps 20 years. Most of states also enacted legislation requiring some sort of popular vote (either simple majority or two-thirds majority) on bond issues.

17Special assessments are levies against real property, in addition to property taxes, to defray some or all of the costs of a public improvement, such as sidewalks or street lighting, which benefit individual properties. The use of special assessments enabled cities to recover costs associated with a public improvement. At times, special assessments rivaled the general property tax as a source of revenue for some localities.
<table>
<thead>
<tr>
<th>STATE</th>
<th>C OR S</th>
<th>PERCENT AGAINST</th>
<th>APPLIED</th>
<th>FOR EXTENDING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>both</td>
<td>20</td>
<td>LAV</td>
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<tr>
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<td>C</td>
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</tr>
<tr>
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<td>15</td>
<td>LAV</td>
<td>none</td>
</tr>
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<td>C</td>
<td>3</td>
<td>EAV</td>
<td>none</td>
</tr>
<tr>
<td>California</td>
<td>S</td>
<td>restricted to 2-1/4 times</td>
<td>latest tax receipts</td>
<td></td>
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<td>8</td>
<td>EAV</td>
<td>none</td>
</tr>
<tr>
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</tr>
<tr>
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<td>none</td>
</tr>
<tr>
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<td>10</td>
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</tr>
<tr>
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<td>C</td>
<td>7</td>
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<td>simple majority</td>
</tr>
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<td>both</td>
<td>15</td>
<td>MV</td>
<td>none</td>
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<td>S</td>
<td>15</td>
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<td>none</td>
</tr>
<tr>
<td>Illinois</td>
<td>both</td>
<td>5</td>
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<td>none</td>
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<td>8-20</td>
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<tr>
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<td>C</td>
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<td>10</td>
<td>EAV</td>
<td>none</td>
</tr>
<tr>
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<tr>
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<td>10</td>
<td>LAV</td>
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<tr>
<td>Missouri</td>
<td>both</td>
<td>5</td>
<td>EAV</td>
<td>2/3</td>
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<tr>
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<td>5</td>
<td>EAV</td>
<td>simple majority</td>
</tr>
<tr>
<td>Nebraska</td>
<td>no limitations</td>
<td>approval</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>10</td>
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<tr>
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<td>4</td>
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<td>none</td>
</tr>
<tr>
<td>New York</td>
<td>C</td>
<td>7</td>
<td>MV</td>
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</tr>
<tr>
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<td>C</td>
<td>5</td>
<td>LAV</td>
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<td>3</td>
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<td>15</td>
<td>LAV</td>
<td>varies</td>
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<td></td>
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<tr>
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<td>18</td>
<td>LAV</td>
<td>none</td>
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<tr>
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<td>LAV</td>
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<td>LAV</td>
<td>none</td>
</tr>
<tr>
<td>Wisconsin</td>
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<td>5</td>
<td>EAV</td>
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<tr>
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<td>C</td>
<td>2</td>
<td>EAV</td>
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**Key**
- C - constitutional; S - statutory
- MV - full market value; LAV - locally established assessed value; EAV - state equalized assessed value;
- simple majority - debt limit can be exceeded with referendum;
- approval - debt limit can be exceed with permission of financial board; varies - provisions for exceeding limit vary.

levies. The holder of such an obligation had no claim against revenues other than those coming from the specific property benefiting from the improvement.

Special assessment debt grew in popularity, so that between 1910 and 1931:18

This type of debt increased fivefold, so that cities over 30,000 had accumulated over a half billion dollars of such obligations, an amount equal to about five percent of total municipal debt for these cities. Cities over 100,000 had special assessment obligations in 1930 totaling over $400 million.

There are several factors which contributed to the growth of special assessment debt. The use of special assessment obligations and other revenue bonds became a means of evading the limits on conventional debt (general obligations) established following the Depression of 1870. Special assessment financing, moreover, was seen as means of accommodating real estate booms which occurred in Florida, California, and a number of other states during the early 20th century. Hillhouse described Florida's real estate boom as:19

one of the greatest in history, bringing a flood of immigration by railroad and automobile. The cause of the boom has been attributed to various factors: surplus wealth seeking investment, the state's climate, activities of millionaire real estate owners in Florida, faulty bond laws, and absence in the state of an inheritance tax. For several years in the 1920s, cities went mad with speculation fever. General-special obligations were issued at a fast and furious obligations. Much of this indebtedness was authorized not by a vote of the people but by the real estate speculators themselves, who had, by various means become the town councilmen...No other state could keep pace with Florida's per capita issue. Florida cities

19Hillhouse, A. M. (1936) op. cit., p. 83
that had been mere swamps in the the 1920s had debts of $1,000 or more per capita six or seven years later. By 1925, Florida was leading the nation in debt issuance; and the 1926 record far surpassed that of the previous year...

Before long, Florida cities soon lead the nation in defaults. By the time of the Great Depression, some 43 percent (621 of 1,456) of all of the taxing districts in the state had defaulted on their bonds.20

Debt and Depressions

During the major periods of economic depression, governments experience difficulties in meeting their debt service requirements. Depressions leading to defaults occurred in the 1840s (with states), in the 1870s (with cities), in the 1890s (with special districts), and in the 1930s (with all units of state and local government). State and local borrowing has tended to be cyclical, that is, during good economic times, when demand for construction is high, when money is available for investment, states and localities tend to act as private producers, issuing debt to finance their various public works projects. When hard economic times hit, investment pools dry up, state and local governments tend to cutback on new investment, cancelling or postponing projects until interest rates fall.

The defaults during the Great Depression were serious. Approximately 3,500 units of local government defaulted on either interest or principal. Some 350 counties, 850 cities and towns, and similarly large numbers of school districts and special districts were involved. Virtually every type of government, in all geographic areas were affected. Municipal assets were frozen in closed banks. Property values dropped 18 percent

20Hillhouse points out that approximately 20 percent of all defaults in the nationa at that time could be attributed to the single state of Florida.
nationwide, and property tax revenues, the most important source of revenues for local government, plummeted. Tax delinquencies increased from 10 percent in 1930 to 26 percent in 1933. At the same time, local expenditures (particularly for public welfare functions) increased greatly. The combined effects of reduced revenues and increased service costs forced many municipalities into default.

While the total amount of debt in default during the 1929 Depression was much greater than in earlier default periods. The amount in default, however, was only 15 percent of the total outstanding debt, a proportion smaller than either the 1837 or 1870 depression periods. Although the loss of interest and principal amounted to $100 million, this represented about one-half of one percent of the total debt outstanding. Moreover, state and local governments recovered more quickly from this default period than they did in earlier default periods:

Most of the large state and local units in default made repayment of all due debt service charges within a few years. For example, all of the 48 cities with population over 25,000 that were in default in this depression period were reportedly out of default by 1938.

Although the Great Depression was serious, cities appeared to have "learned their lessons" from past default periods. Most of the debt in default was eventually repaid. Unlike in previous periods, few governments repudiated debt. Although the depression period caused some cities to experience

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22 In the 1840s, when many state governments went into default, some (including) Florida, Georgia, and Arkansas simply repudiated large portions of their outstanding debt. This, no doubt, angered investors and encouraged voters to enact strict laws against state borrowing.
revenue shortages and thereby default on their bonds, it can not be said that depressions were the sole cause of defaults. A number of useful studies\textsuperscript{23} identifying the causes of default, preventative measures, and adjustment policies emerged. The immediate causes of municipal default included: tax delinquency, unbalanced budgets, and bank failures; the indirect causes included "low price level, real estate overdevelopment, excessive debt, changes in revenue systems, and economic factors affecting the ability of the community to pay".\textsuperscript{24}

Municipalities have defaulted in good times as well as bad. Following the Gold Rush, San Francisco found itself saddled with debt incurred during the boom years which it could no longer support. Philadelphia's default has been blamed on a reorganization plan which involved the consolidation of old districts into a single new corporate entity. As soon as some of the old districts realized that consolidation was to occur, they voted in massive improvements and shifted the debts to the larger corporate entity. The new city inherited some $17 million in outstanding debt, about one quarter of which had been created within thirty days prior to consolidation.\textsuperscript{25} In Pittsburgh, some years later, a similar folly took place, starting with reorganization and ending in default. In Chicago, when the Depression of 1857 struck, large numbers were forced into unemployment. Since the city provided financial assistance to these unemployed workers, it had difficulty meeting its debt obligations. Cities in every geographic region, of every size and type have, at one time or

\textsuperscript{23}see for an example, Chatters, C. (1933) Municipal Debt Defaults: Their Prevention and Adjustment. Municipal Finance Officers Association. Chicago.

\textsuperscript{24}Ibid. p. 8-9

\textsuperscript{25}Philadelphia debt consolidation story.
another, experienced default. Mobile, Alabama\(^{26}\) was the first to default (1839). Duluth, Minnesota,\(^{27}\) Rahway, New Jersey, New Orleans, Louisiana,\(^{28}\) Middlesborough Kentucky, Cimarron, Kansas, and many others followed. In most of these cases, there was some degree of incompetence, poor planning, corruption, and bad luck.\(^{29}\)

During the Great Depression and for some time afterwards, municipal borrowing in the United States actually declined. There are several explanations. First, it was as if the sleeping giant of federal government was finally awakened. Roosevelt and the policies of the New Deal introduced sweeping changes in national economic policy, which were to have profound effects upon the economy and government itself. The most important was the introduction of counter-cyclical economic measures. Up until this point in history, government spending and borrowing tended to be pro-cyclical, expanding and contracting with general economic conditions.

\(^{26}\) An outbreak of yellow fever and the arrival of the Panic of 1837 have been cited as causes for Mobile's default.


\(^{28}\) A combination of excessive railroad aid, reduced property values following the Civil War, and "carpetbagger mismanagement" were cited as causes for New Orleans' default.

\(^{29}\) Memphis' default in the late 1800s was blamed on the yellow fever plague, in which more than 5,000 people died (amounting to about 1/8th of the city's population). Galveston, Texas was struck by a hurricane in 1900 and subsequently went into default. Similarly, Astoria, Oregon was devasted by a fire, an "act of God" leading to default.
Under Roosevelt, new measures, introduced as a cure for depression, expanded public works construction and put unemployed workers back on the job. The Federal government started building roads, bridges, sewers, waterworks, public buildings, housing, hospitals, parks, docks, dams, wharves, airports, power plants, and many other forms of infrastructure which were previously the responsibilities of local governments. New federal agencies such as the Federal Public Works Administration, the Reconstruction Finance Corporation, and the United States Housing Authority set up programs for funneling federal grants and loans to sub-national governments. With these federal assistance programs in place, it can be argued, that the need for municipal spending and borrowing decreased.

A second factor, perhaps more persuasive, than the New Deal in explaining the decrease in municipal borrowing in the post-Depression period was the advent of World War II. During the war, state and local governments were forced to cut back on capital outlays. A Special war-time commission, the Capital Issues Commission, screened and regulated all proposed public capital projects. Those projects which were deemed as not contributing to the war-time effort were cancelled or postponed. This curtailed much of the planned debt of cities and other units of government.

During the post-war period, municipalities began to borrow heavily. There was a large backlog of public construction projects. There was, in addition, a general increase in the need for public investment. High birth rates and rising incomes pushed families into the suburbs and fostered demand for more schools and recreational facilities. The number of automobiles continued to grow, straining the existing system of roads, streets, and highways. Increased demand for higher education, fueled in
part by the GI bill led to the construction of more colleges and universities. At the same time, cities began to make large investments in public housing and health services. New public facilities had to be built; the mood of the country was optimistic and borrowing began to increase.

**The Post War Period**

The most exhaustive study of borrowing practices of state and local government during the postwar period was produced by Roland I. Robinson.\(^{30}\) He noted that governments borrowed primarily to finance capital outlays. Borrowing to finance deficits in current expenditures was rare. Some states borrowed large amounts for veteran's bonuses, but this was the only non-capital item financed with debt. Robinson also pointed out that state and local government capital expenditures were not subject to an evident cyclical influence during the post war period. In other words, borrowing appeared to be unaffected by the three modest dips in business activity. He states, the "planning and execution of these works has such a massive momentum that it is not likely to be disturbed by short-term business fluctuations."\(^{31}\) Robinson suggests, that in the postwar period, borrowing by state and local governments to finance capital expenditures had more of a counter-cyclical than cyclical character.

One of the main reasons, according to Robinson, that city governments borrow for capital spending is that in many states it was easier for a local government to get tax power to cover debt service than to make a capital outlay directly.\(^{32}\) Moreover, cities were more likely to dependent on

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\(^{31}\) Ibid. p. 6.

\(^{32}\) Ibid. p. 37

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borrowing than state governments. State governments frequently had large budgets and detailed plans in which they coordinated the receipt of current revenues (e.g., gasoline taxes) to large capital expenditures (e.g., highway and road expenditures). The proportion of capital expenditures financed by debt at the local levels of government, during the postwar period, was "considerably larger than the proportion of capital expenditures at the state level that is so financed."

Robinson's study was also contributed to an understanding of the process by which borrowing decisions were made in the postwar period. He determined that
governments traditionally arrange financing fully before making any capital expenditures; in other words, financing leads outlays.

According to Robinson, anticipatory borrowing was common during the postwar period. The low rates interests on tax exempt debt that prevailed during this period stimulated borrowing of funds not immediately needed.

State and local government units could borrow with tax-exempt obligations and turn about and invest the proceeds in Treasury securities which were taxable obligations to many other holders. Since state and local governments are tax exempt institutions per se, they used the privilege of tax exemption on their own issues to help to solve their liquidity problems.

While the total amounts of capital expenditure and borrowing increased rapidly, between 1946 and 1951, the ratio of new construction expenditures to borrowing in the same year dropped from over 70 percent to under 50 percent. However, when Robinson compared the long-term borrowing of each to new construction outlays of the following year, the results were

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33 ibid. p. 39
34 ibid. p. 41
different—remaining fairly steady, thereby supporting the view that borrowing anticipated new construction expenditures by about one year.\textsuperscript{35}

Another important finding\textsuperscript{36} by Robinson was that although the one-year lag between borrowing and new construction was a reasonable estimate, for some projects, such as toll roads and bridges, the period of anticipation was much longer than one year. On smaller projects, the degree of anticipation was less than one year.

Robinson's study was particularly useful in that it described some elements of the borrowing process. He maintained that "law and tradition control much of the borrowing process; the margin left for policy determination by finance officers is modest."\textsuperscript{37} Among the decisions made by finance officers is the timing of offerings. At the same time\textsuperscript{38},

many full faith and general credit offerings, however, leave the finance officer relatively little latitude. If the public demand for projects involved is considerable, there is not much public sympathy with waiting because the 'market is temporarily weak'.

Robinson estimated that "margin of maneuver" is not more than a few months. In addition to the timing of offerings, finance officers also can influence the maturity structure of most public offerings. While municipal bonds are "sometimes geared to the life of the asset being financed," Robinson suggested that it is more common to find the maturity tied to some estimate of revenues.

\textsuperscript{35}ibid. p. 44
\textsuperscript{36}ibid. pp. 44-45
\textsuperscript{37}ibid. p. 46
\textsuperscript{38}ibid.
In summary, Robinson described the postwar period as one in which the demand for funds by cities was great, fostered by urbanization and the growth of suburbs. Cities resorted to borrowing in order to finance a wider array of capital expenditures. In Robinson's words, 39

this strong and insistent public demand often encounters the obstacle that our forefathers frequently put rigid limits on the power to tax and to borrow in state constitutions or into statutes creating local governmental units.

Legal and political issues became increasingly relevant to the issuance of debt. In the postwar era, a great deal of borrowing, "while legal, has had to be tailored into a pattern of legality by considerable indirection." 40 Among the tactics for evasion of debt limits include the creation of new or "novel" types of governmental organizations--the various authorities and districts granted authority to tax and borrow, overlapping the boundaries of existing units.

The New York City Fiscal Crisis

The New York City Fiscal Crisis was one of the most important events in recent history to have influenced the municipal bond market. The fiscal crisis can be defined as the chronic inability to match expenditures and revenues resulting in a deficit so large that the City teetered on brink of bankruptcy. The crisis was so serious that banks and other financial institutions closed their doors on the city, refusing to provide the short term loans that city routinely used to finance its operations. The inability to borrow, therefore, was both a cause of, as well as, a consequence of the fiscal crisis in New York City.

39 ibid. p. 50
40 ibid. p. 51
It is useful to distinguish between short term and long range causes of New York's fiscal problems. The **long-term** factors contributing to the 1975 crisis include: 1) a weakening of the city's economic base;\(^{41}\) 2) an increasing share of residents dependent upon municipal services;\(^{42}\) 3) a lack of support from the state and federal government;\(^{43}\) and 4) increased labor costs.\(^ {44}\) On the other hand, **short term** causes such as: 1) the recession of the mid 70's;\(^{45}\) 2) loss of investor confidence in New York City obligations; 3) poor financial management on the part of city officials;\(^ {46}\) 4) duplicity on the part of financial institutions;\(^ {47}\) and 5) over-dependence on short-term notes; were of a fundamentally different nature.

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\(^{46}\) Ring, J. A. (1979) Anatomy of a Fiscal Crisis. The Public Interest. Winter. "to accumulate a debt as massive as New York City's more than $33 billion overall, takes persistent mismangement."

A chronology of key events leading to the fiscal crisis is presented in Figure III-2. While this timeline begins in late 1974, symptoms of New York's fiscal illness had been identified in numerous studies over the previous decade.\(^4\) Perhaps the most serious blister in city finances was the use of short term debt, which grew from $747 million in 1969 to over $4.5 billion in 1975.\(^\text{49}\) By March 31, 1975, New York had outstanding debts in excess of $14 billion, including $7.8 billion in long-term debt and over $5.9 billion in TANs, BANs, and RANs.\(^\text{50}\) It was this mounting level of debt which prompted several groups such as the Comptroller's Technical Debt Committee (CTDC) and the rating agencies to privately express concern over the city's financial condition.

Nonetheless, the City continued on its course of borrowing, floating major issues throughout the end of 1974 and into early 1975. The uneasiness expressed privately in meetings between city officials, bankers, and members of financial community continued to swell. Mayor Beame urged banks to "sell" city issues more, urging them to market New York City nationwide. Bank officials, in justifying all-time high interest costs, cited stiff competition for funds, and "poor" market conditions. In order to smooth over relations between city officials and bankers, the Financial Community Liaison Group (FCLG) was formed. More short term debt was


\(^{50}\) Ibid. p. 2.
issued. The city continued on a collision course with disaster. Short term borrowing was necessary to maintain municipal operations; the banks continued to loan at extremely high rates of interest. The gap between revenues and expenditures continued to widen. The market was soon flooded with New York City short term debt.

In March of 1975, the financial markets closed their doors on New York City. For once, the City could no longer borrow the short term debt on which it had become addicted. New York faced an extreme financial crisis. Thousands of city employees faced losing their jobs, city services began to shut down. On March 23, 1975, Mayor Beame went public, announcing massive expenditure reduction and the elimination of city services and public facilities. The city’s appeal for assistance from the Federal government (President Ford, Treasury Secretary Simon, and Federal Reserve Chairman Burns) fell largely on deaf ears. New York City faced a genuine financial disaster.

One avenue open to the city, which it did not follow, was filing for bankruptcy. Under bankruptcy proceedings, a federal court would have assumed control over city finances, resulting in messy and lengthy arbitration. Bondholders would have had to stand in line with welfare recipients, city workers, and others seeking a claim against city assets.

Governor Hugh Carey took the initiative in bailing out New York City. In the months after financial markets closed to the city, the state advanced the city some $600 million (against future revenue sharing funds). The state, ultimately, would have been responsible for restoring order in New York in event of the city government’s total collapse. The state then set up the Municipal Assistance Corporation (MAC), an independent public corporation authorized to sell bonds to meet the city’s borrowing needs.
MAC bonds were backed first by a "moral obligation" of the state, and second by a set of dedicated taxes, which included the city sales and stock transfer taxes. In order to use these revenues, these taxes were converted from local option taxes into state taxes, and dedicated to the repayment of MAC bonds. MAC was initially authorized to issue up to $3 billion in state bonds. Its first offering of $1 billion in July, 1975, was the single largest offering in history. Over 200 banks and underwriters participated in the sale. Moody's gave these MAC bonds a A rating, Standard & Poor's rated them A+. The offering yield 9.5 % was one of the highest ever.

The second billion dollar offering, later in the summer of 1975, encountered difficulties. Unlike the first offering which sold out in about three weeks, these bonds were more difficult to market. Several different factors contributed to uncertainties among investors. City finances were still under attack and the image of poor management was difficult to erase. In spite of promises to cutback on services, the perception was that expenditures were still out of control. Moreover, several years earlier, moral obligation bonds issued by another state agency, the Urban Development Corporation (UDC) went into default. Finally, these two billion dollar offerings saturated the market. By the time of the second offering, the performance of the first MAC bonds in the secondary market was sliding greatly. The perception was that MAC bonds were almost as lousy as New York City notes.

While MAC served an important financial function, it did little in terms of taking the city's finances "by the horn" and bringing the beast under control. Governor Carey's plan for restoring fiscal order to New York was contained in the Financial Emergency Act which created a watchdog agency, the Emergency Financial Control Board (EFCB). Through this act, the state
appropriated some $750 million in state funds to the city, authorized purchase of MAC bonds with state employee pension and insurance funds, enacted into state law a wage freeze, and created a new position (Special Deputy Comptroller) responsible for overseeing New York City finances. The Deputy Controller reported directly to the State Comptroller. The EFCB (later the Emergency was dropped to form acronym FCB) played a key role in not only restructuring the city's overall debt policy, but in ensuring that New York adopted sound financial management, reporting, and practices.

The abuses committed by the city government were described as:  

"every expense budget has been balanced with an array of gimmicks, revenue accruals, capitalization of expenses, residing reserves, appropriation of illusory fund balances, suspension of receivables, and finally, the creation of a public benefit corporation whose purpose is to borrow and bail out expenses..."

Estimates of the deficit in June of 1975 exceeded $5 billion. Since reliable data were not available, the city's exact financial condition was unknown. The SEC report stated that "New York City's accounting and reporting practices effectively served to obfuscate the city's real revenues, costs, and financial position."  

Accounting methods included the recording of cash due in later years as receivables, the failure to record liabilities of the current year until later year, leading to an overestimate of assets and an underestimate of liabilities.

The City routinely issued RANs secured by general fund revenues and federal/state aid received in the next fiscal year to meet current cash needs. In addition, New York made heavy use of TANs, backed by real estate tax revenues. One report found that over 80 percent of the real estate taxes

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51 Ibid. p. 3  
52 Ibid.
listed by the city as receivable were neither collectible nor readily available. The city included in its taxable base properties not subject to real estate taxation (publicly owned property, diplomatic property, Mitchell-Tama property, property in foreclosure, and the properties of the bankrupt Penn Central Company).

At the same time, New York City delayed reporting of expenses, and maintained a cash basis for payables, "carefully preserving the fiction that incurred expenses did not exist until the bills were paid." The city continued to spend more than it received in revenues. Another shady technique routinely employed by the City was the capitalization of current expenses. Between 1965 and 1975, amounts borrowed through the capital budget to finance appropriations in the expense budget grew steadily from $26 million to over $722 million. In summary, there was a lack of internal control over expenditures, a failure to conform to acceptable accounting practices, and an inability to keep current and capital accounts separate.

While a good deal of the blame for New York City's fiscal crisis can be attributed to city officials, an SEC report stated that although underwriters were subject to intense pressure by city officials to underwrite and market city securities, "they recognized the immediate and catastrophic consequence of the failure to continue to market city securities to the public, and the fact that full disclosure would have eliminated this

54 Ibid.
market." The report also pointed out, "as the city's financial crisis worsened, the public was subjected to a confusing and contradictory financial picture." Perhaps the most questionable tactic employed by the investment banking community was the marketing of city notes in smaller denominations, from $100,000 to $10,000; effectively shifting the risks from large institutions (already weary about New York City debt) to individual investors (attracted by exceptionally high yields). The SEC also reported that between 1974 and 1975, certain underwriting banks ceased purchase of city securities for their fiduciary trusts, yet continued to market the same securities to the general public. These investment banks did not disclose their change in investment strategy.

Although there was some degree of incompetency and duplicity on the part of those involved, overall, one senses that city officials and bankers were floundering as if being pulled towards some inevitable doom. The city was overly dependent on short-term debt. Banks continued to underwrite the debt, accepting higher and higher interest premiums. Soon the market was flooded with city paper. Banks continued to underwrite more debt because to do otherwise would imply a loss of faith in the city's creditworthiness. At the same time, the confidence of inside investors, namely the banks, began to wane. They stopped purchase of New York City securities for their own fiduciary trusts. When the banks realized that city would not be able to meet the loan commitments, they stopped issuing debt to the city.

What was learned from New York's experiences? There were numerous studies examining the New York City fiscal crisis. The SEC and

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56SEC, op. cit. Chapter 4.
57Ibid. p. 72.
other agencies closely inspected the city's financial practices. The list of abuses committed prior to the crisis reads like a litany of what not to do. The extent to which a large number of different actors was drawn into the vortex of the crisis revealed that borrowing affected many different groups. City officials needed debt to keep operations afloat. The financial community was split between those who served an underwriting function and those who were primarily interested in securing sound investments. Others affected by debt included the city workers, who were inclined to view debt service costs as detracting from potential wage increases. Organized labor, on the other hand, viewed city debt as a potential investment for pension funds, provided that it was competitive with alternative investments. The state government was particularly interested in the fiscal crisis because it, ultimately, was responsible for New York City. Given the volume of New York City debt and the fact that it was marketed nationwide, potential stakeholders included those investors and members of the financial community outside New York. Other large cities, facing similar economic constraints, and perhaps, employing similar financial practices closely watched events in New York. It is clear, that as America's largest city, all eyes were upon New York.

In order to recover from the financial crisis in New York, stringent methods were adopted including a moratorium on debt service payments, firing city employees, eliminating pay increases, reducing services, increasing taxes and fares, and the adoption of improved accounting and financial reporting practices. The City has managed to turn around the crisis, returning to the long-term debt market in 1981, achieving investment grade ratings in 1983. Moreover, New York has embarked upon a
massive capital program, planning to expend over $40 billion over the next decade.

**Conclusions: The History of Municipal Borrowing**

In tracing the history of municipal borrowing in the United States, a number of general observations can be drawn. Municipalities issued debt for large capital expenditures. They began to borrow heavily during the period of "internal improvements" in the middle of the 19th century. Limitations on state government borrowing forced many local governments to become involved in the financing of canals, railroads, and other forms of infrastructure. Local debt grew quickly until the Depression of the 1870s when many states began enacting restrictions on conventional forms of local borrowing. At the end of the 19th century, there was an increase in special districts and special assessment debt. During the Depression of the 1890s, there were many defaults on this type of debt. Urbanization and growth increased needs for urban infrastructure. Cities began borrowing larger amounts to fund a wide range of services. Borrowing continued to increase until the Great Depression, when numerous cities went into default. During World War II, municipal capital expenditures were cut back and for the first time, levels of outstanding municipal debt actually declined. In the postwar era, there has been sustained growth in municipal borrowing. High levels of optimism and enlarged demands for service combined with relatively higher levels of prosperity to push up levels of borrowing. Throughout history, municipal borrowing has grown in size and complexity. New governmental entities with debt issuing authority have emerged at the local level. Federal aid and other forms of outside assistance continue to influence borrowing practices. The New York City fiscal crisis serves to illustrate the extent to which municipal borrowing
can affect many different stakeholders beyond issuers and investors. The municipal bond market appears to have recovered from any setbacks resulting from New York's crisis. The growth in annual issuances and levels of outstanding debt suggest that the municipal bond market is strong. Since its origins in the early 1800s, through various wars, calamities, and economic depressions, municipal borrowing has evolved into a prominent and significant feature of public finance.
Chapter 4

Issues in Infrastructure Research

The deterioration of urban infrastructure has been widely documented, both in the popular press, and in numerous government publications. For the most part, the evidence pointed to has been the decline in public investment on capital projects. In real terms, state and local capital spending grew during the 1950s and 1960s. During the seventies, and especially during the early eighties, capital spending in real terms, declined quite substantially. In constant 1972 dollars, state and local capital spending has dropped from $35.9 billion in 1968 to about $23.6 billion in 1981. In constant per capita terms, state and local government investment in infrastructure has fallen from $179 per person in 1968 to $105 per person in 1981. Capital expenditures, moreover, make up a diminishing share of total state and local government outlays. In the 1960s, approximately 27 percent of state and local budgets went to

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infrastructure; by 1980 this proportion has dropped to 15 percent.\(^5\) The decline in capital spending has come at time when many public works were in need of major repair and rehabilitation. In many cities, infrastructure systems have exceeded their expected service life and need replacement.

While state and local government spending on infrastructure have decreased, capital needs have continued to expand:\(^6\)

requirements for highways; water and sewer lines, and other public facilities have increased, not decreased, as the baby boom has grown into adulthood and the number of households and automobiles has increased. Economic growth has required more public services and facilities including increases in water supply and sewage treatment capacity to meet new environmental standards.

The "infrastructure crisis" can be defined as the widening gap between the capital needs and resources pledged to meet those needs.

**Evaluation of Research on the Infrastructure Crisis**

Several recent studies have focused on the problems of infrastructure in America's cities.\(^7\) These studies are quite varied in their methods of


analysis, findings and implications for policy. Many of these studies focus on levels of capital investment as an indication of capital need. As stated in one study,\(^8\)

>a declining level of investment does not indicate existence of a problem per se, there is mounting evidence that the result has, in fact, been the deterioration of existing capital plant...

Tracking investment patterns over time often represents a necessary short-cut in the evaluation of infrastructure conditions. The physical aspects of deterioration may be difficult to assess. Public facilities may be buried deeply underground or so widely distributed that accurate measurement of conditions is difficult and expensive. The basic problem inherent to analyses of this type is that the economic life of a structure is not the same as its service life. While some structures have outlived their economic life, other forms of infrastructure breakdown short of their expected useful life.

Perhaps the most widely distributed report on the “infrastructure crisis” was Pat Choate’s study for the Council of State Planning Agencies which concluded that overall:\(^9\)

America’s public facilities are wearing out faster than they are being replaced. The deteriorated condition of the basic public facilities that underpin the economy presents a major structural barrier to the renewal of our national economy. In hundreds of communities, deteriorated public facilities threaten the continuation of basic community services such as fire protection, public transportation, water supplies, secure prisons, and flood protection...

\(^8\)Subcommittee on Economic Goals and Intergovernmental Policy, Joint Economic Committee (1984) op. cit. p.11

Choate's study, which was based upon secondary data sources, serves to illustrate many of the problems associated with research on public infrastructure. First, data on infrastructure is not collected in a systematic nor coordinated manner. When we speak of infrastructure, we are referring to a vast collection of capital facilities financed and operated by a tremendous number of different government agencies and special units. In Choate's study, the data collection problems were especially pronounced because he attempted to assess the condition of infrastructure, nationwide. His conclusions were based upon a the experience of a hand-full of communities and several aggregate level studies on capital spending, federal aid and municipal debt. Given the fact that there are over 70,000 units of government across the United States, the available data simply did not support the conclusions he reached.

A second flaw in the Choate study stemmed partially from the effort to view infrastructure from a national perspective, but also from ignoring the extent to which investment in infrastructure is related to a variety of variables, such as the fiscal health of government, regional growth, and the demand for public improvements. It is apparent from his analysis that some government have invested in public works, while others have not. Public works investment does not occur in a vacuum. His study did not treat public works investment in much of a theoretical context. There was little, if any explanation as to why spending has declined, or the extent to which different areas have different patterns of investment. It would, for example, be interesting to know whether his conclusions apply to all communities regardless of income, geographic location, age, size, or density.
Other problems in Choate's analysis include: 1) the over-reliance upon existing federal standards (e.g. Environmental Protection Agency, Department of Transportation, etc.) as a proxy for capital need; 2) the failure to account for the extent to which the private sector finances and constructs public infrastructure (e.g., subdivisions, shopping centers, etc. which provide their own sewer lines, streets, and other infrastructure; and 3) an over-emphasis on inefficiency and graft as an explanation for inadequate levels of public capital investment. In short, the available data simply did not support the conclusions reached in his assessment. Yet the Choate study did play an important role in generating attention to an otherwise neglected topic of research.

CONSAD Research Corporation conducted a massive study of public works investment for the Secretary of Commerce in the late 1970s.\(^\text{10}\) This was the most comprehensive study conducted in recent years. The three volume report focused both on aggregate trends as well trends present in individual cities. In addition, CONSAD focused specifically on five types of infrastructure: water systems, sewer systems, streets and highways, bridges, and mass transit. As part of that study, nine cities\(^\text{11}\) were closely examined. This study found that while, in general, water systems were in good or fair condition, the condition of roads, streets, and bridges varied tremendously, from poor to excellent. Moreover, the condition of sewer systems and mass transit systems appeared to have improved, due to the availability of federal funds for these purposes. The CONSAD report concluded that the primary factor affecting urban maintenance is the

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\(^{10}\)CONSAD Research Corporation (1980) op. cit. pp. 11.1-11.338.

\(^{11}\)Baltimore, Dallas, Des Moines, Hartford, Newark, New Orleans, Pittsburgh, St. Louis, and Seattle.
revenue generating capacity of central city governments. The problem of maintenance, according to the CONSAD study, is primarily a revenue generation problem.

There were several shortcomings with the CONSAD study. Similar to Choate's study, the nation-wide coverage proved to be an enormous undertaking. Although CONSAD did manage to track aggregate level trends in capital investment and through its nine case studies, CONSAD was able to make some pertinent observations at the level of individual cities, the study failed in its efforts to connect aggregate level trends with city level trends. It is apparent that more synthesis of the data collected is needed.

The CONSAD study also suffered to the extent that it lacked a specific theoretical framework with which to evaluate changes in capital spending. While the researchers collected a wealth of information, they failed to relate it to any established theories about how governments make decisions, or why certain governments exhibit distinct patterns of capital investment. The report's greatest contribution may have been in terms of compiling available data.

Perhaps the most important contributions of CONSAD's research were buried within the municipal case studies. Although generalizing from the experience of only nine cities is difficult, the case studies did reveal some interesting differences among cities in terms of the organization and delivery of infrastructure services. In some cities, municipal agencies play a critical role, while in others, special or statutory districts providing service to multiple jurisdictions hold the responsibility for infrastructure. Patterns of financing infrastructure also vary widely. While all cities use long-term debt to finance construction, some cities also use debt to finance maintenance. There does, however, appear to be a general bias
against using debt for repair and preventative maintenance of infrastructure. Cities also vary widely in their efforts to raise funding for infrastructure from the private sector. The CONSAD case studies suggest, moreover, that activities such as road paving are more likely to receive funding from private sources than other types of maintenance (such as wastewater treatment). While the CONSAD case studies contained some interesting information, they did not address many questions particularly well suited to the case study method. The case studies failed to identify who is responsible for capital spending decisions and the process by which those decisions are reached. Also missing was any discussion of the lag between the time when decisions are made and when actions such borrowing or outlay occur. It would have been interesting to determine how municipal officials prioritize capital improvement projects and what they consider to be the most important factors associated with capital need.

George Peterson and his colleagues at the Urban Institute\(^2\) completed an assessment of the capital facilities in selected urban areas. In contrast to the work of Choate, and others, their findings are surprisingly optimistic:\(^3\)

On balance, the results of this survey are encouraging. There is no sign of sudden deterioration in service levels, no indication that the physical infrastructure put in place in the nineteenth century is about to wear out. Indeed, some of the most often expressed fears are clearly extremist...

Peterson suggests, that in general, the condition of the capital stock is most closely related to the last decade's history of maintenance and capital


\(^3\)Peterson, G. (1981) op. cit. p. 36
repair. Age, moreover, is only modestly related to the condition of the capital stock. Another important point which Peterson makes is that not all forms of infrastructure have deteriorated. Investment in wastewater treatment, for example, has been spurred by federal grant incentives or federal program mandates.\textsuperscript{14}

The Peterson study, although it suffers from the same general data availability problems of the other efforts, did focus more on the spending and financing practices of individual cities than previous studies. The Peterson study, however, did not explicitly treat the processes by which decisions are made. Moreover, while Peterson's work helps to identify some of the factors associated with capital spending, it falls short of developing a robust theoretical model, with results that can be applied to cities all across the country. His case studies, however, present a strong justification for focusing on individual cities across time.

In a report issued in 1982, the General Accounting Office\textsuperscript{15} asserted that "some cities maintain and rehabilitate their infrastructure, while others do not." The GAO selected four city governments and several county governments and administered a questionnaire to various local officials. This study described Cleveland as a "classic case of poor urban management," with a strong tendency to "favor current expenditures over maintenance and capital investment." Over the period, capital spending grew only 37 percent, while total expenditures grew 162 percent. The authors point out that Detroit's infrastructure is also deteriorating for the

\textsuperscript{14}Ibid. p. 37.

same reasons as Cleveland's: age, poor maintenance, and a lack of rehabilitation. The GAO report, on the other hand, describes Baltimore\textsuperscript{16} as a declining city that has "done a much better job of maintaining, replacing, and rehabilitating its facilities and equipment." Baltimore's capital expenditures, expressed as a ratio to total expenditures increased from 14 percent ($58.7 million) in 1968 to 23 percent ($258.7 million) in 1977.\textsuperscript{17}

In general, the GAO study suffers from the same problems afflicting studies\textsuperscript{18} which utilize surveys of municipal officials. The findings are only as good as the records and, often, the memories of those interviewed. The GAO study did little in the way of developing usable criteria for what constitutes infrastructure decay, or reasonable standards for capital spending. It was, moreover, not at all clear what criteria the researchers used to evaluate quality of urban management or the effectiveness of a particular city's infrastructure policy. Merely surveying local officials as to their opinions on the capital budgeting process is no substitute for actual research on either spending trends or infrastructure conditions.

In reviewing the research on the infrastructure crisis which has emerged in recent years, there appears to several distinct varieties. The first tends to be clearly alarmist, presenting as fact, the worse case

\textsuperscript{16}Cincinnati is described by the Urban Institute as an older industrialized much like Cleveland, Baltimore, and Detroit, which has managed to improve the condition of its infrastructure, largely by giving maintenance and capital replacement needs a high priority; see Urban Institute (1979) America's Capital Stock. Vol. 3: The Future of Cincinnati's Capital Plant. The Urban Institute, Washington, D.C.

\textsuperscript{17}ibid. p. 18.

\textsuperscript{18}Much of the work conducted by Harry Hatry and others at the Urban Institute on capital investment (see for example, Evans, J. and A. Millar (1982) Report on Survey of Central Capital Invesment Priority-Setting Procedures in 25 Municipalities. The Urban Institute. Washington, D.C.) falls into this category of research.
scenarios associated with widespread infrastructure deterioration. The alarmist perspective depends heavily upon the use of real dollars, comparing the growth of the 1950s and 1960s to the decline in public spending in the 1970s and 1980s. This perspective rarely points out that inflation and recessions have taken a huge chunk out of the productive capacity of local government. This perspective also assumes that standards for investment are merely those established in the past. At the other extreme are the pragmatists which suggest that the problem is isolated to a few urban governments which have not managed to institute effective planning, budgeting, and control programs for handling periodic investment and maintenance of infrastructure. From this point of view, the infrastructure problem would simply "go away," if cities adopted more sound management policies. Neither of this perspectives is satisfying. Both of these perspectives suggest a real need for a stronger theoretical foundation in infrastructure planning.

It is clear that infrastructure needs vary across regions, states, and even within individual states. Data on historical capital outlays suggest that on a per capita basis, the greatest capital spending on highways, sewage and water is found in the West, South-Central, and South, while the lowest spending appears to have occurred in the Northeast and Midwest.19 Also, among Western and Southern states, highway and water projects are high priorities while among states in the Midwest and Northeast, sewage treatment projects are high priorities. In spite of these regional differences, there is tremendous variation within regions, and

within states themselves. Factors such as population size, geography, climate, and prospects for future growth all influence the level of infrastructure need. In general, those states with the greatest populations have the greatest capital needs. New York State, for example, projects capital needs in excessservices of $100 billion, while estimates of California's infrastructure need exceed $90 billion (in 1982 dollars, over the next 18 years).20

The level of infrastructure need reported by individual cities is quite varied. Capital spending needs for Kansas City21 were estimated at: streets and highways at $3.4 billion, sewer system at $3 billion, and, public buildings at "hundreds of millions of dollars." The costs of rebuilding Louisville's storm and sewage line was estimated at nearly $500 million.22 Seattle, a relatively new city, reported over $200 million in infrastructure needs in roads, bridges, traffic signals, fire stations, office buildings, and libraries, and "enormous needs" in water, sewer, light, and solid waste.23 Much of Seattle's capital need stemmed from a "severe backlog of repair and replacement needs." New York City reported massive capital needs, on the order of $35 billion to be spent over the next decade, including $14 billion on mass transit, $5.4 billion on streets and bridges, $2.4 billion on sewers and water mains, $3.1 billion on water pollution control, and over $6 billion on services such as sanitation, correction, parks, and hospitals.24

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20ibid. p. 55.
22ibid. p. 317.
23ibid. p. 335.
24ibid. p. 507.
In order to produce an overall assessment of unmet capital needs, researchers should consider several different factors. First, although the physical condition of public works depends on age and use, the maintenance record is most important in terms of assessing the condition of infrastructure systems. Second, capital needs can be gauged in terms of either physical evidence or capital spending patterns. A determination of capital need based on physical inspection is costly and difficult to undertake. On the other hand, an assessment of capital need based on spending patterns may not reveal the true physical state of infrastructure systems. Third, the condition of infrastructure systems, both across different municipalities and across different service areas within a municipality varies greatly. Infrastructure includes public works built long ago with only city resources, as well as capital projects financed quite recently with federal or state government assistance. In any large city, there is bound to be a number of different infrastructure systems, in various states of repair. While there is evidence suggesting that infrastructure has deteriorated, such deterioration is neither uniform, nor easily determined.

The New Federalism and Infrastructure Research

Recent developments in federal policy suggest a renewal of the need for basic research on the effects of federal policies on local government initiatives. Federal government support for infrastructure occurs in two basic forms: 1) direct construction of public works; 2) intergovernmental grants. Direct investments generally involve the construction of large scale projects, such as dams, waterways, hydroelectric plants, and other facilities which, because of their scale have regional impact. Intergovernmental assistance includes various grants-in-aid to state and
local governments. Such grants can either be categorical, meaning that they are targeted funds for specific programs (e.g., highway funds, water and wastewater disposal, urban development, or community development block grants.) General revenue sharing funds include those grants which governments may spend on either operating budgets or capital projects. In the past, approximately one-third of general revenue sharing funds have been spent on capital projects.\textsuperscript{25}

Over the past two and a half decades, federal spending in terms of direct capital outlays as well as intergovernmental assistance have increased steadily until the late 1970s and early 1980s when both forms of capital investment have dropped off. Federal outlays for non-defense public works investment increased from $1.1 billion in 1957 to $8.5 billion in the 1982.\textsuperscript{26} Federal outlays, measured in constant dollars, peaked in 1966 and in 1978, but have since declined sharply.\textsuperscript{27} Federal grants, show a similar pattern of growth in the 60s and early 70s, followed by decline in the late 70s and early 80s. In 1957, federal capital grants-in-aid amounted to less than 10 percent of the total volume of state local capital outlays. By 1977, this figure jumped to nearly 40 percent, replacing debt as the largest source of financing for public works.\textsuperscript{28} (In constant 1972 dollars, federal capital grants increased from $12.2 billion in 1957 to $19 billion in 1977.) More recently, however, there have been significant declines in federal grants both as a percentage of federal budget outlays (from 17 percent in 1978 to 11.5 percent in 1982) and as a percentage of state and

\textsuperscript{25} CONSAD Corporation, (1983). op. cit. p. 3.
\textsuperscript{27} ibid. p. 5.
\textsuperscript{28} ibid.
local expenditures (from 26 percent in 1978 to 20 percent in 1982). Moreover, in terms of direct assistance for infrastructure, federal grants for public works have dropped from $22.4 billion in 1980 to $20.2 in 1982. In real terms, the reduction is much sharper, amounting to a drop (in 1972 dollars) from $20.8 billion to $12.1 billion.

The term "New Federalism" has been used to describe the present administration's efforts to reduce the role of the federal government by turning over responsibilities to state and local governments and the private sector in all areas except defense. Some of the federal initiatives which embody the spirit of the New Federalism include the reduction of funding for airports, mass transit operations, and wastewater treatment systems, which, previously received heavy federal government support.

It can be argued that the progress of the New Federalism is hindered by several different factors. First, states and localities have, over the years, become dependent upon federal financing. In 1983, the federal government made direct non-defense capital investments of $8.7 billion and pumped another $20.3 billion in grants to state and local governments. This represents a massive amount of support which could not, easily be reversed. Second, in addition to the role of financier, the federal government also sets standards by which infrastructure needs are defined. Most of these standards are set through the various grant programs which stipulate, for example, clean water requirements, sewage treatment standards, limits on discharges of pollutants, and other requirements. Due to its role in the setting of standards, the federal government could not easily back away from many of its commitments to infrastructure, in spite of the philosophy of the New Federalism.
In a recent book, two Urban Institute researchers\(^2\) state that "not since 1932 has there been such a redirection of public purposes." They argue that under President Reagan, there have been sweeping changes in federal government policies and spending priorities. For example, grants to state and local governments have declined from 11.7 percent of the federal budget in 1978 to 6.2 percent in 1985 (amounting to an annual loss of $52.7 billion in 1985).\(^3\) This means that state and local governments have that much less to spend, or that much more to raise for capital projects and general government operations. Funds which have been diverted away from domestic programs have been shifted towards military expenditures. Defense expenditures have risen from 22.8 percent of federal spending in 1978 to 25.5 percent in 1985.\(^4\) The administration projects that by 1990, defense spending will rise to 36 percent of total federal outlays. Other changes in federal priorities include: \(^5\)

- cuts in federal housing assistance by over 60 percent since 1982;
- reductions in CDBG (Community Development Block Grant) funds and UDAG (Urban Development Action Grant) funds;
- a 21 percent reduction in public transit funds (since 1980);
- 1986 federal revenue sharing funds amount to 25 percent of their 1972 levels, in inflation adjusted dollars;
- federal education programs declined from 2.4 percent of total outlays in 1979 to 1.8 percent in 1986;
- cuts in Aid to Families with Dependent Children, food stamps, and child nutrition programs;


\(^4\)ibid.

\(^5\)Morial, E. and M. Barry (1986) op. cit. pp. 6-7.
cuts in federal crime-fighting assistance to state and local governments.

These changes in federal priorities mean two things. First, municipalities will lose federal assistance. Lost revenues will need to be made up if initiatives begun under federal programs are to be continued. Second, more than ever before, municipalities will be left to fend for themselves. While the "New Federalism" implies greater discretionary authority at the state and local levels of government, it also suggests that in terms of infrastructure, cities will have to develop and implement, their own plans.

The sum total of both the stated objectives and the observed declines in the level of federal spending (both direct capital outlays and grants-in-aid) suggest that in the long run, state and local governments will have to become financially more self-sufficient. In the absence of federal support, state and local governments will, increasingly, need to issue long-term debt or use other creative methods for financing capital outlays.

The research questions posed by the arrival of the New Federalism are complicated by the fact that there is some degree of uncertainty as to whether federal grants substitute for locally raised funding or stimulate the overall level of spending. The debate over the "stimulative" versus "substitutive" effects of federal grants continues to take new form. The early, "classic" studies involved statistical modelling of both cross-
In general, the bulk of research focuses on current spending, rather than capital spending. One notable exception, contained in a study conducted by George Peterson found that per capita capital spending was a function of income, density, rate of population growth, and proportion of current expenditures financed by federal and state grants. Peterson's analysis focused on county government in the early 1970s, covering the period, 1970–74.

A number of other studies which have explicitly treated the effects of federal aid on capital spending have found stimulative effects, but in general, these studies focused exclusively upon one service area (e.g. transportation or education). The resulting coefficients are of limited value. The fact that for a given year in the mid-seventies, a dollar of interstate highway aid led to $1.64 in total expenditure is interesting only to the degree that the method used can be replicated in other circumstances.

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In summary, researchers who study infrastructure in the 1980s will not have to re-invent the wheel when it comes to assessing the impact of the New Federalism. There is an established body of literature on the effects of federal grants on spending patterns, and although the works which treat capital spending are relatively few in number, the techniques of analysis (cross-sectional and time series regression analysis) are well established methods.

**Limitations on State and Local Government Finances**

During the late 1970s, tax and expenditure limitations appeared in state after state. By 1977, some 41 states had partial limitations on property tax rates and/or restrictions on local spending. By 1978, at least seven states (California, Tennessee, Arizona, Hawaii, Michigan, South Dakota, and, Texas) adopted constitutional amendments limiting local government taxing powers, and three more adopted more stringent statutory limits (Colorado, New Jersey, and North Dakota). By March of 1980, there were another 17 states which had adopted new measures limiting the taxing or spending authority of local governments.

There have been a variety of explanations offered for the so-called “tax revolt.” Break suggested that the vote for Proposition 13 reflected support for a tax shift, rather than tax cut. Boskin argued that because of inflation and rising taxes, real disposable income per worker declined in

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the late 70s, increasing animosity towards government. Wilensky,\textsuperscript{40} pointed that the tax revolt was directed towards highly visible taxes, making the property tax in many states, particularly vulnerable. Kuttner\textsuperscript{41} argued that in addition to unfair tax burdens, and economic hardship, backlash against government helped explain popular support for initiatives like Proposition 13. Citrin suggested that the Vietnam War, corruption in the highest offices (Watergate), and economic decline brought about "unprecedented cynicism towards politics and politicians."\textsuperscript{42}

There is some recent evidence to suggest that the movement to limit state and local government has recently lost some of the steam it had during the late 1970s and early 1980s. Initiatives to further restrict taxing and spending have been turned by voters in California, Minnesota, and in other states.

While the public's desire to limit the size and scope of local government may not be as intense as in the late 70s, there is little, if any evidence to suggest that the public supports the expansion of government, at any level. In spite of the stated objectives of the New Federalism, states and localities remain constrained by tax and spending limitations.

The emergence of these limitations creates special challenges for researchers examining urban infrastructure. The fact that the public may have an unusually strong anti-government disposition may serve to exaggerate their unwillingness to fund infrastructure projects. During the Proposition 13 era, many voters, caught up in the "mood of the times" may


have routinely rejected bond issues and other referenda to increase local spending. Two points are to be made here. First, the preferences revealed during these periods of animosity towards all government activities may not reflect true attitudes towards infrastructure services. Second, the sudden loss of tax revenues due to initiative petitions can tremendously disrupt patterns of savings and investment. Cities under fiscal constraints may well end up cutting capital budgets, postponing planned improvements, and spending funds otherwise marked for debt service.\footnote{see for example the case studies in Susskind, L. (1983) Proposition 2-1/2: Its Impact on Massachusetts. Oelgeschlager, Gunn, and Hain. Cambridge.}

**Changes in the Municipal Bond Market**

In recent years, the municipal bond market has changed dramatically. For the most part, these changes have meant that for cities, borrowing has become more complex, difficult, and expensive. The major changes in the market include the following:

- increase in non-guaranteed debt;
- increase in limited tax bonds;
- increased special district and special purpose borrowing;
- increase in negotiated sales;
- congressional restrictions on debt issuances;
- shift towards individual investors, rather than commercial banks or insurance companies;
- elimination of bearer bonds;
- greater volatility in bond prices;
- proliferation of new debt instruments;
- continued uncertainty as to tax exempt status of municipals;
- changes in the federal income tax law which have served to alter demand for municipal bonds.

During the 70s, non-guaranteed debt financing has so increased in popularity that currently more 70 percent of the total volume of new issues
are revenue bonds. This is in contrast to 1970, when general obligations accounted for more than 70 percent of all new issues. Non-guaranteed debt usually carries higher interest costs than general obligation debt. Revenue bonds are considered more risky than general obligations because they lack the "full faith and credit" backing, which is a guarantee that the municipality will pledge its full authority to levy taxes and raise revenues in order to meet interest and principal payments. As a general rule of thumb, a revenue bond will have interest costs about 50 basis points above a comparably rated general obligation bond. The shift towards revenue bond financing therefore implies an increase in debt service costs.

The popularity of revenue bonds can be explained in three ways. First, numerous states have passed limitations on local government taxing authority, thereby weakening the creditworthiness of general obligation. Second, revenue bonds, since they are self-liquidating, are often exempt from many of the limitations on general obligation bonds. The use of revenue bonds, therefore, can be seen as a means of evading debt limits. Third, in general, revenue bonds not require voter approval, which often is a requirement of general obligation bonding.

In addition to spurring an increase in revenue bond financing, the appearance of tax limitations in many states has also meant an increase in the volume of limited tax bonds. Limited tax bonds, unlike general obligations do not have full faith and credit backing, and therefore are perceived as more risky.

Many states have authorized the use of another type of tax-exempt financing alternative--tax increment financing. This type of financing has gained in popularity in states such as California which have limitations on local government taxing authorities. Under this type of financing, a city declares a section of its jurisdiction as a redevelopment district. A redevelopment authority proceeds to develop the land. As part of the development process, the assessed valuation of real property is fixed at some base value prior to redevelopment. The authority then attempts to draw private investment into the district by promising to provide the necessary infrastructure. To finance this infrastructure, the authority issues bonds payable solely from the incremental tax revenues generated from the increase in assessed value resulting from the private investment.

In the wake of restrictions on local taxes, improvement districts have also increased in popularity. These have been popular mechanisms for financing public improvements since the turn of the century. With an improvement district, the emphasis lies on determining which group of property owners stands to benefit most from a particular public amenity--typically, street lighting, sidewalks, street paving, or other such public improvements. Recently, the list of improvements has been expanded to include amenities such as free parking, street furniture, decorative lighting, malls, pest control, and transportation services for the elderly. The advantage to a special assessment district is that enables a city to provide services to a particular area, raise revenues from those residents most benefiting from the services through a special assessment fee, and avoid raising the overall tax rate. Special assessment bonds can be sold in order to raise the capital necessary to finance construction and
maintenance. Typically, revenues generated from the assessments are used exclusively to retire the improvement bonds.

One of the most significant trends in the municipal bond market has been the use of tax exempt debt for non-traditional purposes. In 1970, the largest borrowers were traditional types of local government--municipalities, counties, townships, and school districts. These traditional forms of government accounted for some 46 percent of the volume of total bond sales. By 1982, special districts and statutory authorities came to dominate the market, accounting for 57 percent of all borrowing. The fact that these non-traditional local government units have edged out the other forms of government is also reflected by their growth in number, increasing from 23,885 in 1972 to 28,433 in 1982.

Over the past decade and a half, there has been a great increase in the use of debt to finance non-traditional projects. About 53 percent of bond sales in 1982 went to finance single family mortgages, private economic development, pollution control, student loans, and private hospital projects. In 1970, these non-traditional purposes amounted to less than 5 percent of the total sale of the total volume of new bond sales. The increase in special districts, statutory authorities, and non-traditional purposes for debt also helps to explain the increased prevalence of revenue bonds. These non-traditional governments usually do not have broadly based taxing authority and therefore can only issue non-guaranteed debt.

Another important change in the municipal bond market pertains to the marketing and sale of bonds. Since 1970, the volume of bonds sold by

47Ibid.
48Ibid. p. 13
negotiated sales, as opposed to competitive sales has increased dramatically. Competitive sales involves underwriters competing to offer the lowest possible interest costs. With negotiated sales, in 1970, only 17 percent of all bonds sold in that year were negotiated sales; by 1982 the proportion had increased to more than two-thirds. (See Figure IV-1.) The primary reason for the increase in negotiated sales is the proliferation of revenue bond financing. Revenue bonds are sold through negotiation because they often entail more complicated financing arrangements than general obligations. In addition, every state in the country (except Pennsylvania) requires that general obligations be sold through competitive sales. The decrease in general obligations relative to non-guaranteed debt is further cause for an increase in negotiated sales.

Other important developments include increased congressional restrictions on the use of tax exempt financing. Congress has acted to eliminate the tax exempt status of single family mortgage bonds (issued after December 31, 1983), and small issue industrial development bonds (issued after December 31, 1986). These restrictions follow those imposed by Congress under the 1982 Tax Equity and Fiscal Responsibility Act, which included public approval requirements, and disqualified certain facilities (country clubs, massage parlors, tennis clubs, racquet sports facilities, hot tub facilities, suntan facilities, and race tracks) from being built with industrial development bond proceeds. These changes suggest that tax exempt feature of municipal bonds may not be sacrosanct.

Another statutory change enacted in 1982 required that all bonds issued after June 1983 to be in registered rather than bearer form. In the past, most certificates were bearer bonds, which did not identify the owner. Registering of bonds will mean that the issuer must record the name of the
Figure IV-1

LONG TERM DEBT BY TYPE OF SALE
1970-1982

MUNICIPAL BOND HOLDINGS
VARIOUS GROUPS, 1970-1982

owner of the bond as well as the names of any others involved in subsequent transactions. Some investors may prefer the anonymity and ease of transfer associated with bearer bonds. In the short run, this may cause registered bonds to be harder to sell than bearer bonds, thereby increasing yields on registered bonds.

Increasingly, the municipal bond market has undergone changes from the investor side as well. Three groups: commercial banks, insurance companies, and high income households constitute the major types of investors interested in municipals. (See Figure IV-2.) In 1982, these three sectors held more than 89 percent of all outstanding municipal bonds.

Although banks have been the dominant investor in municipal bonds since the mid 1960s, they have, since 1971, decreased their holdings relative to individuals, insurance companies, and others investors. Numerous factors are related to the decreased demand for municipals among banks. Included among them are the Tax Reform Act of 1969, the Monetary Control Act of 1980 (which increased competition within the financial sector, forcing banks to seek high yields than tax exempts could offer.), and the Tax Equity and Fiscal Responsibility Act of 1982, which changed the tax treatment of municipal bond holdings, by allowing banks to deduct only 85 percent rather than the full carrying costs of municipal securities issued after December 31, 1982. Moreover, the fact that banks have increasingly become involved in leasing operations which allow the use of investment tax credits (considered more profitable to banks than investing in municipal bonds) is further evidence of the decline in commercial bank demand for

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Another factor which discouraged bank participation in the municipal bond market was the general rise in interest rates over the past two decades. (See Figure IV-3.) This left banks holding low yield bonds at a time when they had to offer high yields to their customers, making them, understandably, less willing to invest large sums in long-term municipals.

To a large degree, the decline in bank participation is offset by increased purchase of municipals by high income households. In 1972, net household purchases of municipals amounted to 16 percent of all new bond sales; by 1982, household purchases comprised 87 percent of all new bond sales. As pointed out in an earlier section, individuals are drawn to the bond market by high yields. An additional factor explaining the high participation of individuals is the growth of mutual bond funds, which can also be classified under the household sector of tax-exempt investors.

At the same time, recent changes in federal tax policy have served to weaken the overall demand for municipal bonds. The attractiveness of municipals is based largely upon their tax exempt status. Recent tax changes have reduced marginal tax rates and created a variety of alternative tax shelters (e.g., IRAs and Keogh self-retirement plans). Beginning in 1982, Congress reduced the maximum marginal individual income tax rate from 70 percent to 50 percent. Over the past several years, Congress has also reduced other income tax rates. Generally, whenever the marginal income tax rates are reduced, the demand for tax-exempt bonds declines.

The recently enacted tax simplification plan, approved by both houses of Congress in late September, 1986. The full effects of this

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50GAO, (1983) op. cit. p. 22.
Figure IV-3

AVERAGE ANNUAL YIELDS
1950-1982

YEAR 1950-1982

Source: Moody's Investor Service
legislation, likely to take effect January 1, 1987, are not fully known. The
main changes in the tax code include the reduction of the top tax rate's from
50 percent to 28 percent; elimination of state-local tax deductibility, as
well as the deductibility of individual retirement accounts, medical
expenses, investment tax credits, and business meals. Moreover, the
collapses 14 income tax rates into two—households earning up to $29,750
will be taxed at 15 percent, while those earning over $29,750 will be taxed
at 28 percent. Under present law, long-term capital gains are taxed at 20
percent. When the new law takes effect capital gains will be taxed at 28
percent. While state and local bonds will remain tax-exempt, the new law
will put limits on the amount of debt that public agencies can issue on
behalf of private concerns (industrial development, hospitals, universities,
etc.). Bonds issued purely for public purposes—roads, sewers, etc.—will be
unaffected.

The full impact of the law on the municipal bond market is difficult
to gauge. On the one hand, a reduction in the top income tax rates suggests
that the value of tax-exempt securities will decrease. On the other hand,
because of the elimination of many tax-shelters, many households and
business will look to municipals as a way of reducing tax liabilities. The
fact that capital gains will be taxed, under the new system, at the same
rate as salaries and wages, may serve to weaken the demand for certain
types of municipals (those below par, zero coupons, etc.).

The tax simplification plan will lead to changes in investment
patterns. Most analysts believe that wealthy individuals will pay higher
taxes under the new system, suggesting that there will still be a market
for tax-exempt securities. Moreover, the fact that investment income will

52 Ibid.
be taxed at the same rate as salaries and wages suggests that parents who have set up trusts for their children, may want to switch over to municipals. Under the new law, the maximum amount which can placed in a tax-deferred account (401K Savings Plan), will be reduced from $30,000 to $7,000. This change also increases the attractiveness of municipal bonds. Finally, because the new law limits the deductibility of interest payments to only first and second homes, those who invested in real estate may wish to switch to municipal bonds.

When all the pieces are put together, it becomes apparent that the municipal bond market has undergone substantial change. Revenue bond financing has risen tremendously during the past decade and has caused an increase in the demand for negotiated underwriters. This suggests that overall interest costs on municipals have increased. Because of increased borrowing for non-traditional purposes and the increase in borrowing by special districts and other statutory authorities, much of the market is dominated by local issuers other than city governments. According to the Municipal Finance Study Group, an increase of $1 billion in tax exempt bonds results in interest rates that are 3 to 5 basis points higher for the overall market. Based on an estimate of some $40 billion in non-traditional bonds issued in 1982, it would appear that interest costs were some 120 to 200 basis points higher, because the volume of non-traditional debt. At the same time, the continued presence of restrictions on local government taxing authority have eroded the backing of general obligation bonds. This has helped to foster the growth of special districts and other mechanisms

for financing public improvements. New debt instruments—hybrid and limited tax bonds, along "moral obligations," have flooded the market. Municipal bond insurance companies have continued to expand their base of operations, perhaps growing in popularity because of the increased uncertainties in the market. Moreover, there are more than a dozen new fiduciary or fiscal instruments which have turned the staid, sedate, bond world into an exciting, innovative aspect of public administration.

The effects of the recently enacted tax overhaul plan remain to be seen. City governments with traditional projects face stiff competition from special district and statutory authorities. Their presence in the market has served largely to drive up interest costs, and has cut into the pool of investors who might otherwise help to finance traditional infrastructure projects, offered by general purpose governments, like cities. Additionally, changes in the federal tax code may serve to weaken the demand for tax exempts. The end result is that municipal yields will increase, and marketing of bonds, directed towards individuals, rather than institutions will become increasingly complicated.

All of this implies that increasingly, control is moving further away from issuers and more and more into specialized roles within the municipal bond market. The decline in competitive sales reinforces this general point. Increasingly, through negotiated underwriting, key decisions as to the structuring of bonds, interest costs, and even the nature of the security

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backing the bonds, involve more and more, members of the financial community.

**Infrastructure and Municipal Debt: Research Needs**

Unmet capital needs, the New Federalism, limits on state and local taxing authority, and major changes in the municipal bond market suggest that there are many potential topics for research in this area.

It is clear that more research needs to be conducted on the determinants of municipal capital expenditures. How do municipalities vary in terms of their levels of capital investment? What kinds of attributes (size, density, growth, etc.) are associated with capital investment. While numerous studies have been conducted on expenditure determinants, most of the past research has focused on current or total spending rather than specifically on capital spending.

Needed too, is more analysis on patterns of financing capital outlays. How do cities vary in terms of their use of debt, federal aid and other sources of financing for infrastructure. What attributes are associated with debt financing of capital outlays? Are certain cities more prone to use debt than other techniques of financing? Clearly, there is a need for more cross-sectional analysis of municipal government spending and borrowing practices.

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At the same time, many of the unanswered questions might best be addressed through the development of new approaches and methods for analyzing borrowing practices. Typically, the research conducted on municipal debt has been approached from a market perspective, one in which the researcher examines the flow of funds from investor to borrower. The concerns are typically those shared by investors looking for either a high return on their capital, security for their investment, and maximum liquidity. The literature on risk and return, portfolio creation, and municipal bond investment performance is vast.

While a substantial amount of research on municipal borrowing is geared towards the investment community, very little of it is directed to the public sector. There is a need to better understand borrowing practices, to identify appropriate decision-making frameworks, and to develop a more sound theory as to how, when, and why municipalities use long-term debt.
Politics and Economics

Charles Lindblom, in his book, "Politics and Markets" suggests that "the greatest distinction between one government and another is the degree to which market replaces government or government replaces market." This dichotomy between government and market is particularly useful to the study of municipal borrowing. To begin with, borrowing is a form of public sector intervention. A city floats a bond issue, ostensibly, to finance needed capital improvements. Yet, market conditions and market rules play a heavy hand in determining when and how a city will borrow. Previous chapters have illustrated the extent to which government and market intermingle during the course of municipal borrowing.

Borrowing is an example of a politico-economic mechanism. It is a means for altering the present state of affairs and moving a community towards some desired and hopefully improved state. Debt enables a community to finance construction of some needed public facility such as a sewer system, water system, or some other form of infrastructure. It allows a community to make an in-ground investment that will provide service for future generations. As such, debt enables a community to shape its future. In the process of borrowing, a bond, note, or some other promise to pay is created. This claim to future income in the form of promised interest and principal payments is the basis of exchange between government issuers and investors. Holders of this claim to interest and principal payments may subsequently trade or sell their bonds prior to

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maturity. Municipal bonds are, therefore, a medium of exchange between economic actors. Investors view municipal bonds as opportunities to increase income, thereby changing their financial status. Municipal debt therefore can be examined from the perspective of government issuers or from the perspective of investors. Both perspectives involve decision-making, that is, deciding upon alternative courses of action, that hopefully, will lead to a changed, or improved state.

What, therefore, does the issuer hope to gain in the process of borrowing? First, a government which borrows may raise the necessary capital to finance needed public improvements. Borrowing enables a government entity to balance expenditure demands with available resources. Second, borrowing is a type of adjustment process by which future generations are forced into sharing the costs of public facilities planned for and built today. Borrowing may be the only way to equitably finance large public projects which provide service for many years. Third, borrowing is a mechanism which allows a community to exert greater control over its own future. Unlike intergovernmental assistance which may be earmarked for certain types of capital projects (e.g., water pollution control, handicapped access to public buildings, etc.) borrowed funds can be deployed for whatever reasonable purpose a community deems as necessary. There are fewer "strings attached" when a community issues a bond, because the community can determine its own capital needs, allocate an appropriate share of current assets which can be pledged towards the improvement, and raise the remaining necessary funds through the sale of debt. Fourth, the public sector may utilize debt to leverage development. The notion here is that borrowed funds can be used to fuel economic growth. The issuer can leverage development directly, as through an industrial revenue bond,
whereby bond funds are conveyed directly to a private corporation. The issuer can also assist development more indirectly, through a strategically located public improvement or infrastructure investment. The point here is not so much to argue the merits of industrial development financing, but rather to argue that leveraging development is, quite often, a reason for borrowing. Borrowing, therefore, can be seen as a mechanism for increasing economic activity and employment, as well as a means for financing needed capital expenditures.

Examining the other side of the equation, what does the investor hope to gain in the process of buying a municipal bond? In contrast to the government issuer, the goals and objectives of an investor are rather simplistic: earn the greatest return possible on the invested capital. While the goals and objectives of an investor are straightforward, the road to successful investment is paved with numerous pitfalls, shortcuts, and sharp turns. Basically, an investor takes surplus assets or other liquid funds and purchases municipal bonds. The investor may hope to earn money is one of two basic ways. First, by holding on to a bond, the investor is entitled to claim a stream of interest which, hopefully, exceeds the rate of interest on alternative investments at any given time. Second, the investor has the option of selling this claim to interest for a price which will, hopefully, realize a profit. Built into this scheme are factors such as the federal income tax code, which exempts interest payments on certain types of municipal bonds. The tax savings may increase due to exemptions of interest income from state and city income taxes as well. The investor also must accept a certain amount of risk of default, that is, the failure of the issuer to meet all debt service payments in a timely manner. The pricing mechanism serves to distinguish between bonds with different
payment structures as well as different risks of default. There are a range of different opportunities for investment in municipal bonds in both the primary market and the secondary market. The point here is that setting aside the distinctions between long and short term investment strategies, and the various risks associated with changing federal income tax statutes, and the risks of default, the goals and objectives of investors are relatively simple.

Municipal borrowing serves to confirm a fundamental distinction between the public and private sector: in the course of decision-making, government faces a multiple objective function, while decision-making in the marketplace tends towards the more single-minded concerns of maximizing return on investment and profit. The topic of municipal borrowing draws together these two worlds of “politics and markets” in several other ways as well. This will become apparent in the next section which examines alternative approaches to explaining changes in levels of municipal borrowing.

**Alternative Approaches to Explaining Municipal Borrowing**

In this section, the major theoretical frameworks appropriate to the analysis of borrowing are briefly reviewed and evaluated. The struggle to understand government actions is, perhaps, as old as government itself. Adam Smith, for example, envisioned government as possessing a minimal role, serving to lessen regulation and strengthen competition in the private economy. He was very much aware of the tension between government action and private enterprise. This is a recurring theme, brought to life again in the Reagan administration. Many of the early economists viewed government either superficially or as some necessary evil (e.g., Alfred

Marshall). In fact, it can be asserted that the field of public finance emerged more out of the concern for the effect of taxes on economic activity rather than as an independent and legitimate field of study. Public finance theory, up until the turn of the century, focused intently upon the tax and revenue side of government rather than on expenditures, budgeting, and the provision of public services. Mills, Ricardo, McCulloch, Senior, and others associated with formation of public finance theory held a rather limited view of government, giving short shrift to its full role as producer and provider of goods and services. Even more rare was any detailed discussion and analysis of sub-national governments (i.e., states and municipalities) and their potential actions (taxation, expenditure, and borrowing).

In spite of the fact that as a topic within the field of public finance, municipal finance theory was somewhat retarded, interest in municipal problems continued to grow. A municipal finance officers association formed in the early 1900s and numerous publications offering practical advice to those involved in the management and operations of municipalities emerged. Chatters' Local Government Debt Administration, published in 1939, is an example the pragmatic approach taken in works of this period. These volumes served as handbooks or manuals for handling a number of bond related concerns such as,\(^3\)

- the best time to sell bonds, preparation of the circular; proper forms, records, and accounting entries; relationships with the paying agent; and protection of the municipality against forgeries, and against liability on limited obligation special assessment bonds.

These works\(^4\) were thin on theory and thick on matters of practical concern. The literature, for example, presumed that city officials had already developed an appropriate debt policy and needed only the mechanics necessary to launch and carry out a debt program.

An important breakthrough in terms of public finance theory occurred sometime after World War II, when theorists such as Samuelson\(^5\) reformulated and popularized the notions of public sector equilibrium introduced some years early by Lindahl,\(^6\) Wicksell, and others. The notion of an equilibrium meant that taxes were more likely to be evaluated in conjunction with expenditures. There was now a rational framework for evaluation and government actions became more likely topics of study. The end result was the formation of a body of theory which treated government much as one would treat a household or firm in economic analysis.

Under conventional economic analysis, government is assumed to possess a utility function derived from several identifiable objectives. This function is maximized subject to constraints. In order to optimize the particular function, government must undertake some sort of intervention, such as taxation, expenditure, or redistribution of income. This type of analysis hinges upon a number of key assumptions. The first is that government acts as a single entity. The various departments and hierarchies within government are collapsed, both vertically, and


horizontally, into a unitary entity. This much like the concept of a "firm." The second assumption is that this unitary entity acts rationally, that is, its actions are consistent with well-defined, self-interested objectives. The profit-maximizing firm, becomes the "welfare-optimizing" government entity.

Another approach taken focuses more upon the behavior of residents. Tiebout\textsuperscript{7} envisioned a world in which residential choice was based upon a market-basket of goods and services offered by a government for a particular tax price. Interpreted in this way, the behavior of residents was similar to the behavior of rational consumers.

Another theorist to contribute to the field of municipal finance was Niskanen.\textsuperscript{8} He assumed that government output is produced by self-interested bureaucrats. Rational self-interest for a government bureaucrat involves maximizing budgets. Since bureaucrats can not legally keep profits, they seek other things, such as high salaries, power, and prestige—all things associated with large budgets.

Other important theoretical developments in the past 50 years involve the process by which individual level decision-making is aggregated into a collective outcome. Central to this is the median voter model as


described by Bowen\textsuperscript{9}, Black\textsuperscript{10} and Downs\textsuperscript{11} whereby an election serves as a process for revealing the median voter's preference. A variety of different concerns with the election process have emerged over the years. Issues of fairness,\textsuperscript{12} agenda control,\textsuperscript{13} and barriers to entry into politics\textsuperscript{14} are some of the more common concerns raised with electoral politics in the United States. The point worth emphasis here is that voting, in spite of the problems associated with it, is the most straightforward means of translating individual preferences into collective outcomes.

\textbf{Determinants of Local Government Spending}

The literature on determinants of local government expenditures is extensive, perhaps too vast to adequately summarize here. The technique most commonly employed in these studies is a single equation, cross-sectional, multiple regression. Variations in expenditures are explained in terms of variations in social or economic variables.


\textsuperscript{14}Tullock, G. (1965) "Entry Barriers in Politics" American Economic Review. 55. No. 2.
One of the earliest studies was conducted by Solomon Fabricant15 who explained variations in 1941 expenditures by state and local governments with three variables: per capita income, population density, and urbanization. He found that all three were important for both total operating expenditures and expenditures on specific services. Fisher16 repeated what was essentially the same analysis with 1957 data. Low per capita income was found to be an important determinant. Sacks and Harris17 found that state and federal aid were important explanatory variables. Because the increased presence of federal aid, it was argued that the income, density, and urbanization variables were of lessening significance.

Hawley18 examined the variation in per capita expenditures in 75 central cities. He determined that population and housing density in the central city and population size, percentage of population incorporated, and density in the metropolitan area were positively related to expenditures. His research pointed to the notion that socio-economic variables in the region, outside the central city, can be very important determinants of expenditures.

Brazer's19 work, who employed a similar methodology some years later, served to illustrate many of the complexities associated with cross-

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sectional analysis of municipal spending patterns. Brazer analyzed a number of different samples of cities, including a large sample of 462 cities, three smaller samples of cities in California, Massachusetts, and Ohio, and a small sample which included data on the forty largest cities. Regressions were performed on specific expenditure functions (e.g., police, fire, etc.) as well on total general operating expenditures. Although intergovernmental revenue was significant and positively influenced expenditures for all functions; density was significant for most functions (except recreation), and positively related to expenditures. Population size, growth, and composition of the labor force were, in general, not significant, and only important for a few functional areas of expenditure.

This research was particularly useful in that it demonstrated a good deal of variation in local spending patterns exists across different states. Variables which were important in one state, were not necessarily particularly important in others. The relationship between state government and city government may well have had much to bear upon the level and nature of municipal expenditures.

In order to eliminate the variations that could result from national or statewide studies, Sacks and Hellmuth\textsuperscript{20} studied data on villages and cities in the Cleveland area. The variables such as density, income and urbanization did not explain much of the variation, probably because of the large differences between villages and cities in terms of the services they provided. In their analysis, assessed property valuation proved to be significant and positively related to expenditure levels.

Bollens\textsuperscript{21} analyzed 1955 expenditure data on local governments in the St. Louis metropolitan area. His research pointed to the importance of assessed property valuation and an "index of service quality." Similar to Sacks and Hellmuth he found that variables such as density and size, generally, were not important. Bollen did find, however, that housing density was negatively related to refuse collection expenditures, suggesting the importance of economies of scale for some municipal operations.

Other interesting expenditure determinant studies which have conducted over the years include Dye's study\textsuperscript{22} which determined that variables such as party competition, partisanship, and apportionment, are much less powerful than the usual economic factors in explaining expenditures variations within states. Lineberry and Fowler\textsuperscript{23} national sample of two hundred cities found that cities run by managers spend and tax less than those run by mayors. There is no explanation why, and certainly no empirical evidence to suggest that manager cities are more efficient or that mayor cities are more prone to having larger populations who demand high levels of service. Kain\textsuperscript{24} found that the cost of the inter-neighborhood system depended primarily on the shape and size of the region being serviced. Netzer,\textsuperscript{25} on the hand, found that urbanization and high

\textsuperscript{24}Kain, J. (1967) Urban Form and the Costs of Urban Services. Program on Regional Economics; Harvard University.
demands for public services among suburban newcomers (relative to original residents) were important factors in explaining the expenditure variations.

Helen Ladd\textsuperscript{26} confirmed that expenditures were highest for the most rapidly declining communities. She showed, moreover, that expenditures will decrease as the rate of population decline slows, reaching a minimum at a positive rate of population growth; and will rise again in rapidly growing cities. Her work focused on a sample of 103 Massachusetts communities.

In summary, there are several different ways of imposing an economic perspective on government. Government can be viewed in a manner similar to how one would view a private firm. In this manner, government uses various resources to produce certain goods and services needed to achieve certain objectives. In order to ensure, for example, economic growth, government taxes residents, borrows against that power to tax, and then uses the bond proceeds to produce some form of infrastructure. Economic principles also guide the process by which government determines that a particular facility is needed. A primary mechanism for resolving collective choice problems is voting. A bond issue referendum is an example, however flawed, of how government goes about revealing the preferences of citizens. Another approach is to assume that people, "vote with their feet," that is, by choosing to live in a particular community which offers a certain level of public service for a given tax price, residents are, in effect, revealing their preferences for service. Economic theory helps to understand: 1) why municipalities borrow; 2) how

municipalities determine an appropriate level of borrowing; and 3) what is an optimal level of capital expenditure and debt.

In reality, providing answers to such questions is a tall order for economic theory alone. Economic models serve better as examples of how decisions should be made, rather than how decisions are made in reality. There are few, if any, pure and simple economic answers and "politics" manages to enter into virtually all types of decision-making. The inevitability of interaction between "politics" and "markets" stems from the following reasons. First as pointed out earlier, government faces a multiple objective function, meaning that goals and objectives are rarely, if ever, clear-cut and universally beneficial. Public sector decision-making does not occur in a vacuum, and increasingly what has been termed, "checks and balances," or, alternatively "interest group pressures," have been on the increase. In the second place, government can be characterized as a bureaucracy. As such, it is quite vulnerable to a variety of organizational pressures which may fly in the face of a pure market approach. By this, we mean that organizational behavior and theory may as strong an influence in government as economic theory. All large organizations are vulnerable to these influences. Government because of its multiple objective functions is particularly susceptible.

Financial Decision-making in Local Government

The terms "bureaucracy" and "bureaucrat" often bear negative connotations. Yet virtually all large organizations are subject to "bureaucratic" influences. Such influences may be either positive or dysfunctional. The point here is not to argue whether or not bureaucracy is good or bad, but rather to establish the fact that there are a variety of
organizational pressures which, like economic pressures guide and influence behavior and decision-making, including those relevant to borrowing.

The range of theoretical insight into organizational influences is quite broad. Max Weber was one of the first to see bureaucracy as the most efficient means of organizing economic life. Others (Merton, March and Simon, Gouldner, Selznick, etc.) were less optimistic about the beneficial aspects of bureaucratic organization.

An important article which suggested that organizational influences were as powerful as economic motivations was written by Herbert Simon\textsuperscript{27} in the 1950s. He pointed out that "firms aim at a satisfactory, rather than highest level of profits." If firms function in this manner, it is quite conceivable that government agencies also behave this way, seeking "satisfice" rather than maximize.\textsuperscript{28} Cyert and March's study\textsuperscript{29} of a large department store served to reinforce this perspective. Rational behavior was extended to include the maximization of not just economic resources, but also things like power, prestige, satisfaction, and other non-monetary items.

Perhaps the most relevant of all the studies were those conducted upon decision-making processes within local government itself. Hunter's study of community power,\textsuperscript{30} Dahl's study of leadership in New Haven,\textsuperscript{31}

Sayre and Kaufman's study of New York City, and Banfield's study on political influence stand out as the classic studies which have spawned nearly three decades of research on decision making in public organizations. Initially, the research focused on themes such as the existence of a "power elite," and the dynamics of local government decision-making. Much of the debate structured on the process itself, including the identification of stakeholders, the behavior of those identified as decision-makers, the "rules of the game," the use of strategy, and discretionary authority of decision-makers. More recently, concerns have been expressed over the

34Sayre, W. and H. Kaufman (1960) op. cit., identified the following "contestants" in city government: party leaders, public officials, bureaucrats, non-governmental interest groups, state and federal officials, and the electorate.
extent to which federal policies and programs influence local government decision-making.39

An alternative, therefore, to the conventional economic framework for analyzing borrowing decisions, involves constructing some type of organizational model. Perhaps the most compelling models involve the concepts of "bounded rationality," and the "limited problem-solving" capabilities of decision-makers. Articulated by, Lindblom,40 Dahl, Simon, Wildavsky,41 and others, this point of view suggests that while decision-making is admittedly rational, it is not necessarily economically rational. As Lindblom describes,42

Since people cannot intellectually master all their social problems...they depend on various devices to simplify problem solving. Among them are trial and error and rules of thumb, as well as routinized and habitual responses to categories of problems. One commonplace strategy for a policy maker is to proceed incrementally and sequentially, with close interplay between ends and means. In such a strategy, a policy maker is less concerned with "correctly" solving his problem than with making an advance. He is also less concerned with a predetermined set of goals than with remedying experienced dissatisfaction with past policy while goals and politics are both reconsidered...

Many borrowing decisions are likely to be made in this manner. The decision to borrow involves consideration of numerous factors. In addition to determining levels of capital need, decision-makers must ensure that there are adequate resources available to support additional debt service payments, both immediately and in the future. Borrowing can take numerous forms in terms of length of maturity, nature of security backing the obligation, refunding provisions, and so on. Many of these decisions may be made as "routinized and habitual" responses. One sees in the literature, many such "rules of thumb" as to the amount of debt a city should issue each year, the necessary coverage of debt service payments, and so on. While a local official may have final decision-making authority, he, more than likely will seek the advice and inputs of advisors both inside and outside government. The decision to incur debt, as pointed out earlier, will result in a collection of both winners and losers. As stakes increase, the pressure to decide one way over another will undoubtedly increase. The selection of one negotiated underwriter over several others, for example, may mean that the chosen firm is ensured a steady inflow of underwriting responsibilities. Finally, it is hard to image a city where borrowing decisions are made completely independent of the personalities of the key elected and appointed leaders. Although borrowing, particularly that which is used to finance capital expenditures is often planned on a long-term horizon, the power of executives to reorder priorities and create their own long range plans not only occurs, but is often expected.

In summary in terms of social, political, and economic theory, there are really two dominant frameworks for analyzing debt. Whether you call it "politics and markets" or economic versus organizational frameworks, virtually all methods of analyzing borrowing must begin with either of
these two perspectives. We can, in the process of analysis, blend these two frameworks, but the point worth emphasis is that there are really two distinct intellectual streams for analyzing not just borrowing decisions, but virtually all government interventions.

**Unique Aspects of Municipal Borrowing**

Before addressing the issues pertinent to municipal borrowing, two points need to be established. First, borrowing by a municipal corporation is fundamentally different from borrowing by a private business. Second, municipal debt is quite different in terms of the purpose, scope, and impact of federal debt.

Municipal bonds are quite different from corporate bonds. Although both entities may borrow to finance capital expenditures, the similarities between cities and private companies are really quite limited. According to an often cited article by Merton Miller, the major concern of firms is the extent to which capital structure influences market value. He takes the position that "even in a world in which interest payments are fully deductible in computing corporate income taxes, the value of the firm, in equilibrium will still be independent of its capital structure." A municipal corporation, on the other hand, is less concerned with "market value," and, more concerned with meeting public demands for service. Municipal corporations, moreover, are exempt from corporate income taxation, and the deductibility of debt service payments, while a matter of concern to private firms, is largely irrelevant to city borrowers.

Municipal borrowing is quite different from corporate borrowing for several other reasons. Municipal borrowing is subject to a set of

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constitutional or statutory restrictions expressed in the form of limits or ceilings on the amount of debt that may be issued or in stipulations regarding the authorization of debt (e.g., mandatory referendum for bond issues). Corporations, while less encumbered by legal restrictions on borrowing are more concerned with the effects of debt on the overall value of the firm. The private corporation's actions must be accountable to stockholders, while the actions of a municipal corporation are judged by a broader audience of residents and citizens.

Borrowing by state and local government entities is fundamentally different from federal government borrowing. The federal government has the ability to expand the money supply, a convenience not available to state and local entities, which are forbidden by the constitution to print money. The Federal Reserve System is responsible for maintaining monetary and credit conditions which help to promote economic growth, full employment, stable prices, and the balance of payments between the U.S. and foreign countries. There is no equivalent to the Federal Reserve at the state and local levels of government.

State and local government borrowing is closer to borrowing by private corporations than federal government borrowing. The federal government uses its debt and monetary policies to stabilize prices and the national economy; state and local governments and private corporations, on the other hand, generally borrow to finance specific capital projects. There are, moreover, many different state and local government borrowers, but only one federal government. As such federal government bonds and notes are generally considered the most secure of all investments, surpassing any obligation of any state and local government or private corporation.
Municipal borrowing is a type of government action. The proceeds of debt financing are used to construct capital facilities. Debt service is a type of expenditure, a cost to government like salaries and wages, equipment and supplies, or pension fund contributions. Perhaps one of the reasons that the study of municipal borrowing is difficult is that it does not fit neatly into a revenue-expenditure categorization. In the short term, debt is likely to be viewed as a type of revenue. Bond proceeds enable a city to purchase goods or services which it might not otherwise be able to afford. Over time, however, debt service becomes a fixed expenditure payment, that is, an obligation which the municipality must meet.

The question as to what constitutes an appropriate level of long term borrowing involves two separate considerations: 1) what the city actually needs to borrow; and 2) what the city can afford to borrow. Although the two are related, need is quite different from borrowing capacity. Need can be expressed as the difference between total capital expenditure commitments and total non-debt resources which can be expended on capital projects. Non-debt resources include current receipts, federal and state grants, and other monies such as income from the sale of property or trust income which can be used on capital projects. The question as to what a city can afford to borrow involves assessing the potential for additional debt service payments and determining how much additional debt a government can accumulate. Such an assessment should be based upon factors such as the government's potential for generating revenue and the amount of long term debt outstanding.

In the next chapter, I will examine spending and borrowing practices for the largest cities in the United States. Chapter 6 will describe patterns of spending and borrowing, and relate these patterns to attributes
of individual cities, such as size, density, growth, age, and expenditure responsibility.

Several behavioral models for explaining debt will be more fully developed in Chapter 7. These models will focus on the behavior of municipal finance officers responsible for implementing debt policy. They are assumed to be a rational, reasonable group of decision-makers. These decision-makers have access to information which they use to evaluate the consequences of their actions. Although they have different personalities, preferences, and objectives, they are similar in their capacity to foresee the outcome of their actions. This approach is a particularly useful way to describe the process of borrowing. Borrowing is practice carried out by individuals who make decisions for a city. A city, per se, is incapable of reasoning, planning, and acting. As such, it makes sense to focus on the behavior of those responsible for borrowing. A behavioral model enables us to consider a full range of motives and reasons for implementing a particular debt program. Moreover, it enables us to specify the extent to which personality traits as well as "the limits to rationality" may influence a city's debt policy.

In Chapter 8, the arguments and models developed in the next two chapters will be tested. This chapter contains an analysis of capital spending, borrowing, and federal aid over and 18 year period, 1965-82. The purpose of this chapter is to further strengthen the notion that a behavioral approach to borrowing holds great promise.
Chapter 6
Outlays and Debt: A Cross-sectional Analysis

We begin this chapter with a premise: capital spending and debt are purely rational activities. They are examples of a planned government intervention—a means of producing some desired change. As such, capital spending and borrowing occur in response to a set of conditions that exist within a particular community. This chapter will describe those conditions which create the need for capital investment, which in turn create the need for borrowing. As earlier chapters have shown, borrowing, particularly through the issuance of long term municipal bonds, involves many different interest groups and stakeholders. Municipalities must bring their issues to market, that is, they must find willing investors. Part of the explanation for municipal borrowing, therefore, involves the ability to successfully market long term debt. Combining together borrowing needs and ability provides a seemingly rational model of borrowing practices. Simply put, those cities with the greatest need to borrow as well as the greatest capacity to incur debt should, over time, exhibit the highest levels of borrowing.

Method of Inquiry and Data Sources

In order to answer some of these questions, we will examine a sample of the 37 largest cities in the country in terms of their borrowing needs and capacity to support bonded debt. The cities included in this sample represent a diverse lot. (See Figure VI-1). All have a 1980 population of more than 300,000 inhabitants. The smallest is Omaha, with a population of 313,939, while the largest is New York City, having more than 7 million inhabitants. The data have been extracted from numerous sources, but most
Figure VI-1.

The 37 Largest Cities in America
1980 Population Greater than 300,000
of the information comes from the U.S. Bureau of Census, City Government Finances.¹

There are several reasons why these 37 cities were selected for study. Because of their size and location, they serve as important centers for economic and social activity. Municipalities are complex entities which provide a wide range of public services for a heterogeneous population. Historically, large cities have been plagued by a variety of socio-economic problems. Problems such as poverty, crime, inadequate housing, pollution, and congestion have persisted in spite of numerous public interventions, planning efforts, and social programs. Municipalities are, by definition, general purpose governments, which are different from special districts, statutory authorities, and other single purpose government entities. In addition to their heavy service responsibilities they have an increasingly sophisticated array of revenue generating mechanisms. Nevertheless, cities continue face a variety of financial difficulties, some directly related to borrowing. Understanding debt policy can potentially contribute to a betterment of conditions in large urban areas.

There are, admittedly, numerous problems related to methods and data. These 37 cities are vastly different in terms of their organization, their relations with state governments, and overlapping jurisdictions. Some cities are responsible for financing and provision of services that are provided for by non-municipal governments in other areas. Some areas face "border city" problems while others because of their remote location are free of the additional service costs imposed by outside commuters. Another serious problem relates to the fact that each city is chartered

according to the particular laws of the state in which it is located. This means that there are over 30 different municipal charters, further complicating direct comparisons between municipalities.

The cities are grouped according to various attributes in Table VI-1. All of the population attributes (size, growth, and density) were derived using 1980 census data. The measures of growth and decline refer to population changes occurring between 1970 and 1980. There are both old and young cities included in the sample. An indicator of a city's age is the age of its housing stock. With the exception of San Francisco, the cities with the largest proportion of housing built before 1940 are located in the East and industrial north. Cities with a large proportion of more recently built housing tend to be located in the west and southern parts of the country. The highest rates of homeownership appear to be in those cities located in the middle regions of the country. Almost all of the largest cities in the United States have large non-white populations. The only cities to have less than 20 percent non-white population are Minneapolis, Omaha, Phoenix, and Portland. In terms of the type of government, 25 of the 37 cities have the mayor-council form of government, 11 have the city manager form, and one city, San Antonio is governed by the commission form of government.

According to the U.S. Bureau of Census, there are some 19,000 municipalities, having a total population of over 141 million people. Altogether, the 37 cities selected for study contain some 34 million people, amounting to about 24 percent of all those who live in municipalities. The 37 sample cities generated some $41.4 billion in general revenues, and spent over $37 billion in annual general expenditures. In other words, these 37 municipalities raised nearly 45 percent of all total
Table VI-1
Sample Cities Grouped According to Various Attributes

<table>
<thead>
<tr>
<th>Population Greater Than 1 Million</th>
<th>Density Greater Than 20 Persons Per Acre</th>
<th>Population Growth Greater than 20%</th>
<th>Population Decline Greater than 15%</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Chicago</td>
<td>Honolulu</td>
<td>Buffalo</td>
</tr>
<tr>
<td>Detroit</td>
<td>New York</td>
<td>Houston</td>
<td>Cincinnati</td>
</tr>
<tr>
<td>Houston</td>
<td>Newark</td>
<td>Memphis</td>
<td>Cleveland</td>
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<tr>
<td>Los Angeles</td>
<td>Philadelphia</td>
<td>Phoenix</td>
<td>Detroit</td>
</tr>
<tr>
<td>New York</td>
<td>San Francisco</td>
<td>San Antonio</td>
<td>St. Louis</td>
</tr>
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<td>Washington</td>
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<table>
<thead>
<tr>
<th>More Than 50% Housing Built Before 1940</th>
<th>More than 20% Housing Built After 1969</th>
<th>More than 50% Homeownership</th>
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</thead>
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<tr>
<td>Baltimore</td>
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<td>Fort Worth</td>
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<td>Houston</td>
<td>Memphis</td>
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<tr>
<td>Minneapolis</td>
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<td>Memphis</td>
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<td>Philadelphia</td>
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<td>St. Louis</td>
<td>Phoenix</td>
<td>Phoenix</td>
</tr>
<tr>
<td></td>
<td>San Antonio</td>
<td>Portland</td>
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<td>San Diego</td>
<td>San Antonio</td>
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<tr>
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<td>Toledo</td>
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</table>

<table>
<thead>
<tr>
<th>More than 50% Non-White Population</th>
<th>More than 30% Manufacturing Jobs</th>
<th>More than 30% Service Jobs</th>
<th>City Manager Government</th>
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</thead>
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<tr>
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<td>Chicago</td>
<td>Atlanta</td>
<td>Atlanta</td>
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<tr>
<td>Baltimore</td>
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<td>Baltimore</td>
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<td>Chicago</td>
<td>Detroit</td>
<td>Cincinnati</td>
<td>Dallas</td>
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<tr>
<td>Detroit</td>
<td>Fort Worth</td>
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<td>San Diego</td>
<td>Long Beach</td>
</tr>
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<td>Newark</td>
<td>Milwaukee</td>
<td>San Francisco</td>
<td>Oakland</td>
</tr>
<tr>
<td>Oakland</td>
<td>Newark</td>
<td>Seattle</td>
<td>Oklahoma City</td>
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<tr>
<td>Washington</td>
<td>Toledo</td>
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<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Toledo</td>
</tr>
</tbody>
</table>
revenues generated by all 19,000 municipalities in the United States. Of the $85 billion spent annually by all municipal governments, these 37 cities accounted for more than 43 percent. Similarly, this group of cities accounted for more than 40 percent of all capital outlays and over 45 percent of total municipal spending on salaries and wages. In summary, these 37 cities account for a significant proportion of the total financial activity of all municipalities in the country. It is important, therefore, to understand the fiscal behavior of these cities because they account for such a large share of total financial activity. In addition, understanding the actions of these cities may help further an understanding of other, smaller municipal units.

**Patterns of Spending and Borrowing: The Largest Cities**

As pointed out in earlier sections, capital outlays tend to be large, irregular expenditures. The planning, design, and construction of an infrastructure project can occur over a period of years, perhaps decades. As such, it makes sense to utilize a multiple year perspective when examining outlays and debt. Researchers who opt for a single year analysis risk creating a "hit or miss" situation when it comes to analyzing capital outlays and debt. In this chapter, annual spending and borrowing patterns of the 37 largest cities, averaged over an 18 year time period (1965-82), will be examined.

In order to provide some basis of comparison between cities, the values for capital spending and debt are expressed in per capita terms. In other words, an 18 year average is divided by 1980 population. There are some drawbacks to this approach. Because population may have changed over the 18 year period, using 1980 population may not be a good way to determine per capita spending trends. There are also other possible ways
of standardizing the capital spending and debt values, such as using assessed valuation or percentage of personal income. After consideration of the various available alternatives, it was determined that the potential problems created by use of 1980 population could be overcome by considering a range of other variables (size, growth, density, age, etc.) in this analysis.

Table VI-2 contains average values (averaged over 18 years) for capital outlays, long-term debt outstanding, and long-term debt issued. It also contains the total amount of debt issued in a single year, 1982. Several points emerge from examining this table. As indicated by the mean and large standard deviation values for outlays and debt, there is an extremely wide distribution of values. In other words, there appears to be tremendous differences in this sample of 37 municipalities. Per capita capital outlays range between a low of $40 (San Antonio) to a high over $383. Long-term debt outstanding ranges between $1400 (Washington, D.C.) and $143 (San Diego). Debt issuances are also widely divergent: San Diego issued on average $8 per person, while New York City borrowed approximately $180 per resident.

The cities with above average levels of long term debt outstanding are: Atlanta, Baltimore, Boston, Columbus, Los Angeles, Memphis, Minneapolis, New York, Oklahoma City, Philadelphia, San Antonio, Seattle and Washington. The cities with an above average level of debt issuance (over the 18 year period) include all those mentioned plus Buffalo, and Dallas. One city, Seattle, has an above average level of outstanding debt, but a below average record of debt issuance. There is generally a strong relationship between high levels of debt outstanding and high levels of debt issuance.
## Table VI-2
Capital Outlays, Long-term Debt Outstanding, and Long-term Debt Issued

<table>
<thead>
<tr>
<th>City</th>
<th>CAPOUT</th>
<th>LTDI</th>
<th>LTDI82</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atlanta</td>
<td>174.38</td>
<td>156.78</td>
<td>39.29</td>
</tr>
<tr>
<td>Baltimore</td>
<td>198.41</td>
<td>68.52</td>
<td>228.96</td>
</tr>
<tr>
<td>Boston</td>
<td>117.15</td>
<td>89.05</td>
<td>0.00</td>
</tr>
<tr>
<td>Buffalo</td>
<td>129.26</td>
<td>82.04</td>
<td>0.00</td>
</tr>
<tr>
<td>Chicago</td>
<td>49.22</td>
<td>27.67</td>
<td>9.77</td>
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<tr>
<td>Cincinnati</td>
<td>149.04</td>
<td>37.03</td>
<td>49.87</td>
</tr>
<tr>
<td>Cleveland</td>
<td>66.60</td>
<td>51.63</td>
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<tr>
<td>Columbus</td>
<td>58.93</td>
<td>55.36</td>
<td>191.00</td>
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<tr>
<td>Dallas</td>
<td>61.21</td>
<td>74.81</td>
<td>248.57</td>
</tr>
<tr>
<td>Denver</td>
<td>87.18</td>
<td>58.18</td>
<td>40.49</td>
</tr>
<tr>
<td>Detroit</td>
<td>92.26</td>
<td>46.18</td>
<td>103.16</td>
</tr>
<tr>
<td>FortWorth</td>
<td>69.11</td>
<td>47.74</td>
<td>129.87</td>
</tr>
<tr>
<td>Honolulu</td>
<td>69.29</td>
<td>23.97</td>
<td>62.58</td>
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<td>65.04</td>
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<td>99.00</td>
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<td>47.54</td>
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<td>102.47</td>
<td>39.05</td>
<td>72.18</td>
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<tr>
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<td>48.67</td>
<td>71.08</td>
<td>24.46</td>
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<td>Memphis</td>
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<td>70.07</td>
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<td>73.36</td>
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<td>383.46</td>
<td>133.12</td>
<td>425.77</td>
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<tr>
<td>NewOrleans</td>
<td>69.85</td>
<td>46.51</td>
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<td>NewYork</td>
<td>113.81</td>
<td>180.64</td>
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<td>Newark</td>
<td>40.90</td>
<td>40.89</td>
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<tr>
<td>Oakland</td>
<td>93.94</td>
<td>44.79</td>
<td>81.98</td>
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<tr>
<td>OklaCity</td>
<td>86.15</td>
<td>62.57</td>
<td>39.00</td>
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<tr>
<td>Omaha</td>
<td>85.21</td>
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<td>59.80</td>
<td>136.35</td>
</tr>
<tr>
<td>SanAntonio</td>
<td>40.61</td>
<td>110.22</td>
<td>291.87</td>
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<tr>
<td>SanDiego</td>
<td>44.50</td>
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<td>5.09</td>
</tr>
<tr>
<td>SanFran</td>
<td>131.97</td>
<td>92.87</td>
<td>59.70</td>
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<td>Seattle</td>
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<td>57.45</td>
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<td>139.51</td>
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<tr>
<td>Toledo</td>
<td>61.18</td>
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<td>27.32</td>
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<tr>
<td>Washington</td>
<td>216.92</td>
<td>155.06</td>
<td>227.27</td>
</tr>
<tr>
<td>mean</td>
<td>96.43</td>
<td>65.42</td>
<td>97.33</td>
</tr>
<tr>
<td>St. Dev</td>
<td>64.08</td>
<td>38.95</td>
<td>95.82</td>
</tr>
</tbody>
</table>

CAPOUT—ANNUAL CAPITAL OUTLAYS AVERAGED OVER PERIOD 1965-82
LTDI—ANNUAL LONG-TERM DEBT OUTSTANDING AVERAGED OVER PERIOD 1965-1982
LTDI82—ANNUAL LONG-TERM DEBT ISSUED, AVERAGED OVER PERIOD 1965-82
LTDI82—ANNUAL LONG-TERM DEBT ISSUED IN 1982.
Table VI-2 serves to illustrate another interesting point, which supports the view that researchers adopting a single year perspective run the risk of "hit or miss." The point is that although Boston and Buffalo had above average levels of annual debt issuances over the 18 year period, as indicated by the last column of the table, these two cities issued no debt whatsoever in 1982. Similarly, St. Louis, which had a relatively low level of average annual borrowing over the 18 year period issued over $139 per capita, for the single year of 1982.

In inspecting Table VI-2, it is somewhat surprising to find that there are some cities with low capital outlays and high debt (San Antonio), as well as some cities with high capital outlays and low debt (Long Beach). While the relationship between outlays and debt appears to be positive, at first glance it does not appear to be especially strong.

The fact that the relationship between outlays and debt is not particularly strong is confirmed by the calculation of the rank-order correlation coefficient (Spearman's rho). Shown in Table VI-3, the coefficient is only .43. This suggest that less that half of the variation in debt is predicted by capital outlays. Since long-term debt is used to finance municipal capital outlays, then, we expect a strong, positive relationship between debt and capital outlays. This may be an oversimplification. Some cities may make use of non-debt resources (federal aid, current revenues, etc.) in financing capital outlays. In other cities, the relationship between debt and outlays may not be so straight-forward. If, for example, debt is used to finance re-fundings of outstanding debt, then there may not be a strong correlation between debt and capital outlays.

The Impact of Municipal Characteristics on Outlays and Debt
<table>
<thead>
<tr>
<th>City</th>
<th>Capeout</th>
<th>Ldti</th>
<th>D</th>
<th>D Squ</th>
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</thead>
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<td>2</td>
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<td>1</td>
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<td>19</td>
<td>13</td>
<td>6</td>
<td>36</td>
</tr>
<tr>
<td>Milwaukee</td>
<td>24</td>
<td>22</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Minneapolis</td>
<td>1</td>
<td>4</td>
<td>-3</td>
<td>9</td>
</tr>
<tr>
<td>New Orleans</td>
<td>21</td>
<td>24</td>
<td>-3</td>
<td>9</td>
</tr>
<tr>
<td>New York</td>
<td>9</td>
<td>1</td>
<td>8</td>
<td>64</td>
</tr>
<tr>
<td>Newark</td>
<td>36</td>
<td>28</td>
<td>8</td>
<td>64</td>
</tr>
<tr>
<td>Oakland</td>
<td>13</td>
<td>26</td>
<td>-13</td>
<td>169</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>16</td>
<td>16</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Omaha</td>
<td>17</td>
<td>30</td>
<td>-13</td>
<td>169</td>
</tr>
<tr>
<td>Philadelphia</td>
<td>12</td>
<td>9</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Phoenix</td>
<td>20</td>
<td>17</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Portland</td>
<td>29</td>
<td>18</td>
<td>11</td>
<td>121</td>
</tr>
<tr>
<td>San Antonio</td>
<td>37</td>
<td>5</td>
<td>32</td>
<td>1024</td>
</tr>
<tr>
<td>San Diego</td>
<td>35</td>
<td>37</td>
<td>-2</td>
<td>4</td>
</tr>
<tr>
<td>San Francisco</td>
<td>6</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Seattle</td>
<td>18</td>
<td>15</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>St Louis</td>
<td>31</td>
<td>32</td>
<td>-1</td>
<td>1</td>
</tr>
<tr>
<td>Toledo</td>
<td>28</td>
<td>36</td>
<td>-8</td>
<td>64</td>
</tr>
<tr>
<td>Washington</td>
<td>2</td>
<td>3</td>
<td>-1</td>
<td>1</td>
</tr>
</tbody>
</table>

\[
\rho = 1 - \frac{6 \sum D^2}{N(N^2 - 1)}
\]

\[
= 1 - 0.5653
\]

\[
= 0.4347
\]
In stating the initial argument it may be useful to distinguish between capital needs and expenditures. Expenditures represent the amount that a city spends, regardless of its capital needs. Capital needs can be defined as the need to invest in infrastructure and capital projects. When a city relies heavily upon debt financing, there will be a strong connection between capital expenditures and borrowing. Borrowing may or may not be tied to capital needs. Hopefully, it is. Capital needs amount to what the city should be spending its money on (raised through borrowing or other means). Capital expenditures represent what the city spends in reality, which is independent of actual need.

As the previous chapter pointed, while there has been a tremendous amount of empirical research on expenditure determinants, very little is known about what determines capital spending. There is, as suggested earlier, ample evidence to suspect a number of different (and contradictory) frameworks in which capital spending is affected by municipal characteristics. As cities increase in size and density, there is reason to believe that there will be a corresponding increase in the need for capital investment. Large, densely populated areas require the heaviest investments in infrastructure. On the other hand, there is also evidence to suggest that there are possible economies of scale associated with the provision of infrastructure services. This suggests the possibility of a negative relationship between size and density and capital spending. As areas grow, and as new development occurs, old infrastructure systems must be expanded or rehabilitated, or new systems must be put in place. As infrastructure systems age, they require replacement or rehabilitation. Those cities with the oldest systems, potentially, have pressing capital needs. At the same time, the well established presence of a U-shaped
expenditure curb, suggests that there may not be a simple relationship between growth and capital spending. In fact, declining areas and growing areas may both share the highest rates of expenditure.

In this analysis, size is operationalized, using 1980 central city population. Density is expressed as persons per acre in 1980. Growth is measured as a percentage change in resident population between 1970 and 1980. Age is estimated on the basis of the proportion of the housing stock in 1980 built before 1940.

Another factor frequently pointed to as a determinant of spending is the level of financial responsibility held by the municipal government. Those municipalities which share fewer responsibilities with other units of government will, according to this view, have the highest levels of spending. The expenditure responsibility variable used in this analysis is municipal government expenditures divided by total metropolitan area expenditures. It gives a measure of the financial responsibility of the central city government.

A number of statistical tests were run to determine the nature and magnitude of the relationships between outlays/debt and municipal characteristics (size, density, growth, age, and expenditure responsibility). The results of the ANOVA test are presented in Table VI-4.

Few of the attributes turned out to be significant determinants of either capital outlays or long-term debt outstanding, or long-term debt issued. Population size appears to be strongly and positively related to capital outlays and long-term debt issuances. The other variables exhibited much weaker effects on outlays and debt.

In summary, of the five variables (size, density, growth, age, and expenditure responsibility), only size had a bearing upon outlays and debt.
### Table VI-4

Summary Table, ANOVA Test Results, Capital Outlays, Long-term Debt Issued and Long-term Debt Outstanding Against Various Municipal Attributes

#### Capital Outlays

<table>
<thead>
<tr>
<th>Attribute:</th>
<th>SS, Between</th>
<th>Sampling</th>
<th>D.F.</th>
<th>F-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>5,849</td>
<td>142,219</td>
<td>2/34</td>
<td>7.02*</td>
</tr>
<tr>
<td>Density</td>
<td>6,510</td>
<td>141,849</td>
<td>&quot;</td>
<td>.78</td>
</tr>
<tr>
<td>Growth</td>
<td>34,144</td>
<td>144,921</td>
<td>&quot;</td>
<td>.40</td>
</tr>
<tr>
<td>Age</td>
<td>21,760</td>
<td>126,328</td>
<td>&quot;</td>
<td>2.92</td>
</tr>
<tr>
<td>Exp. Resp.</td>
<td>10,582</td>
<td>137,506</td>
<td>&quot;</td>
<td>1.30</td>
</tr>
</tbody>
</table>

#### Long-term Debt Outstanding

<table>
<thead>
<tr>
<th>Attribute:</th>
<th>SS, Between</th>
<th>Sampling</th>
<th>D.F.</th>
<th>F-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>103,267</td>
<td>3,077,908</td>
<td>2/34</td>
<td>.57</td>
</tr>
<tr>
<td>Density</td>
<td>342,643</td>
<td>2,745,592</td>
<td>&quot;</td>
<td>2.12</td>
</tr>
<tr>
<td>Growth</td>
<td>403,331</td>
<td>2,684,903</td>
<td>&quot;</td>
<td>2.55</td>
</tr>
<tr>
<td>Age</td>
<td>5,050</td>
<td>3,080,185</td>
<td>&quot;</td>
<td>.04</td>
</tr>
<tr>
<td>Exp. Resp.</td>
<td>176,652</td>
<td>2,911,583</td>
<td>&quot;</td>
<td>1.03</td>
</tr>
</tbody>
</table>

#### Long-term Debt Issued

<table>
<thead>
<tr>
<th>Attribute:</th>
<th>SS, Between</th>
<th>Sampling</th>
<th>D.F.</th>
<th>F-ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>1,627</td>
<td>52,695</td>
<td>2/34</td>
<td>8.70*</td>
</tr>
<tr>
<td>Density</td>
<td>4,353</td>
<td>49,979</td>
<td>&quot;</td>
<td>1.48</td>
</tr>
<tr>
<td>Growth</td>
<td>6,354</td>
<td>47,968</td>
<td>&quot;</td>
<td>2.25</td>
</tr>
<tr>
<td>Age</td>
<td>849</td>
<td>53,483</td>
<td>&quot;</td>
<td>.26</td>
</tr>
<tr>
<td>Exp. Resp.</td>
<td>799</td>
<td>53,533</td>
<td>&quot;</td>
<td>.25</td>
</tr>
</tbody>
</table>

*significant at .01 level
Table VI-5

Population Size and Capital Outlays

Summary ANOVA Table

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares, SS</th>
<th>Degrees of Freedom, df</th>
<th>Mean Square</th>
<th>F-Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>58,694</td>
<td>3 - 1 = 2</td>
<td>29,347</td>
<td>7.02*</td>
</tr>
<tr>
<td>Sampling Error, E</td>
<td>142,219</td>
<td>37 - 3 = 34</td>
<td>4,182.9</td>
<td></td>
</tr>
<tr>
<td>Total, T</td>
<td>3565</td>
<td>37 - 1 = 36</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* significant at .01 level
Table VI-6

Population Size and Long Term Debt Issued

Summary ANOVA Table

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares, SS</th>
<th>Degrees of Freedom, df</th>
<th>Mean Square</th>
<th>F-Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>1,627</td>
<td>3 - 1 = 2</td>
<td>13,490</td>
<td>8.70*</td>
</tr>
<tr>
<td>Sampling Error, E</td>
<td>52,695</td>
<td>37 - 3 = 34</td>
<td>1,549</td>
<td></td>
</tr>
<tr>
<td>Total, T</td>
<td>2,423</td>
<td>37 - 1 = 36</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* significant at .01 level
Moreover, population size was significantly related to per capita debt issued, but was not significantly related to per capita debt outstanding. Tables VI-5 and VI-6 contain the ANOVA tables for population size and outlays and population size and debt.

In order to probe the relationship between attributes and outlays/debt even deeper, several regression equations were formulated. Three basic equations were utilized. The first attempted explain capital spending as a function of size, density, growth, age, and expenditure responsibility. The second equation attempted to explain per capita debt outstanding on the basis of the five attribute variables. The third equation attempted to explain the variation in average annual long-term debt issuances as a function of the five attribute variables.

Mathematically, the form of the regression equations used can be expressed as linear, additive models, whereby:

\[ Y = a_1 + \beta_1 \text{SIZE} + \beta_2 \text{DENSITY} + \beta_3 \text{GROWTH} + \beta_4 \text{AGE} + \beta_5 \text{EXPRESP} + E \]

with \( a_1 \) equal to the intercept, \( \beta_n \) equal to the regression coefficients, \( \text{SIZE}, \text{DENSITY}, \text{GROWTH}, \text{AGE}, \) and \( \text{EXPRESP} \) equal to the attribute variables described earlier.

In addition to the general linear models, the variables were also transformed (using logarithms) in order to produce three logarithmic models (outlays, debt outstanding, and debt issued). The results of the two approaches are summarized in Table VI-7.

The summary table containing the regression results demonstrates that five municipal attributes can explain up to 25 percent of the variation in capital outlays, 42 percent of the variation in long-term debt outstanding, and 28 percent of the variation in long-term debt issued. The use of the logarithmic transformations produced mixed results. On the one
### Table VI-7
Summary of Multiple Regression Results

#### Capital Outlays

<table>
<thead>
<tr>
<th></th>
<th>Linear Model</th>
<th></th>
<th>Logarithmic Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>t</td>
</tr>
<tr>
<td>Size</td>
<td>-.002</td>
<td>.014</td>
<td>-.13</td>
</tr>
<tr>
<td>Density</td>
<td>.038</td>
<td>3.27</td>
<td>-.01</td>
</tr>
<tr>
<td>Growth</td>
<td>-106.</td>
<td>102.</td>
<td>-1.04</td>
</tr>
<tr>
<td>Age</td>
<td>.462</td>
<td>1.17</td>
<td>.39</td>
</tr>
<tr>
<td>Exp. Resp.</td>
<td>.352</td>
<td>631</td>
<td>.56</td>
</tr>
<tr>
<td>R²</td>
<td>.17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-ratio</td>
<td>1.27</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Debt Outstanding

<table>
<thead>
<tr>
<th></th>
<th>Linear Model</th>
<th></th>
<th>Logarithmic Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>t</td>
</tr>
<tr>
<td>Size</td>
<td>.152</td>
<td>.057</td>
<td>2.66</td>
</tr>
<tr>
<td>Density</td>
<td>-7.2</td>
<td>12.5</td>
<td>-.57</td>
</tr>
<tr>
<td>Growth</td>
<td>-119.1</td>
<td>382.</td>
<td>-3.03</td>
</tr>
<tr>
<td>Age</td>
<td>-6.97</td>
<td>4.5</td>
<td>-1.55</td>
</tr>
<tr>
<td>Exp. Resp.</td>
<td>4.88</td>
<td>2.35</td>
<td>2.08</td>
</tr>
<tr>
<td>R²</td>
<td>.423</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-ratio</td>
<td>4.45</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Debt Issued

<table>
<thead>
<tr>
<th></th>
<th>Linear Model</th>
<th></th>
<th>Logarithmic Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>t</td>
</tr>
<tr>
<td>Size</td>
<td>.009</td>
<td>.008</td>
<td>1.25</td>
</tr>
<tr>
<td>Density</td>
<td>1.72</td>
<td>1.86</td>
<td>.923</td>
</tr>
<tr>
<td>Growth</td>
<td>-110.</td>
<td>57.8</td>
<td>-1.90</td>
</tr>
<tr>
<td>Age</td>
<td>-.91</td>
<td>.665</td>
<td>-1.36</td>
</tr>
<tr>
<td>Exp. Resp.</td>
<td>.055</td>
<td>.348</td>
<td>.158</td>
</tr>
<tr>
<td>R²</td>
<td>.285</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-ratio</td>
<td>2.47</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
hand, the log transformations improved the capital outlays equation, raising the $R^2$ value from .17 to .25. On the other hand, the log transformations produced lower $R^2$ values for the debt outstanding and debt issued equations.

The best equation for estimating capital outlays is the log model. According to this model, outlays are negatively related to both size and age, but positively related to density, growth, and expenditure responsibility. Such a finding confirms the notion that there may be economies of scale in terms of the provision of infrastructure in the largest cities. Also, the negative relationship between outlay and age suggests that as cities become older they spend comparatively less on infrastructure than younger cities. The positive relationship between density and outlays makes some degree of sense (ignoring for the moment, the possibilities of scale economies)—as density rises, so too should the level of infrastructure investment. The positive relationship between expenditure responsibility and level of capital spending was expected. Because of the low $R^2$ values and t-test results, it makes the most sense to use these findings to gauge the direction (positive or negative) and magnitude of relationships, rather than as predictors of outlays based on attributes.

Table VI-7 also displays the results of the regression equation for debt outstanding. Here, the best model is the linear model, which produced an $R^2$ of over .42. With an F-ratio value of 4.45, this equation produces a highly significant regression. In this model, density, growth, and age are negatively related to debt outstanding, while size and expenditure responsibility are positively related to debt outstanding. According to these results, we can state with confidence that the largest cities with the highest level of expenditure responsibilities have accumulated the most outstanding debt. It was surprising to find a negative relationship between
age and debt outstanding. One would expect that older cities should have accumulated the greatest volume of outstanding debt. It was also surprising to find a negative relationship between growth and debt outstanding. However, the strong positive relationship between expenditure responsibility and level of outstanding debt was anticipated.

When examining the debt issued equations, the linear model produces the best results (R$^2$ of .285). In this model, only growth and age are negatively related to the amount of per capita debt issued. The other attributes (size, density, and expenditure responsibility) are positively related to average annual debt issuances. In other words, large, densely populated cities with high levels of expenditure responsibilities have the greatest propensities to borrow. On the other hand, both growing cities and old cities are less likely to issue debt.

Several concluding points emerge from this analysis. While the R$^2$ values are certainly respectable for cross-sectional analyses of this sort, there is reason to be skeptical about the appropriateness of this method. First, there is reason to believe that outlays/debt and municipal attributes do not necessarily follow a linear pattern. The logarithmic transformations did not, on the whole, produce significantly higher levels of explained variation. The dependent variables, might indeed be distributed in a U-shaped curve for some variables. Second, the equations might not be focusing on the appropriate municipal attributes. Other attributes might lead to a more powerful explanation of spending and borrowing. In answer to this concern, several other variables, such as metropolitan population size and metropolitan area population change were also run in both the linear and log-linear models. None of these variations produced more significant R$^2$ or t-test results.
In spite of the deficiencies associated with the linear regressions, this analysis has produced some noteworthy findings. It is clear that relationship between capital spending and municipal attributes does not fit into a simple framework. At best, only one-fourth of the total variation in spending patterns among the 37 cities was explained. While there does appear to be a consistent negative relationship between size and spending, the relationships between all the other variables (except expenditure responsibility) and outlays appears to be too unstable to predict. In all of the equations, the expenditure responsibility variable demonstrated the greatest degree of robustness: it was positively related to outlays, debt outstanding, and issuance. Another point worth drawing attention to is that while overall the outstanding debt equation (linear model) produced the highest level of explained variation, this equation did produce some peculiar results, such as a strong negative relationship between both growth and outstanding debt and age and outstanding debt. What is implicit in this finding is that high growth cities share patterns of debt use which are similar to older cities.

The fact that the expenditure responsibility variable stands out as the only consistently positive variable across the outlay and debt equations suggests that both spending and borrowing practices may more be a function of other variables. In the next section, other variables, such as type of government, financial capabilities of government, and geographic location will be explored.

Factors Related to Debt Use Among City Governments

Table VI-8 contains the following relevant financial data for the 37 largest cities: current expenditures, capital expenditures, general revenues, total federal revenue, property taxes, and long-term debt issued.
The figures represent per capita amounts averaged over the 18 year period. The mean, standard deviation, and range for these variables are:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>current expenditures</td>
<td>$355</td>
<td>$268</td>
<td>$115-1415</td>
</tr>
<tr>
<td>capital expenditures</td>
<td>96</td>
<td>63</td>
<td>41-383</td>
</tr>
<tr>
<td>general revenues</td>
<td>507</td>
<td>358</td>
<td>154-1820</td>
</tr>
<tr>
<td>federal revenues</td>
<td>86</td>
<td>113</td>
<td>24-738</td>
</tr>
<tr>
<td>property taxes</td>
<td>118</td>
<td>103</td>
<td>14-541</td>
</tr>
<tr>
<td>debt issued</td>
<td>65</td>
<td>38</td>
<td>8-181</td>
</tr>
</tbody>
</table>

These statistics reveal the tremendous variation in levels of spending, revenue generation, and borrowing among the 37 largest cities. In terms of current spending, Washington D.C. outspent San Antonio by a factor of more than 12. Minneapolis' average capital budget was more than nine times greater than San Antonio's. In terms of federal revenues, San Francisco received almost six times the per capita allotment than Houston received. In addition, per capita property tax collections ranged between $13.88 in Columbus to $540.79 in Boston.

Given the wide variations in financial activity among these governments, it should come as no surprise to find that municipal attributes, in and of themselves, are poor descriptors of capital investment and borrowing patterns. In reality, there are two separate considerations when it comes to capital spending and borrowing. The first is need, and the second is financial ability. Need, as suggest earlier is an elusive concept, complicated by both physical standards as well as economic terms (willingness to pay). Financial ability, on the other hand, can be more readily quantified. For example, it is possible to determine the total level of financial resources available, the total expenditure requirements, and the
<table>
<thead>
<tr>
<th>City</th>
<th>CUREXP</th>
<th>CAPEXP</th>
<th>GREV</th>
<th>TFREV</th>
<th>PTX</th>
<th>LTDI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atlanta</td>
<td>226.94</td>
<td>174.38</td>
<td>434.69</td>
<td>54.69</td>
<td>98.22</td>
<td>156.78</td>
</tr>
<tr>
<td>Baltimore</td>
<td>668.97</td>
<td>196.41</td>
<td>1012.85</td>
<td>122.34</td>
<td>227.13</td>
<td>68.52</td>
</tr>
<tr>
<td>Boston</td>
<td>775.94</td>
<td>117.15</td>
<td>1049.05</td>
<td>114.18</td>
<td>540.79</td>
<td>89.05</td>
</tr>
<tr>
<td>Buffalo</td>
<td>609.63</td>
<td>129.26</td>
<td>775.95</td>
<td>119.52</td>
<td>214.78</td>
<td>82.04</td>
</tr>
<tr>
<td>Chicago</td>
<td>252.54</td>
<td>49.22</td>
<td>355.65</td>
<td>75.53</td>
<td>92.47</td>
<td>27.67</td>
</tr>
<tr>
<td>Cincinnati</td>
<td>487.21</td>
<td>149.04</td>
<td>705.22</td>
<td>111.58</td>
<td>66.41</td>
<td>37.03</td>
</tr>
<tr>
<td>Cleveland</td>
<td>281.69</td>
<td>66.60</td>
<td>408.03</td>
<td>76.99</td>
<td>80.76</td>
<td>51.63</td>
</tr>
<tr>
<td>Columbus</td>
<td>188.46</td>
<td>58.93</td>
<td>242.59</td>
<td>39.28</td>
<td>13.88</td>
<td>55.36</td>
</tr>
<tr>
<td>Dallas</td>
<td>142.42</td>
<td>61.21</td>
<td>235.37</td>
<td>25.14</td>
<td>99.35</td>
<td>74.81</td>
</tr>
<tr>
<td>Denver</td>
<td>366.52</td>
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<td>57.81</td>
<td>112.59</td>
<td>25.85</td>
</tr>
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<td>72.88</td>
<td>48.76</td>
<td>43.10</td>
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<tr>
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<td>305.98</td>
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<td>71.08</td>
</tr>
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<td>76.20</td>
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<td>70.07</td>
</tr>
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<td>Milwaukee</td>
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<td>34.93</td>
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<td>49.79</td>
</tr>
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<td>383.46</td>
<td>57.70</td>
<td>126.72</td>
<td>133.12</td>
</tr>
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<td>69.85</td>
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<td>63.54</td>
<td>54.03</td>
<td>46.51</td>
</tr>
<tr>
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<td>113.81</td>
<td>1469.57</td>
<td>79.25</td>
<td>345.77</td>
<td>180.64</td>
</tr>
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<td>40.90</td>
<td>812.16</td>
<td>41.95</td>
<td>272.19</td>
<td>40.89</td>
</tr>
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<td>93.94</td>
<td>412.97</td>
<td>85.02</td>
<td>85.17</td>
<td>44.79</td>
</tr>
<tr>
<td>Okla City</td>
<td>136.78</td>
<td>86.15</td>
<td>262.77</td>
<td>60.72</td>
<td>42.67</td>
<td>62.57</td>
</tr>
<tr>
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<td>85.21</td>
<td>273.58</td>
<td>55.29</td>
<td>79.05</td>
<td>38.20</td>
</tr>
<tr>
<td>Philadelphia</td>
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<td>531.56</td>
<td>76.72</td>
<td>82.05</td>
<td>80.82</td>
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<tr>
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<td>153.13</td>
<td>71.93</td>
<td>251.73</td>
<td>43.49</td>
<td>31.04</td>
<td>60.17</td>
</tr>
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<td>319.36</td>
<td>62.19</td>
<td>102.51</td>
<td>59.60</td>
</tr>
<tr>
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<td>40.61</td>
<td>154.22</td>
<td>41.38</td>
<td>37.70</td>
<td>110.22</td>
</tr>
<tr>
<td>San Diego</td>
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<td>44.50</td>
<td>217.83</td>
<td>34.14</td>
<td>37.37</td>
<td>6.28</td>
</tr>
<tr>
<td>San Fran</td>
<td>528.49</td>
<td>131.97</td>
<td>1010.50</td>
<td>136.35</td>
<td>252.13</td>
<td>92.87</td>
</tr>
<tr>
<td>Seattle</td>
<td>244.06</td>
<td>80.94</td>
<td>394.13</td>
<td>52.92</td>
<td>60.64</td>
<td>63.72</td>
</tr>
<tr>
<td>St. Louis</td>
<td>398.99</td>
<td>57.45</td>
<td>526.14</td>
<td>81.89</td>
<td>75.50</td>
<td>31.87</td>
</tr>
<tr>
<td>Toledo</td>
<td>214.99</td>
<td>61.18</td>
<td>270.18</td>
<td>64.11</td>
<td>19.50</td>
<td>22.36</td>
</tr>
<tr>
<td>Washington</td>
<td>1414.98</td>
<td>216.92</td>
<td>1819.58</td>
<td>738.12</td>
<td>251.17</td>
<td>155.06</td>
</tr>
<tr>
<td>AVERAGE</td>
<td>354.63</td>
<td>96.43</td>
<td>507.07</td>
<td>86.05</td>
<td>117.72</td>
<td>65.42</td>
</tr>
</tbody>
</table>

CUREXP - 18 year average of current expenditures.
CAPEXP - 18 year average of capital expenditures.
GENREV - 18 year average of general revenues.
TFREV - 18 year average of total federal revenues.
PTX - 18 year average of property tax revenues.
LTDI - 18 year average of long-term debt issued.
total amount that can be borrowed. For municipal governments, the following identity can be expressed:

\[ CO = (CR - CE) + (LT - RD) \]

where,

- \( CO \) = capital outlays
- \( CR \) = current revenues
- \( CE \) = current expenditures
- \( LT \) = long-term debt issued
- \( RD \) = debt redemption total.

Table VI-9 contains estimated capital spending for the 37 largest municipalities, based on the above identity. The first term, \( CR - CE \), represents average annual \textbf{budgetary surplus}. This amount might also be called the revenue-expenditure “gap.” The larger the gap, the greater the amount available for capital projects. The second term, \( LT - RD \), represents average long-term debt issued minus average debt redemption total. This difference is the amount which can be pledged towards capital outlays. This term might also be called the \textbf{available debt} term. Adding the two terms together, budgetary surplus and debt pledged toward capital projects, yields an estimate of the amount which municipalities should have invested on infrastructure.

The technique produced in most instances wild estimates of capital spending. Virtually no city spent more than the estimated amount, except for Philadelphia, Minneapolis and Memphis. According to this estimation procedure, virtually all cities spent, on average, far less than they should have. Cities such as New York, San Francisco, Boston, Baltimore, Washington, Atlanta, have accumulated huge deficits in capital spending. Cities with more modest deficits include Toledo, Columbus, Honolulu, Omaha, and Fort Worth.
Table VI-9

Estimated Capital Outlays

<table>
<thead>
<tr>
<th>City</th>
<th>CR-CE</th>
<th>LT-RD</th>
<th>EXPECTED</th>
<th>ACTUAL</th>
<th>DIFFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atlanta</td>
<td>207.75</td>
<td>123.98</td>
<td>331.73</td>
<td>174.38</td>
<td>-157.34</td>
</tr>
<tr>
<td>Baltimore</td>
<td>343.89</td>
<td>21.19</td>
<td>365.08</td>
<td>198.41</td>
<td>-166.66</td>
</tr>
<tr>
<td>Boston</td>
<td>273.10</td>
<td>20.72</td>
<td>293.83</td>
<td>117.15</td>
<td>-176.67</td>
</tr>
<tr>
<td>Buffalo</td>
<td>166.32</td>
<td>5.55</td>
<td>171.87</td>
<td>129.26</td>
<td>-42.61</td>
</tr>
<tr>
<td>Chicago</td>
<td>103.11</td>
<td>3.58</td>
<td>106.70</td>
<td>49.22</td>
<td>-57.47</td>
</tr>
<tr>
<td>Cincinnati</td>
<td>218.01</td>
<td>33.79</td>
<td>251.80</td>
<td>149.04</td>
<td>-102.76</td>
</tr>
<tr>
<td>Cleveland</td>
<td>126.34</td>
<td>-2.75</td>
<td>123.59</td>
<td>66.60</td>
<td>-56.99</td>
</tr>
<tr>
<td>Columbus</td>
<td>54.13</td>
<td>15.59</td>
<td>69.72</td>
<td>58.93</td>
<td>-10.80</td>
</tr>
<tr>
<td>Dallas</td>
<td>92.95</td>
<td>38.72</td>
<td>131.67</td>
<td>61.21</td>
<td>-70.46</td>
</tr>
<tr>
<td>Denver</td>
<td>206.77</td>
<td>34.65</td>
<td>241.42</td>
<td>87.18</td>
<td>-154.23</td>
</tr>
<tr>
<td>Detroit</td>
<td>200.71</td>
<td>8.32</td>
<td>209.03</td>
<td>92.26</td>
<td>-116.77</td>
</tr>
<tr>
<td>Fort Worth</td>
<td>82.91</td>
<td>22.09</td>
<td>105.00</td>
<td>69.11</td>
<td>-35.89</td>
</tr>
<tr>
<td>Honolulu</td>
<td>99.81</td>
<td>-3.24</td>
<td>96.57</td>
<td>69.29</td>
<td>-27.28</td>
</tr>
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<td>77.09</td>
<td>46.59</td>
<td>123.69</td>
<td>56.02</td>
<td>-67.67</td>
</tr>
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<td>109.56</td>
<td>9.35</td>
<td>118.91</td>
<td>65.04</td>
<td>-53.87</td>
</tr>
<tr>
<td>Kansas City</td>
<td>150.64</td>
<td>12.25</td>
<td>162.89</td>
<td>99.00</td>
<td>-63.89</td>
</tr>
<tr>
<td>Long Beach</td>
<td>123.58</td>
<td>25.29</td>
<td>148.88</td>
<td>102.47</td>
<td>-46.41</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>112.55</td>
<td>45.74</td>
<td>158.29</td>
<td>48.67</td>
<td>-109.62</td>
</tr>
<tr>
<td>Memphis</td>
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<td>20.26</td>
<td>72.03</td>
<td>51.77</td>
</tr>
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<td>Milwaukee</td>
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<td>10.52</td>
<td>138.50</td>
<td>66.97</td>
<td>-71.52</td>
</tr>
<tr>
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<td>228.06</td>
<td>383.46</td>
<td>155.40</td>
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<tr>
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<td>23.78</td>
<td>140.13</td>
<td>69.85</td>
<td>-70.29</td>
</tr>
<tr>
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<td>-5.24</td>
<td>495.74</td>
<td>113.81</td>
<td>-381.93</td>
</tr>
<tr>
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<td>4.15</td>
<td>135.57</td>
<td>40.90</td>
<td>-94.67</td>
</tr>
<tr>
<td>Oakland</td>
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<td>18.59</td>
<td>172.69</td>
<td>93.94</td>
<td>-78.75</td>
</tr>
<tr>
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<td>16.38</td>
<td>140.37</td>
<td>86.15</td>
<td>-54.22</td>
</tr>
<tr>
<td>Omaha</td>
<td>103.24</td>
<td>14.57</td>
<td>117.81</td>
<td>85.21</td>
<td>-32.60</td>
</tr>
<tr>
<td>Philadelphia</td>
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<td>34.13</td>
<td>25.53</td>
<td>97.62</td>
<td>72.09</td>
</tr>
<tr>
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<td>47.64</td>
<td>126.24</td>
<td>71.93</td>
<td>-54.31</td>
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<td>125.75</td>
<td>59.16</td>
<td>-66.59</td>
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<td>40.61</td>
<td>-86.68</td>
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<td>89.39</td>
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<td>-44.89</td>
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<td>80.94</td>
<td>-95.16</td>
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<td>137.90</td>
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<td>-80.45</td>
</tr>
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<td>61.18</td>
<td>-1.15</td>
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<td>404.60</td>
<td>109.94</td>
<td>514.44</td>
<td>216.92</td>
<td>-297.52</td>
</tr>
</tbody>
</table>

CR - CE = Average current revenues - current expenditures.
LT - RD = Average long-term debt - debt redemption total.
Expected = (CR - CE) + (LT - RD);
Actual = Average capital spending.
Difference = Actual - Expected.
The problem with this technique is that in reality, average annual values were not meant to be applied against each other. In other words, while the reasoning is acceptable, the operationalization of the variables is flawed. Another way to have conducted this procedure would have been to take each year individually and determine the surplus and available debt terms. Then, an estimate for each year could be produced. The only problem with such an approach is that it ignores the fact that capital spending and borrowing decisions often occur over a multiple year time frame. Given the nature of infrastructure decisions, it was decided in this section to examine 18 year averages rather than individual years. In future chapters, individual years for each city will be inspected more closely.

Given the above identity, there are two possible reasons why cities, for the most part, have not invested enough in infrastructure. First, the budgetary surpluses may have gone to purposes other than capital investment. Surpluses, for example, could have been rolled over into tax reductions or to fund current operating expenses in future years. The determination of budgetary priorities involves a political process, a process in which the outcomes may not always be planned. The second possibility is that cities, for one reason or another, may fail to issue adequate amounts of long-term debt. In other words, because the level of borrowing has not kept pace with new debt requirements, a capital shortage has accumulated over time. This second possibility, that cities have failed to issue adequate levels of debt, while subject to some of the same political pressures governing the use of operating budget surpluses, is, from the perspective of this analysis, the central problem in infrastructure planning.
Given this perspective, and based on the identity presented earlier (Table VI-9), the difference between actual and expected levels of capital outlay can be seen as an estimate of the shortfall in long-term debt. In other words, those cities which appear to be spending far less than they should be are doing so because of inadequate levels of debt.

The question as to why cities have not borrowed enough is difficult to answer. The analysis of debt on the basis of municipal attributes failed to produce much in the way of strong, significant relationships. Perhaps other factors more directly related to the issuance of debt.

**Alternative Explanations**

There are several alternative hypotheses that one could formulate in explaining patterns of debt use in American cities. Each of these alternative hypothesis are proposed not with the intention of conducting a full-blown analysis, but more to suggest the wide range of potential explanations that are applicable to municipal debt.

Since most debt is backed by the full-faith credit of a city, debt issuances might be related to the taxing strength of the municipality. In other words, there might be a strong relationship between property taxation and debt issuances. Another hypothesis involves federal aid. While some believe that federal aid may substitute for debt, others hold that federal aid may stimulate borrowing, by increasing the stock of resources which can be pledged towards debt retirement. In either case, there should be a strong relationship between debt and federal aid. Next, one might hypothesize those cities which have large surpluses are in the best position to borrow, while those which have the most severe budgetary shortages are in the worse position to issue debt. In this case would expect there to be strong relationship between revenue-expenditure gap and debt. Another hypothesis
which has been tested by other researchers, is the possibility that type of
government (mayor versus manager) has some impact upon borrowing
practices. While such studies typically offer no explanation, the accepted
wisdom is that "mayor" cities spend more than "manager cities." As such,
it follows that "mayor" cities should also borrow more. Finally, one might
test the hypothesis that sunbelt cities differ from frostbelt cities in terms
of their borrowing practices. There has been much research on how certain
regions of the country have been experiencing rapid growth and development,
while others appear headed for prolonged stagnation and economic decline.
it would be interesting to test these hypotheses, using the data set,
however limited, that is described in this chapter.

In order to test the strength of the relationship between debt and
property taxes, a Chi Square table has been prepared (Table VI-10). This
table shows a clearly that there is a strong, significant relationship
between average level of property taxes and average level of long-term debt
issued among the 37 largest cities in the country. Of the 17 cities with
property taxes below $80 per capita, 12 have have levels of debt issuance
below $60 per capita. Of the three cities with debt issuances above $120,
two collect more than $160 in property taxes.

The Chi Square table for Debt and Federal Revenue (Table VI-11), on
the other hand, does not produce a significant Whitney Chi square value. This
suggests that at least in terms of this cross-sectional analysis, there is
not a particularly strong relationship between federal revenues and debt.

In examining Table VI-12, it is clear that a significant
relationship does exist between revenue-expenditure gap and debt issued.
The table suggests that as budgetary surpluses increase, so too does the
Table VI-10

Chi Square Test for Property Taxes and Long-term Debt Issued

<table>
<thead>
<tr>
<th>Long-term Debt Issued</th>
<th>Property Taxes</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;80</td>
<td>80-160</td>
<td>&gt;160</td>
<td></td>
</tr>
<tr>
<td>&lt;60</td>
<td>12</td>
<td>10</td>
<td>1</td>
<td>62.2%</td>
</tr>
<tr>
<td></td>
<td>10.5</td>
<td>8.06</td>
<td>4.36</td>
<td></td>
</tr>
<tr>
<td>60-120</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>29.7%</td>
</tr>
<tr>
<td></td>
<td>5.0</td>
<td>3.8</td>
<td>2.07</td>
<td></td>
</tr>
<tr>
<td>&gt;120</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>8.1%</td>
</tr>
<tr>
<td></td>
<td>1.36</td>
<td>1.03</td>
<td>0.55</td>
<td></td>
</tr>
<tr>
<td></td>
<td>45.9%</td>
<td>35.1%</td>
<td>18.9%</td>
<td></td>
</tr>
</tbody>
</table>

\( \chi^2 = 11.09 \)

(significant at .025 level)
### Table VI-11

**Chi Square Test for Federal Revenue and Long-term Debt Issued**

<table>
<thead>
<tr>
<th>Long-term Debt Issued</th>
<th>Federal Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;60</td>
<td>12</td>
</tr>
<tr>
<td>60-120</td>
<td>9</td>
</tr>
<tr>
<td>&gt;120</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>22</td>
</tr>
<tr>
<td><strong>&lt;60</strong></td>
<td>10.6</td>
</tr>
<tr>
<td><strong>60-120</strong></td>
<td>8.9</td>
</tr>
<tr>
<td><strong>&gt;120</strong></td>
<td>2.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>21.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Long-term Debt Issued</th>
<th>Federal Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;60</td>
<td>4</td>
</tr>
<tr>
<td>60-120</td>
<td>5</td>
</tr>
<tr>
<td>&gt;120</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>11</td>
</tr>
<tr>
<td><strong>&lt;60</strong></td>
<td>5.3</td>
</tr>
<tr>
<td><strong>60-120</strong></td>
<td>4.4</td>
</tr>
<tr>
<td><strong>&gt;120</strong></td>
<td>1.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>11</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Long-term Debt Issued</th>
<th>Federal Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;60</td>
<td>2</td>
</tr>
<tr>
<td>60-120</td>
<td>1.9</td>
</tr>
<tr>
<td>&gt;120</td>
<td>1.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>5.5</td>
</tr>
<tr>
<td><strong>&lt;60</strong></td>
<td>1.9</td>
</tr>
<tr>
<td><strong>60-120</strong></td>
<td>1.6</td>
</tr>
<tr>
<td><strong>&gt;120</strong></td>
<td>1.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>4.5</td>
</tr>
</tbody>
</table>

| **X^2** | 2.974 |
|-----------------|
| (not significant at .10 level). |
### Table VI-12

**Chi Square Test for Revenue-Expenditure Gap and Long-term Debt Issued**

<table>
<thead>
<tr>
<th>Long-term Debt Issued</th>
<th>Revenue-Expenditure Gap</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;100</td>
<td>100-200</td>
<td>&gt;200</td>
<td></td>
</tr>
<tr>
<td>&lt;60</td>
<td>5</td>
<td>12</td>
<td>4</td>
<td>56.7%</td>
</tr>
<tr>
<td></td>
<td>6.23</td>
<td>9.63</td>
<td>5.12</td>
<td></td>
</tr>
<tr>
<td>60-120</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>32.4%</td>
</tr>
<tr>
<td></td>
<td>3.56</td>
<td>5.81</td>
<td>2.91</td>
<td></td>
</tr>
<tr>
<td>&gt;120</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>10.8%</td>
</tr>
<tr>
<td></td>
<td>1.19</td>
<td>1.83</td>
<td>0.97</td>
<td></td>
</tr>
<tr>
<td></td>
<td>29.7%</td>
<td>45.9%</td>
<td>24.3%</td>
<td></td>
</tr>
</tbody>
</table>

\[ \chi^2 = 9.398 \]

(significant at .10 level)
propensity for borrowing. Of the 11 cities with surpluses less than $100, not one has issued debt over $120 per capita.

The remaining Chi Square test (Table VI-13) examines the strength of the relationship between type of city government and long-term debt issuances. The results suggest that there is no significant difference between cities run by mayors and those run by managers in terms of their average borrowing levels.

In order to determine if a significant difference between sunbelt and frostbelt cities exists, the W-Statistic (Wilcoxon-Mann-Whiney) was used. Used to compare ranked, ordered observation, the statistic was used first on long-term debt outstanding (Table VI-14), and then on long-term debt issued (Table VI-15). The calculation of the statistics are as follows:

\[
E(w) = \frac{1}{2}mn(m + n + 1) = 85.5
\]
\[
\text{var}(w) = \frac{1}{12}mn(m + n + 1) = 128.25
\]

long-term debt outstanding:

\[
\Pr \left( w \leq 106 \right) = \Pr \left( \frac{w - \mu_w}{\sigma_w} \leq \frac{106 - 85.6}{\sqrt{128.25}} \right) = \Pr (z \leq 1.80)
\]

significant at .05 level

long-term debt issued:

\[
\Pr \left( w \leq 97 \right) = \Pr \left( \frac{w - \mu_w}{\sigma_w} \leq \frac{97 - 85.6}{\sqrt{128.25}} \right) = \Pr (z \leq 1.00)
\]

not significant at .10 level.
Table VI-13

Chi Square Test for Type of City Government and Long-term Debt Issued

<table>
<thead>
<tr>
<th>Long-term Debt Issued</th>
<th>Type of City Government</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mayor-Council</td>
<td>City-Manager</td>
</tr>
<tr>
<td>&lt;60</td>
<td>14</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>13.86</td>
<td>6.08</td>
</tr>
<tr>
<td>60-120</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>7.67</td>
<td>3.67</td>
</tr>
<tr>
<td>&gt;120</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>2.77</td>
<td>1.22</td>
</tr>
</tbody>
</table>

\[ \chi^2 = 1.7622 \]

(not significant at .25)
Table VI-14
W Statistic, Long-term Debt Outstanding, Comparison of Frostbelt and Sunbelt Cities

<table>
<thead>
<tr>
<th>Combined Ordered Observations</th>
<th>Combined Ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frostbelt</strong></td>
<td><strong>Sunbelt</strong></td>
</tr>
<tr>
<td>323</td>
<td>144</td>
</tr>
<tr>
<td>382</td>
<td>244</td>
</tr>
<tr>
<td></td>
<td>280</td>
</tr>
<tr>
<td></td>
<td>402</td>
</tr>
<tr>
<td></td>
<td>280</td>
</tr>
<tr>
<td></td>
<td>427</td>
</tr>
<tr>
<td></td>
<td>464</td>
</tr>
<tr>
<td></td>
<td>473</td>
</tr>
<tr>
<td></td>
<td>547</td>
</tr>
<tr>
<td></td>
<td>548</td>
</tr>
<tr>
<td></td>
<td>584</td>
</tr>
<tr>
<td></td>
<td>598</td>
</tr>
<tr>
<td></td>
<td>604</td>
</tr>
<tr>
<td>667</td>
<td>654</td>
</tr>
<tr>
<td>674</td>
<td>1341</td>
</tr>
</tbody>
</table>

m=9  n=9  w=106
Table VI-15
W Statistic, Long-term Debt Issued
Comparison of Frostbelt and Sunbelt Cities

<table>
<thead>
<tr>
<th>Combined Ordered Observations</th>
<th>Combined Ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frostbelt</strong></td>
<td><strong>Sunbelt</strong></td>
</tr>
<tr>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>24</td>
<td>2</td>
</tr>
<tr>
<td>28</td>
<td>3</td>
</tr>
<tr>
<td>39</td>
<td>4</td>
</tr>
<tr>
<td>41</td>
<td>5</td>
</tr>
<tr>
<td>48</td>
<td>6</td>
</tr>
<tr>
<td>52</td>
<td>7</td>
</tr>
<tr>
<td>55</td>
<td>8</td>
</tr>
<tr>
<td>60</td>
<td>9</td>
</tr>
<tr>
<td>70</td>
<td>11</td>
</tr>
<tr>
<td>71</td>
<td>12</td>
</tr>
<tr>
<td>75</td>
<td>13</td>
</tr>
<tr>
<td>82</td>
<td>14</td>
</tr>
<tr>
<td>89</td>
<td>15</td>
</tr>
<tr>
<td>110</td>
<td>16</td>
</tr>
<tr>
<td>133</td>
<td>17</td>
</tr>
<tr>
<td>181</td>
<td>18</td>
</tr>
</tbody>
</table>

m=9  n=9  w=97
These results suggest that while there is a significant difference between frostbelt and sunbelt cities in terms of outstanding debt, the differences between the two groups in terms of debt issuances is minor. The finding that in frostbelt areas, levels of outstanding debt are significantly higher, while levels of debt issuances are similar suggest that frostbelt cities either started the 18 year period with heavier debt burdens than did the sunbelt cities, or, they have been slower to retire their outstanding debts. Either way, the frostbelt cities are in a comparatively disadvantageous situation. While the sunbelt cities can more readily take on new debt, the frostbelt cities are strapped into paying off old outstanding debts. Given the arguments concerning the economic advantages associated with the sunbelt regions, high levels of outstanding debt are both problematic as well as symptomatic of greater ills.

Conclusions: A Need for a New Approach to Study Capital Outlays and Municipal Debt

While this chapter has served to describe the variegated pattern of outlays and debt in the largest cities, it has also shown the need for a new perspective on capital spending and debt. There were some notable findings, and although the regression equations fell short of expectation, the analysis has served in most, if not all cases, to illustrate the direction and magnitude of the relationships between various variables and capital outlays and debt. Certainly there is ample evidence throughout this chapter to suggest that even among a relative small group of cities, there is wide variation in financial capacity, spending patterns, and borrowing practices.

It is clear from this analysis that there are a number of very different forces which affect capital outlays and debt. On the one hand, there are various physical characteristics (size, density, age, growth, etc.)
which exert some influence over capital spending and debt. These variables
accounted for more than 42 percent of the variation in long-term debt
outstanding, and over 25 percent of the variation in capital outlay and debt
issued. In addition to these attributes, there are also a range of other
variables which can exert an influence over outlays and debt. The analysis
found that while expenditure responsibility, property taxes, and revenue-
expenditure gap are significantly related to levels of debt, federal aid and
type of government (mayor v. city manager) are not. Finally, the analysis
produced some preliminary evidence that there is a difference between
sunbelt and frostbelt cities, not in terms of debt issuances, but in levels of
outstanding debt.

In this chapter a mathematical identity was constructed, in which it
was postulated that capital spending should equal total operating surpluses
added to available debt (debt issuances minus debt redemption). Based on
this formulation; the expected level of average capital spending for all 37
cities was derived. This expected levels far exceeded actual levels of
investment. While this identity was offered more as a theoretical construct
rather than as an accurate estimation of true need, one could go so far as to
use the deficits in spending (actual - expected) as measures of borrowing
shortfall.

In summary, the results of this analysis are not entirely satisfying.
While it is quite apparent that municipal borrowing is, indeed, a complex
activity, this chapter demonstrates that a new approach to understanding
and describing debt is in order. In the next chapters, a behavioral
approach for examining decision-making over time will be developed.
Chapter 7
A Behavioral Model of Municipal Borrowing

The Need for a Behavioral Model

The previous chapter, which focused on a cross-sectional view of municipal borrowing, served to illustrate the need for a behavioral model. The framework developed in Chapter 6 attempted to relate municipal characteristics to long-term borrowing practices. It was suggested that certain cities with similar attributes should, over time, demonstrate similar patterns of borrowing. Although several statistically significant relationships were described, the analysis in Chapter 6 fell short of producing a complete explanation of municipal borrowing. The previous chapter concluded with a suggestion that a more penetrating examination of the decision-making process might help to explain borrowing in America's largest cities.

In this chapter, the focus is on the development of models to characterize the behavior of decision-makers responsible for capital spending and borrowing decisions. Several important assumptions, necessary for the adoption of this approach must be made. First, we assume that municipal borrowing is the outcome of a decision-making process. A decision making process can be defined as thinking that results in the choice of alternative courses of action. Second, we assume that all decision-making authority is collapsed both vertically and horizontally into a single, powerful entity. Third, we assume that the decision-maker is responsive, intelligent, and committed to finding the best possible solution. This chapter is different from the previous one because here we begin with
the constraints and opportunities faced by the decision maker, rather than focusing on the various socio-economic conditions present within the community.

Once all of the key constraints, factors, decisions, and outcomes have been identified, a number of different models for decision-making can be specified. Another way of describing this approach is to think in terms of the key inputs and outputs to a decision-making process. The outcomes depend not only upon the combination of inputs, but also the sequence by which they are entered into the decision-making framework. The value to this approach is its flexibility; behavioral models can account for a wider range of outcomes, as well as influencing factors, than the cross-sectional methods employed in the previous chapters.

Another advantage to this method is its intimate connection with micro-level decision-making processes. When conducting an aggregate level analysis of the sort presented in Chapter 6, the tendency is to engage in a never-ending search for statistically significant relationships. With the ease of computer generated contingency tables or regression equations, the temptation to demonstrate that a relationship exists, no matter how spurious, is often overpowering. With a behavioral model, on the other hand, the range of influencing factors is bounded. There is a much closer connection between rationality (human thought) and action.

**Key Inputs to Borrowing Decision**

As with any decision-making process there is a finite set of inputs associated with the decision to borrow. These inputs to borrowing decision can be organized into data concerning: 1) capital needs; 2) financial capabilities; and 3) market conditions. (See Figure VII-1). In theory,
Figure VII-1
Inputs to Decision-making Process

FINANCIAL CAPABILITIES

CAPITAL NEEDS

DECISION

BORROW

MARKET CONDITIONS
decision-makers draw upon these three kinds of inputs in deciding when and how much to borrow.

The first input to the decision-making process is the level of unmet capital need within the community. A high level of unmet need increases the likelihood that a community will have to borrow. In cities with low capital needs, there is, obviously, less of a need for borrowing. This is not to suggest that low capital need cities are completely removed from debt related issues. The reality is that such cities 1) will eventually face high capital needs; 2) have faced capital needs in the past; and 3) need to establish an appropriate debt policy with guidelines for borrowing.

The determination of capital need is a difficult task. In some cities, capital needs will be determined largely on the basis of physical standards, while in others the key determinant of need is economic criteria (i.e., the willingness to pay, for additional services). As pointed out earlier, capital expenditures may or may not serve as a good indicator of capital need. The pattern of actual spending can exceed or fall short of need. For this reason, capital expenditure data needs to be interpreted cautiously.

From the earlier chapters, it is apparent that the relationship between capital outlays and various municipal attributes is difficult to specify. Table VII-1 contains a comparison of five cities with high capital expenditures with five cities having low capital expenditures. Although high expenditure cities have slightly higher levels of personal income, lower percentages of non-white residents than low expenditure cities, the extent of similarity between cities with high capital expenditures and those with low expenditures is striking.

Another set of inputs to the decision-making process is the financial strength of the municipality. Obviously some cities are in a better position
Table VII-1.

A Comparison of High and Low Capital Expenditure Cities

<table>
<thead>
<tr>
<th></th>
<th>Capital Exp</th>
<th>Personal Income</th>
<th>1940 Housing</th>
<th>Home Own</th>
<th>Non-white</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minneapolis</td>
<td>$383</td>
<td>$7940</td>
<td>57%</td>
<td>47%</td>
<td>12%</td>
</tr>
<tr>
<td>Washington</td>
<td>217</td>
<td>8963</td>
<td>39</td>
<td>32</td>
<td>73</td>
</tr>
<tr>
<td>Baltimore</td>
<td>198</td>
<td>5877</td>
<td>50</td>
<td>44</td>
<td>50</td>
</tr>
<tr>
<td>Atlanta</td>
<td>174</td>
<td>6550</td>
<td>21</td>
<td>38</td>
<td>23</td>
</tr>
<tr>
<td>Memphis</td>
<td>149</td>
<td>6875</td>
<td>46</td>
<td>35</td>
<td>48</td>
</tr>
<tr>
<td>Average</td>
<td>224</td>
<td>7241</td>
<td>43</td>
<td>39</td>
<td>35</td>
</tr>
<tr>
<td><strong>Low</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>San Antonio</td>
<td>41</td>
<td>$5672</td>
<td>14</td>
<td>56</td>
<td>21</td>
</tr>
<tr>
<td>Newark</td>
<td>41</td>
<td>4525</td>
<td>47</td>
<td>19</td>
<td>67</td>
</tr>
<tr>
<td>San Diego</td>
<td>45</td>
<td>8027</td>
<td>13</td>
<td>46</td>
<td>23</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>49</td>
<td>8422</td>
<td>23</td>
<td>38</td>
<td>38</td>
</tr>
<tr>
<td>Chicago</td>
<td>50</td>
<td>6936</td>
<td>52</td>
<td>36</td>
<td>50</td>
</tr>
<tr>
<td>Average</td>
<td>45</td>
<td>6717</td>
<td>55</td>
<td>39</td>
<td>40</td>
</tr>
<tr>
<td><strong>37 City Average</strong></td>
<td>196</td>
<td>7582</td>
<td>40</td>
<td>59</td>
<td>47</td>
</tr>
</tbody>
</table>

A per capita capital expenditures, averaged over 1965-82
B 1979 personal income
C Proportion of Housing in 1980, built before 1940.
D Proportion of metropolitan area expenditures made by municipality
E Proportion of population nonwhite in 1980.
to issue bonds than other cities. Cities with unlimited taxing authority and broadly based taxing authority are in a better position to issue debt than cities which are highly dependent upon a single tax source. Cities with low levels of outstanding debt are also in a superior position to take on new debt than those places strapped with heavy debt burdens and large debt service payments.

The assessment of financial capacity involves consideration of non-debt sources of revenue which can be pledged towards capital improvements. There are two basic non-debt sources of financing for capital improvements: own source revenues and intergovernmental assistance. Own source revenues include property taxes, sales taxes, income taxes, other tax revenues and income from fees and charges. Intergovernmental aid includes all funds received from state and local governments. Table VII-2 shows various financial characteristics of the 37 largest cities for selected years. Over the period 1966 to 1982, there has been substantial growth in all types of financial activity. Federal aid grew by almost 20 times, state aid by over five times, and property taxes by more than two times. The growth of general revenues from an average of $235 million to over $1.1 billion, paralleled an expansion in current spending (which grew from $159 million to $736 million) and capital spending ($41 million to $137 million). While outstanding debt more than doubled, and long term debt issued jumped from an average of $43 million in 1965 to over $102 million in 1982, it is important to note that between 1976 and 1982, there was an apparent drop off in borrowing, as the average amount borrowed by the 37 largest cities was $165 million in 1976.

The cities with highest level of per capita general revenue collection include Washington ($1820), New York ($1470), Boston ($1049), Baltimore.
Table VII-2.

General Financial Characteristics
Sample Cities, Selected Years,
Mean Values

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>General Revenues</td>
<td>1.1 b</td>
<td>756 m</td>
<td>493 m</td>
<td>235 m</td>
</tr>
<tr>
<td>State Aid</td>
<td>277 m</td>
<td>229 m</td>
<td>47 m</td>
<td>52 m</td>
</tr>
<tr>
<td>Federal Revenue</td>
<td>157 m</td>
<td>103 m</td>
<td>41 m</td>
<td>8 m</td>
</tr>
<tr>
<td>Property Taxes</td>
<td>209 m</td>
<td>165 m</td>
<td>129 m</td>
<td>87 m</td>
</tr>
<tr>
<td>Current Expenditures</td>
<td>736 m</td>
<td>520 m</td>
<td>356 m</td>
<td>159 m</td>
</tr>
<tr>
<td>Capital Outlays</td>
<td>137 m</td>
<td>90 m</td>
<td>80 m</td>
<td>41 m</td>
</tr>
<tr>
<td>Long Term Debt Issued</td>
<td>102 m</td>
<td>165 m</td>
<td>84 m</td>
<td>43 m</td>
</tr>
<tr>
<td>Outstanding Debt</td>
<td>891 m</td>
<td>785 m</td>
<td>566 m</td>
<td>415 m</td>
</tr>
</tbody>
</table>
($1013), and San Francisco ($1010). These cities all have high levels of capital outlays and debt. Cities with a low level of general revenue collections, in the range of $154 to $232, including San Antonio, Houston, Fort Worth, San Diego, and Phoenix, have lower than average levels of capital spending and debt.

The cities with the highest per capita property tax collections include Boston ($541), New York ($346), Newark ($272), San Francisco ($252) and Washington, D.C. ($251). With the exception of Newark, these cities all have high capital outlays and high levels of long term debt. They also demonstrate a greater propensity to use general obligations over non guaranteed debt. The cities with low rates of property tax collection (less than $38 per capita) include Columbus, Toledo, Phoenix, San Diego, and San Antonio. These cities have low levels of capital spending, and below average levels of long term debt, particularly general obligation debt.

The 37 sample cities varied widely in terms of federal aid. Washington D.C. which received, on average, $738 per capita topped the list, while Houston, at the bottom, received only $24 per capita. The relationship between debt and federal aid is complicated. On the one hand, federal aid represents a source of financing with which to back municipal debt. The availability of federal aid may free up discretionary funds thereby increasing revenues which can be used for debt service. In this way, high federal aid is positively related to borrowing. On the other hand, federal aid could be used as a substitute for borrowing. That is, federal aid and debt could be negatively related.

The fact that no simple relationship exists between general revenues, property taxes, federal aid, and borrowing is summarized in Table VII-3. In this table, cities were first grouped according to various fiscal attributes.
Table VII-3

Cities Grouped According to Various Fiscal Attributes

Average Level of Debt Issuance

<table>
<thead>
<tr>
<th>Classification</th>
<th>Average Long Term Debt Issued</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Revenues:</strong></td>
<td></td>
</tr>
<tr>
<td>&gt; $1000</td>
<td>$116.92</td>
</tr>
<tr>
<td>$500 - $1,000</td>
<td>$53.85</td>
</tr>
<tr>
<td>$300 - $400</td>
<td>$64.41</td>
</tr>
<tr>
<td>&lt; $300</td>
<td>$52.23</td>
</tr>
<tr>
<td><strong>Property Taxes:</strong></td>
<td></td>
</tr>
<tr>
<td>$345 - $540</td>
<td>$134.80</td>
</tr>
<tr>
<td>$214 - $272</td>
<td>$87.88</td>
</tr>
<tr>
<td>$98 - $126</td>
<td>$71.28</td>
</tr>
<tr>
<td>$60 - $93</td>
<td>$52.44</td>
</tr>
<tr>
<td>&lt; $60</td>
<td>$48.91</td>
</tr>
<tr>
<td><strong>Federal Revenue:</strong></td>
<td></td>
</tr>
<tr>
<td>&gt; $135</td>
<td>$155.10</td>
</tr>
<tr>
<td>$111 - $113</td>
<td>$69.15</td>
</tr>
<tr>
<td>$70 - $85</td>
<td>$56.80</td>
</tr>
<tr>
<td>$52 - $64</td>
<td>$65.55</td>
</tr>
<tr>
<td>$34 - $43</td>
<td>$54.77</td>
</tr>
<tr>
<td>&lt; $34</td>
<td>$72.60</td>
</tr>
</tbody>
</table>

1Attributes all expressed as in mean per capita values over the period 1965 to 1982.

2Per capita values averaged over 18 year period (1965-1982).
Then group averages for long term debt were calculated. Generally speaking, high levels of general revenues, property taxes, and federal revenues were associated with high levels of long term debt. Of the three fiscal variables, only property taxes emerged as consistently and positively related to borrowing. Federal revenues appear to both stimulate as well as substitute for long term borrowing. Those municipalities receiving highest levels of federal revenue (> $135) had the highest levels of borrowing. At the same time, those municipalities receiving the least amount of federal assistance (< $34) demonstrated the second highest level of long term debt issuance. These results are consistent with the results from the Chi-square analysis conducted in the previous chapter.

There are other factors which may help or hinder a city’s financial capabilities. Debt limits or referenda requirements can make it more difficult for issuers to float bonds as needed. The presence of tax limitations or spending caps can also interfere with borrowing decisions. Fiscal restraints increase the competition for public dollars among competing interests as well as weaken the “full faith and credit” backing which make municipals attractive investments.

Another important factor which decision-makers consider is the condition of the municipal bond market at the time they expect to float a new issue. Obviously the strategy is to issue debt when interest rates are low, and, to the extent possible, postpone borrowing when rates are high. Strategic placement of debt during period of low interest rates could result in considerable savings. For example, consider the costs of a $20 million bond, issued at 5 percent for 30 years. The total debt service, over the life of the repayment period would be approximately $38.6 million. If the same bond were issued at 6 percent, the total debt service would exceed $43.1
million, or about $8.5 million above the bond issued at 5 percent. Given the fact that original issue was for $20 million, the difference due to a one percentage difference in the interest rate is quite substantial.

Figure VII-2 contains a plot of average annual yields (interest costs) and the total amount amount of long term debt issued by the 37 largest cities. This figure shows that as interest rates peaked first in 1969 and 1970, debt issuances remained relatively low. When rates declined in 1971, borrowing picked up. Similarly in 1975, when interest rates reached a five year high, then borrowing reached a five year low. The pattern borrowing when rates were low and postponing debt when rates were high appeared to be upset during the 1976 to 1978 period. As interest rates climbed to all time record highs from 1979 to 1982, borrowing by the largest cities leveled off.

In summary, if capital needs are determined to be low, then the need to borrow is also low. If, on the other hand, capital needs are deemed to be high, then, the decision maker faces a choice: to use debt financing or some alternative to borrowing. Assuming that the decision-maker elects to finance the capital improvements with debt, the next choice involves the use of general obligation or revenue bond financing. This choice may be constrained by legal restrictions on the type of debt instruments that a city is authorized to use. There are, in either course, costs associated with the decision to borrow. Many states require a referendum in order to authorize general obligation bonding. At the same time, the use of revenue bond financing involves generally higher interest costs charged by the underwriter—usually 50 basis points above what is charged on general obligations. On the other hand, revenue bonds generally can be authorized
Figure VII-2

Average Yields and Debt Issued, 1965-82

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<th>Year</th>
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Table VII-3.
Rankings of Cities Based on Capital Outlays and Debt

Top Ten Cities

<table>
<thead>
<tr>
<th>CAPOUT</th>
<th>LTDI</th>
<th>LTDI</th>
<th>GODEBT</th>
<th>NGDEBT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minneapolis</td>
<td>Washington</td>
<td>New York</td>
<td>New York</td>
<td>Atlanta</td>
</tr>
<tr>
<td>Washington</td>
<td>New York</td>
<td>Atlanta</td>
<td>Washington</td>
<td>San Antonio</td>
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<tr>
<td>Baltimore</td>
<td>Atlanta</td>
<td>Minneapolis</td>
<td>Boston</td>
<td>Minneapolis</td>
</tr>
<tr>
<td>Atlanta</td>
<td>Oklahoma City</td>
<td>San Antonio</td>
<td>Oklahoma City</td>
<td>Oakland</td>
</tr>
<tr>
<td>Cincinnati</td>
<td>Seattle</td>
<td>San Francisco</td>
<td>San Francisco</td>
<td>Houston</td>
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<tr>
<td>San Francisco</td>
<td>Memphis</td>
<td>Boston</td>
<td>Buffalo</td>
<td>Seattle</td>
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<tr>
<td>Buffalo</td>
<td>Philadelphia</td>
<td>Philadelphia</td>
<td>Los Angeles</td>
<td>Long Beach</td>
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<tr>
<td>Boston</td>
<td>San Francisco</td>
<td>Boston</td>
<td>Philadelphia</td>
<td>Dallas</td>
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<tr>
<td>New York</td>
<td>Baltimore</td>
<td>Philadelphia</td>
<td>Memphis</td>
<td>Oklahoma City</td>
</tr>
<tr>
<td>Long Beach</td>
<td>Boston</td>
<td>Dallas</td>
<td>Baltimore</td>
<td>Philadelphia</td>
</tr>
</tbody>
</table>

Bottom Ten Cities

<table>
<thead>
<tr>
<th>CAPOUT</th>
<th>LTDI</th>
<th>LTDI</th>
<th>GODEBT</th>
<th>NGDEBT</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Antonio</td>
<td>San Diego</td>
<td>San Diego</td>
<td>Oakland</td>
<td>Newark</td>
</tr>
<tr>
<td>Newark</td>
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<td>Long Beach</td>
<td>Los Angeles</td>
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<tr>
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<td>Long Beach</td>
<td>Honolulu</td>
<td>San Diego</td>
<td>Indianapolis</td>
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<td>Los Angeles</td>
<td>Portland</td>
<td>Indianapolis</td>
<td>St. Louis</td>
<td>Honolulu</td>
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<td>Chicago</td>
<td>Toledo</td>
<td>San Diego</td>
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<td>Houston</td>
<td>Omaha</td>
<td>St. Louis</td>
<td>San Antonio</td>
<td>Cincinnati</td>
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<td>Portland</td>
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<td>Newark</td>
<td>Newark</td>
<td>Honolulu</td>
<td>Columbus</td>
</tr>
</tbody>
</table>

CAPOUT - annual capital outlays averaged over period 1965-82
LTDI - long term debt outstanding, averaged over period 1965-82.
LTDI - long term debt issued, averaged over period 1965-82.
GODEBT - general obligation debt, averaged over period 1965-82.
NGDEBT - non guarantee debt, averaged over period 1965-82.
without the expense and delay associated with a public referendum. Upon approval to borrow, the total costs of borrowing will depend upon the prevailing levels of interest at the time the bonds are marketed. Obviously, the lower the interest costs, the lower the total costs of borrowing.

Table VII-3 contains rankings of cities based on capital outlays and various measures of debt. Several different measures of debt are used. The variables LTDO and LTDI refer to total long term debt issued. GODEBT and NGDEBT refer to levels of general obligation debt and non-guaranteed debt. The table demonstrates the point that cities likely to have high levels of capital spending are also likely to exhibit high levels of debt use. There are, moreover, cities such as Boston and New York which make heavy use of general obligations, while others such as Oakland, Long Beach and San Antonio, which make heavy use of non-guaranteed debt and very little use of general obligations. Cities such as Minneapolis and Philadelphia use both full faith credit as well as non-guaranteed debt quite liberally. The cities which have low capital expenditures, on the other hand, have low levels of borrowing in both categories of debt.

Table VII-3 serves to illustrate another important point in terms of the process by which borrowing decisions are made. After the decision to borrow has been made, the city must select between the use of general obligation debt or non-guaranteed financing. Over the period 1965 to 1982 the largest municipalities showed a preference for general obligations over revenue bonds. On the average, the 37 cities issued $42 per capita in general obligations as compared to $24 per capita in non-guaranteed debt. Only one city, Oakland, issued no general obligations whatsoever, cities such as Newark, Los Angeles, Indianapolis, and Honolulu issued either extremely small levels of non-guaranteed debt. If the top ten issuers in general
obligations are compared the top ten in revenue bond borrowers, some
general trends emerge. Older cities have a preference for general
obligations while younger cities appear to be more inclined to use revenue
bonds. With some exceptions, the highest use of non-guaranteed debt
appears concentrated in the western, sunbelt, and growing areas of the
country. Of the top ten issuers in revenue bonds, only Philadelphia stands
out as an Eastern, older city.

**Behavioral Models: A Typology of Municipal Borrowers**

Upon examination of the data on the largest cities in the country, after studying several case histories on municipal government decision-
making, there appear to be several different behavioral models which appear
to be quite relevant to the explanation of municipal debt. These are
presented as models for explaining the behavior of financial officers
responsible for debt policy. Each of these different models emphasis a
different combination of variables and outcomes. The behavioral models
include the following:

- The Good Government Do-Gooders
- The Postponement Syndrome
- The Last Chance Borrowers
- The Referenda Referees
- The Debt Limit Loaders
- The Interest Rate Watchers
- The Wheeler-Dealer Urban Financiers
- The Business As Usual Bureaucrats

The *Good Government Do-Gooders*, characterized in Figure VII-3,
represents a style of decision-making which, to the extent possible, comes
closest to an idealized version of how municipal borrowing should occur.
The financial officers exhibiting this sort of behavior respond first to the
perceived level of capital need. If capital needs are perceived to be high,
then a choice is made between debt-financing or the use of non-debt
Figure IV-3.
The Good Government Do-Gooders

- DECISION
- EVENT
Perhaps the needed capital improvement can be financed entirely through federal aid or some combination of other non-debt resources. If on the other hand, a decision is made to borrow, then the financial officers must decide between using general obligation debt and revenue bond financing. The fact that revenue bonds impose at least a 50 basis point cost increase also needs to be weighed against the costs of a referendum and other restrictions put on general obligations. Upon deciding what kind of bond to issue, the decision-maker must then float the issue, hoping for the lowest possible interest costs.

The *Good Government Do-Gooders* put capital needs before all other considerations. As soon as these officials perceive that there are unmet capital needs, the search for financing begins. In this framework, the only factors which heavily influence the borrowing outcomes are: 1) whether non-debt financing is available, 2) whether general obligation or revenue bond financing is chose, and 3) what the level of interest happens to be at the time of debt issuance.

The *Postponement Syndrome*, depicted in Figure VII-4, is characterized by an unwillingness to admit the existence of high capital needs. From this perspective, as long as capital needs are ignored, then there is no need to borrow. Because of the lumpy and irregular nature of capital outlays, and the fact that infrastructure deteriorates slowly over the course of many years, the postponement syndrome is a common style of decision-making. Officials, elected on promises to hold the line on taxes and spending, may be hard pressed to find revenues which can be easily diverted to increasing salaries and wages and other rising operating costs. Cancellation of large expensive infrastructure projects stand out as a quick
Figure VII-4.
The Postponement Syndrome

HIGH CAPITAL NEEDS

DEBT FINANCING

NON DEBT FINANCING

LOW CAPITAL NEEDS

DON'T BORROW

□ DECISION
● EVENT
and easy solution to revenue shortages. By simply denying the existence of high capital needs, officials can avoid having to borrow altogether.

Eventually, cities in which officials exhibit the postponement system face capital needs so large or potentially catastrophic, that the period of postponement must end. The postponement syndrome must give way to another style of decision-making, one that is more attuned to the true levels of capital need.

The Last Chance Borrowers represent those cities which have identifiable capital needs, but use debt financing only as a means of last resort. (See Figure VII-5). Financial officers in these cities will conduct an exhaustive search for non-debt sources of financing before issuing long-term bonds. In these cities, there is a strong bias against using debt to finance even the most important infrastructure projects. Financial officers would sooner apply revenues from taxes, fees, or reserves directly to meeting capital costs than enter the bond market. In addition to scouring the stock of own-source revenues, those who are seasoned last chance borrowers look for available intergovernmental revenues prior to initiating borrowing plans. Only if the stock of non-debt resources which can be pledged towards capital projects is judged inadequate do the last chance borrowers consider issuing long-term debt.

A version of the Last Chance Borrowers, might be labelled the Federal Aid Finders. This characterizes the pattern of decision-making in which the availability of federal aid, more so than than the level of capital needs, determines whether or not a particular city will invest in infrastructure. Given adequate levels of federal support, officials will be willing to take on capital projects that they might not have considered in the absence of outside support. As pointed out earlier, the question as to whether or
Figure VII-5

The Last Chance Borrowers

Diagram showing sources of revenue and obligations for last chance borrowers, with arrows indicating the flow of funds and decisions.
not federal aid stimulates or substitutes for locally generated revenues has not been resolved. There is evidence to support both positions. In the case of a stimulative effect, increased aid could, conceivably lead to higher outlays and levels of borrowing. As to the substitutive effects, there should then be a negative effective relationship between federal aid and levels of spending and debt.

Two related types of decision-makers: the Referenda Referees and the Debt Limit Loaders make decisions on the basis of information and outcomes related to the restrictions placed on municipal debt by state governments. Virtually all states require approval by referendum for the authorization of general obligations. The Referenda Referee is depicted in Figure VII-6. Decision-making simply involves following the outcome of bond issue referenda. Although financial officers can play an active role in agenda control, the outcome of the decision-making process depends upon the electorate. Government by referendum may not necessarily be the optimal way to make debt-related decisions. Voters may not have complete information nor fully comprehend all of the factors associated with the proposed bond issue. Consequently if the decision-maker envisions a high probability of failure, an alternative path, via revenue bond financing may be undertaken. It is difficult to identify this style of decision-making, primarily because centralized data on bond issue referenda are not generally available.

As to the other type of decision-making, the Debt Limit Loader, this style of decision-making can be identified more readily. Table VII-5 contains a listing of the restrictions on general obligation and revenue bond debt for each state having one of the 37 largest cities. These restrictions
Figure VII-6.
The Referenda Referees

REFERENDUM

PASS

BORROW

DON'T BORROW

FAIL

REVENUE BONDS
<table>
<thead>
<tr>
<th>State</th>
<th>Limits on General Obligation (% of Equalized Assessed Value)</th>
<th>Interest Rate Ceilings</th>
<th>General Obligations</th>
<th>Revenue Bonds</th>
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</thead>
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<td>Washington</td>
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</table>
are expressed in terms of limits on the amount of general obligation debt that can be issued relative to equalized assessed value, and in some cities, restrictions on allowable interest rates. In reviewing these restrictions, it appears that the states with the most stringent ceilings on municipal debt include: Indiana, Colorado, Oregon, New Jersey, and Arizona. These states limit borrowing to 4 percent or less of equalized assessed valuation (EAV). At the other end of the spectrum, states such as California, Maryland, Minnesota, Nebraska, Tennessee, Pennsylvania and Texas either have no restrictions whatsoever, or have very generous ceilings of 15 to 10 percent of equalized assessed value.

The "debt limit loaders" operate in states such as Minnesota, California, Texas, and Maryland. Cities in these states (Minneapolis, San Francisco, San Antonio, Dallas, Baltimore) have high levels of borrowing. On the other hand, stringent state restrictions on borrowing appear to have resulted in low levels of debt in places such as Newark (3.5% EAV limit), Indianapolis (2% EAV limit), Portland (3% EAV limit), St. Louis (5% EAV limit), and Chicago (5% EAV limit).

The Interest Rate Watchers (Figure VII-7) follow changes in interest rates and base their borrowing decisions upon market fluctuations rather than capital needs. To some degree this approach makes a good deal of sense. Capital needs generally develop over an extended period of time. The deterioration of infrastructure takes many years. Strategic placement of debt during period of low interest rates could result in considerable savings. Table VII-6 contains a description for each of the 23 states, of the interest rate ceilings on general obligations and revenue bonds. Thirteen of the 23 states have interest rate ceilings on general obligations, while only 7 of the 23 states have ceilings on revenue bond interest rates.
Figure VII-7.
The Interest Rate Watchers

- Borrow
- Don't Borrow

General Obligation

Debt Financing

High Capital Needs

Low Interest

Low Capital Needs

Revenue Bond

50 Basis Points
States which have such limitations help to encourage "interest rate watching;" in addition to the cost savings due to borrowing when interest rates are low, many municipalities simply can not issue debt when interest rates are high. These forced interest rate watchers include: San Francisco, Long Beach, Los Angeles, Honolulu, Chicago, New Orleans, Detroit, Minneapolis, St. Louis, Oklahoma City, Portland, Philadelphia, Memphis, San Antonio, Dallas, Houston, and Ft. Worth. California, Illinois, Minnesota, Pennsylvania, and Oregon, have stringent limits on allowable interest on general obligations but no limits, whatsoever, on revenue bond interest rates. Not surprisingly, these cities tend to have higher levels of non-guaranteed debt than other cities.

The Wheeler-Dealer Urban Financier is characterized in Figure VII-8. This approach to borrowing has persisted throughout history. For example, tax-exempt debts issued by municipalities were used to subsidize canals, railroads, and other private enterprise in the 1800s, speculative real estate projects in the early 1900s, industrial development projects in the 1930s, and in recent years to subsidize student loans, hospitals, mortgages, pollution control devices, and economic development. Each of these uses of tax exempt financing has involved the "wheeler-dealer urban financier." Basically, borrowed funds are used to leverage economic development and growth. The proceeds of this growth are then used to pay debt service requirements. For example, a city might use bond funds to construct a building, plant, or facility. Upon completion of the project, the city would then either lease or sell the property to a business or private interest. The income from the sale or lease would be used to retire the debt.

The final model of decision-making has been termed the Business As Usual Bureaucrat. Under this model, the decision-maker merely follows the
Figure VII-8

The Wheeler-Dealer Urban Financier

- Borrow
  - Construct Capital Facilities
    - Postpone Construction
    - Lease
      - Default
      - Repayment
  - Sell
    - Default
    - Repayment
path established in the past. The key determinant of borrowing decisions, therefore, is not capital needs nor interest rates nor referenda outcomes, but, instead, the past record of borrowing. This is a particularly convenient model of decision-making for borrowing, because of the long range time horizon associated with capital outlays and debt service schedules.

The existence of these different modes of decision-making helps to explain why patterns of borrowing are so difficult to predict. Complicating the picture is the fact that over time, cities may elect to follow a different pattern of decision-making. Within every city government there will be periodic replacement of elected and appointed officials. The evolutionary nature of local government management makes it even more difficult to track behavioral patterns over time. New administrations will bring to government their own distinctive style of management and decision-making. Over time, government officials will adjust their administrative styles which can potentially affect the process and outcome of debt related decisions.

Implications of Models

Behavioral models were introduced as a means of better understanding how municipalities make borrowing decisions. The experience of the 37 largest cities suggests that it is difficult, if not impossible to predict long term borrowing purely on the basis of attributes like population size, density, income, age of infrastructure, and so on. Behavioral models enable us to better understand the reasons why a high debt city may share characteristics similar to that of a low debt city.

In order to use these models, one might go about by assigning likelihoods to various events and costs associated with alternative
outcomes. There are two basic difficulties in using these models in such a formal manner. First, it is difficult to determine and assign probabilities to given events occurring within a particular community without having a great deal of additional information. Second, the formulation of costs and benefits is complicated by the fact that debt is both minimized and maximized to produce the maximum benefit. While the decision makers want to have the lowest possible debt service costs, the amount borrowed has to be large enough to cover necessary capital improvements. That is, the borrowing decision is not simply a case of minimizing debt service costs.

As such, it makes the most sense to use these decision models as heuristic devices. In formulating an appropriate debt policy, city officials would be well advised to take into consideration different rationales and behavioral patterns that exist as alternatives to the normative model. As such, a number of important questions which decisions makers should ask emerge out of this analysis. There are three basic kinds of questions to be asked: 1) questions about the community's capital needs; 2) questions about the community's financial capabilities; and 3) questions regarding the municipal bond market.

The relevant questions that a decision-maker should ask about capital needs include the following:

- How great are capital needs?
- How have capital needs changed over the past decade?
- What is the present level of debt and non-debt financing for capital needs?
- What is the level of participation by federal, state, and other local authorities in the financing and delivery of infrastructure?
- To what extent can the demand for capital expenditures
be segmented into identifiable groups?

As developed in the previous chapters, understanding capital need involves an assessment of both physical demands for infrastructure, as well as economic, willingness to pay arguments. Factors associated with change in capital needs include growth in population, increase in personal income, new residential, commercial or industrial development, and deterioration of old plant and facilities. As communities change, so too do needs for capital investment. One issue facing many large communities is adaptive reuse of public buildings, (e.g., schools, little cityhalls, police substations, etc.). These represent assets to the city. The properties can be: 1) conveyed to private or non-profit organizations for development projects; 2) liquidated in the local real estate market; 3) adapted for reuse in meeting new capital needs.

Another important question which city officials need to ask is what is the present level of commitment, through both debt and non-debt sources, to financing capital improvements? What proportion of current revenues routinely goes towards capital improvements, maintenance of infrastructure, and debt service? Has the commitment to finance capital improvements changed over time? Have other priorities, such as funding pension plans, meeting contractual wage and salary increases, and other financial demands moved ahead of capital expenditures?

During the past two decades, federal aid to large cities has increased considerably. Federal aid can both substitute for and stimulate local spending on infrastructure. The extent to which the availability of federal aid "frees up" local revenues is important. Federal aid is another important factor to consider in the formation of an overall debt policy. At the same
time, the unpredictable nature of federal assistance may make long range planning difficult.

Cities vary widely in terms of their responsibilities for service. Places such as Washington, Baltimore, Honolulu, Newark, and Boston are responsible for more than 90 percent of the services provided. Other cities, such as San Diego, Los Angeles, Oakland, and Atlanta are responsible for 37 percent or less. Cities with a high level of responsibility for services need to identify the full set of resources both locally and externally necessary to ensure that an adequate level of financing is provided. Cities with a low level of responsibility face problems of coordination among the various state and local authorities which share in the provision and financing of infrastructure.

Another important question regarding capital needs is whether or not the demand for infrastructure can be segmented according to various population groups within the community. For example, with new housing developments requiring sewer lines, sidewalks, curbs, street lighting, and other improvements, there are identifiable beneficiaries of public capital investment. These beneficiaries include the residents, the developers, and property owners in the area. There are a number of different ways to charge the costs of improvement to the beneficiaries. The city can set up a special district, collect special assessments levied on the property owners within the designated area and use the revenues to pay back debt service and other costs associated with improvements. Another approach is to collect fees or other exactions from developers. These can be either cash contributions or in-kind services, such as the construction of infrastructure normally built by the city. The city can also use tax increment financing. With this approach, the city targets an area for development and determines
its assessed valuation prior to development. After development occurs, the city reassesses the value of property in the area, and uses the resulting increase in tax revenues to cover debt service payments and other costs associated with improvements in the area. Beneficiaries of public improvements should, whenever possible, pay for these improvements.

The second set of questions which a decision-maker needs to address before borrowing involve the community's financial condition. The important questions that decision-makers should ask include the following:

- How high are the city's own source revenues in comparison to its expenditure commitments?
- To what extent can federal aid substitute for local revenues in terms of financing needed capital improvements?
- How can the city justify using current revenues to finance capital improvements which will provide public service over a long range time horizon?
- How have non-debt resources changed over time?
- Are there opportunities for creating reserve funds for eventual use in financing capital improvements?
- Does the city have sound budgeting and accounting practices as well as an adequate financial reporting system?

To a very large degree, the financial condition of a particular city depends upon its economic base. A city experience growth in income, real estate values, employment, and population will have, as a general rule, a stronger tax base than a city characterized by low/declining incomes, economic stagnation, and unemployment. Assuming that the city has a strong tax base, the question that decision-makers need to ask is: how high are revenues in comparison to expenditures? Those cities which maintain a healthy margin between revenues and expenditures are more likely to be in a position to support new debt. At the same time as having a strong revenue base, communities need to exert control over expenditures. Expenditure control involves disaggregating the municipal budget into its
various components, identifying fixed and adjustable expenses, and ensuring that all expenditure increases are capped.

A related concern is whether or not the city provides a disproportionate level of public services to non-residents and others such as commuters. If the city is shouldering a large share of costs benefiting those living outside its boundaries, the state government may need to 1) grant new taxing authority to the locality to help recover some of these costs; 2) play a more active role in the provision of services within the municipality.

Other questions pertinent to financial condition involve the mix of revenues which the community can draw upon. Cities dependent upon sales and income taxes may be in comparatively weak position during periods of economic stagnation. Cities dependent upon property taxes face the potential loss of revenue due to property abandonment, disinvestment, and changes in the ability to pay taxes among homeowners. Tax limitation laws can also lower revenue yields, and create problems in terms of planning an appropriate debt policy. The cities having a good mix of taxes to draw upon, as well as having a strong base with which to tax, will be in the best position to incur new debt.

Debt involves the payment of interest and principal according to a fixed schedule. The key question that decision-makers must ask is: can the city afford debt service payments both now and in the future? Perhaps the best way to answer this question is to generate a set of scenarios based upon revenues yields, intergovernmental aid, expenditure commitments, and other factors associated with the fiscal health of the city. The ability to generate such scenarios depends upon the availability of accounting and budgeting information. Adoption of standard accounting and financial
reporting practices, therefore, is critical to the formulation of sound debt policy.

It is important to note that debt policy is directly related to the financial condition of a city. Debt service payments are financial commitments which must be honored. As such, cities with high debt service payments generally have limited capacity to incur new debt and face potentially higher tax burdens. An optimal level of borrowing is high enough to address necessary capital needs, but low enough so that the city remains in good fiscal health. Signs of poor fiscal health include the inability to meet expenditures, the unwillingness of creditors to lend to the city on a short or long term basis, and an inability to meet public demands for service. A strong debt policy, therefore, is an important part of strengthening a city's financial condition.

The final set of considerations that decision-makers should address before issuing long term debt involves conditions in the municipal bond market. The municipal bond market is the mechanism which channels funds between governments and investors. The types of questions that a decision-maker must ask include:

- Will the city receive the lowest possible interest costs on the debt that it issues?
- What can the city do to lower interest costs?
- Should the issuer postpone borrowing until interest rates drop?
- What can the city do to improve the marketability of its bonds?
- Should the city borrow because interest rates are low?

The questions that a decision-maker should ask about market conditions primarily center on interest rates. The borrower should seek to minimize interest costs, both by issuing bonds at times when interest rates are low.
and by taking steps to ensure that interest costs are as low as possible. There are several things a city can do to lower its interest costs. First, it can work to achieve the highest bond ratings possible. The higher the rating, the lower the interest rate. Second, the city should sell their bonds by competitive bid. If bonds are sold through negotiation, the city should agree to the lowest possible interest costs. Third, the city should provide full financial disclosure. An abundance of information will help create a positive image of the city among investors, financial publishers, and others in the investment community.

The issuer should also time their bond sales to occur during periods of low interest rates. Whenever possible, cities should borrow when rates are low and postpone borrowing when rates are high. Cities should prioritize their capital needs. Invariably, some projects will have to be initiated during periods of high interest rates. In order to minimize interest costs, the project can be broken into several different phases, and the construction timed to when interest rates fall. Some projects lend themselves to phasing more than others. Obviously, the business of predicting interest rate swings is quite difficult. The advice of experts and those who track interest rates should be incorporated into decision-making. Another option is to refinance debt issued during periods of high interest rates when interest rates decline. Here too, the timing of borrowing is critical. Refinancing bonds should be issued when interest rates are low.

There have, in recent years, been various attempts to improve the marketability of municipal bonds. One approach is to lower the face value of the bonds to attract a broader spectrum of investors. The typical municipal bond, with a face value of $5,000 may be out of the reach of many
people. Small denomination bonds, $500, $100, $50, $25, etc., on the other hand, can be marketed more easily to residents, and incorporated into savings plans. Other possibilities include zero coupons (allowing all interest payments to accumulate to be returned upon maturation), variable rate bonds, deep discount bonds, and other types of non-traditional municipal bonds. These alterations can help improve the marketability of municipals by expanding the range of investment opportunities.

In summary, the key concern for financial officers is minimizing the interest costs on the bonds issued. At the same time, they need to ensure that their bonds will be bought by investors, and the the city develops a solid record of repayment. Cities need to develop a good credit history to promote investor confidence in their securities. As such, cities which borrow smaller amounts, at regular intervals, are bound to have a comparative advantage over those cities which embark irregularly upon extremely large capital projects, heavily financed with debt. At the same time, to present a world in which cities borrow small amounts, timed to occur when interest rates are low, capital needs are manageable, and investors are anxious to purchase bonds, may represent a case of wishful thinking.

This chapter has served to demonstrate the theoretical as well as practical utility of behavioral models for explaining long term borrowing by the largest cities in the country. Styles of decision-making can influence municipal borrowing. A behavioral approach allows us to identify factors that might not otherwise be detected, particularly if one conducts a traditional cross-sectional analysis. On the practical side, a behavioral approach also serves to identify a range of different questions which arise in the course of the borrowing process. In general, the factors that
decision-makers need to consider include: capital needs, financial capabilities, and bond market conditions. In the next chapter, a city by city analysis will be undertaken to identify the patterns in borrowing, over time.
Previous chapters have pointed to the difficulties of analyzing data on capital spending and long-term debt. In addition to the scarcity of well-developed theoretical foundations, the long-term nature of capital investment and borrowing decisions create special problems. Cross-sectional studies can miss the mark entirely because of the irregularities associated with capital spending and debt issuances. As such, the study of infrastructure investment, almost by its very nature, requires longitudinal analyses.

With the longitudinal approach, one might go about examining aggregate level data on savings and investment. The Flow of Funds Account provided by the Board of Governors of the Federal Reserve does, in fact, provide one acceptable source for this type of time series study. There are a number of problems with this approach. Because the data are in aggregate form, combining together all the various units of local government issuers (cities, counties, special districts, etc.), the behavior of individual units of governments is hidden. Many of the behavioral arguments developed in previous chapters would be lost through the use of aggregate level data. The behavioral perspective is weakened when the unit of analysis is the local government "sector" rather than the individual government unit. Moreover, the results of a "sectoral" approach could be quite biased, since there would no way to control for the behavior of the very large issuers, like New York City, which issue many times the volume of debt of smaller issuers.
At the risk of tackling a more unmanageable study, this chapter investigates the financial behavior, over time, of the 37 largest cities in America. This chapter draws upon the framework constructed in the previous chapters.

**Method of Analysis**

In this chapter, a modified case study approach will be used. The case studies in this section depart from traditional case studies because they are constructed, almost entirely, from secondary source data. In addition, rather than selecting only a few cities to study in-depth, this chapter will provide information on the 37 largest cities in the U.S. Much of the data comes from the annual survey of city government finances conducted by the Bureau of the Census.¹ The analysis focuses on three principal variables: 1) capital outlays, 2) long term debt, and 3) federal aid. Each of these variables for all 37 of the largest cities have been plotted for the period 1965 to 1982. A graph for each municipality showing outlays, debt, and aid in constant dollars has been included.

Following a short description of each city and its socio-economic characteristics, there will be a short discussion of overall trends in outlays, debt, and federal aid. Each case history will report the results of a regression analyses, in which federal aid and long-term debt will be regressed on annual capital spending. Two different regression equations will be specified. The **unlagged model** will be specified as:

\[
\text{CAPOUT} = \alpha + \beta_1 \text{FEDAID} + \beta_2 \text{DEBT}
\]

where,

\[
\alpha = \text{intercept};
\]

\[ \beta = \text{regression coefficients} \]
\[ \text{CAPOUT} = \text{total annual capital outlays} \]
\[ \text{FEDAID} = \text{total annual federal aid} \]
\[ \text{DEBT} = \text{total annual debt issued} \]

The **lagged model**, however, will utilize a two year moving average of the debt variable, in an effort to smooth out some of the regularities associated with borrowing:

\[ \text{CAPOUT} = \alpha_1 + \beta_1 \text{FEDAID} + \beta_2 \text{MADEBT} \]

where,

\[ \text{MADEBT} = \text{two year moving average of total annual debt issued.} \]

In addition to reporting \( R^2 \) values, F-ratios, and t-statistics (on the beta coefficients) for those cities in which there are statistically significant results,\(^2\) each case history will conclude with a short prognosis of capital spending needs and financing trends.

**Case Histories: Capital Spending in the Largest Cities**

**Atlanta**

*Socio-economic Trends*

Although Atlanta experienced almost a 15 percent decline in population between 1970 and 1980, the metropolitan area grew by 27 percent. Atlanta is a city in which two-thirds of its population is non-white. The 1979 per capita income ($6550) was below the 37 city mean by

\(^2\)The F-ratio, \( [R^2/p]/[(1-R^2)/(n - p - 1)] \), is statistically significant, at the 95 percent confidence level, for values in excess of 3.68. The t-value, \( \beta/SE_\beta \), is statistically significant, at the 95 percent confidence level, for values in excess of 1.75.
about $744. With only 21 percent of its housing stock in 1980, built before 1940, Atlanta's infrastructure is relatively young.

**Trends in Outlays, Debt and Federal Aid**

From 1965 to 1977, Atlanta experienced only moderate growth in capital spending, spending less than $80 million annually. Atlanta's capital spending peaked in 1980-81, when the city spent more than $180 million annually.

In real dollars, the major debt peaks occurred in 1971 and in 1978 (See Figure VIII-1). The 1978 peak corresponds to a period of relatively low interest rates. In general, large federal aid allotments occurred at the same time as large outlays, while debt appeared to lag behind outlays.

**Regression Results**

The lagged model performed much better than the unlagged model. By using a moving average of the debt variable, an $R^2$ of 45.6 percent ($F$-ratio = 6.4) was achieved, compared to only 32.6 percent for the unlagged model.

\[
\text{CAPOUT} = 21.9 + .885 \text{FEDAID} + .243 \text{MADEBT}
\]

The $t$-values, contained in the parentheses, show that both federal aid and debt are significantly and positively related to capital outlays.

The regression results suggest that Atlanta is more dependent upon federal aid than debt, when it comes to capital spending. Upon closer inspection, however, it appears that the first period of heavy capital investment, 1971 to 1973, was financed largely by debt. At that time, Atlanta's federal aid allotments were small; below $10 million, annually. The second period of heavy capital investment, during the late 70s, however, occurred at a time when federal aid had grown to nearly $20 million (in real
Figure VIII-1.

ATLANTA, 1965-82

FEDERAL AID, DEBT, AND OUTLAYS

AMOUNT IN REAL DOLLARS (Millions)

YEAR

FEDERAL AID
DEBT ISSUED
CAPITAL OUTLAY

-214-
dollars). The point worth emphasis is that model, as specified, provides a better explanation of how Atlanta financed capital outlays in the late 70s, than in earlier years.

Assessment of Capital Spending Record

While the level of capital investment has increased in the late 70s, the fact that the metropolitan area has grown substantially, suggests that demands for capital investment will increase, rather than decrease. While Atlanta's infrastructure is relatively young, the fact that personal income is low and that the city has a disproportionately large share of minorities and low income residents suggests that in the years ahead, there may be increasing pressure to provide an increase in operating budgets, by sacrificing capital projects. The fact that capital outlays plunged, in real terms, from over $70 million in 1980 to less than $30 million in 1982, suggests that there may be some need to stabilize capital spending in the years ahead.

Baltimore

Socio-economic Trends

While the metropolitan area population grew by five percent, during the decade of the 1970s, Baltimore lost more than 13 percent of its population. Baltimore can be characterized as a city with a large non-white population, a low personal income ($5877 in 1979), an aged housing stock (more than 50 percent built before 1950), and an average level of home ownership (44 percent in 1980).

Trends in Outlays, Debt, and Federal Aid

Baltimore experienced two periods of heavy capital spending, one in 1976-78 and another in 1981-82. Long term borrowing, however, remained
quite low (approximately $30 million, annually), until 1980 when the city began issuing large amounts of debt. In 1980, Baltimore issued $110 million, in 1981, over $130 million, and in 1982, nearly $180 million in long term debt. Capital outlays in the 1976-78 period were financed with a combination of state and federal aid, while the latter period of capital spending was heavily debt-financed.

Figure VIII-2 displays federal aid, debt, and outlays in real dollars over the period 1965 to 1982. Several points are apparent. Throughout much of the 1970s (1972-1979), Baltimore issued in real dollars, $20 million or less in long term debt. In real dollars, the amount of debt was almost constant. The graph also shows the extent to which periods of high capital spending were, in general, accompanied by high federal aid allotments.

Regression Results

Upon inspection of the graph of outlays, aid, and debt, it became clear that the lagged model would not necessarily perform better than the unlagged model, because there were so many years where the amount of debt issued was virtually a constant. In fact, the lagged model produced an $R^2$ of 34.9 percent, only 0.1 percent greater than the unlagged model. As expected, neither model produced a significant debt coefficient.

\[
\text{CAPOUT} = 61M + .581\text{FEDAID} + .03\text{MADEBT}
\]

(2.68) (0.06)

Assessment of Capital Spending Record

Although a recent return to bond market (Baltimore issued more than $40 million in long-term debt annually from 1980), may help to improve Baltimore's ability to finance infrastructure in the absence of federal aid,
Figure VIII-2.

BALTIMORE, 1965-82
FEDERAL AID, DEBT, AND OUTLAYS

[Line graph showing the amount in real dollars (millions) for different years from 1965 to 1982. The graph includes data for Federal Aid, Debt, and Outlays.]
the regression results demonstrate a strong dependency on federal aid which may be difficult to shake. In 1978, when federal funds began to drop, capital spending dropped by about $90 million in one year. It is clear that as federal funds continue to shrink, Baltimore must develop other means of financing its capital needs.

It is interesting to note that Baltimore demonstrates many of the behavioral patterns of the "wheeler-dealer urban financier" as described in the previous chapter. Note that the most massive capital outlay occurred in 1976 (See Figure VIII-2), two years before federal aid peaked, and four years before borrowing increased. Given Baltimore's comeback as an urban center, it would appear that the increase in capital investment may have helped to spur economic development.

Boston

Socio-economic Trends

With a population density of 19 persons per acre, Boston is one of the most densely populated cities in the country. While the city lost about 12 percent of its population during the 1970s, the region grew slightly, increasing in size by about 1 percent to over 3.9 million persons. With 63 percent of its housing stock built before 1940, Boston also has one of the oldest infrastructure systems.

Trends in Outlays, Debt, and Federal Aid

Boston's record of capital spending is marked by a peak in the mid-70s, followed by a pronounced decrease in the early 80s. The pattern of borrowing roughly matches its capital spending record: both outlays and debt reach peaks in 1973 and 1976. In 1982, Boston issued no long term debt whatsoever, and capital outlays for that year reached an 18 year low.
While state aid has increased steadily, it appears to have had little if any effect on stemming the decline in capital spending since the mid-70s. High federal aid allotments in 1976 and 1979 correspond with slight increases in capital spending.

In real dollars, Boston's spending on infrastructure (See Figure VIII-3) fluctuated between a low of less than $10 million in 1982 to a high of over $70 million, in 1976. In general, peaks in debt, federal aid, and outlays occurred within the same years. In the early part of the series, it actually appeared as though Boston was borrowing after, not before, making large capital outlays. In later years, Boston withdrew from the bond market. Shortly thereafter, federal aid began to decrease. A pattern of declining capital investment soon took shape.

Regression Results

Of the two models, the model with the unlagged debt term performed much better than the lagged model. The unlagged model produced an $R^2$ of 72 percent (F-ratio 19.29) compared to 50.3 percent for the lagged model.

$$\text{CAPOUT} = 14.2 M + .0002\text{FED AID} + .001\text{DEBT}$$

Both the federal aid and debt terms are highly significant. The fact that the unlagged model performs better than the lagged model suggests that Boston is more likely to spend debt proceeds in the same year debt is issued rather than waiting for a few years.

Assessment of Capital Spending Record

The fact that Boston's capital spending has dropped in almost every consecutive year since 1977 signals a pattern of disinvestment which must be reversed if the city is to avoid widespread collapse of infrastructure.
Figure VIII-3.

BOSTON, 1965-82
FEDERAL AID, DEBT, AND OUTLAYS

AMOUNT IN REAL DOLLARS (Millions)

YEAR

1965 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82

Federal Aid      Debt Follows Outlays

Debt Issued

Period of Declining Capital Investment

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Complicating the situation in Boston is: 1) the old age of the infrastructure; 2) the high population density; and 3) the financial pressures associated with Proposition 2-1/2. The fact that Boston had virtually retreated from the bond market altogether suggests too that there is a great need to restructure the city's entire capital plan.

**Buffalo**

*Socio-economic Trends*

Buffalo's population plummeted by more than 22 percent during the 1970-80 period. The metropolitan area lost more than 8 percent during the same period. Of the largest cities in the U.S., Buffalo has the oldest housing stock, with 73 percent of it built before 1940, and only 3 percent built after 1969. Compared to many large cities, it has a relatively small non-white population, less than 30 percent in 1980.

*Trends in Outlays, Debt, and Federal Aid*

Buffalo exhibited two peaks in capital spending over the 18 year period. One occurred in 1977 and another in 1982. Both years were peak years in terms of federal aid. In 1981, Buffalo issued close to $160 million in long term debt, more than two times the amount it had ever issued. This suggests that borrowing played a much more important role in financing the capital improvements in the 1980s.

In real dollars, (See Figure VIII-4) Buffalo spent a fairly constant amount on capital projects, except for 1976-77, when outlays increased to just over $45 million. During the early years of the series, there was a fairly clear match between debt, federal aid, and outlays. In 1972, the city issued debt which lagged behind outlays by as much as four years.

*Regression Results*
Figure VIII-4.
BUFFALO, 1965-82
FEDERAL AID, DEBT, AND OUTLAYS

AMOUNT IN REAL DOLLARS (Millions)

YEAR


FEDERAL AID

DEBT

OUTLAY

FEDERAL AID

DEBT

OUTLAY

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Because of the fact that the lag between debt and outlays may have been as much as four years, both models encountered difficulties in estimating the debt terms. However, the lagged model did produce the highest $R^2$ value, 57.5 percent (F-ratio = 7.59).

$$\text{CAPOUT} = 17.2 M + .342 \text{FEDAI}D + .152 \text{MADEBT}$$

Upon closer inspection of the graph of Buffalo's capital spending, debt, and federal aid (Figure VIII-4), it becomes clear that the relationship between debt and outlays is much more difficult to discern than the relationship between federal aid and outlays. Buffalo is yet another example of city where federal funds are spent more quickly than funds raised through the issuance of long-term debt.

Assessment of Capital Spending Record

The period of protracted economic decline throughout the 70's in both the central city and in the Buffalo metropolitan region suggests that the decline in public capital investment may have much to do with the stagnation of the private economy. In addition to its economic woes, Buffalo's infrastructure is among the oldest of the 37 largest cities. The combination of population decline and old infrastructure suggests that future capital needs are more likely to involve repair and rehabilitation of existing systems rather than the construction of new facilities.

Chicago

Socio-economic Trends

With a population of more than 3 million persons in 1980, Chicago was the second largest city in America. Moreover, during the decade of the
70s, the city grew by about 27 percent. Its population density of 21 persons per acre was surpassed only by New York City and San Francisco. In 1980, 50 percent of its population was non-white, the per capita income was $6939 (compared to the 37-city average of $7294), and 36 percent of the households were homeowners.

*Trends in Outlays, Debt, and Federal Aid*

For fifteen years (1965-79) Chicago maintained a relatively flat capital spending profile, spending, for the most part, approximately $150 million annually. In the 1980-81, capital spending jumped to almost $350 million. This sudden increase in capital spending paralleled increases in intergovernmental aid and debt issuances of over $200 million in 1980. Chicago's debt profile is interesting. The city floated major bond issues in 1971, 1972, and 1976. The city issued virtually no debt in 1968, 1975, and 1979.

In real terms (See Figure VIII-5) Chicago has been spending, for the most part, less and less each year on capital outlays. The "postponement syndrome" as described in earlier chapters appears to be dominant behavioral pattern in Chicago.

*Regression Results*

The fact that neither the unlagged nor the lagged model produced a significant $R^2$ (neither exceeded 28 percent) suggests that capital spending patterns in Chicago have been basically unresponsive to either federal aid allotments or increased debt.

It may well be the case that Chicago, which has a low level of per capita debt, has not borrowed enough to ensure a high level of capital spending. At the same time, Chicago, which has received generous federal
Figure VIII-5.

CHICAGO, 1965-82
FEDERAL AID, DEBT, AND OUTLAYS

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aid allotments, particularly in the mid to late 70's, may have not spent these funds on capital outlays.

Assessment of Capital Spending Record

All of the available evidence points to a pattern of neglect in terms of infrastructure in Chicago. First, there is the fact that capital outlays have decreased steadily, in spite of its increasing population size and growing density. Second, there is evidence that increased federal aid did not significantly increase levels of capital spending. Third, in per capita terms, Chicago borrowed much less than other large cities. While the analysis can not determine whether or not Chicago faces a critical level of unmet capital need, it is clear, however, that the trend of declining capital expenditures will eventually have to be reversed.

Cincinnati

Socio-economic Trends

While the Cincinnati metropolitan area grew by 3 percent, the central city population dropped by more than 15 percent. In 1980, 35 percent of its population was non-white, and 35 percent of its households owned their own homes. Cincinnati had a population density of 7.7 person per acre, about 10 persons per acre less than the 37 city average. Cincinnati was one of the 11 cities with a city manager, rather than mayor-council form of government.

Trends in Outlays, Debt, and Federal Aid


In real terms, the heaviest levels of capital spending occurred in the late 60s and early 70s when the city spent more than $50 million annually on infrastructure. (See Figure VIII-6.) At no other time did it match that level of commitment to capital projects. From the graph, it appears that capital spending is more influenced by federal aid than by debt issuances.

Regression Results

The regressions did not produce significant $R^2$ values. The lagged model ($R^2 = 12.4$ percent) performed slightly better than the unlagged model ($R^2 = 9.0$ percent.) The fact that the models failed to explain much of the variation in outlays was somewhat disappointing given the similarity of outlays and federal aid, particularly during the later part of the series. One factor which may have contributed to the poor performance of the models is that Cincinnati's heaviest capital expenditures occurred during the late 1960s and early 1970s, at a time when debt and federal aid were quite low.

Assessment of Capital Spending Record

Although Cincinnati's population has declined, the growth of the metropolitan area suggests that demands for capital investment should continue into the decades ahead. What's most striking about Cincinnati is the extent to which it appeared to finance a sizeable amount of infrastructure during the period 1968-71, in the absence of large federal aid or major debt issuances. Also interesting, is the extent to which debt, relative to outlays has remained quite small, in real terms, certainly less than $30$ million. It would appear that Cincinnati has an excess capacity to borrow, particularly since the period 1977 were especially lean in terms of the volume of debt issued.
Figure VIII-6.

CINCINNATI, 1965-82

FEDERAL AID, DEBT, AND OUTLAY

AMOUNT IN REAL DOLLARS (Millions)

YEAR

FEDERAL AID  +  DEBT ISSUED  ○  CAPITAL OUTLAY
Cleveland

*Socio-economic Trends*

Even upon casual inspection, Cleveland appears to be a city in trouble. The metropolitan region lost about 6 percent of its 1970 population, while in 1980, the central city showed a decline of more 23 percent. The city's per capita income ($5770) in 1979 was lower than all but two of the 37 largest cities. With 58 percent of its housing stock built before 1940, and a population that was 46 percent non-white, Cleveland faced difficulties in setting its budgetary priorities. Only 6 percent of its adult population in 1980 were college educated, far below the mean (16 percent) for the 37 largest cities.

*Trends in Outlays, Debt, and Federal Aid*

Cleveland experienced one major peak in capital spending over the 18 year period which occurred in 1976-77. For those years, the city spent between $65 and $70 million on capital projects. Cleveland entered the bond market sporadically over the 18 year period. Although the city issued over $50 million in 1969 and 1971, the city issued no debt in 1973, 1974, 1979, 1980, and 1982 and virtually no debt in 1970, 1972, 1975, and 1976. The lack of borrowing helps to explain the enormous issue ($150 million) brought to market in 1977. Although state aid continued to increase steadily, the decline in federal aid since the late 70s helps to explain Cleveland's dropoff in capital spending.

In real terms, (See Figure VIII-7), there was strong decline in capital investment from 1977 to 1982. Outlays dropped from nearly $40 million to below $10 million. This decline persisted in spite of large federal aid allotments (in excess of $50 million, in real dollars).

*Regression Results*
Figure VIII-7.
CLEVELAND, 1965-82
FEDERAL AID, DEBT, AND OUTLAYS

AMOUNT IN REAL DOLLARS
(Millions)

85 86 87 88 89 70 71 72 73 74 75 76 77 78 79 80 81 82
YEAR

FEDERAL AID
DEBT
OUTLAYS
POSTPONEMENT SYNDROME
DECLINING OUTLAYS
FEDERAL AID
DEBT
OUTLAYS
CAPITAL OUTLAY

-230-
In viewing the graph of outlays, federal aid, and debt (Figure VIII-7), it is apparent that increased outlays tend to be correlated with increased federal aid allotments, except for perhaps, two years--1971 and 1972. Debt issuances, on the other hand, appear to match even more directly the pattern of capital outlays. It is, therefore, not surprising to find that the unlagged model performs better than the lagged model. The unlagged model produced an $R^2$ of 42.8 (F-ratio = 5.6) while on the lagged model, the $R^2$ dropped to 12.4 percent.

$$\text{CAPOUT} = 25.8M - 0.171 \text{FEDAID} + 0.211 \text{DEBT}$$

(-1.74) (3.06)

Although the Federal aid term in the regression was not significant, it did produce a negative sign. Rather than interpret this negative sign as evidence that increased federal aid decreases capital spending, it makes more sense to put this federal aid in the context of the financial problems Cleveland encountered in the 70's. The negative sign suggests that in spite of large federal aid allotments, capital spending continued to decrease.

Assessment of Capital Spending Record

Cleveland's record of capital spending is undoubtedly related to the financial problems it encountered throughout the later part of the time series. In a city with both a declining population and economic base, the loss of outside aid can represent an especially crippling blow. The fact that Cleveland may not have borrowed much in the late 70s, moreover, reinforces the perception that this city was, potentially, a serious credit risk. Cities in financial straits similar to Cleveland present the strongest case for continued federal assistance.
Columbus

Socio-economic Trends

In addition to growing about 5 percent over the decade of the 70s, the Columbus metropolitan area expanded by 8 percent, to over 1.2 million persons in 1980. In 1980, Columbus was a city with a relatively high per capita income ($6783), a high degree of homeownership (45 percent), and a relatively small non-white population (24 percent).

Trends in Outlays, Debt, and Federal Aid

Over the past two decades, Columbus experienced two periods of capital spending. One occurred in the late 60s and the other began in 1978 and peaked in 1981. The period 1971 to 1977 was relatively flat, with capital outlays in the $20 million to $30 million range. Columbus' capital outlays appear closely tied to its federal revenue allotments which increased significantly in 1979, when the city began its most ambitious capital improvements. Long term borrowing roughly follows the pattern set by capital outlays. Borrowing peaks occurred in 1967, 1973, and 1981-82.

In real terms (See Figure VIII-8), Columbus spent the most on capital projects in 1967 when it spent more than $35 million on infrastructure. In the same year it borrowed more than $20 million. The next heavy outlay occurred in 1974. This time there was a two year lag between debt and outlays. Later increases in capital spending appear related to increases in federal aid.

Regression Results

Because of the fact that the largest outlays occurred in the late 1960s, when federal aid was insignificant, one would not expect to see a strong relationship between outlays and federal aid. The fact that debt
Figure VIII-8.

COLUMBUS, 1965-82
FEDERAL AID, DEBT, AND OUTLAYS

AMOUNT IN REAL DOLLARS (Millions)

YEAR

-233-
lagged behind outlays by two, perhaps more, years also reduced expectations as to the success of the regressions.

Neither regression produced $R^2$ values in excess of 15 percent. The $R^2$ value on the lagged model, however, was twice as large as the $R^2$ value on the unlagged model. This suggests that the most promising explanations for Columbus' capital spending involve the construction of model in which the debt term is lagged behind the outlay variable.

Assessment of Capital Spending Record

The fact that both the central city and the metropolitan area experienced growth, as well as the relative prosperity of the city suggests that demands for capital improvements will expand in the years ahead. Similar to Cincinnati, Columbus financed its largest capital outlays in the late 60's, during a time when federal aid was quite low. Although a noticeable relationship between federal aid and outlays occurred in the years 1977-80, Columbus appears to be capable of financing its infrastructure needs on its own. As federal aid dropped in 1980-81, Columbus incurred the highest volume of debt ever.

Dallas

Socio-economic Trends

While the metropolitan area grew by 25 percent, the central city grew by more than 7 percent. Dallas had all the characteristics of a growing area: low population density (5 persons per acre), low proportion of housing built before 1940 (10 percent), high proportion of college educated residents (20 percent), and a higher than average level of per capita income ($8614). Dallas is one of the largest cities to be run under the city-manager form of government.
Trends in Outlays, Debt, and Federal Aid.


In real terms, (See Figure VIII-9), the largest levels of debt were issued in the early 1970's and mid-1970's. The debt issuances were generally followed by increases in capital spending one to two years later. Although federal aid increased in the mid-70's, the relationship between federal aid and outlays does not appear to be as strong as the relationship between debt and outlays.

Regression Results

As expected, the lagged model produced the best results, explaining at least 53 percent of the variation in annual capital outlays. The unlagged model, however, produced an $R^2$ of only 17 percent.

\[ \text{CAPOUT} = 7.4 + .182 \text{FEDAID} + .505 \text{MADEBT} \]

\[ (936) \quad (4.07) \]

The fact that debt term was more stronger than the federal aid term suggests that Dallas is a city that is less dependent than other cities on federal aid for the financing of capital projects.

Assessment of Capital Spending Record
Figure VIII-9.

DALLAS, 1965–82
FEDERAL AID, DEBT, AND OUTLAYS

AMOUNT IN REAL DOLLARS (Millions)

YEAR

85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00

FEDERAL AID

DEBT ISSUED

CAPITAL OUTLAY
The fact that Dallas is in one of the fastest growing areas in the country suggests that capital needs are likely to expand rather than decrease in the coming years. In addition, the relative prosperity of the area suggests too that the willingness to pay for capital improvements may be higher in Dallas than in places with lower levels of personal income. Dallas, moreover is a city with a proven record of financing infrastructure in the absence of federal support. Dallas is one city which increased spending in 1980-81, despite large cuts in federal aid. In addition, since Dallas appears to have maintained a fairly constant level of capital investment over the past 18 years, infrastructure systems are in better shape than many of the other cities which have neglected their capital facilities.

**Denver**

*Socio-economic Trends*

While Denver's population fell by almost 5 percent, the metropolitan population in 1980 reached 1.6 million, an increase of more than 30 percent. With a per capita income of $8556, Denver is one of the more wealthy cities in the country. Forty-seven percent of the population were homeowners and 22 percent were college educated.

*Trends in Outlays, Debt, and Federal Aid*

Denver's capital spending profile reveals growth in the late 60s and mid-70s. Spending peaks occurred in 1969 ($40 million), 1976 ($70 million), and 1979 ($80 million). Large debt issuances occurred in 1967 ($30 million), 1970 ($40 million), 1976 (over $50 million), and 1978 ($70 million). State aid has grown steadily over the period, while federal peaks occurred in 1974 and 1979.
In real terms, there has been some growth in capital spending, particularly during the mid 70s (see Figure VIII-10). The graph of outlays, debt and aid shows that first period of heavy capital expenditures (1969) was largely debt-financed, using proceeds of bonds issued two years earlier (1967). Later on, outlays appear to be financed with a combination of debt and federal aid.

**Regression Results**

Given the apparent lags as depicted in Figure VIII-10, it was not surprising to find that the lagged model explained more than 64 percent (F-ratio=13.87) of the total variation in capital outlays, compared to the unlagged model which had an $R^2$ of 35.6 percent (F-ratio=4.15). In both models, federal aid and debt were positive and significant.

\[
\text{CAPOUT} = 6.9M + 0.234\text{FEDAID} + 0.163\text{MADEBT}
\]

(2.34) (3.99)

Denver is a city in which both federal aid and long-term debt has played a significant role in infrastructure finance.

**Assessment of Capital Spending Record**

The fact that Denver's population dropped by 6 percent during the decade of the 70's needs to be weighed against the metropolitan growth rate of 30 percent. The growth of the region, the high per capita income, and the high rate of homeownership suggest that capital needs are likely to expand rather than contract.

There is some evidence to suggest that Denver's dependency upon federal aid may be difficult to overcome in the years ahead. First, the regression equations shows a strong, positive, and significant relationship between outlays and aid. Second, when federal aid dropped by more than
$10 million between 1980 to 1982, capital spending was almost cut in half. As such the planned shrinkage in federal aid suggests that Denver will need to use debt, more than ever before, in the financing of infrastructure.

**Detroit**

*Socio-economic Trends*

The central city population suffered a 20 percent decrease in the 1970s, while metropolitan area population fell by about 1 percent. A relatively old city (46 percent of the housing stock built before 1940, 3 percent built after 1969), Detroit was one of only six cities in the U.S. to have a population greater than one million. Detroit can also be characterized as a relatively poor city (1979 per capita income was $6215), with a large non-white population (65 percent).

*Trends in Outlays, Debt, and Federal Aid*

Detroit experienced a modest growth in capital spending in the early 70s, and more significant growth in 1980-81, when capital spending peaked at over $250 million, annually. Although Detroit borrowed more than it ever had before ($160 million) in 1979, its record of capital spending more closely parallels its federal aid receipts than its borrowing patterns. While there is a fairly close match between years of high federal aid and high capital spending, the city went into a borrowing slump between 1972 and 1978.

When viewing the graph of outlays, debt and aid (see Figure VIII-11), one can sense that Detroit is a city facing severe economic hardships. Unlike virtually any other city, the relationship between outlays and federal was established from the early years of the series. Debt issuances have been infrequent and show an overall pattern of deterioration. In real terms,
Figure VIII-11.

DETROIT, 1965-82
FEDERAL AID, DEBT, AND OUTLAYS

AMOUNT IN REAL DOLLARS
(Millions)

YEAR

FEDERAL AID  DEBT ISSUED  CAPITAL OUTLAY
the largest issuance occurred in 1971. The three largest issuances of debt appear to lag behind outlays by two to three years.

Regression Results

The lagged model (R² = 70.7, F-ratio = 18.1) was able to explain about 4 percent more of the total variation in outlays than the unlagged model (R² = 66.8, F-ratio = 15.09). In either model, only the federal aid term was significantly related to outlays.

\[ \text{CAPOUT} = 23.6M + 0.371 \text{FEDAID} + 0.241 \text{MADEBT} \]

(4.92) (1.43)

Assessment of Capital Spending Record

Detroit is a city with an obvious dependency on federal aid. When viewing the demographic trends, especially the population losses and the low level of personal income, the prospects for Detroit, in the face of severe federal cuts, appear quite dismal. Unlike other cities which have a proven capacity to take on new long-term debt as needed, Detroit with its severe economic problems is not likely to be viewed as a good credit risk. In part because of its inability to raise the necessary capital for financing infrastructure, Detroit will continue to lose jobs and people to other areas.

Fort Worth

Socio-economic Trends

Although the central city population lost about 2 percent of the 393,000 inhabitants it had in 1970, the metropolitan area grew by more than a half million people (25 percent). With only 17 percent of its housing built before 1940 and a per capita income of $7336. With a
population density of only 3 persons per acre, only two other cities Oklahoma City and Kansas City were less densely populated.

Trends in Outlays, Debt, and Federal Aid

Of the cities examined, Fort Worth exhibited one of the most sporadic patterns in capital spending, with peaks occurring in 1968, 1972, 1977, and 1981. In 1970-71 Fort Worth had a capital budget of approximately $17 million. One year later it shot up to almost $45 million. By 1974, capital spending was below the 1970-71 level. Although a peak in 1977 was followed by another dip, the fluctuations appear to be less wide in the latter part of the series. The city's debt profile exhibits a similar zig-zagging pattern, with peaks in 1968, 1972, 1978, 1980, and 1982. Federal aid peaked in 1974 and 1977-79. State aid peaked in 1971 and 1974 and has remained at low levels ever since.

In real terms (see Figure VIII-12), Fort Worth's pattern of capital spending appears closely related to its debt issuances, at least up until the mid-70s. The outlays in 1977 to 1978, however, appear to financed with federal aid. In most years, there appears to be a year to year match between receipt of debt proceeds and spending.

Regression Results

Of the two models, the unlagged model produced the best results, having an $R^2$ of 51.9 percent compared to only 19.4 percent with the lagged model. In spite of the heavy use of federal aid in the mid-70s, only the debt term was statistically significant at the 95 percent confidence level.

$$\text{CAPOUT} = 8.9 \text{M} + .243 \text{ FEDAID} + .468 \text{ DEBT}$$
$$\quad \quad \quad \quad \quad \quad (1.63) \quad \quad \quad \quad \quad \quad (3.98)$$

Assessment of Capital Spending Record
Figure VIII-12.

FORT WORTH, 1965-82
FEDERAL AID, DEBT, AND OUTLAYS

[Graph showing trends of Federal Aid, Debt, and Outlay from 1965 to 1982.]
In general, it appears that Fort Worth is in good financial condition. The fact that much of its infrastructure in the past has been financed by debt is apparent, not only from the regression equation results, but also from inspection of the graph of outlays, debt and aid. It is interesting to note that Fort Worth's highest capital expenditures occurred at a time when federal aid was virtually non-existent (1972). Given the growth of the region, the relatively young age of the city's infrastructure, Fort Worth is likely to be a city which will be able to meet its capital needs in the absence of federal assistance.

Honolulu

Socio-economic Trends

Honolulu is one of the few cities in which the central city and the metropolitan area are the same. The population grew by more than 20 percent, increasing from 631,000 in 1970 to over 763,000 in 1980. In 1980, only 11 percent of the housing stock was built before 1940, and 33 percent was built after 1969. Although the city has a large non-white population (70 percent), unlike many American cities, only 2 percent of the city's population was black, and only 7 percent was hispanic (the majority were asians). In 1980, the city had a per capita income ($8948), and a high proportion of college graduates (21 percent).

Trends in Outlays, Debt, and Federal Aid

Annual capital spending in Honolulu grew to $50 million the late 60s, to $85 million in the mid 70s, and increased in 1982 to nearly $100 million. Large bond issues occurred in 1967 ($25 million), 1973 ($35 million), 1976 ($38 million), 1978 ($52 million), 1982 ($50 million). For three years, 1979, 1980, 1981, Honolulu issued no debt whatsoever. Federal aid peaked
in 1978 and has declined steadily. To some extent, the loss of federal funds have been offset by increased state aid in 1980-82.

In real terms, (see Figure VIII-13), the heaviest capital spending occurred in the late 1960's and mid 1970's. Although the growth in capital spending in the 1970's corresponded to an increase in federal aid, the city also issued its largest debt (in real terms) in 1972 and 1973. In the late 1970's, debt, federal aid, and outlays all declined simultaneously. As debt issuances dropped to zero in 1979 to 1981, outlays reached their lowest levels in the 18 year period.

Regression Results

The high level of capital spending in the late 1960's and early 1970's is difficult to explain on the basis of borrowing and federal aid. There does not appear to be any lag between debt and outlays, ruling out the possibility that the lagged model would produce better results than the unlagged model. Given the patterns exhibited in the graph of outlays, debt and aid, the regression results were not surprising. The $R^2$ value on the lagged models was 6.1 percent; on the unlagged model it reached 19.4 percent ($F$-ratio = 1.81).

Assessment of Capital Spending Record

Honolulu is a city which has experienced considerable growth, both in population and in income, over the decade of the 70s. As such, it appears quite likely that eventually, this city will need to increase its level of capital investment. While the loss of federal aid will increase the financial burden of financing infrastructure, Honolulu is in relatively good financial shape to incur more debt. With a relatively high level of personal income, low levels of outstanding debt, and increasing growth, Honolulu appears to be a good credit risk.
Houston

Socio-economic Trends

Only one other city, Phoenix, experienced a greater increase in population during the 1970-80 decade. Houston's population grew by over 29 percent to almost 1.6 million. The metropolitan area grew by 43 percent, outpaced again by only one city, Phoenix. Houston is a young city, with only 8 percent of its housing built before 1940. Close to 40 percent of its housing stock was built after 1969. With a per capita income of $8796, Houston was one of the more prosperous of the cities with more than one million inhabitants.

Trends in Outlays, Debt, and Federal Aid

Except for two modest peaks (in 1969 and 1976), the greatest growth in capital spending occurred after 1978, when Houston's capital budget grew from $75 million to $225 million. The increase in capital spending was accompanied by increased intergovernmental aid. Houston's debt profile remained relatively flat between 1965 and 1973 (at about $50 million in annual issuances), peaked slightly in 1974 and 1978, and then shot up to $400 million in 1980.

In real terms (see Figure VIII-14), Houston exhibited a pattern of gradually increasing outlays, reaching over $80 million by the early 1980s. Houston also increased borrowing over the period, issuing $90 million in 1974 and $160 million in 1980. Throughout the period, federal aid also increased steadily.

Regression Results

The unlagged model produced an $R^2$ of 45 percent (F-ratio = 6.6), while the lagged models produced an $R^2$ of 60.8 percent (F-ratio = 11.6). In the
Figure VIII-14.

HOUSTON, 1965–82

FEDERAL AID, DEBT, AND OUTLAYS

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<th>YEAR</th>
<th>FEDERAL AID</th>
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unlagged model, the federal aid term was significant while the debt term was not. In the lagged model, however, the only the debt term was significant. Since this was one of the only instances where the two models produced different findings, both are included for discussion.

\[
\begin{align*}
\text{CAPOUT} &= 30.8M + 0.698 \text{FEDAID} + 0.101 \text{DEBT} \\
&= (2.56) (0.81)
\end{align*}
\]

\[
\begin{align*}
\text{CAPOUT} &= 20.3M + 0.321 \text{FEDAID} + 0.391 \text{MADEBT} \\
&= (1.18) (2.63)
\end{align*}
\]

These findings suggest that spending on infrastructure is influenced by both federal aid and debt. The unlagged shows that federal aid and outlays tend to occur in the same year. The lagged model shows that debt lags behind outlays by at least one year.

**Assessment of Capital Spending Record**

The fact that both debt and federal aid are significantly related to outlays suggests that even Houston, a relatively prosperous and growing area, is likely to encounter some hardship in financing infrastructure as federal aid is cut. Between 1974 and 1982, federal assistance was quite stable, showing little of the wide fluctuations as in some of the other cities. Given the tremendous growth in Houston and the accompanying expansion of capital needs, the large volume of debt issued in 1980 indicates that Houston already is on its way to expanding its infrastructure.

**Indianapolis**

*Socio-economic Trends*

Although the metropolitan area grew by about 5 percent, Indianapolis lost about 6 percent of its population during the period 1970-80. With only 2.88 persons per acre, Indianapolis is one of the most sparsely populated
cities in the United States. About 54 percent of the households in this city owned their homes in 1980, which was high when compared to the 37 city average of 44 percent. The city's per capita income of $7585 was quite close to the mean for all cities ($7294).

Trends in Outlays, Debt, and Federal Aid

For the 15 year span of 1965 to 1979, Indianapolis experienced modest incremental growth in capital spending, increasing from about $10 million to $60 million in annual outlays. Then, in 1980 and 1981, capital spending jumped up to almost $130 million. In 1979, Indianapolis floated a $72 million bond issue, the largest offering made during the 18 year period. In addition to the large amount of borrowed funds, the city's intergovernmental revenues peaked in 1981.

In real dollars (see Figure VIII-15), Indianapolis increased spending in the early 1970s and in the early 1980s. During these periods, this city spent between $20 and $40 million (in real dollars) on infrastructure. Over the period, there was a steady and noticeable increase in federal aid. Debt, on the other hand, was more much more irregular, with large issuances occurring much more sporadically over the period.

Regression Results

Although the lagged model did yield a slightly higher $R^2$ value, the lagging of the debt term did not produce a significant t-value. In both the lagged and unlagged models, outlays were positively and significantly related to federal aid. The lagged model produced an $R^2$ of 61.8 percent (F-ratio = 12.13).

\[
\text{CAPOUT} = 14.7 M + .417 \text{FEDAID} + .262 \text{MADEBT}
\]

\[
(4.91) \quad (1.40)
\]
Figure VIII-15.

INDIANAPOLIS, 1965-82

FEDERAL AID, DEBT, AND OUTLAYS
These results suggest that federal aid was the most important factor in explaining capital outlays in Indianapolis. In inspecting the graph of outlays, debt and aid, (Figure VIII-15), it is apparent that debt played an important role in financing infrastructure in 1972, when federal aid was virtually non-existent.

**Assessment of Capital Spending Record**

While the region appears to be stable, in terms of growth and income, the dependency on federal aid does spell trouble in the years ahead. While the city issued over $30 million in debt in the late 70s, it still has one of the lowest levels of per capita borrowing in the country (approximately $26 annually). Whether this low level of borrowing is more a function of the availability of federal funds, or, because of difficulties encountered in the bond market, remains yet to be seen.

**Kansas City**

**Socio-economic Trends**

With a density of two persons per acre, Kansas City has one of the lowest densities among large cities in America. Although the region grew a modest 4 percent during the 1970s, Kansas City’s population dropped by almost 12 percent. A city with relatively high homeownership, (53 percent), Kansas City is governed by the city-manager form of government.

**Trends in Outlays, Debt, and Federal Aid**

If not for one year, 1977, Kansas City would have exhibited a virtually flat capital spending profile, fluctuating between $20 million and $30 million annually. In 1977, however, Kansas City’s capital outlays shot up to $140 million. Intergovermental aid increased over the entire period, with a slight peak in 1977. Kansas City’s debt profile, on the other hand, was quite
unusual. The city floated one massive bond issue in 1968 ($110 million) and smaller issues ($20-$40 million) in 1971 and 1974. The city issued virtually no debt throughout the mid 70s and early 1980s.

Even in real dollars (see Figure VIII-16), the lag between debt and outlays is quite pronounced. On the other hand, there does appear to be a pattern of steadily increasing federal aid which generally accompanied the growth in capital spending.

Regression Results

The pattern of borrowing for Kansas City does not appear to meet the general specifications of either the lagged or unlagged models. In particular, the nine year lag between the largest debt issue and the largest capital outlay is longer than the observed lags in other cities. In addition, while federal aid increased gradually over the 18 year period, capital outlays exhibited much more wide fluctuations.

It was, therefore, not surprising to find $R^2$ values of only 2 to 5 percent. These findings suggest that the pattern of decision-making is different in Kansas City than in other cities.

Assessment of Capital Spending Record

The fact that the region is growing while the central city is decreasing indicates that Kansas City will need to re-examine its spending priorities. Although the ability of the city to finance its own improvements may decline, the pressures to provide infrastructure with region wide benefits is likely to increase. Since Kansas City has already demonstrated some capacity for long-range planning (i.e., the nine year gap between debt and outlays), perhaps this city will be able raise the necessary funds through the long-term bond market. A point of some
Figure VIII-16.

KANSAS CITY, 1965-82

FEDERAL AID, DEBT, AND OUTLAYS

AMOUNT IN REAL DOLLARS
(Millions)

YEAR

FEDERAL AID + DEBT ISSUED ☯ CAPITAL OUTLAY
concern, however, is the fact that between 1974 and 1982, Kansas City issued virtually no debt whatsoever.

**Long Beach**

* Socio-economic Trends

While the city grew by a little more than one-half of a percent, the Long Beach metropolitan area grew by 15 percent between 1970 and 1980. This city was run by a city manager, had a relatively young housing stock (20 percent built after 1969), and had a below average percentage of non-white residents (25 percent).

*Trends in Outlays, Debt, and Federal Aid*

Long Beach follows a pattern of capital spending characteristic of many sunbelt areas: relatively low spending through the 60s and early 70s, slight increases in the mid-70s, and heavy outlays in the 1980s. Between 1976 and 1981, Long Beach's capital budget grew from $40 million to over $100 million. Over the same time period, annual borrowing grew from less than $10 million to over $85 million. While state aid increased over the entire period, federal aid peaked in 1980.

In real dollars (see Figure VIII-17), Long Beach's pattern of spending is quite different from its actual spending. Once accounting for inflation, the pattern of capital spending appears to be more constant. There were two periods of heavy spending: one in the early 70's and the other in the early 80's.

*Regression Results*

The unlagged model performed much better than the lagged model. The R² for the unlagged model was 36.7 percent (F-ratio = 4.35), compared to only 21 percent for the lagged model. This suggest that Long Beach is a
Figure VIII-17.

LONG BEACH, 1965-82
FEDERAL AID, DEBT, AND OUTLAYS

AMOUNT IN REAL DOLLARS (Millions)

YEAR

FEDERAL AID
DEBT ISSUED
CAPITAL OUTLAY
city in which debt and outlays, more often than not, occur in same year. Federal aid was not significant in neither model.

\[
\text{CAPOUT} = 18.5 \, M + 0.087 \, \text{FEDAID} + 0.398 \, \text{DEBT}
\]

(0.47) (2.46)

These results suggest that in Long Beach debt is used more regularly than federal aid to finance capital outlays.

Assessment of Capital Spending Record

The fact Long Beach is part of the Los Angeles metropolitan area presents both constraints and opportunities. On one hand, regional growth can increase Long Beach's capital requirements. On the other hand, because of the existence of other cities (e.g. Los Angeles), there are opportunities for sharing the costs of infrastructure.

Los Angeles

Socio-economic Trends

Sharing the same metropolitan area with Long Beach, the city of Los Angeles grew by more than 5 percent during the 1980s, while the region's population increased by 15 percent. With a per capita income of $8422, the city had a higher level of personal income than most of the other large cities. About 38 percent of its residents were non-white. Thirty-eight percent of its residents were homeowners.

Trends in Outlays, Debt, and Federal Aid

Like other west coast cities, Los Angeles' capital spending grew mostly in the 1980s, increasing from about $175 million in the late 70s to over $300 million in 1982. In 1980, the city issued approximately $650 million in long term debt, the largest amount ever issued in a single year.

In real dollars (see Figure VIII-18), the heaviest capital outlays occurred in 1973, two years after the city issued about $160 million in long-term debt. The other major outlay occurred in 1977, one year before a substantial increase in federal aid, and three years before the largest debt issue ever undertaken ($260 million).

Given the fact that the largest outlays occurred in 1973, at a time when federal aid was still quite small, and, given the fact the other large outlay (1977) occurred before large increases in debt and aid, the two models are not likely to produce highly significant results.

Regression Results

Neither model produced an $R^2$ of more than 8.7 percent. As structured, these equations were poor predictors of Los Angeles' capital spending record. The heavy investment in the early 70’s and the tendency for outlays to occur before either debt or federal aid, may have contributed to the poor performance of the two models.

Assessment of Capital Spending Record

The capital requirements of city such as Los Angeles are vast and difficult to predict with much certainty. There does, however, appear to be a great deal of fluctuation in how much Los Angeles spends on infrastructure. In constant dollars, annual spending ranged between $280 million and $60 million! Although such wide fluctuations may not necessarily be indicative of a shortage per se, the fact that there is no readily distinguishable pattern of investment is somewhat disconcerting. One would expect that a city which functions as the center of region
Figure VIII-18.

LOS ANGELES, 1965–82

FEDERAL AID, DEBT, AND OUTLAYS

AMOUNT IN REAL DOLLARS (Millions)

YEAR

FEDERAL AID  DEBT ISSUED  CAPITAL OUTLAY
experience growth in population and growth, would, over time exhibit a pattern of increasing capital investment.

Memphis
Socio-economic Trends

In 1980, there were about 646,000 people in Memphis, an increase of 23 percent over the 1970 population. This city grew even faster than its metropolitan area, which only increased by 9 percent during the 1970s. Only 14 percent of its housing stock was built before 1940, and over 20 percent was built after 1969. Forty-eight percent of its residents in 1980 were non-white.

Trends in Outlays, Debt, and Federal Aid

Memphis experienced three periods of heavy capital investment: 1971, 1975-76, and 1981-82. During these peak years, capital outlays ranged between $60 million and $75 million. In spite of the fact that Memphis had three peaks in capital spending, this city had only one prominent peak in borrowing in 1977, when it issued over $200 million in long term debt. In all other years, Memphis borrowed no more than $60 million. Trends in capital spending corresponded closely with state aid receipts. Federal aid, however, remained at less than $10 million annually, until 1982, when it jumped to approximately $45 million.

When inflation is accounted for (see Figure VIII-19), Memphis appears to have one very prominent issuance of long term debt in 1977 ($120 million). While during the early years of the series, there appears to be a close match between outlays and debt, in later years, the strongest relationship appeared to be between debt and federal aid.

Regression Results
Figure VIII-19.

MEMPHIS, 1965–82
FEDERAL AID, DEBT, AND OUTLAYS

AMOUNT IN REAL DOLLARS (Millions)

130
120
110
100
90
80
70
60
50
40
30
20
10
0

1965 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82

FEDERAL AID

DEBT

INTEREST RATE WATCHING

OUTLAY

FEDERAL AID

CAPITAL OUTLAY

DEBT ISSUED

YEAR
The $R^2$ values for both models (unlagged and lagged) ranged between 5 to 6 percent. Neither the federal aid term nor the debt term was found to be statistically significant. The fact that neither model explained much of the variation over time in capital investment suggest that Memphis may be one of those cities which first makes a capital outlay and then arranges for financing (either through the use of debt or through federal financing).

Assessment of Capital Spending Record

The fact that Memphis experienced such large and rapid growth during the 70s, was, in no way reflected in its pattern of capital spending. The fact that outlays, in real terms, decreased over the period, suggests that this city is in for a period of heavy capital investment in the years ahead. While the issuance of debt in 1977 may represent an instance of "interest rate watching," the proceeds could also be applied to either past outlays, or, more likely, to planned improvements which have not yet been undertaken.

Milwaukee

Socio-economic Trends

The City of Milwaukee lost over 11 percent of its population during the 1970s, although the region remained pretty much unchanged (it lost about 5,000 of its 1.5 million residents). With 42 percent of its housing built before 1940, Milwaukee had a homeownership rate of about 45 percent, and a non-white population of about 26 percent.

Trends in Outlays, Debt and Federal Aid

Capital spending increased in 1969-70 and again 1979-82. The period 1971-78 was marked by relatively low spending (less than $40 million), but in 1982, capital outlays (at $75 million) had nearly doubled. Milwaukee's debt history, however, contained much more fluctuation, with peaks that
occurred in 1968, 1972, 1976, 1978, and 1981. In these years, the city borrowed between $35 million and $70 million.

In real dollars (see Figure VIII-20), Milwaukee’s heaviest capital investment occurred in 1969-70, on year after the city issued more than $40 million in long-term debt. Capital spending continued to drop from that point on. The slight increase in outlays in the late 70’s corresponded to a rise in debt.

Regression Results

Although federal aid grew in the early 70’s, this growth happened after the major period of capital investment. In addition, when federal aid was on the decline in 1979-82, capital spending in Milwaukee actually picked up. Given these patterns, the regressions are not likely to produce the best of results.

The unlagged regression produced an $R^2$ of 55 percent (F-ratio = 9.02), compared to one of 33 percent produced by the lagged model. In both models, federal aid and debt had significant, negative coefficients.

\[
\text{CAPOUT} = .46.4 M - .746 \text{FEDAID} - .474 \text{DEBT} \\
(-3.89) \quad (-2.76)
\]

These negative terms are quite surprising. Virtually no other city produced negative coefficients on both the debt and aid terms.

Rather than interpret these negative coefficients as evidence of an inverse relationship between outlays and aid or outlays and debt, it makes the most sense to attribute these results to faulty model specification. This is a clear instance where the lagging of both the debt and aid terms would serve to improve the overall predictive power of the equations.

Assessment of Capital Spending Record
Figure VIII-20.

MILWAUKEE, 1965-82
FEDERAL AID, DEBT, AND OUTLAYS

AMOUNT IN REAL DOLLARS (Millions)

YEAR
FEDERAL AID + DEBT ISSUED ◆ CAPITAL OUTLAY

-265-
The regression results, though statistically significant, run counter to both established theory and precedents set by other cities in the sample. Several points do emerge from this analysis. First, Milwaukee's level of capital investment appears to have leveled off since its growth in the early 70's. Second, the city has borrowed, albeit, smaller amounts than in the early part of the time series, throughout the decade of the 70s. From inspection of the graph of outlays, debt and aid, it would appear that Milwaukee's capital investment has moved towards a pattern of steady state, a necessary pattern in view of a declining population.

**Minneapolis**

*Socio-economic Trends*

Although the metropolitan area grew by more than 8 percent, Minneapolis' population fell by about 15 percent during the 1970s. This city's per capita income, $7940, was higher than the 37 city average. With 57 percent of its housing stock built before 1940, Minneapolis was one of the older cities. Minneapolis had the lowest proportion of non-white residents among the 37 cities; only 12 percent of its population was non-white in 1980.

*Trends in Outlays, Debt, and Federal Aid*

The first major period of increased capital spending occurred in 1976-77, when the city expended over $45 million in capital outlays. Outlays dropped sharply by 1979 to less than $30 million, but rebounded to in the 80s. The heaviest borrowing occurred in 1978 ($120 million), 1980 ($122 million), and 1982 ($150 million). While state aid has increased steadily, Minneapolis' federal aid peaked in 1979.
In real dollars (see Figure VIII-21) Minneapolis displayed a pattern of steadily increasing outlays until the mid-70's. After 1977, however, outlays, in real terms, decreased markedly. This decrease occurred in spite of large federal grants and huge debt issuances. From inspection of the graph of outlays, debt and aid, it is not clear as to whether Minneapolis issues debt before or after making capital outlays. There does appear to be a readily identifiable relationship between outlays and federal aid.

Regression Results

Both models (unlagged and lagged) produced R$^2$ values in the range of 2.9 to 3.6 percent. These unimpressive results suggest that the model, as specified, does not work well in Minneapolis.

Two factors apparently weakened the regressions: 1) the massive amounts of debt issued during the late 1970s, and 2) the decrease in capital outlays at a time when federal aid increased (1977-79). In viewing Figure VIII-21, it appears that during the late 1970s, capital spending was unusually low, given the large amounts the city borrowed and the large federal grants it received. The expected level of capital spending, based on previous levels of spending has been drawn on to the graph. At a minimum, Minneapolis has underspent on infrastructure by $10 to $20 million, annually.

Assessment of Capital Spending Record

Although the region grew, the loss of population in Minneapolis suggests that an estimate of capital needs based on extrapolation of past trends may not necessarily be accurate. The age of Minneapolis' infrastructure, as well as the relatively high level of personal income, however, may serve to enlarge demands for capital improvements.
Figure VIII-21.

MINNEAPOLIS, 1965–82

FEDERAL AID, DEBT, AND OUTLAYS

Estimated deficit in capital outlays
Rather than view the difference between the high level of debt and low level of capital investment as a deficit, perhaps a better way to understand this disparity is in terms of a longer range time perspective. In other words, the large volume of debt in the late 70's may have been issued to finance large infrastructure projects which will be undertaken in the near future. The relationship between debt and outlays would therefore balance out over time. Such interruptions between planned debt and outlay sequences are likely occurrences because of the somewhat arbitrary nature of the years chosen for study (1965 to 1982). While the period is large enough to capture many of the long-term relationships between debt and outlays, obviously there will be some at the beginning or end of the time series which may have been, as in the case of Minneapolis, truncated.

Newark

Socio-economic Trends

Newark lost almost 14 percent of its population in 1970s, while its metropolitan area lost only 4 percent during the same period. This city showed all of the signs of decline: lowest per capita income of the 37 cities ($4525), large non-white population (67 percent), lowest homeownership of largest cities (19 percent), old housing stock (47 percent built before 1940, and low proportion of college graduate (6 percent). With almost 22 persons per acre, Newark was also one of the most densely populated cities.

Trends in Outlays, Debt, and Federal Aid

Newark's greatest capital spending occurred in 1969, when it expended nearly $225 million. Capital spending declined ever since, although Newark did manage to expend over $175 million in 1974, 1975, and

After accounting for inflationary effects, (see Figure VIII-22), the extent to which capital spending has declined is all the more apparent. In spite of substantial federal assistance in the mid-seventies, outlays continued to drop. The fact that between 1974 and 1980, capital spending fell in each consecutive years suggests that Newark has postponed making necessary capital improvements.

Regression Results

The regressions show a strong, positive, statistically significant relationship between debt and outlays, but a negative (though not significant) relationship between aid and outlays. The lagged model produced an $R^2$ of 40.5 percent ($F$-ratio = 5.11), almost double the explanatory power of the unlagged model ($R^2 =$21.7 percent).

The negative coefficient on federal aid is probably best interpreted as evidence of Newark's persistent deferral of capital improvements, a deferral which continued in spite of large and frequent federal grants.

Assessment of Capital Spending Record

The fact that Newark faces a severe pattern of capital disinvestment is compounded by a range of socio-economic problems: low personal income, old age of infrastructure, and a large, non-white population in need of public services.

It is clear too that Newark's ability to fend for itself has weakened over time. During the early years of the time series, Newark issued relatively large amounts of debt one to two years in advance of making
Figure VIII-22.

NEWARK, 1965-82
FEDERAL AID, DEBT, AND OUTLAYS

AMOUNT IN REAL DOLLARS
(Millions)

YEAR

FEDERAL AID  DEBT ISSUED  CAPITAL OUTLAY

-271-
capital outlays. In later years, borrowing levels dropped quite noticeably. The continued loss of federal assistance will undoubtedly place greater stress on Newark's system of revenue collection. As such, it is hard to envision just how this city will be able to establish itself as a credible borrower in the years ahead.

New Orleans

Socio-economic Trends

Although the New Orleans metropolitan area grew by about 14 percent, the central city declined by 5.9 percent. Its population density was 4.4 persons per acre, below the 37-city average of 17.4 persons per acre. In 1980, New Orleans had a non-white population of 57 percent. Approximately 38 percent of its housing stock was built before 1940.

Trends in Outlays, Debt, and Federal Aid

Capital outlays peaked once in 1976 at ($58 million) and increased to over $70 million by 1982. The highest levels of borrowing (more than $80 million, annually) occurred in 1980 and 1981, just prior to the highest levels of capital spending. Intergovernmental aid peaked both in 1976 and again in the early 1980s.

Capital spending, in real terms (see Figure VIII-23) fluctuated between $0 and $35 million over the 18 year period. Both debt and outlays fluctuated so widely that it was difficult to determine whether outlays came before or after debt. What can be said is that while the order is unclear, the movements of debt, outlays, and federal aid appear to be closely tied.

Regression Results
Figure VIII-23.

NEW ORLEANS, 1965-82
FEDERAL AID, DEBT, AND OUTLAYS

AMOUNT IN REAL DOLLARS (Millions)

YEAR

-273-
As formulated, the regression equations performed poorly. $R^2$ values ranged between 5.0 and 5.1 percent. Neither equation could muster a single significant coefficient on neither the federal aid nor debt term.

New Orleans is an example of a city which simply just does not respond to the framework established to explain outlays and debt. The fact that the linear model fails so completely is, perhaps, reason to suspect that decision-making in New Orleans is different from other cities.

Assessment of Capital Spending Record

One of the striking features of New Orleans' graph of outlays, debt and aid, is the extent to which outlays appear to have reach some kind of steady state—approximately $25 million, annually. One question which arises is: will growth in the region, in spite of apparent stabilization in the central city, lead to increased demands for infrastructure in New Orleans? How long can the pattern of constant spending on capital outlays last, given the deterioration of existing infrastructure? These are questions which decision-makers are likely to face in the coming years.

New York City

Socio-economic Trends

With a population of over 7 million in 1980, New York was the largest of the 37 cities. Its metropolitan area was also the largest (17 million). During the decade of 1970s, New York City lost about 10 percent of its population. The metropolitan area lost approximately 4 percent. With 37 persons per acre, New York was the most densely populated city in the country. Forty-nine percent of the housing was built before 1940, and only 22 percent of its households were homeowners.

Trends in Outlays, Debt, and Federal Aid

Even after adjusting all the values for inflation (see Figure VIII-24,) New York's picture is clouded by the fiscal disturbances it encountered in the mid-seventies. In real terms, annual debt issuances fell from over $1.0 billion to about $600 million. Then, in 1976, debt skyrocketed to over $2.5 billion, as the city underwent massive financial reorganization (see Chapter 3 for detailed discussion). In the meantime, capital outlays plummeted. The relationship between debt, aid, and outlays, which up until the point of the fiscal crisis appeared somewhat consistent, suddenly fell apart.

Regression Results

Perhaps it was a bit unrealistic to expect New York City to behave like other cities in the U.S. It was, therefore, not surprising to find that the regression equations could only explain about 2 to 3 percent of the total variation in capital outlays. As such neither the lagged model nor the unlagged model were of use in this analysis.

The city's fiscal crisis brought much to bear upon the appearance of the graph of outlays, debt and aid. In more recent years, the city has turned
Figure VIII-24.

NEW YORK, 1965–82
FEDERAL AID, DEBT, AND OUTLAYS

AMOUNT IN REAL DOLLARS
(Times 10^6)

0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0 2.2 2.4 2.6

YEAR

FEDERAL AID  DEBT ISSUED  CAPITAL OUTLAY

-276-
the corner on its past, and should, eventually, acquire a pattern of spending and borrowing in which the models should have more relevance.

Assessment of Capital Spending Record

New York's capital needs are massive. In spite of its size, and tremendous revenue generating capacity, it too will suffer in the wake of the New Federalism. Restoring to order its fiscal house is a necessary first step to ensure that it can borrow to meet its future needs. New York is an example of city in which capital needs will continue to expand, first because of its role as a regional, if not national center of social and economic activity, and second because of the continuous deterioration of capital stock. New York's massive size, density, and the age of its infrastructure suggest that capital needs will continue to grow, further widening the gap between needs and ability to finance them.

Oakland

Socio-economic Trends

In 1980, Oakland had a population of 339,000. This represented about 6 percent less than its 1970 population. While the city lost population, the metropolitan area grew by 13 percent. Oakland can be described as a city with a relatively low population density (9 persons per acre), large non-white population (61 percent), with a size proportion (41 percent) of its housing built before 1940. Oakland was also run by the city manager form of government.

Trends in Outlays, Debt, and Federal Aid


In real dollars (see Figure VIII-25), Oakland's heaviest capital spending occurred in the late 1960s and early 1970s. There were also noticeable bulges in spending in 1976 and 1980-81. Over time, there has been increased use of federal aid and debt in financing these improvements.

**Regression Results**

The lagged model produced an $R^2$ of 37.1 percent ($F$-ratio = 4.42), almost double the $R^2$ produced by the unlagged model. While the lagged model did produce a positive coefficient on both terms, only the debt term was statistically significant.

$$\text{CAPOUT} = 12.3 \ M + 0.018 \ \text{FEDAID} + 0.817 \ \text{DEBT}$$

It was surprising to find that Oakland's federal aid was not more significantly related to capital spending.

**Assessment of Capital Spending Record**

One of the more unique features of Oakland is the extent to which federal aid fluctuated so widely across the time series. In many cities, the pattern of federal assistance was much more steady, gradually increasing or decreasing over a number of years. In Oakland, however, federal aid doubles in a single year, then drops below previous levels, only to jump up to new heights in the next year. Similarly, capital spending exhibits this pattern of rising and falling.

While only the debt term was statistically significant, there is evidence support the contention that the loss of federal funds will hamper Oakland's ability to finance its capital outlays. First, relative to borrowing,
Figure VIII-25.

OAKLAND, 1965-82
FEDERAL AID, DEBT, AND OUTLAYS

AMOUNT IN REAL DOLLARS
(Millions)

YEAR

FEDERAL AID
+ DEBT ISSUED
○ CAPITAL OUTLAY

-279-
Oakland has received extraordinarily large federal grants at key points prior to, or immediately following large capital expenditures. Second, the uneven distribution of federal grants too closely resembles the lumpy pattern of financing of capital projects rather than "flatter" pattern of spending associated with operating budgets. In all likelihood, a large proportion of the federal grants went to finance infrastructure in Oakland.

**Oklahoma City**

*Socio-economic Trends*

Oklahoma City has the distinction of being the most sparsely populated city with a population greater than 300,000. There was less than 1 person per acre in 1980. Although its population grew by over 10 percent, the pace of growth for the region was 20 percent, or double the rate of the central city. With only 16 percent of its housing stock built before 1940 and close to 30 percent built since 1969, Oklahoma City showed all the signs of a growing city in the 1970s.

*Trends in Outlays, Debt, and Federal Aid*

Over the period 1965-1976, Oakland spent about $20 million annually on capital projects. The first increase occurred in 1977, when spending for that year surpassed $50 million. Capital spending continued to grow to a high point of nearly $100 million in 1981. In 1982, however, capital spending dropped to just below the $50 million mark. Oakland exhibited a fluctuating pattern of borrowing over the 18 year period. Debt issuances peaked in 1969 ($45 million). There were smaller peaks in 1971, 1974-75, 1978, and 1981.

In many ways the graph of outlays, debt and aid (see Figure VIII-26) for Oklahoma bears some resemblance to Kansas City's graph. Both cities
issued large amounts of debt in the early 60's and 70's, when interest rates were low. Also evident is the relationship, particularly in the later years of the series, between outlays and debt.

Regression Results

The unlagged model produced the highest $R^2$ value, 51.5 percent ($F$-ratio = 7.96). The federal aid term was positive and significantly related. However, the debt term was negative, though not statistically significant. When the lagged model equation was run, although a lower $R^2$ value resulted, there was a significant federal aid term, and a positive debt term (although, unfortunately, the debt term was again not statistically significant).

\[
\text{CAPOUT} = 13.3 \, M + 0.623 \, \text{FEDAID} - 0.08 \, \text{DEBT} \\
\quad (3.87) \quad (-0.65)
\]

\[
\text{CAPOUT} = 10.6 \, M + 0.639 \, \text{FEDAID} + 0.06 \, \text{MADEBT} \\
\quad (3.90) \quad (0.33)
\]

The use of the two year moving average helped to smooth out some of the lag between debt and outlays. Perhaps a three or four year moving average may have even produced a statistically significant coefficient.

Assessment of Capital Spending Record

The available data suggest that Oklahoma City will experience a growth in capital needs. Not only is the central city growing, so too is the region. As a result, there will be increased pressure to allow for a higher density of development and to build more public facilities.

In real terms, Oklahoma City has been increasing its level of capital spending. The methods of financing appear to have changed over the time series. In the early years, most of the capital outlays was financed with debt. In 1977, federal aid takes over as the primary means of financing infrastructure. As federal cuts increase in size, Oklahoma City may find it
Figure VIII-26.

OKLAHOMA CITY, 1965-82

FEDERAL AID, DEBT, AND OUTLAYS

AMOUNT IN REAL DOLLARS (Millions)

<table>
<thead>
<tr>
<th>Year</th>
<th>Federal Aid</th>
<th>Debt Issued</th>
<th>Capital Outlay</th>
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<tbody>
<tr>
<td>65</td>
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<td>82</td>
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</table>
necessary to revert back to borrowing as the primary means of financing capital outlays.

**Omaha**

*Socio-economic Trends*

While Omaha's metropolitan area grew by 5 percent, Omaha itself lost almost 10 percent of its population in the 1970s. A city where only 14 percent of the population was non-white in 1980, Omaha had one of the highest rates of homeownership (58 percent), surpassed only by Phoenix and Toledo. The smallest of the 37 cities with more than 300,000 in 1980 population, Omaha also had a below average population density (6 persons per acre).

*Trends in Outlays, Debt, and Federal Aid*

Omaha's capital spending peaked in 1975, at approximately $70 million, two years after it borrowed approximately $33 million. Another slight peak in capital spending occurred in 1978, the same year that Omaha's federal aid reached an all-time high.

Inflation-adjusted figures (see Figure VIII-27), show that Omaha's heaviest spending occurred in 1974, when it expended over $50 million on capital projects. Other large outlays occurred in 1969 and 1977. For the most part, federal aid increased steadily over the 18 year period.

*Regression Results*

The lagged model produced the best $R^2$ value, 43.9 percent ($F$-ratio = 5.87), while the unlagged regression could muster only 17.8 percent. In Omaha, debt, more so than federal aid, was significantly related to outlays.

$$\text{CAPOUT} = 6.6 \ M + 0.129 \ FED\text{AID} + 1.31 \ MADEBT$$

-283-
Figure VIII-27.

OMAHA, 1965-82
FEDERAL AID, DEBT, AND OUTFAYS

AMOUNT IN REAL DOLLARS
(Millions)

65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82

YEAR

FEDERAL AID
DEBT ISSUED
CAPITAL OUTLAY

OUTLAYS

DEBT

FEDERAL AID

-284-
Omaha was a particularly interesting test of the model, because its pattern of outlays, over time, was quite irregular. Even with its extremely "lumpy" appearance, Omaha's spending could be explained through the use of this model.

**Assessment of Capital Spending Record**

The fact that debt is so strongly related to outlays while federal aid is not, represents both good news and bad news for city such as Omaha. On the one hand, it proves that this city is capable of planning and arranging financing through the bond market for infrastructure. On the other hand, it raises some serious questions as to what the federal funds were used for—since there is no strong connection between capital outlays and federal aid. If the weak relationship between aid and outlays is indicative of "lost opportunities," then the onset of the New Federalism represents, even more so, foregone funding for infrastructure.

Because Omaha's metropolitan area is growing, because of the low population density, and because of the high rates of homeownership, this city is likely to experience some enlargement of capital needs.

**Philadelphia**

**Socio-economic Trends**

With a population of 1.6 million, Philadelphia is one of the largest and oldest cities in the nation. Only Chicago, Los Angeles, and New York were larger. Although the central city population dropped by 13 percent, the metropolitan area lost only one percent of its population during the 1970-80 period. With 20.5 persons per acre, Philadelphia is one of the most
densely populated of the 37 cities. Fifty-eight percent of its housing stock was built before 1940. Forty-one percent of its residents were non-white.

Trends in Outlays, Debt, and Federal aid

Capital outlays peaked in 1980 ($350 million), following a period of heavy borrowing, 1976-79 in which the city issued $220 million to $240 million in long term debt. Simultaneously, the city began receiving increased state and federal aid. The high level of borrowing and federal aid received in 1982 suggests the possibility of increased capital spending in the coming years.

In examining the graph of inflation-adjusted outlays, debt, and federal aid (See Figure VIII-28) it is apparent that Philadelphia had particularly heavy outlays in 1970, 1975, and 1979. It is difficult, on the basis of this graph alone, to determine if debt was issued before or after outlays. Similarly, while periods of increased federal aid occurred close to the time of large outlays, the matter of sequence is unresolved.

Regression Results

Perhaps it was because of the indeterminant order of outlays, debt, and aid, that the regressions yielded such unimpressive results. Although the lagged model managed an $R^2$ of 26.8 percent ($F$-ratio = 2.75), this equation did produce a debt term which was just barely statistically significant ($t$-value = 2.33) at the 95 percent confidence level. The unlagged regressions produced an $R^2$ value of merely 15.1 percent. Neither term on the unlagged model was significant.

There is some evidence, gleaned from inspecting Figure VIII-28, that the lag between debt and outlays may be either longer than one or two years and, also, outlays may occur before either debt or federal aid. Further data,
Figure VIII-28.

PHILADELPHIA, 1965-82
FEDERAL AID, DEBT, AND OUTLAYS

AMOUNT IN REAL DOLLARS (Millions)

YEAR

0  FEDERAL AID  +  DEBT ISSUED  ○  CAPITAL OUTLAY
perhaps, only available from Philadelphia financial officers, are needed in order to make a more definitive assessment.

**Assessment of Capital Spending Record**

As a large old city, experiencing some population decline, but located within a stable metropolitan area, Philadelphia will encounter a pattern of changing capital needs characteristic of many cities in the frostbelt region of the country. While pressures to provide infrastructure to accommodate regional needs expands, the ability to finance these improvements will be hampered both by the loss of federal aid and the disadvantaged position of the central city vis-a-vis the surrounding suburbs. There is particular reason for concern in Philadelphia: since 1976, with the exception of one year (1982), this city has issued progressively less and less debt. Whether the increase in borrowing which began in 1982 continues remains to be seen.

**Phoenix**

*Socio-economic Trends*

Phoenix, which grew by more than 35 percent over the decade 1970-80, was fastest growing of the 37 largest cities. The Phoenix metropolitan area also grew by 55 percent during the same period. With a density of less than 5 persons per acre, and less than 5 percent of its housing stock built before 1940, Phoenix displayed all the characteristics of a growing city. Phoenix is run by the city manager form of government.

*Trends in Outlays, Debt, and Federal Aid*

Phoenix displayed a familiar pattern of capital spending: low capital spending throughout the 60s and mid 70s, and rapidly increasing expenditures in the late 70s and early 1980s. Between 1970 and 1982, capital outlays grew from less than $20 million to over $130 million,
annually. Phoenix's borrowing patterns exhibited similar growth, peaking in 1975 ($80 million) and 1978 ($160 million). Steadily increasing state and federal aid helped Phoenix to increase its capital outlays in the 1980s.

In viewing Figure VIII-29 (graph of outlays, debt and aid in real dollars), it is apparent that Phoenix is a city in which there is a strong relationship between the three financial variables. There was steady, almost linear growth in aid and outlays, and periodic swells in borrowing. Phoenix paints almost a picture perfect model of how one expects debt, aid and outlays to be related.

Regression Results

Both models produced $R^2$ in excess of 82 percent (F-ratio = 34.5). The unlagged model performed slightly better. The unlagged model, however, produced a negative debt coefficient. Lagging the debt term changed the sign on the coefficient, although the two year moving average failed to produce a statistically significant beta coefficient.

$$\text{CAPOUT} = 17.1 M + .95 \text{FEDAID} + .05 \text{MADEBT}$$

(3.79)  (.30)

It was somewhat surprising to find that federal aid is strongly related to outlays in Phoenix. The fact that debt term is not statistically significant is probably a function of the lag between debt and outlays which in many instances exceeds one year. As such, a different smoothing technique may yield a more significant debt coefficient.

Assessment of Capital Spending Record

Because of the almost phenomenal level of growth occurring in Phoenix, there has, undoubtedly, been a tremendous expansion in capital needs. Perhaps the best way to view Phoenix's record is in terms of a
Figure VIII-29.

PHOENIX, 1965-82
FEDERAL AID, DEBT, AND OUTLAYS

AMOUNT IN REAL DOLLARS (Millions)

YEAR

0 10 20 30 40 50 60 70 80 90
85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 00 01 02

FEDERAL AID
DEBT
OUTLAWS

-290-
comparison with a city, such as Detroit, or Cleveland, which is in a declining region of the country. Phoenix represents, in this light, an area of considerable advantage: not only is there growth in population and income, but also an increased level of public investment. Because of its growth and prosperity, Phoenix is able to take on more debt. Because it has fewer socio-economic problems, more of the federal aid went towards capital spending. With greater capital investment, Phoenix can attract even more population and jobs. The fact that Phoenix is one of the only cities with such unmistakeable growth in outlays and debt is, in effect, empirical confirmation of its comparative economic advantage.

Portland

Socio-economic Trends

Although the City of Portland lost about 4 percent of its population, the metropolitan area grew by 24 percent. Portland has a sizeable amount of older housing—46 percent of its housing stock was built before 1940. Fifty percent of its residents are homeowners.

Trends in Outlays, Debt, and Federal Aid

Portland's capital spending grew from just over $5 million in 1965 to over $20 million in 1970, to over $40 million in the early 1980s. Portland exhibits a pattern of slow growth until the late 70s when capital outlays nearly doubled. Federal revenue to Portland peaked in 1978, just as it launched its own program of debt financed capital projects. The city borrowed more than $60 million annually from 1978 to 1981.

In real dollars (see Figure VIII-30), Portland's heaviest capital outlays occurred in 1968-69, when the city spent more than $20 million on infrastructure. Other periods of heavy investment occurred in 1972, and in
Figure VIII-30.

PORTLAND, 1965-82
FEDERAL AID, DEBT, AND OUTLAYS

AMOUNT IN REAL DOLLARS
(Millions)

YEAR

FEDERAL AID  DEBT ISSUED  CAPITAL OUTLAY
1978 to 1980. In general, debt issuances and federal aid allotments occurred at about the same time as large outlays.

Regression Results

The results were disappointing; $R^2$ values equaled 20.9 percent for the lagged model and 30.1 percent (F-ratio = 3.23) for the unlagged model. Several factors contributed to the unimpressive results. Although the heaviest capital investment occurred in the late 1960s, the largest volume of debt was issued in the late 1970s, at a time when federal aid was at an all-time high. Moreover, in some cases it appeared as though debt was issued after and not before outlays.

Assessment of Capital Spending Record

The fact that Portland is in a growing region as well as being a city with a relatively old housing stock, suggests that there may be some need for increased capital investment. Although outlays have declined, in real terms, since the late 1960s, there has been a general growth in debt, especially towards the end of the time series. While some of this debt may go towards the financing of projects already built, more than likely, this debt will go towards new projects which have yet to show up as outlays.

San Antonio

Socio-economic Trends

San Antonio grew by almost 26 percent during the period 1970-80. Its rate of growth even outpaced its metropolitan area which grew only 21 percent. While showing many of the familiar signs of growth (26 percent of its housing was built after 1969, and 56 percent of its residents were homeowners, San Antonio also had a very low per capita income ($5672).
This city was the only city above 300,000 in population to be run by a commission form of government.

Trends in Outlays, Debt, and Federal Aid

Capital spending grew from $30 million to $40 million in 1976, to $60 million in 1980, and to over $75 million in 1982. Accompanying this steady rise in capital spending was a gradual growth in borrowing, from $25 million in 1967, to $100 million in 1975, to a peak of almost $300 million in 1981. The similarity between San Antonio's capital outlays and debt profiles is quite striking. Capital outlays, debt and intergovernmental aid increased most during the late 70s and early 80s.

Of all the cities examined, San Antonio had the highest debt to outlay ratios, issuing often two to three times the annual volume of capital outlays. The volume of debt in San Antonio grew to exceptionally high levels in the mid to late 1970s. Most of this debt was non-guaranteed debt, issued for purposes other than infrastructure. For example in 1979, $150 million of the $151 million in long-term debt was non-guaranteed debt (only $1 million was general obligation debt). In 1977, San Antonio issued $128 million in non-guaranteed debt, but only $21 million in general obligations.

As a result of its heavy usage of non-guaranteed debt (primarily to finance home mortgages, industrial development, and other non-traditional forms of public investment), the regression equations must be interpreted cautiously. In fact, the graph of outlays, debt and aid (see Figure VIII-31) acquires a somewhat altered meaning. Rather than view the relationship between debt and outlays in the manner of other cities, it makes more sense to envision this relationship as indication of the extent to which debt is used to finance non-traditional forms of infrastructure. Debt over and above capital outlays, therefore, is likely to be non-guaranteed debt.
Figure VIII-31.

SAN ANTONIO, 1965-82

FEDERAL AID, DEBT, AND OUTLAYS

YEAR

AMOUNT IN REAL DOLLARS (Millions)

FEDERAL AID  DEBT ISSUED  CAPITAL OUTLAY
Regression Results

In spite of the obvious problems with using these models to explain the relationship between outlays and debt, they produced high $R^2$ values -- between 65 and 69 percent. In both models the debt term was positive and statistically significant.

The fact that statistically significant results were attained is no substitute for a clearly inappropriate model specification. In all likelihood, the relationship between debt and outlays, in this instance is spurious since most of the debt proceeds, by their very nature would not go to public capital projects.

A clearly superior model would have regressed general obligation debt on capital outlays. There are some problems with using this approach for all cities. In many cities, there is a substantial volume of revenue bond financing (which is counted towards the non-guaranteed debt total). In these cities, debt goes towards the financing of self-liquating projects--water systems, municipal recreational facilities, that do represent public capital investments. As such, to examine only general obligation debt, rather than total debt issued could lead to an undercounting of the volume of debt applied to the infrastructure. Moreover, San Antonio, is somewhat unique in terms of its zeal for non-guaranteed debt. As such, the decision to use total debt issued, rather than simply general obligation debt seems justified, at the possible expense of producing inaccurate estimates for cities such San Antonio.

Assessment of Capital Spending Record

In addition to sharing a growth rate similar to Phoenix, San Antonio also exhibits a similar pattern of incrementally increasing outlays over the 18 year period. The fact capital needs have grown seems to be reflected in
both the steady increase in capital investment as well as the volume of new debt issued. Even though the debt may not all go towards infrastructure, the fact that it is so large indicates a sizeable amount of economic activity in San Antonio.

San Diego

Socio-economic Trends

San Diego's population grew from 697,000 in 1970 to over 876,000 in 1980. The region grew by 37 percent, surpassed only by growth in the Phoenix metropolitan area. With only 13 percent of its housing built before 1940 and 33 percent built after 1969, San Diego also had an above average per capita income ($8027). Forty-six percent of its residents were homeowners.

Trends in Outlays, Debt, and Federal Aid

Like other cities in the West, San Diego's capital budget grew most in the 1980s, reaching $70 million to $90 million annually. Between 1965 and 1977, capital spending fluctuated between $20 million and $40 million. While the pattern of state and federal aid receipts was quite similar, San Diego's borrowing fluctuated widely over the period. In fact, San Diego borrowed more in 1968 ($27.5 million), than it did in any of the subsequent peak years (1969, 1971, 1975, 1978, and 1981). In seven of the 18 years in the series, San Diego issued no debt whatsoever.

In real dollars (see Figure VIII-32), San Diego displays a pattern of capital investment similar to other growing cities. Although there is one pronounced peak in spending in 1971, there is a general increase in the level of capital investment over time.

Regression Results
Figure VIII-32.

SAN DIEGO, 1965–82
FEDERAL AID, DEBT, AND OUTLAYS

AMOUNT IN REAL DOLLARS (Millions)

YEAR

-298-
Neither model produced an $R^2$ in excess of 21.1 percent. Although the lagged model performed slightly better, neither model produced a statistically significant coefficient on either the debt or federal aid terms.

In reviewing the graph of outlays, debt and aid, there is an apparent lag between debt and outlays in excess of one or two years. As such, the regression equations were not sensitive enough to detect the relationship between debt and outlays in San Diego.

Assessment of Capital Spending Record

If the trend towards increased capital investment continues, then San Diego will, most definitely, need to increase the volume of long-term debt that it issues. Not since 1971, has this city issued more than $10 million in long-term debt. In fact, during a number of years, San Diego issued no debt whatsoever. Given proposed cuts in federal aid, the pattern of minimalist borrowing is likely to become a characteristic of the past. Two points suggest that borrowing is likely to increase. Given the fact that in 1966, San Diego issued almost $30 million in long-term debt, it has some track record in issuing relatively large bonds. These bonds, with maturities of 20 to 30 years, will shortly be completely paid off. Given its prosperity, its growth, and its low levels of outstanding debt, San Diego stands out as an excellent credit risk. It should have few problems in raising all the capital it needs.

San Francisco

Socio-economic Trends

Among the largest cities in the country, San Francisco had the second highest level of per capita income ($9267) behind only Seattle. With a population density of 23 persons per acre, only New York City was more densely populated. Although San Francisco lost over 5 percent of its
population in the 1970s, its metropolitan area grew by 13 percent. Fifty-eight percent of its housing was built before 1940, and 34 percent of its residents were non-white.

**Trends in Outlays, Debt, and Federal Aid**

Although San Francisco experienced a modest increase in capital spending in 1971, the major growth in capital outlays occurred between 1976-82. Capital outlays grew from $60 million to over $200 million. San Francisco borrowed large amounts in 1968 ($75 million), 1976 ($130 million), and 1979 ($200 million). Intergovernmental aid increased steadily over the 18 year period.

When viewing the graph of outlays, debt and aid expressed in real dollars (see Figure VIII-33), it is apparent that capital spending first peaked in 1970 at over $70 million, and then again in the late 1970s at over $80 million. The city issued large quantities of debt just prior to these heavy capital outlays. From the mid-seventies, a general rise in federal aid accompanied the growth in capital spending.

**Regression Results**

While the city generally issued debt two to three years prior outlays, federal grants generally coincided on a year to year basis with capital outlays. Thus, it was not surprising to find strong positive coefficients on the federal aid terms, and positive (though not statistically significant) coefficients on the debt terms. The lagged model, with an R² of 64.8 percent (F-ratio = 13.81 percent) performed slightly better than the unlagged model.

\[
\text{CAPOUT} = 26.4 M + .527 \text{FEDAID} + .081 \text{DEBT}
\]

\[
(3.99) \quad (3.8)
\]
Figure VIII-33.

SAN FRANCISCO, 1965-82

FEDERAL AID, DEBT, AND OUTLAYS

AMOUNT IN REAL DOLLARS
(Millions)

YEAR

FEDERAL AID + DEBT ISSUED ○ CAPITAL OUTLAY
These results suggest that San Francisco is heavily dependent upon federal aid for the financing of infrastructure. Moreover, the relationship between debt and outlays is complicated by both the irregular pattern of borrowing as well as the lags between debt and outlays.

Assessment of Capital Spending Record

Located in rapidly growing metropolitan area, the demand public improvements in San Francisco is likely to come not only from residents, but from commuters and others who use this city as center of social and economic activity. The relatively high personal income also suggests that there may be a higher than normal willingness to pay for public improvements and amenities. Adding to these conditions is also the requirements associated with any large, densely populated city, with an aged housing stock. As such, the pattern of increasing capital investment characteristic of growing areas is likely to hold, if only to a somewhat lesser degree, in San Francisco. While the debt term failed to turn up significant in either equation, San Francisco has demonstrated a strong capacity to issue large amounts of debt prior to making capital investment. As federal aid continues to slip downward, this city will begin to borrow increasingly large amounts.

Seattle

Socio-economic Trends

Although Seattle lost about 7 percent of its population during the 1970s, its metropolitan area grew by 14 percent. Seattle’s per capita income ($9282) was the highest among all 37 cities. A city with relatively low population density (9 persons per acre), 40 percent of its housing was
built before 1940 and 10 percent was built after 1969. Seattle is run by the
city-manager form of government.

Trends in Outlays, Debt, and Federal Aid

From 1965 to 1969 annual capital spending remained at less than $20
million. In the mid 70s, it grew to $40-50 million. The major increases,
however, occurred in 1981-82, when annual outlays exceeded $80 million.
While outlays peaked in the 80s, Seattle's debt peaked in 1974, when the
city issued about $90 million in long term debt. Other small peaks in

In real dollars (see Figure VIII-34), Seattle had two periods of heavy
capital investment: 1970-74 and 1980-82. During these years, the city
expended more than $30 million annually on capital improvements. Debt in
Seattle appears to have been issued well in advance of outlays. While
federal aid increased until the late seventies, there is no easily discernable
relationship between outlays and federal grants.

Regression Results

Neither model produced strong results. The $R^2$ value on the unlagged
model (13.4 percent), however, was twice as high as the $R^2$ value on the
lagged model (7.7 percent). While not significant at the 95 percent
confidence level, the regressions produced positive coefficients on both
federal aid and debt.

These results suggest that a lagged model utilizing a two year moving
average performs no better than the simple, unlagged model. The lags
between debt and outlay in Seattle, moreover, are generally more
complicated and longer than in other cities. For example, the 1974 debt
issue occurred at least six years before the next major capital outlay.

Assessment of Capital Spending Record
Figure VIII-34.

SEATTLE, 1965–82
FEDERAL AID, DEBT, AND OUTLAYS

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In spite of being a growing city, located in a growing metropolitan area, Seattle displayed a relatively flat pattern of capital spending. One would expect a greater level of investment, particularly given the sizeable debt issued in the mid-seventies. Given the fact that Seattle has the highest level of personal income among all 37 cities, one would expect a greater willingness to pay for capital improvements. The prospects for increased capital spending appear likely. Seattle, moreover, appears to be in a strong enough financial position to avoid any major levels of unmet capital needs.

St. Louis

Socio-economic Trends

St. Louis, which lost over 27 percent of its population between 1970 and 1980, declined more than any other city in the country. The metropolitan area dropped from 2.4 million persons to 2.3 million. Its per capita income, $5880, was lower than all cities except Detroit, Baltimore, Newark, and San Antonio. Sixty-one percent of its housing stock was built before 1940. Forty-six percent of its residents were non-white.

Trends in Outlays, Debt, and Federal Aid

Between 1965 and 1974, capital spending in St. Louis remained fairly flat at less than $20 million, annually. Between 1975-79, spending on capital improvements grew slightly, to just over $30 million. In 1980-81, however, capital spending shot to over $55 million. In 1979, the city issued over $50 million in long term bonds and over $60 million in 1982. St. Louis, capital spending, however, was more directly related to its federal aid allotments which peaked in 1980-81 and, to some extent, to state aid which peaked in 1981.
In real dollars (see Figure VIII-35), much of the early levels of capital spending appear to be financed with debt. From 1973 on, however, federal aid appears to exert a stronger influence over capital spending.

Regression Results

The $R^2$ value of 37.7 percent on the unlagged model (F-ratio = 4.54) was slightly higher than the $R^2$ value on the lagged model (36.5 percent). This was somewhat surprising, given the amount of fluctuation in both the debt and federal aid variables.

$$\text{CAPOUT} = 12.5 M + .151 \text{FEDAID} + .159 \text{DEBT}$$

These results suggest that St. Louis is a city in which the general model, as specified, works quite well.

Assessment of Capital Spending Record

St. Louis' record of capital spending needs to be viewed in the context of its population losses, and the relatively low level of personal income. Given these conditions, it is not at all surprising to see that outlays in St. Louis have been virtually flat, since the mid-sixties. Cuts in federal aid stand out as particularly damaging in this city which has exhibited a strong dependency on intergovernmental aid. Moreover, the irregular pattern of borrowing suggests that St. Louis may not be able to raise the necessary capital through the bond market. The loss of nearly 30 percent of its population during the decade of the seventies casts a rather dark shadow over this city's future revenue raising capabilities. The exodus of residents and jobs to other areas means that St. Louis will need to adopt strict policies regarding the management and financing of infrastructure.
Figure VIII-35.

ST. LOUIS, 1965–82

FEDERAL AID, DEBT, AND OUTLAYS

AMOUNT IN REAL DOLLARS
(Millions)

YEAR

<table>
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DEBT

FEDERAL AID

OUTLAYS

-307-
Toledo

Socio-economic Trends

Although the Toledo metropolitan area grew by 2 percent, Toledo’s population fell by more than 7 percent during the period 1970-80. Toledo, a city run by the city-manager form of government, had a high percentage of homeownership, 59 percent (only Phoenix was higher), and a sizeable proportion (42 percent) of its housing built before 1940.

Trends in Outlays, Debt, and Federal Aid


In real dollars, (see Figure VIII-36), Toledo had heavy levels of capital spending (over $18 million) in 1968, 1975, and 1981. In 1968, 1972, 1976, and 1979, the city issued about $8 million in long-term debt. Federal aid grew from 1970 on, but the most pronounced increases occurred in 1974, and 1977. Between 1977-79, while federal aid was over $16 million, capital spending was at an all-time low (below $10 million).

Regression Results

Given the fact that much of Toledo’s capital spending occurred in the late 1960s when debt and federal was quite small, the prospects for either model do not appear to be particularly promising. Consequently, the $R^2$ values, ranging between 5 to 10 percent, were not surprising. Moreover, the negative, though not statistically significant debt term, resulted in all likelihood because of the lag between debt and outlays.

Assessment of Capital Spending Record
Figure VIII-36.

TOLEDO, 1965–82
FEDERAL AID, DEBT, AND OUTLAYS

AMOUNT IN REAL DOLLARS (Millions)

YEAR

FEDERAL AID DEBT ISSUED CAPITAL OUTLAY
Although the regression equations failed to produce a satisfactory explanation of Toledo's capital investment and borrowing practices, several points emerged out of this analysis. First, Toledo managed to finance a large amount of capital outlays without using much debt or federal funds during the late 1960s. Second, outlays, which dropped off in 1977 to 1979, rebounded to levels higher than ever before in 1981 and 1982. Third, debt issuances, as irregular as they have been, have been relatively constant, ranging between $8 and $10 million in real terms over the entire 18 year period.

Washington, D.C.

Socio-economic Trends

Washington had the largest non-white population (73 percent), of the 37 cities. It also had the third highest level of per capita income. While Washington lost more than 15 percent of its population, the metropolitan area increased by 7 percent, growing from 3.0 million in 1979 to over 3.2 million in 1980.

Trends in Outlays, Debt, and Federal Aid.


In many ways, Washington, D.C. is an anomaly. Because of the massive amounts of federal revenue it receives, the hypothesized relationship
between aid and outlays needs to be treated with special care. On the other hand, because Washington, D.C. has issued a large amount of debt to finance capital outlays, it bears certain similarities to other large cities in the U.S. In real dollars (see Figure VIII-37), capital outlays have declined over the 18 year period. Debt, which increased in the late 1960s, paralleled the general movements in outlays.

**Regression Results**

Both models produced $R^2$ values in excess of 40 percent. The unlagged regression achieved the best results, ($R^2 = 43.9$ percent). With both models, the federal aid term was negative, not because of a negative relationship between aid and outlays, but more likely because of the general pattern of decreasing capital spending in spite of growing federal aid allotments. Washington's federal aid went to general government operations as well as towards the financing of infrastructure.

$$\text{CAPOUT} = 100M - .169 \text{FEDAID} + .635 \text{DEBT}$$

$$(-2.52) \quad (3.41)$$

These results confirm the existence of a strong positive relationship between debt and outlays.

**Assessment of Capital Spending Record**

Demands to increase capital investment in Washington, D.C. are likely to result from the growth in the metropolitan area, and from the role that this city plays as a center of social, political, and economic activity, for not just the region, but the nation as a whole. The loss of population, the large non-white resident population, and the general pattern of falling capital outlays by the city itself, suggests that in spite of the pressure for added investment, Washington has, and will continue to experience a gap between capital needs and investment.
Figure VIII-37.

WASHINGTON, D.C., 1965-82

FEDERAL AID, DEBT, AND OUTLAYS

AMOUNT IN REAL DOLLARS
(Millions)

YEAR

□ FEDERAL AID  ■ DEBT ISSUED  ○ CAPITAL OUTLAY

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Summary of Findings from Case Histories

The case histories in this chapter serve to empirically confirm a number of important ideas regarding debt and capital spending. There is, as has been suspected, a strong link between capital outlays and debt, a link that becomes more apparent when year to year variations in outlays and debt are viewed simultaneously. There is, also, in most cities a lag between debt and outlays. The experience of these 37 municipalities suggests that in most, but not all instances, large debt issuances precede large outlays by one to two years. There are some instances where the lag is longer, or, perhaps reversed (outlay precedes debt), but such patterns are unusual. Compared to this lag between borrowing and capital outlays, there appears to much less of a lag between the receipt of large intergovernmental grants and capital outlays. Peak years in state or federal aid generally seem to correspond with peak years in capital outlays.

The regression equations met with mixed results. On the one hand, the equations were able to achieve statistically significant results in 22 of the 37 cities. In some cities, such as Boston, Detroit, and Phoenix, the unlagged model performed better than the lagged model. In other cities, such as Atlanta, Buffalo, and Omaha, the lagging of the debt term (using the two year moving average technique) produced results which were far superior to the unlagged model results. The $R^2$ values ranged between 2 percent to over 80 percent. It is clear that in some cities, such as Boston, Phoenix, and San Antonio, the regression models worked quite well, while in others (Minneapolis, New York City, Kansas City), neither model, as specified was able to achieve significant results.

In viewing the 37 case histories, it is quite apparent that a single explanation for borrowing and capital investment decision-making is not
likely to hold for all cities. As such, the need to develop a behavioral perspective, which focuses on how decision-makers respond to key inputs over time, is quite apparent.

The regression analysis shows that in slightly more than half of the 37 largest cities, annual capital spending could be predicted on the basis of debt and federal aid. While to some extent this represents a tautology (since debt and federal aid are used explicitly for capital investment), the fact that more significant results were not achieved, both in individual cities and across all cities represents an important finding.

In a perfectly functioning world, one would expect all debt and a large proportion of federal aid to go towards outlays. Increases in either debt or aid, should result in high levels of investment. The empirical results suggest otherwise. Not only is it difficult to specify a regression equation, it is also quite difficult to discern obvious patterns and relationships from inspecting the graphs of debt, aid, and outlays over time.

Several other findings emerge from the case histories. First, when examining capital investment in real terms, there are some cities, such as Detroit, Memphis, and St. Louis which exhibited relatively constant levels of capital investment over the 18 year period. Other cities, such as those in Texas, as well as Phoenix and others in the sunbelt areas, exhibited, in real terms, growing levels of capital investment. Finally, the majority of large American cities exhibited, in real terms, a pattern of declining investment in capital spending. The cities in which disinvestment is most obvious include: Boston, Chicago, Cincinnati, Cleveland, Columbus, Milwaukee, Newark, New York City, Portland, and Washington, D.C. In these cities, there was an unmistakable decline, in real dollars in capital investment over the 18 year period.
By comparing the long run record of capital spending, borrowing, and intergovernmental aid, to the theoretical models presented in the previous chapter, this chapter further supports the notion that behavioral arguments have much to do with understanding patterns of municipal borrowing. A behavioral model suggests that decision-makers, base their decisions on a variety of inputs, and it is the selection of these inputs, rather than the attributes of a community per se, which ultimately shape the outcomes of decision-making.

Cities in which decision-makers exhibit the postpone syndrome fall quite easily into the trap set by the very nature of capital planning. The facts are that infrastructure is built to last for many decades and deterioration of public works occurs gradually over many years. As such, decisions are made with a long range time horizon and problems associated with infrastructure may remain buried for many years at a time. Quite easily, cities can fall into the postponement syndrome: decision-makers can end up keeping capital decisions on the back burner for too long. The end result is the distinctive single peak pattern of capital spending and borrowing observed in many of the largest cities. The city must therefore play "catch-up" suddenly infusing the local economy with a large boom in public construction. Such a boom can mean a windfall in terms of employment, construction contracts, and spin-off economic benefits. But, just as suddenly as it arrives, the heavy dose of public investment is cut off. The "boom and bust" pattern of resource allocation is a natural consequence of the postponement syndrome.

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In contrast to the postponement syndrome are other patterns of capital spending and borrowing. In some cities, such as those in the sunbelt and growing areas of the country, the single peak pattern of outlays and debt is a consequence of growing capital needs. In these cities, expenditure profiles remain flat not so much because of deferred decision-making, but rather because the growth in capital needs has occurred more recently. The pattern of capital outlays and debt exhibited by these cities resembles an incline: both are steadily increasing over time. There is, moreover, a distinct difference between the shape of expenditure profiles in sunbelt areas (Houston, San Antonio, San Diego, Seattle, Phoenix, etc.) compared to frostbelt cities (Baltimore, Boston, Cincinnati, Cleveland, Kansas, New York, etc.). While sunbelt cities exhibit gradually increasing levels of capital spending, frostbelt cities show much wider fluctuations in capital spending over the 18 year period. To some degree, this finding serves to confirm the idea of a city life cycle, the somewhat strained argument that all cities experience a similar pattern of aging—from youth through old age. In this case, the sunbelt cities as a group have only recently begun their large scale investments in infrastructure. The arguments can be extended further to encompass patterns of debt use. Several cities (Houston, Phoenix, Portland, and San Antonio) began to borrow heavily for the first time in late 70s and early 80s. Identified as "first time borrowers," their debt profiles were markedly different from "seasoned borrowers," older cities (Boston, Washington, Minneapolis, San Francisco, and Philadelphia), which have floated large bond issues throughout the 18 year time series.

The fact that a certain class of problem borrowers exists has long been recognized. The existence of bond ratings since the early 1900s
suggests that at least from the market perspective, there has been a clear recognition of differences in financial status. When comparing bond ratings to patterns of debt issue, the results are somewhat mixed. On the one hand, cities with low bond ratings (Boston, Detroit, Newark, and Philadelphia) appear to be more prone to having fluctuating patterns of debt issuance. On the other hand, there are some cities with high bond ratings (Indianapolis, Minneapolis, and San Francisco) which also exhibit fluctuating borrowing patterns. There are high debt cities with high bond ratings (Minneapolis, Dallas), as well as low debt cities (Newark) with low bond ratings. Problem borrowers can be characterized as those cities which experienced interruptions in borrowing throughout the decade of the 70s. These cities, in addition to having low bond ratings, also went several years without issuing any debt whatsoever.

The case histories also support the contention that financial managers in some cities, are quite attuned to fluctuations in interest rates. In comparing 18 year graphs of interest rates and long term borrowing, there is some correspondence between periods of low interest and peaks in borrowing. The record of some cities, however, with regard to financing during periods of low interest rates is better than other cities. Cities such as Atlanta (1978), Boston (1972), Cleveland (1978), Dallas (1971), Denver (1978), Detroit (1971), Fort Worth (1972), Honolulu (1978), Indianapolis (1972), Memphis (1977), Milwaukee (1978), Newark (1972), Phoenix (1978), and San Diego (1978) borrowed unusually large amounts during periods of low interest rates. On the other hand, cities such as Baltimore, Buffalo, Cincinnati, Columbus, Detroit, Houston, Long Beach, Minneapolis, New Orleans, New York, Oakland, St. Louis, Toledo, and Washington have floated
their largest bond issues at times during which interest rates were relatively high. Many of these cities, therefore, have had to shoulder interest costs two times the level of those cities which have managed to time their offerings with periods of low interest rates.

Another input into the decision-making process pertains to the availability of federal funds. To some extent, the presence of state aid poses similar issues. However, on inspection of the state aid graphs, it was determined that there was far less fluctuation in state allotments than in federal aid receipts. In general, state aid to the 37 cities has increased gradually, and steadily, over the 18 year period. In contrast, federal aid increased suddenly in the early 70s and then again in the late 70s. Because of its variability, federal aid stands to have a much greater impact on capital spending and borrowing.

The case histories provide support for two different views on the role of federal aid. On the one hand, there is a noticeable connection between peak years in capital spending and peak years in federal aid. This would suggest that federal aid stimulates capital spending. This should come as no surprise since many federal grants were intended to support infrastructure projects. In many instances, the receipt of large federal grants coincided with large time-lag adjusted debt offerings. In other words, federal grants, debt, and capital outlays are all positively related, and grants and debt act to reinforce each other. In other instances, this study found that federal funds may substitute for borrowed funds. Particularly in those cities with high federal aid allotments (Newark, St. Louis, Detroit, etc.), federal funds may have been used in lieu of borrowed
funds. In fact, in these cities, federal funds rather than borrowed funds stand out as the primary source of financing for capital projects. The extent to which capital spending mirrors federal fund receipts in these cities is especially striking.

One of the key underlying assumptions of a behavioral model is that outcomes of decision-making processes can be explained in terms of the actions (or inaction) of decision-makers. Two behavioral patterns—the wheeler-dealer urban financier, and the business as usual bureaucrat, stand out as opposite extremes in terms of municipal finance decision-making. The financier views public capital as a means of leveraging private investment. This is the same perspective put forth by the entrepreneurs who used municipal bonds to build railroads, canals, and communication lines in the 1800s. Public investment will spark development, development would bring increased private investment as well as new revenues to the public sector, and any debt incurred in the process will be easily retired. The conventional rules of debt preceding outlay need not apply. In fact, a large capital outlay, financed with federal funds, short term debt, or current receipts may provide the needed impetus to start the engine of development. In a number of cities (Minneapolis, Baltimore, Kansas City, Memphis, New Orleans, etc.) large capital outlays have preceded major periods of borrowing. The opposite of the urban financier, is the bureaucrat which treats the business of capital planning as an opportunity to maintain the status quo. This behavioral pattern emerges whenever a city slips into a static mode of spending and borrowing. In spite of changes in capital needs, financial capacity of the city, interest rates, and other factors, the city appears locked into a pattern of inactivity, spending the same amounts on
capital projects year after year. The lockstep pattern can carry over to debt policy as well.

It is clear that several of these behavior pattern overlap with each other. Over time, an individual city may be exhibiting multiple behavioral patterns. Administrations change, decision-makers come and go, and different political agendas must into and out of the limelight. As such, one could hardly expect that borrowing patterns remain constant and easy to interpret. It is clear that a set of unique circumstances, personalities, events, and conditions shapes the borrowing decisions of large cities. No formula, however, comprehensive can possibly hope to simultaneously account for the behavior of all cities, at every juncture in time. At the same time, this analysis does serve to identify a number of clear decision rules.

First, under ideal circumstances, borrowing decisions involve consideration of the following inputs: 1) capital needs; 2) non-debt resources (especially federal aid); and 3) bond market conditions. This general framework has been developed into both a normative model, as well as several alternative models for describing the real world behavior of large American cities.

Second, municipal attributes appear to be only loosely related to actual patterns in borrowing. There does, however, appear to be a clear difference in the spending and borrowing practices of "sunbelt" cities versus cities located in the "frostbelt." Where sunbelt cities have incrementally increasing spending and borrowing levels over time, the other
cities appear more prone to fluctuating patterns in capital spending and debt.

Third, while many cities were successful in issuing debt during periods of low interest rates, others were not. Interest rate watching appears to have been more prevalent in the early 70s. Prolonged periods of high interest (late 70s to early 80s) may have pushed otherwise prudent managers into floating large bonds in spite of the heavy interest costs.

Fourth, federal aid, more often than not, appears to work hand in hand with borrowing. Instances where municipalities reduced their borrowing because of large federal aid allotments appear to be few in number. In some cities, however, federal aid has greatly boosted capital spending, so that capital projects could go ahead even in the absence of borrowed funds.

Fifth, factors such as outstanding debt burdens, levels of current spending, and existence of limitations on debt, appear to have exerted little if any influence over patterns of borrowing. Some cities borrowed extremely large amounts in a single year and yet remain in relatively good fiscal health (Atlanta, Minneapolis, Houston). Others (St. Louis, Newark, and Detroit) borrowed comparatively little over the 18 year period, and yet remain by most standards, in poor fiscal health.

Finally, in viewing patterns of capital spending over the 18 year period, several cities appear headed for troubled times in the years ahead. Cities such as Boston, Cleveland, Denver, Kansas City, Newark, New York, Omaha, and St. Louis, show unmistakable patterns of decline in capital
spending over the 18 year period. Inflation adjusted curves reveal even sharper decreases in capital spending. Some of these are high debt cities, while others have issued relatively little debt over the 18 year period. It remains to be seen whether or not a city with high levels of outstanding debt, such as Boston or New York, can borrow amounts adequate to finance its needed capital improvements. Can problem borrowers such as Newark, Cleveland, and St. Louis, which have been shut out of the national bond market for some time, regain the necessary footing to begin active debt financing of capital projects? At the same time, when will cities such as Atlanta, Washington, Minneapolis, San Francisco, and Philadelphia, leading the nation in terms of their 18 year record of spending and borrowing, finally reach their limits? What effect will the apparent growing appetite for capital investment and debt among sunbelt cities have, in the next decade, upon the ability of older cities to attract needed investment capital?

The rules of the road in terms of municipal borrowing appear to be changing. Since the mid 70s, the municipal bond market has changed quite radically. Previous chapters have described how there are new investors in municipals, new debt instruments (moral obligations, zero coupons, small denomination bonds), new regulations (elimination of bearer bonds and disqualification of certain projects from tax exempt financing), new issuing authorities (housing, transportation, high education), and a variety of other changes which have made the bond market more competitive, more risky, and more difficult for municipalities seeking to finance infrastructure. The 18 year capital spending and borrowing curves reveal how the bond market has been more unstable. In the early years of the time series, the
correspondence between debt and capital spending is much easier to follow. By the mid 70s, however, capital spending and debt both began fluctuating much more widely. The lag between debt and capital spending increased. Municipalities began dropping out of the bond market altogether. Some cities piled on huge amounts of debt, while others sank further and further behind in terms of maintaining infrastructure. By the early 1980s, the differences between prosperous and poor areas became even more pronounced. With the planned shrinkage of federal aid to cities, and the consolidation of 57 categorical grant programs into 9 block grants, the federal government's role in redistribution of resources to cities has greatly diminished. Increasingly, the rules of the road, with regard to urban capital finance involve a Darwinian notion of survival.
Chapter 9

Conclusions: The Role of Cities in Financing Infrastructure

Old Wine in New Bottles

Some years ago, Douglas Yates wrote a book entitled, *The Ungovernable City: The Politics of Urban Problems and Policy Making*. He argues that given its political organization and decision-making processes, the large American city is fundamentally ungovernable. That is, cities are "incapable of producing coherent decisions, developing effective policies or implementing state or federal programs."¹ Although Yates does not treat capital planning or borrowing decisions per se, his central argument² could just as easily be applied to the problems associated with financing infrastructure. He maintains that cities are too decentralized to permit coordinated planning, yet too centralized to support a responsive, flexible system. Cities are at once too dependent on higher level governments to initiate their own strong policy initiatives, and too independent to be entrusted with the implementation of state or federal programs. Moreover, the system of municipal government from the mayor, through various administrators on down to street level bureaucrats functions largely as a rudder-less vessel, and the principal actors have little control over their subordinates and even less over the direction and future of the ship as a whole. Finally, the city itself provides unique services which create problems which are impossible to avoid, including absorbing the newest and poorest immigrants, and accommodating a wide range of socio-economic groups. Without shedding many of these burdens, cities will face chronic

²Ibid. pp. 6-7.
revenue shortages, continued competition between public service beneficiaries, and basic structural weakness (tax base, employment opportunities, etc.) compared to their more affluent suburban neighbors.

The problems associated with financing urban infrastructure are by no means new. In fact, large cities have always seemed burdened with a set of recurring problems. The “infrastructure crisis” is, in effect, “old wine in a new bottle.” An earlier chapter, in tracing the history of municipal bonds, described how cities made large capital investments in infrastructure and transportation networks in order to promote economic development. Cities in the 1800s feared that without adequate investment in public facilities, population and jobs would go elsewhere. Mayors in the largest cities make a similar argument today.

Throughout history, cities have struggled to define their role in terms of financing infrastructure. In the 1800s, tensions existed between municipalities and state governments, many of which were constitutionally barred from borrowing to finance infrastructure. Not until the Great Depression did the federal government begin to alleviate some of the financial pressure imposed on municipal governments. Following World War II, states began to invest heavily in capital facilities, primarily in the areas of higher education, transportation, housing, and health. At the same time, suburban expansion and the movement of people out from the central city stimulated the development of local government entities–townships, townships, townships.

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villages, school districts, water districts, and other statutory authorities. Central cities began to express a set of concerns that have become quite redundant over the years. In addition to serving as a "dumping ground" for the poor and immobile members of society, they also provide numerous services which benefit a regional rather than local community.\(^5\) The topic of infrastructure finance raises issues pertinent to intergovernmental relations, not just between municipalities and state and federal governments, but also between large cities and the various neighboring local government entities.

In many ways, the "infrastructure crisis" bears certain similarities to the problems of big cities in the 1960s. Although urban renewal, Model Cities,\(^6\) and other Great Society programs of the sixties were designed with the intention of helping the urban poor and black communities, the problems of poverty, unemployment, and inadequate housing opportunities for blacks have not gone away; in fact, hispanics and other recent arrivals have joined the ranks of the urban poor. Today, the talk of "rebuilding America's cities" focuses on repairing sewer lines, water systems, public housing, schools, jails, transit systems, and other forms of public works. One member of Congress expressed a commonly shared belief:\(^7\)

Infrastructure and economic development are tightly intertwined; it's time we put them together. It's time we made our cities productive, so that their businesses and industries can reach full productivity again...

\(^5\)For data on city-suburb disparities see Department of Housing and Urban Development (1979), Changing Conditions in Municipal Areas. urban Data Reports No. 1., Office of Policy Development and Research. Washington, D.C.


The implication here, is that by investing in infrastructure, cities can address many of the problems of poverty and unemployment which remain as resilient as ever.

The notion that public works should be used as a countercyclical measure was first introduced under Franklin D. Roosevelt's New Deal Programs of the 1930s. Unemployed workers were put to work on large scale infrastructural projects under federal programs such as the Works Progress Administration, the Civilian Conservation Corps, and the Employment Service. Federal legislation in the sixties, such as the Economic Opportunity Act and the Manpower Development Training Act, as well as the Comprehensive Employment and Training Act (CETA) in the 1970s, and the Job Training Partnership Act (JTPA) in the 1980s, reflect the federal government's commitment to promoting full employment. Yet unemployment, particularly in cities and among minorities and youths remains a major problem. In recent years, decreased federal support programs such as CETA and the Job Corps (for youth) has meant a shift away job training and greater emphasis upon job creation.

The evidence in earlier chapters suggests that the pattern of capital accumulation in sunbelt cities over the period 1965-1982 is different from that of older, frostbelt cities. In the sunbelt areas, capital spending curves resemble a steepening incline, while the patterns of capital spending in other cities fluctuate much more unpredictably. The empirical results suggest that sunbelt cities face fewer difficulties in arranging financing for their capital projects. In addition to growing populations and tax bases,

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they have, in general, lower levels of current spending and outstanding debt and higher bond ratings. Upon closer examination of the "infrastructure crisis," it become quite clear that it is the cities in the Northeast, the Industrial Midwest, and the frostbelt which face the most severe problems. In this way, the "infrastructure crisis" can also be seen as part and parcel of the decline accompanying regional shifts in population and economic activity.9

Finally, the "infrastructure crisis" represents a reincarnation of the fiscal crises which have periodically surfaced in large American cities. The most serious fiscal emergencies occurred during the Panics of the 1800s and the Great Depression when thousands of local governments went into default. Because of severe revenue shortages, heavy debt burdens, and large expenditure commitments, cities were unable to finance capital projects. New York City's fiscal crisis10 in the mid-70s, and Cleveland's near default in 1978, stand out as similar, yet more localized events. In both cases, borrowing was curtailed and capital projects cancelled. A


similar amount of brinksmanship was evident in the aftermath of many of the tax-expenditure limitations¹¹ (Proposition 13, Proposition 2-1/2, etc.) which were enacted in the late 70s and early 80s. In many of the affected communities, the response was to cut capital budgets and postpone large infrastructural improvements. Moreover, in some communities, such as in Massachusetts following Proposition 2-1/2, the rating agencies suspended bond ratings, thereby, putting a freeze on long term borrowing. As communities devised new ways of increasing and diversifying local revenues, garnering greater amounts of state aid, the effects of tax limits have subsided. The backlog of postponed capital improvements, much like that encountered after the Depression and World War II, has helped to fuel the "infrastructure crisis."

In summary, the problems associated with financing and building urban infrastructures represent "old wine in a new bottle." In other words, urban problems are pretty much the same, but the packaging is different. Cities still face revenue shortages, commitments above and beyond their financial means, and an assortment of economic externalities over which they have relatively little control.

**The Need for a Strong Debt Policy**

The earlier chapters show that among the largest cities in the country, there are wide variations in capital spending. In some cities, the pattern of decreased capital spending is unmistakeable. In other cities, levels of investment in infrastructure appear to be growing far beyond previous levels. The analysis has shown that in general, long term debt

precedes capital outlays by one to two years. Large federal aid allotments, on the other hand, generally tend to occur in the same year as large capital outlays. Over the past two decades, there has been a firm connection between federal aid, long term debt, and infrastructure.

The present direction of federal policy towards cities suggests that large federal grants for infrastructure are likely to become relics of the past. Grants to state and local governments have declined from 11.7 percent of the federal budget in 1978 to 6.2 percent in 1985 (amounting to an annual loss of $52.7 billion in 1985). State and local governments have that much less to spend, or, in other words, that much more to raise for capital projects and general government operations. Lost revenues will need to be made up if initiatives begun under federal programs are to be continued.

Second, more than ever before, municipalities will be left to fend for themselves. While the "New Federalism" implies greater discretionary authority at the state and local levels of government, it also suggests that in terms of infrastructure, cities will have to develop and implement, their own plans.

Large cities currently face a double-edged sword: there is at the same time strong evidence of increasing capital needs and also a weakening in the financial capacity of cities. There is physical evidence, visible signs of deterioration of public facilities. Moreover, capital spending and maintenance of infrastructure has diminished. At the same time, it has become increasingly difficult for municipalities to borrow in the bond market. Traditional investors (banks and insurance companies) have been

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replaced by more fickle newcomers (individuals and bond funds). Increasingly, the market has shifted away from general obligations (marketed by competitive sales) and towards revenue bonds (arranged through negotiation). New non-traditional units of local government (special districts, statutory authorities, non-profits, etc.) have become much more prominent. Finally, numerous changes in the federal tax code have made municipals less attractive investments. The bond market has become an increasingly unstable and risky environment for traditional borrowers.

Long term debt and federal aid have played major roles in financing local capital improvements. Reductions in federal aid suggest that municipalities will have to become increasingly self sufficient in terms of generating funds for infrastructure. At the same time, borrowing in the bond market has become more difficult. Now more than ever before, cities must adopt strong debt policies.

A strong debt policy begins with an accurate determination of capital need. In earlier sections, a distinction was made between needs based on physical standards, and needs which are based on the willingness to pay among members of a community. A sound assessment of capital needs, therefore, involves both a precise determination of what level of service a particular facility will provide (e.g., millions of gallons of water treated, number of patient beds, tons of garbage converted to energy, etc.), and what the facility will cost, in terms of both capital and operating costs. Other important information includes the expected service life of the facility, and projections of income (if any) which may be generated by the project. By combining project specific information with data on the community's
willingness to pay for such a facility, the level of capital need can be established.

A strong debt policy attempts to **balance debt and non-debt resources**. A municipality has a number of different revenue sources which can be used for financing infrastructure. Current revenues include: taxation, service charges, miscellaneous revenues, and intergovernmental revenues. There are only three basic sources of taxation: wealth (e.g. personal or real property), income (earned or unearned), and business transactions (sales taxes, licence taxes, utility taxes, and occupancy taxes). Service charges include those for water, electricity, gas, tolls, and transit fares. Also included among these are fees for school lunches, sewage hook-ups, parking, and admission receipts. There are also a variety of current revenues which are included in the category of miscellaneous revenues: special assessments, sale of property, interest income, fines and forfeits, rents and royalties, donations, net lottery revenues, insurance adjustments, unclaimed moneys, and profits from sale of securities. Some municipalities also collect revenues from the operation of liquor stores and insurance trust operations. Finally, there are a variety of intergovernmental revenues, including various grants, shared taxes, loans, and advances. A sound debt policy includes taking stock of all available current revenues which can be pledged toward meeting capital needs. A debt policy should distinguish between pay-as-you-acquire financing and pay-as-you-use financing schemes. A pay-as-you-acquire financing plan involves using current revenues to acquire needed capital facilities. A pay-as-you-use plan involves using debt financing to spread costs of a facility over time, so that future generations benefiting from the project share in its costs. A city which depends entirely upon debt financing of capital
facilities risks overloading its credit limit and increasing borrowing costs. On the other hand, pay-as-you-acquire techniques may help to encourage greater fiscal responsibility, reduce debt loads and borrowing costs, and strengthen future efforts to borrow. Rather than view pay-as-you-acquire and pay-as-you-use as mutually exclusive conditions, a strong debt policy involves balancing debt and non-debt financing of capital facilities.

A strong debt policy allows for both flexibility in terms of the selection of security pledged and in terms of the length of maturity of debt instruments. Ideally, bonds should be issued during periods of comparably low interest costs, or outstanding bonds with higher coupons should be refinanced when interest rates come down. A sound debt policy should encourage "interest rate watching." At the same time, cities with strong debt policies will have at their disposal a wide range of instruments: general obligations, revenue bonds (enterprise, special tax, lessee bonds, special assessment debt, and moral obligations). While general obligations (full faith and credit) have the lowest interest costs, they may require special referenda and competitive sale to underwriters. Non-guaranteed debt, while more expensive, may enable a community to evade debt limits and ceilings, as well as avoid the more time consuming elements of floating a general obligation. A strong debt policy specifies appropriate conditions for the use of short-term debt. As events during the New York City fiscal crisis illustrate, a city's long term debt market can be greatly affected by short term borrowing practices. A strong debt policy goes hand-in-hand with sound techniques of financial management, accounting, and full disclosure.

Finally, a strong debt policy encourages policy-makers and administrators to track and monitor levels of debt, particularly in relation
to changing revenues. Cities should work to develop their own "red flags" indicating that outstanding debt has grown too large relative to equalized assessed valuation or some other measure, such as total government income. The notion of municipal debt carrying capacity\textsuperscript{13} is particularly important and financial managers should track long term debt, short term debt, as well as other liabilities, such as those resulting from unfunded pension plans. Rather than suggest "rule of thumb" standards, the emphasis here is on encouraging municipal finance officers to develop their own information systems, monitoring debt over time, in relation to key financial variables.

Because of the increase in unmet capital needs and the withdrawal of federal government support of local infrastructure projects, municipalities must develop strong debt policies. The pressure to do so exists now more than ever before.

The Need for Additional Research

A obvious temptation upon completion of this or similar studies is to call out for more research. While there have been virtually no longitudinal studies of in this ilk, the general availability of data suggests that more could be done. While this study focused mainly upon three variables: debt, federal aid, and outlays, the Census of Government collects annual data, for the largest cities on many other variables. It would be interesting, for example, to find out how the long-term pattern of capital investment is related to other revenue sources (i.e., charges and fees, sale of property, interest income, etc.) Another set of analyses could attempt to relate investment practices with cash management practices (i.e., do cities which

\textsuperscript{13}See for example, Date, D. J. (1978) Municipal Debt Carrying Capacity Study. New London Ontario.
have reserve funds, investment funds, etc.) have greater levels of capital spending.

Another set of research questions which should be asked include those regarding the actual, physical condition of urban infrastructure. Earlier, when existing studies and surveys were analyzed, the difficulties and costs associated with conducting such an assessment of capital needs was discussed. As pointed out earlier, it is one thing to analyze spending patterns and infer the condition of infrastructure, and quite another to actually conduct a physical inspection of infrastructure systems. Empirical research linking investment patterns to actual physical conditions of infrastructure is sorely needed. It is not inconceivable to formulate a regression equation, which has as the dependent variable an interval scale measure of infrastructure condition, and several independent variables such as age, volume of use, and level of maintenance. With such an equation, one could estimate, with greater accuracy, the impacts of deferred maintenance or project the required costs necessary to achieve an acceptable level of infrastructure quality.

Along these wishful lines of thinking, one could also imagine a more detailed set of case histories involving the collection of additional data from the city officials responsible for decision-making. There are obvious differences between cities. The cross-sectional analysis in Chapter 5 demonstrates that not only do cities differ in terms of their use of debt and in their levels of capital investment, but certain attributes (i.e., size, growth, density, age, etc.) can explain some of these differences. Perhaps based on this cross-sectional analysis one could select a smaller sample of cities to investigate in greater detail.

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Once this subset of cities was identified, one could go about conducting traditional case studies. Perhaps, the theoretical decision-models presented in Chapter 7 could be confirmed or embellished with the input of financial officers. Certainly it would be interesting to know how they would categorize the style of decision-making which prevails in their community. Similar to the community power studies of the fifties and sixties, one could identify key decision-makers and test the accuracy of the hypothesized models. It was also be valuable to hear, first-hand, why certain decisions pertaining to borrowing and spending were made, and what factors were considered. The longitudinal analyses in Chapter 8 enable the pinpointing of many of the "big decisions" for each of the cities. Armed with this level of specificity, one could certainly do much in the way of establishing the connection between decisions and outcomes.

To suggest these possibilities, which for the most part require the collection of new data represents, to some extent, a dodge of some of the weaknesses inherent in this particular study. In fairness, there are several flaws in this study, which I acknowledge in a spirit of "academic mea culpa," permissible in studies such as this. First, there should have been greater emphasis upon identifying, describing, and developing a life-cycle theory of cities as it relates to capital investment and borrowing decisions. Only by conducting the longitudinal analysis did the striking differences between growing cities and declining cities emerge. While the cross-sectional analyses served to confirm some of these distinctions (note in particular the W-statistic results) between sunbelt and frostbelt cities, the declines in capital spending, the dependency on federal aid, and the erratic nature of borrowing became even more obvious when they were graphed. Second, this particular study may have suffered from the
ambitiousness associated with research conducted in areas where "few have ventured." In addition to the difficulties associated with theory-building, the job of integrating all of the related historical, economic, and political developments which have a bearing on municipal bonds and capital investment, was left unfinished. The task was initiated, both in the cross-sectional analysis and in the time-series analysis, but it was, unfortunately, never fully completed. If debt was more narrowly defined (i.e., the focus was only on general obligation bonds) or if infrastructure was confined to a few specific areas (i.e., water, sewer, or streets), perhaps, then a more complete integration could have occurred.

While a discussion of "what might have been" could continue until virtually no stone is left unturned, a more useful and positive ending points to the discovery that while the infrastructure needs of large American cities differ widely, urban areas do share a strikingly common destiny. Whether one views the current predicaments of cities in the Northeast as a long run harbinger of things to come for sunbelt cities, or if one takes the position that regardless of geographic location, the disparities between wealthy and poor cities continue to grow, the end result is much the same: all cities need to invest in infrastructure and all cities face new challenges in capital finance.

The system of Fiscal Federalism has taken a rather sweeping turn—some would argue for the worse, others would maintain the opposite, but few would deny it. It is clear that under the new system, cities and states will have to become increasingly self-sufficient. Cities will have to look more within their own boundaries to find the necessary resources to finance not just infrastructure, but many other social programs. Adjusting to these
times means rethinking local service priorities, reorganizing public services, cultivating new financial arrangements, and bolstering productivity.

One might argue, moreover, that the current infrastructure crisis spells the end of the large general purpose municipal government. Increasingly, solutions to the infrastructure problem point to the need to create more special purpose districts, regional authorities, or other statutory entities which remove from cities their capital planning responsibilities. At the same time, the idea that certain urban problems (i.e., crime, poverty, unemployment, inadequate housing etc.) continue to bear signs of incurablity, a condition which tends to stifle innovation or at least the willingness to try new solutions. Often, remedies are perceived as political infeasable, economically unreachable. In a sense, urban problems are what they are because few care enough to think about them and even less are willing to tackle them. As such, the anticipated demise of municipal government seems highly overrated; in the absence of big city governments, who would pick up the pieces?

In the final assessment, it is up to municipal government to develop a strong debt policy, to squeeze state and federal agencies for continued support, to explore the use of new debt instruments, to encourage greater savings and investment, to forge new partnerships, and to institute the organizational reforms necessary to promote better infrastructure planning. Municipal attributes and behavioral patterns are quite diverse. The range of potential solutions to the infrastructure crisis is quite wide. In the end, it
might be said even among cities,¹⁴

natural selection is daily and hourly scrutinizing, throughout the world, the slightest variations; rejecting those that are bad, preserving and adding up all that are good; silently and insensibly working, whenever and wherever opportunity offers, at the improvement of each organic being in relation to its organic and inorganic conditions of life. We see nothing of these slow changes in progress, until the hand of time has marked the lapse of ages, and then so imperfect is our view ...that we see only that the forms of life are now different from what they formerly were...

Bibliography


Muller, T. (1975) "The Declining and Growing Metropolis" in G. Sternlieb and J. Hughes, Post Industrial America: Metropolitan Decline and Regional Job Shifts. The Center for Policy Research. New Brunswick;


Temporary Commission on City Finances (1965) Report of the Temporary Commission on City Finances. New York City;


