

1991

## An Investigation of the Determinants of the Municipal Decision to Privatize Residential Sanitation Collection.

Richard C. Brooks

*Louisiana State University and Agricultural & Mechanical College*

Follow this and additional works at: [https://digitalcommons.lsu.edu/gradschool\\_disstheses](https://digitalcommons.lsu.edu/gradschool_disstheses)

---

### Recommended Citation

Brooks, Richard C., "An Investigation of the Determinants of the Municipal Decision to Privatize Residential Sanitation Collection." (1991). *LSU Historical Dissertations and Theses*. 5109.  
[https://digitalcommons.lsu.edu/gradschool\\_disstheses/5109](https://digitalcommons.lsu.edu/gradschool_disstheses/5109)

This Dissertation is brought to you for free and open access by the Graduate School at LSU Digital Commons. It has been accepted for inclusion in LSU Historical Dissertations and Theses by an authorized administrator of LSU Digital Commons. For more information, please contact [gradetd@lsu.edu](mailto:gradetd@lsu.edu).

## INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

**The quality of this reproduction is dependent upon the quality of the copy submitted.** Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps. Each original is also photographed in one exposure and is included in reduced form at the back of the book.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.

# U·M·I

University Microfilms International  
A Bell & Howell Information Company  
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA  
313/761-4700 800/521-0600



**Order Number 9200052**

**An investigation of the determinants of the municipal decision to  
privatize residential sanitation collection**

**Brooks, Richard C., Ph.D.**

**The Louisiana State University and Agricultural and Mechanical Col., 1991**

**U·M·I**  
300 N. Zeeb Rd.  
Ann Arbor, MI 48106



AN INVESTIGATION OF THE DETERMINANTS OF  
THE MUNICIPAL DECISION TO PRIVATIZE  
RESIDENTIAL SANITATION COLLECTION

A Dissertation

Submitted to the Graduate Faculty of the  
Louisiana State University and  
Agricultural and Mechanical College  
in partial fulfillment of the  
requirements for the degree of  
Doctor of Philosophy

in

The Department of Accounting

by  
Richard C. Brooks  
B.S., Montclair State College, 1981  
M.A.T., Montclair State College, 1985  
May 1991

## ACKNOWLEDGEMENTS

I wish to express my appreciation to the members of my dissertation committee for their support and guidance: Professors Nicholas G. Apostolou (chairman), Barbara A. Apostolou, Daryl M. Guffey, Glenn E. Sumners, and Geoffrey K. Turnbull (economics).

I would also like to thank Dr. Daniel G. Kyle, Legislative Auditor of the State of Louisiana, for his assistance in securing data for this dissertation.

The faculty and staff of LSU provided invaluable assistance to me while working on my doctorate. In particular, I would like to acknowledge: Professor Vincent C. Brenner, Chairman of the Department of Accounting; Professor W. Bartley Hildreth, of the Public Administration Institute; and Billie Tripp, of the Governmental Services Institute.

The support of family is especially important when one decides to take on an ambitious goal such as earning a doctorate. This dissertation is dedicated to my mother, Henrietta S. Brooks, and to the memory of my father, Charles G. Brooks.

## TABLE OF CONTENTS

ACKNOWLEDGEMENTS . . . . .	ii
LIST OF TABLES . . . . .	v
LIST OF FIGURES . . . . .	vi
ABSTRACT . . . . .	vii
 Chapter	
1. OVERVIEW OF THE STUDY . . . . .	1
Introduction . . . . .	1
Theoretical Framework . . . . .	7
Research Question . . . . .	10
Method . . . . .	11
Contributions of the Study . . . . .	12
Summary . . . . .	15
2. REVIEW OF THE LITERATURE . . . . .	16
Efficiency of Public Versus Private Production . . . . .	16
The Determinants of Privatization . . . . .	29
Public Choice Theory . . . . .	36
Determinants of Accounting Choice . . . . .	42
Summary . . . . .	45
3. THEORETICAL FRAMEWORK . . . . .	47
The Theory of Bureaucracy . . . . .	48
Public Choice Theory . . . . .	61
Public Choice, Bureaucracy Theory and the Decision to Privatize . . . . .	75
Municipal Accounting Data and the Decision to Privatize . . . . .	83
Summary . . . . .	88
4. METHOD . . . . .	90
Research Question . . . . .	90
Research Hypotheses . . . . .	92
The Model . . . . .	100
Data Collection . . . . .	102
Data Analysis . . . . .	104
Summary . . . . .	105

5.	DATA ANALYSIS . . . . .	107
	Data Collection . . . . .	107
	Descriptive Statistics . . . . .	110
	Inferential Statistics . . . . .	113
	Tests of the Model . . . . .	119
	Summary . . . . .	134
6.	SUMMARY AND CONCLUSIONS . . . . .	137
	Summary of the Study . . . . .	137
	Implications . . . . .	138
	Limitations . . . . .	147
	Suggestions for Future Research . .	148
	REFERENCES . . . . .	151
	APPENDIX: Survey Instrument . . . . .	156
	VITA . . . . .	161

## LIST OF TABLES

Table Page		
4-1	Summary of Null Hypotheses Tested . . .	100
4-2	Hypotheses, Variable Definitions, and Expected Sign for Coefficients . .	103
5-1	Breakdown of Respondents by RSC Arrangement . . . . .	110
5-2	Descriptive Statistics for Demographic Variables . . . . .	111
5-3	Descriptive Statistics for Independent Variables . . . . .	112
5-4	T-Test Results for Demographic Variables . . . . .	115
5-5	T-Test Results for Independent Variables . . . . .	116
5-6	Pearson's Product-Moment Correlation Coefficients . . . . .	121
5-7	Results of Multiple Regression Tests for Multicollinearity . . . . .	121
5-8	Summary of Logit Results . . . . .	124
5-9	Summary of Re-Estimated Logit Results .	133
5-10	Summary of Hypotheses Test Results . . .	136

## LIST OF FIGURES

Figure		Page
3-1	Demand for G by sponsor organization . . . . .	50
3-2	The budget-output function . . . . .	52
3-3	The cost-output function . . . . .	54
3-4	The marginal cost function . . . . .	55
3-5	Demand constrained equilibrium . . . . .	57
3-6	Budget constrained equilibrium . . . . .	58
3-7	Level of G desired by voters A, B and C.	62
3-8	Demand for G by voters A, B and C at various tax prices . . . . .	64
3-9	Direct democracy model . . . . .	66
3-10	Preferred combination of G and X at different tax prices . . . . .	68
3-11	Relationship between political ideology and number of voters . . . . .	71
3-12	Representative democracy model . . . . .	74
3-13	Voter utility levels for various levels of G . . . . .	76
3-14	Value of G to sponsors with differing budget-output functions . . . . .	79
3-15	Theoretical model . . . . .	82

## ABSTRACT

The Governmental Accounting Standards Board (GASB) Concepts Statement No. 1, Objectives of Financial Reporting states that (GASB 1987, 27) "Financial reporting should assist in fulfilling government's duty to be publicly accountable and should enable users to assess that accountability." Government accountability requires that public officials answer to the citizenry. Further, accountability rests on the notion that the citizenry has a "right to know" (GASB 1987, 21). Therefore, according to GASB Concepts Statement No. 1, municipal accounting data should reflect public resource allocation decisions made by government officials. This study investigates the usefulness of municipal accounting data for modeling a particular public resource allocation decision: the decision to privatize residential sanitation collection (RSC).

Data from Louisiana municipalities are used in this study. Inferential statistics are used to characterize the two groups of municipalities (those that privatize RSC and those that do not privatize RSC) in terms of demographic and financial variables. Public choice theory and the theory of bureaucracy are used to suggest municipal accounting information that is useful for modeling the municipal decision to privatize RSC. Logistic regression (logit) analysis is employed to test

whether municipal accounting data is useful for modeling the municipal decision to privatize RSC. The explanatory value of the overall model is evaluated using a chi-square statistic. Chi-square tests of the individual coefficients in the logit model are used to test the individual hypotheses. Five of the nine independent variables are statistically significant at the .10 level.

The major conclusion of this study is that public resource allocation decisions are impounded in the municipal accounting numbers. This finding makes it possible to assess the accountability of public officials by using municipal accounting data. Furthermore, public choice theory and the theory of bureaucracy provide the theoretical underpinnings necessary to develop models of public resource allocation decisions using municipal accounting data.

CHAPTER 1  
OVERVIEW OF THE STUDY

Introduction

The Governmental Accounting Standards Board (GASB) Concepts Statement No. 1, Objectives of Financial Reporting states that (GASB 1987, 27): "Financial reporting should assist in fulfilling government's duty to be publicly accountable and should enable users to assess that accountability." Government accountability requires that public officials answer to the citizenry and rests on the notion that the citizenry has a "right to know" (GASB 1987, 21). Therefore, according to GASB Concept Statement No. 1, municipal financial records should reflect public resource allocation decisions made by government officials. The ability of municipal accounting data to reflect public resource allocation decisions has not received much attention in the accounting literature. This study investigates the usefulness of municipal accounting data for modeling a particular public resource allocation decision: the decision to privatize residential sanitation collection (RSC).

RSC is one of the most important public services a municipal government provides to its residents and the cost of this service is not inconsequential. Depending on the range of services offered, a local government may devote as much as 30% of its budget to RSC (Savas 1979, 25). Municipal residents pay for RSC via personal taxes (e.g., property taxes, general sales taxes) or user fees based upon the cost of the service. Regardless of the financing arrangement, city residents bear the cost.

While municipalities generally provide (i.e., finance) RSC, they do not necessarily engage in the actual production of the service. That is, a municipality has a choice regarding who actually performs RSC. Two alternatives to using municipal employees for RSC are: (1) contracting with a private sector firm, and (2) contracting with another governmental unit (e.g., city, county).

The purpose of this study is to investigate the usefulness of municipal accounting data for modeling the municipal decision to privatize RSC. Privatization, as used in this study, refers to the contracting out of a municipal service to a private sector firm. This definition of privatization implies that the production of a service is turned over to a private sector firm while financing remains the responsibility of the municipality. Throughout this study privatized RSC and

contract RSC are used interchangeably and refer to an arrangement whereby RSC is carried out by a private sector firm under contract with a municipality.

RSC is the focus of this study for three reasons: (1) the importance of RSC to city residents, (2) the widespread proliferation of privatized RSC, and (3) the existing body of literature concerning the privatization of RSC provides a solid foundation on which to build. Each of these reasons is discussed below.

Millar (1983, 191) summarizes the importance of RSC:

Residential solid waste collection is one of the most basic of all municipal services. It is estimated that American households alone discard [a lot] of solid waste each year and all of it needs to be collected.

Given the magnitude of the problem, it is not surprising that residential solid waste collection is an important issue for every city.

The highly visible effect of RSC on the appearance of a community and its impact on public health combine to create concern among local government officials (Savas 1979, 25).

While many public services are privatized in the United States, some services possess qualities which increase their attractiveness to private sector firms. A partial listing of services that are often privatized includes: airports, data processing, fleet or vehicle maintenance, hospitals, parking lots or garages, public safety or corrections, RSC or disposal, transit or

transportation, utilities, and vehicle towing or storage. RSC is a likely candidate for privatization because the necessary inputs to production are abundant in the economy (e.g., unskilled labor and specific capital). Also, the costs for private sector firms to enter into (and exit from) the RSC market are relatively low. This propensity for private sector firms to enter into the RSC market is apparent from the results of a 1987 survey of privatization in America, sponsored by Touche Ross (now Deloitte Touche), the International City Management Association (ICMA), and the Privatization Council:

. . . the services most frequently contracted out in the last five years have been solid-waste collection or disposal (nearly 60%), vehicle towing or storage (45%), and building or grounds maintenance and service (nearly 45%) (David 1988, 47).

According to David (1988, 47), these same services are expected to remain among the most frequently privatized.

Finally, there exists a substantial volume of prior research regarding the privatization of RSC. Most empirical studies compare the cost of contract RSC with the cost of municipal RSC. The majority of these studies find that municipal RSC is more costly than contract RSC (Kitchen 1976; Savas 1977; Stevens 1978; Bennett and Johnson 1979; McDavid 1985; Berenyi and Stevens 1988). If this is true, one must wonder why so many municipalities use municipal employees for RSC.

This particular issue has not received much attention in the literature. The present study provides some insights as to the determinants of the municipal decision to privatize RSC.

Millar (1983) identifies the following methods of RSC as the five most popular RSC arrangements in use in the United States:

1. Municipal--RSC is carried out by municipal employees.
2. Contract--RSC is carried out by a private sector firm under contract with the local government.
3. Franchise--RSC is carried out by a private sector firm that is awarded the exclusive right to operate in a specific area by the local government. Under this arrangement the firm is paid directly by the individual citizens.
4. Private--RSC is carried out by a private sector firm hired and paid directly by its customers (the citizens). The firm does not have exclusive rights, therefore, several firms may engage in RSC in the same geographic area.
5. Self-Service--each household delivers its own refuse to a disposal site or transfer station.

The data for the present study is drawn from the State of Louisiana which has 301 municipalities. Louisiana is dominated by small municipalities (population less than 10,000). This is a significant feature of the data because of the limited amount of prior research regarding small governmental units.<sup>1</sup>

Privatization of municipal services is a topic that concerns public officials, public employees, citizens, and scholars. Each of these groups has an interest in a decision regarding the privatization of municipal services. The cost of privatization in economic as well as political terms is important to public officials. Public employees fear they will lose their jobs because of privatization. Citizens are interested in the impact of privatization on the taxes they pay as well as the quality of services they receive. Finally, scholars seek to understand the economic and political impact of privatization, as well as the factors that influence the decision to privatize.

Most academic research regarding privatization is published in the fields of economics, political science, and public administration. One line of research compares the cost of private sector service delivery to the cost of public sector service delivery, showing that

---

<sup>1</sup>Stallings and Ferris (1988) find that between 1940 and 1984 less than 24% of the papers in Public Administration Review focus on local government.

private sector service delivery is less costly than public sector service delivery (e.g., Deacon 1979, McGuire and Van Cott 1984, Ferris 1988). A second area of research utilizes the tools of economics to investigate the political forces that drive political decision making (e.g., McGuire, Ohsfeldt and Van Cott 1987). This second area of research is within the realm of public choice theory. The present study employs the public choice approach.

#### Theoretical Framework

The decision to privatize RSC is a public resource allocation decision. Decisions regarding the allocation of public resources are made via the political process. The political process is a complex set of interactions between voters, politicians, and bureaucrats. To understand the decisions resulting from this complex set of interactions a comprehensive theoretical framework is necessary to model the behavior of voters, politicians, and bureaucrats. Public choice theory and the theory of bureaucracy provide the foundation for such a theoretical framework.

Public choice theory maintains that in a democracy, such as the United States, voters decide how public funds are expended. In a representative democracy, voters elect public officials on the assumption that, once elected, the official will make decisions that are

in the best interest of the citizenry. The median voter model (Hotelling 1929; Bowen 1943; Downs 1957) is the dominant theoretical framework for investigating government spending. The median voter model is based on the premise that in a simple majority rule election the voter with the median preferences is the deciding vote. Therefore, politicians will seek the support of the median voter. According to the median voter theorem, the allocation of public resources coincides with the preferences of the median voter.

The theory of bureaucracy (Niskanen 1971) maintains that bureaucrats are utility maximizers that do not rely on votes to remain in their jobs. Because they are isolated from the voting mechanism, bureaucrats are able to allocate public resources such that their personal utility is maximized. Therefore, to understand bureaucratic decision making, the arguments of a bureaucrat's utility function must be known. According to Niskanen (1971) one of the arguments in the utility function of a bureaucrat is the size of his or her budget. Accordingly, a bureaucrat attempts to maximize his or her budget.

Bureaucrats serve under elected politicians. Therefore, bureaucrats can only act as self-interested utility maximizers so long as they do not jeopardize the political careers of the politicians they serve. The

present study synthesizes public choice theory and the theory of bureaucracy into an unified theoretical framework to analyze the municipal decision to privatize RSC. In this framework, bureaucrats are utility maximizers constrained by the political process and voters are rationally ignorant regarding political issues. That is, voters only become politically active when the benefits of political activity exceed the costs of becoming politically active (Downs 1957). The rational ignorance of voters implies that there is a range of government activity within which voters are apathetic. This range is referred to herein as the "range of voter indifference." According to this framework, a bureaucrat seeks to maximize personal utility, disregarding the best interests of the citizenry, within the range of voter indifference. Outside of the range of voter indifference, voters mobilize and react to political events, forcing bureaucrats to implement policies more consistent with their desires. Tax increases beyond some threshold level and the perception of excessive waste in government are two issues that typically mobilize voters into action. The range of voter indifference provides some insight as to why some observed public resource allocation decisions are not always necessarily in the best interest of the citizenry.

### Research Question

Prior research suggests that contract RSC is less costly than municipal RSC (Kitchen 1976; Savas 1977; Stevens 1978; Bennett and Johnson 1979; McDavid 1985; Berenyi and Stevens 1988). However, there are many municipalities that do not use contract RSC. Therefore, decision makers in the public sector (i.e., bureaucrats) are not minimizing costs. Niskanen (1971) provides a theoretical rationale (i.e., the theory of bureaucracy) for the lack of cost minimizing behavior on the part of bureaucrats. Public choice theory provides a framework for predicting the actions of voters and politicians. Together, public choice theory and the theory of bureaucracy provide the foundation for a comprehensive theory of public resource allocation decisions. The present study combines public choice theory with the theory of bureaucracy to investigate the municipal decision to privatize RSC. The principal research question is:

Is municipal accounting data useful for modeling the municipal decision to privatize RSC?

Hypotheses derived from public choice theory and the theory of bureaucracy are used to investigate this research question. Municipal accounting data are used to operationalize the hypotheses.

Municipal accounting data is a written, historical, and verifiable record of public resource allocation decisions. Prior research suggests that municipal accounting data is useful in explaining voter behavior since it measures the effects of policy decisions consistent with voter assessment (Ingram and Copeland 1981, 830). The present study is a response to a call for additional research regarding the usefulness of municipal accounting information (Ingram and Copeland 1981, 841).

#### Method

A survey of Louisiana municipalities is used to obtain data for this study. The survey ascertains the method of RSC, the cost of RSC, as well as other data necessary for the study. Inferential statistics are used to characterize the two groups of municipalities (those that privatize RSC and those that do not privatize RSC) in terms of demographic and financial variables. Public choice theory and the theory of bureaucracy are used to guide the selection of municipal accounting data useful for modeling the municipal decision to privatize RSC. Logistic regression (logit) analysis is employed to test the extent to which municipal accounting data is useful for modeling the municipal decision to privatize RSC. Multicollinearity among the independent variables in a logit model can

make the interpretation of the individual coefficients difficult. Therefore, the independent variables are examined for evidence of multicollinearity. The explanatory value of the model is evaluated using a chi-square statistic. Chi-square tests of the individual coefficients in the logit model are used to test the individual hypotheses.

#### Contributions of the Study

The GASB Concepts Statement No. 1, "Objectives of Financial Reporting," implies that governmental financial reports should reflect public resource allocation decisions (GASB 1987). This study demonstrates the use of municipal accounting data for modeling a particular public resource allocation decision: the decision to privatize RSC. Public choice theory and the theory of bureaucracy guide the selection of municipal accounting data to operationalize the determinants of the decision to privatize RSC. While the decision to privatize RSC is a specific public resource allocation decision, this study illustrates how a theoretical framework which incorporates public choice theory and the theory of bureaucracy can be used to suggest municipal accounting data useful for modeling other public resource allocation decisions. Thus, this study strengthens the link between municipal accounting

data, public choice theory, and the theory of bureaucracy.

This study synthesizes public choice theory and the theory of bureaucracy into an unified theory of constrained bureaucratic decision making. That is, a formal framework is presented which models bureaucratic decision making that is constrained by the political process (i.e., voters and politicians). While the specific decision of privatization of RSC is the focus of this study, the theoretical framework should be useful for investigating other public resource allocation decisions.

The decision regarding how municipal services are delivered is a public resource allocation decision. Once the decision to provide a public service is made, the mode of service delivery must be considered. This study investigates two modes of RSC: municipal--where RSC is carried out by municipal employees, and contract--where RSC is carried out by a private sector firm under contract with a municipality.

Prior research suggests that contract RSC is less costly than municipal RSC (Kitchen 1976; Savas 1977; Stevens 1978; Bennett and Johnson 1979; McDavid 1985; Berenyi and Stevens 1988). However, prior research uses data from municipalities with populations greater than 10,000. This study uses data from Louisiana

municipalities, the majority of which are small (population less than 10,000). Therefore, this study extends the current body of literature by providing empirical evidence regarding the effect of privatization on the cost of RSC in small municipalities.

According to the U.S. Bureau of Census (1989, 285), 88% of all municipal governments serve less than 10,000 people; 94% of all township governments serve less than 10,000 people; and 23% of all county governments serve less than 10,000 people. However, in an examination of articles appearing in Public Administration Review between 1940 and 1984, Stallings and Ferris (1988, 583) find a rather small percentage (less than 24%) of papers concerning local government. The majority of articles focus on the federal government, while state government appears to be a popular topic during the decade of the 1950s. Cornia and Usher (1981, 74-75) also allude to the lack of research regarding local governments. They point out that most budgeting research deals with state and federal government and results are often generalized to the local level. Such generalizations, however, may not be appropriate because of institutional differences that exist between local governments and federal/state governments (Cornia and Usher 1981, 75). For example, unlike local governments, the federal government is not

required to submit a balanced budget (Cornia and Usher 1981, 75). The present study contributes to the existing body of literature by providing empirical evidence regarding the determinants of the decision to privatize RSC by small municipalities (i.e., municipalities serving less than 10,000 people).

### Summary

This chapter provides an overview of the study. GASB Concept Statement No. 1 is presented as the motivation for the study. Public choice theory and the theory of bureaucracy are presented as the building blocks of a comprehensive theoretical framework for investigating the usefulness of municipal accounting data for modeling public resource allocation decisions. The research question and research method are described. The contributions of the study are also discussed. The remaining chapters present a review of the literature relevant to the study, a formal presentation of the theoretical framework, a detailed description of the research method, an analysis of the data, and the conclusions of the study.

CHAPTER 2  
REVIEW OF THE LITERATURE

The purpose of this chapter is to review the literature relevant to the present study. The literature is separated into four sections. The first section reviews studies regarding the efficiency of public sector vs. private sector production of government services. The second section analyzes research that investigates the determinants of the privatization decision. The third section discusses public choice theory and the theory of bureaucracy. The fourth section reviews studies that use logit or probit to investigate the determinants of accounting choices.

Efficiency of Public Versus  
Private Production

Many studies document the efficiency of private sector production over public sector production.<sup>2</sup> Generally, three reasons account for the efficiency of private sector production. First, competition in the

---

<sup>2</sup> For example, Ahlbrandt (1973) investigates fire protection; Kitchen (1976), Savas (1977), Stevens (1978), Bennett & Johnson (1979), McDavid (1985), and Berenyi & Stevens (1988) all investigate refuse collection; and McGuire & Van Cott (1984) investigate school bus transportation.

production of services tends to drive costs down since the marketplace forces high priced, inefficient firms out of business. Second, private sector firms can take advantage of scale economies since they are not constrained by geographical boundaries. Therefore, private sector firms can choose an optimal size or scale of operation--a choice typically unavailable to municipalities (Spann 1977, 89). Finally, the incentive structure for the manager of a private sector enterprise is more conducive to efficient production than the incentive structure of the public bureaucracy (Spann 1977, 89). This is true because many private sector enterprises offer salaries that can be increased via efficient production such as a bonus plan based on net income. However, municipal managers rarely have such bonus plans to provide an incentive to operate efficiently.

#### Kitchen

Kitchen (1976) uses data from 48 Canadian municipalities (all with populations in excess of 10,000) to study the factors affecting the average unit cost of refuse collection. The results suggest that refuse collection costs increase: (1) when the site of collection is at the rear of a dwelling, (2) as annual snowfall increases, (3) as weekly labor cost per truck increase, and (4) as population density increases. On

the contrary, refuse collection costs decrease: (1) when specialized collection vehicles are used, (2) as the number of persons per household increase, (3) as the proportion of residential only collection increases, and (4) when contract collection is used rather than municipal collection (Kitchen 1976, 72).

#### Savas

Savas (1977) reports the results of a study of the prevalence and comparative efficiency of municipal vs. contract RSC for cities with populations between 2,500 and 750,000. In this study, efficiency is defined as cost per household. This definition of efficiency eliminates the need to obtain cost information from contract firms. Instead, only the prices they charge (which include profits) are necessary (Savas 1977, 58).

The findings indicate that municipal and contract RSC account for 46.9% of the 2,531 cities in the study, with municipal RSC being almost twice as popular as contract RSC (30.3% and 16.6% respectively). Other arrangements such as franchise, private, and self-service account for the remainder of the cities in the study. The results also indicate that for cities with a population in excess of 50,000, contract RSC is more efficient (i.e., cost less per household) than municipal RSC. However, for cities with populations between 2,500 and 20,000, there are no significant differences between

the cost of municipal RSC and contract RSC. According to Savas (1977, 73-74), some of the policy implications of these results are: (1) cities with less than 20,000 residents may be able to lower their RSC cost per household by forming larger markets of up to 50,000 in population, and contracting out RSC to "a single organization--public or private" (Savas 1977, 73); (2) cities with 50,000 to 100,000 residents may significantly lower the cost of RSC per household by contracting with a private sector firm; and (3) the best approach for cities in excess of 100,000 residents is to divide up the city into several districts and have one or more of the districts serviced by a municipal agency while the other districts are contracted out to one or more private sector firms.

The Savas (1977) study uses 1970 Census data, and includes only those U.S. cities with populations in excess of 2,500 that are within a ". . . Standard Metropolitan Statistical Area (SMSA) lying entirely within a single state and having a total population of less than 1,500,000" (Savas 1977, 54). The size of the cities in the Savas (1977) study range from 2,500 to 750,000 in population.

The present study uses more recent data, and includes all municipalities within a single state (Louisiana). The size of the municipalities in the

present study range from 430 to 556,913 in population. Since many of the municipalities in Louisiana are very small (population less than 2,500) a comparison of the cost of municipal RSC and contract RSC for very small communities is possible. Data from a single state excludes some of the confounding factors present when using data from many different states.

### Stevens

Stevens (1978) examines the effect of market structure, degree of competition, and market size on the cost of RSC. Three market structures are investigated: (1) private monopoly, in which RSC is carried out by a private sector firm under contract with a municipality; (2) public monopoly, in which RSC is carried out by a public agency; and (3) competitive, in which RSC is performed by several different organizations (e.g., private sector firm, public agency, etc). The dependent variable in this study is total cost to households served. An ordinary least squares regression is used to determine whether market structure impacts on the ratio of total costs to households served. Market size and service level are held constant in the analysis.

The data for this study is from 340 cities throughout the United States. The populations of these cities range from 2,500 to over 700,000. For cities with populations less than 50,000, Stevens (1978) finds

no significant difference in the cost of RSC when comparing the private monopoly arrangement to the public monopoly arrangement. However, for cities with populations greater than 50,000, the public monopoly arrangement is significantly more costly than the private monopoly arrangement. Stevens (1978, 447) concludes that the cost differences are due to different management and production techniques for the two arrangements. In support of this conclusion, Stevens (1978) finds that private monopolist are more likely to use smaller work crews, larger collection vehicles, and vehicles that can be loaded from the front or side rather than the rear. Also, absenteeism is significantly lower for private monopolist. These findings suggest that private monopolist are superior to public monopolist (i.e., bureaucrats) with respect to minimizing costs.

#### Bennett and Johnson

Bennett and Johnson (1979) compare the cost of county RSC to the cost of private RSC. The fees charged by private RSC firms operating in Fairfax County, Virginia are compared to the fees charged by the Fairfax County Solid Waste Division of Public Works. The Fairfax County Solid Waste Division services approximately one-third of the homes in Fairfax County. The remaining homes contract individually with one of

the 29 private sector firms that operate in the area (Bennett and Johnson 1979, 58-59).

A t-test finds that private RSC is significantly less costly than county RSC. Bennett and Johnson (1979) footnote the fact that the county services an area that is further from the sanitary landfill than the area serviced by the private sector firms. This geographical difference confounds their t-test results since the cost of traveling this additional distance automatically increases the county's RSC costs. This factor is not taken into account by a simple t-test.

#### McDavid

McDavid (1985) reports the results of a study of privatization in the RSC industry in Canada. A questionnaire mailed to all Canadian cities excepting Quebec with 1976 populations in excess of 10,000 is used to collect data for this study. McDavid (1985) obtains a 61.5% response rate.

Three institutional arrangements dominate Canadian cities: (1) municipal--in which public employees are responsible for RSC; (2) contract--in which private sector firms under contract with a municipality are responsible for RSC; and (3) mixed--in which most RSC is the responsibility of municipal employees while private sector firms under contract with the municipality are responsible for the remaining RSC.

McDavid (1985) finds that municipal RSC is the most expensive arrangement (\$42.29 per household), while contract RSC is the least expensive (\$28.02 per household) arrangement. The cost of municipal RSC in mixed systems (\$31.31) is more costly than a strictly contract arrangement, but less costly than a strictly municipal arrangement. According to McDavid (1985, 604), the difference between the cost of municipal RSC and contract RSC is due to managerial differences. McDavid (1985) finds that private sector firms use smaller work crews, larger capacity vehicles, and pay lower wages.

The McDavid (1985) study suggests that private sector firms are superior to municipal agencies with respect to minimizing costs. The results also indicate that competition forces all producers (both public sector and private sector) to minimize costs. The absence of competition under the strictly municipal arrangement apparently provides an environment in which minimizing costs is not necessary.

McDavid (1985) also investigates the effect of privatization on the cost of RSC for two individual Canadian municipalities. The analyses indicate that privatization results in substantial savings. However, since only two cities are analyzed these results must be viewed as antidotal. Valid statistical inferences are

possible only when data from many observations are examined.

#### Berenyi and Stevens

Berenyi and Stevens (1988) compare contract service delivery with municipal service delivery for eight local services (one of which is RSC). The analyses focus on differences in the cost of providing the service, and the quality of the service, as well as, the reasons for any observed cost differences. Data for this study include cities in the Los Angeles Standard Consolidated Statistical Area with populations between 10,000 and 250,000.

Berenyi and Stevens (1988) find that contracting is less costly for all eight of the services investigated. The difference is statistically significant for six of the services. Municipal RSC is significantly more costly than contract RSC ( $\alpha = .05$ ). The results also indicate that differences in the quality of service are not statistically significant. Berenyi and Stevens (1988, 17) conclude that the lower costs associated with contract RSC (in comparison to municipal RSC) are probably due to differences in management and personnel policies.

Berenyi and Stevens (1988) find that private sector organizations make use of incentive systems more often and have fewer levels of management between program

directors and direct labor workers ( $\alpha = .05$ ). In addition, private sector organizations: (1) are more likely to grant managers the authority to hire and fire workers, (2) have lower absentee rates, (4) offer fewer vacation days per worker, (5) utilize younger (less tenured) workers, (6) have a smaller percentage of workers that are unionized, and (7) have ratios of fringe benefits to total salaries and wages that tend to be lower than public sector organizations (all significant at the .01 level). These findings support the notion that private sector organizations are managed differently than public sector organizations.

#### Deacon

Deacon (1979), in a study of 64 cities in Los Angeles county, finds that cities that purchase services from county or private sector vendors spend significantly less than cities that choose to produce their own services. Deacon classifies cities as either "producing" or "purchasing" according to the percentage of budgeted outlays contracted out. This partitioning scheme was developed by Sonenblum et al. (1975)<sup>3</sup>. Most "purchasing" cities in the Deacon (1979) study contract

---

<sup>3</sup>In the Sonenblum et al. (1975) study, cities that contract out less than 10% of their budgeted outlays are labeled self-provision (i.e., producing) cities, while those that contract out more than 10% of their budgeted outlays are labeled contracting (i.e., purchasing) cities.

out more than 20 percent of their budgeted outlays, while none of the "producing" cities contract out more than 3 percent.

Deacon (1979) re-specifies a public expenditure model based on the median voter theorem (Barr and Davis, 1966; Borcharding and Deacon, 1972; and Bergstrom and Goodman, 1973) to allow for the possibility of bureaucratic influences. This is accomplished by including a dichotomous variable where a value of 1 indicates a purchasing city. Expenditure equations are estimated for three cost categories: total expenditures, police protection, and street maintenance. The results indicate that purchasing municipalities spend about 86 percent as much for total expenditures as their producing counterparts. Figures for police protection and street maintenance are 58 percent and 70 percent respectively (Deacon 1979, 388).

#### McGuire and Van Cott

In a study of the effects of public sector versus private sector school bus operation, McGuire and Van Cott (1984) find that private sector school bus operation is less costly than public operation. This study is an extension of the prior research of Bails (1979). McGuire and Van Cott (1984) employ a different data set to correct problems inherent in the data used by Bails (1979).

Bails (1979) compares transportation costs at the county level across six states. The states are divided into two groups: (1) public sector ownership and (2) private sector ownership. The problems inherent in this classification scheme are twofold. First, public ownership exists in varying degrees in the states classified as public, while private sector ownership exists in varying degrees in the states classified as private. Second, public accounting procedures, regulatory practices, climate, and topographical conditions are not consistent across the states. These conditions introduce extraneous, confounding factors into the analysis.

McGuire and Van Cott (1984) restrict their study to the state of Indiana to avoid problems inherent in interstate comparisons. The data for the McGuire and Van Cott (1984) study includes 275 school districts. Of these, 144 provide transportation with district-owned (public) buses; 49 school districts use the services of private sector contractors; and 82 districts use both district-owned and contractor-owned buses. Opportunity costs, not available in the accounting records (e.g., foregone interest income associated with district ownership, economic depreciation rather than accounting depreciation, and registration fees implicit in district

ownership), are estimated and included in the cost of providing transportation via district-owned buses.

McGuire and Van Cott (1984) find that the cost per mile is higher for public bus systems in 12 of 15 comparisons. In five of these comparisons the difference is statistically significant. The cost per trip is higher for public bus systems in 11 of 15 comparisons. In six of these comparisons the difference is statistically significant.

#### Ferris

Ferris (1988) investigates the effects of local service contracting on public spending and employment.

Ferris (1988) merges four sources of data:

- (1) Cross-sectional data from the 1982 International City Management Association (ICMA) survey on local supply arrangements,
- (2) County and City Data Book of 1982,
- (3) The Annual Survey of Governments: Finance and Employment Statistics 1981, and
- (4) Moodys' Municipal and Government Manual 1982.

A sample of 500 cities with populations of 25,000 or more is used in this study. The results indicate that as the percent of public services produced externally increases, general expenditures, total expenditures, and public employment all decrease. These results suggest that external (private sector)

production is less costly than internal (public sector) production.

All of the above studies suggest that public sector production is more costly than private sector production. Therefore, municipalities that do not privatize RSC are spending more public resources than would be spent if RSC was contracted out to a private sector firm. The present study investigates the determinants of the decision to privatize RSC.

#### The Determinants of Privatization

This section reviews three studies that investigate the determinants of privatization. These studies provide a foundation for the present study. The present study extends prior research by using public choice theory and the theory of bureaucracy (Niskanen 1971) to guide the selection of municipal accounting data useful for modeling the municipal decision to privatize RSC.

#### Sonenblum, Kirlin and Ries

Sonenblum, Kirlin and Ries, (1977) investigate cities in Los Angeles county to determine why cities contract out services, how contracting affects tax rates, and how contracting and its effects on tax rates affect the level and composition of expenditures. In their study, a sample of 72 cities in Los Angeles County are partitioned into two groups based on the percentage

of budgeted outlays contracted out. Municipalities are labeled "self-provision" cities if they contract out less than 10 percent of their city budget. Forty-four cities are considered self-provision cities. The remaining 28 cities contract out between 10 and 100 percent of their budgeted outlays and are labeled "contracting cities." The results suggest that contracting cities have a smaller tax base and spend less on municipal services than self-provision cities.

The researchers use a system of multiple regression equations in which independent variables are entered in a recursive fashion (Sonenblum et al. 1977, 117). The model uses a three stage process as follows:

Step I: Contracting =  $F_1$  (community characteristics, tax bases)

Step II: Tax Rates =  $F_2$  (community characteristics, tax bases, contracting)

Step III: Expend =  $F_3$  (community characteristics, tax bases, contracting, tax rates)

The results of the Sonenblum, Kirilin and Ries (1977) study suggest that the extent of contracting out is determined by trade-offs between the desire to: (1) maintain control over service delivery, (2) keep expenditures low, and (3) minimize the tax burden on property owners. Specifically, the findings suggest that the degree of contracting out increases as the desire to maintain local control decreases. However, regardless of the preference for local control,

declining commercial sales within a municipality tend to increase the degree of contracting out. Therefore, the tax base variable dominates the local control variable. An increase in the incidence of contracting is also associated with an increase in the property base per capita and a decrease in family incomes.

Another conclusion of the Sonenblum, Kirlin and Ries (1977) study is that contracting is associated with lower property tax rates and lower property taxes per capita. However, contracting is also associated with the use of special districts. A special district is a special purpose governmental unit set up to administer a specific local function. Special districts may be independent special purpose governmental units created under state law or they may be component units of county, city, or other general governmental units (Hay 1989). When special district tax rates are explicitly considered, the overall average municipal service tax rate of contracting cities is identical to that of self-provision cities (Sonenblum, Kirlin and Ries 1977, 132). Therefore, when considering the effect of contracting on property tax rates, it is important to account for the use of special districts (and hence special district taxes). Failure to do so may result in the misleading conclusion that contracting reduces the overall tax burden of the citizen.

The conclusions of the Sonenblum, Kirilin and Ries (1977) study must be interpreted with caution. Specifically, the contracting, tax rate, and expenditure variables are all endogenous. Therefore, the estimation procedure used yields unreliable (i.e., biased and inconsistent) estimates. A simultaneous-equation model (e.g., three-stage least squares<sup>4</sup>) should be used to take into account the codetermination of tax rates, expenditures, and the propensity to contract out.

#### Ferris

Ferris (1986) examines the determinants of privatization in cities across the United States. This study uses cross-sectional data from the 1982 ICMA Survey of Alternative Approaches for Delivering Services; the 1983 County and City Data Book; the Survey of Governments: Finance Statistics, 1981; and the Advisory Committee on Intergovernmental Relations Significant Features of Fiscal Federalism, 1982-83. Because of the unavailability of data for cities with populations of less than 25,000, a data set consisting of 477 cities with populations of at least 25,000 is used. Three sets of factors are used to model the decision to contract out:

---

<sup>4</sup> See Pindyck and Rubinfeld 1981 Econometric Models and Economic Forecasts New York: McGraw-Hill Company (pp. 334-338) for a discussion of the three-stage least squares technique.

. . . the potential for reducing the costs of producing services, the fiscal pressures to reduce the costs of producing services, and the political inducements and obstacles to contracting out (Ferris 1986, 291).

Specifically, Ferris (1986, 291) states that contracting out is more likely as (1) potential cost savings increase, (2) the incentive to reduce costs increase, and (3) political opposition to contracting becomes weaker. Based on this conceptual model, the following equation is estimated:

$$\text{CONTRACT} = a + b_i \text{SUPPLY}_i + b_j \text{FISCAL}_j + b_k \text{POLITICAL}_k$$

where **CONTRACT** is the percentage of services provided by the city that are produced externally; **SUPPLY** is a vector of variables related to the costs of production and the supply of external producers; **FISCAL** is a vector of variables that characterize the fiscal environment of the city; and **POLITICAL** is a vector of political forces that influence the contracting out decision.

The results of the Ferris (1986) study suggest that a city is more likely to privatize when private sector salaries are lower than the salaries paid to city employees. Also, large cities are more likely to privatize than small (population between 25,000 and 50,000) cities. With respect to the political variables, the results suggest that privatization is less likely as: (1) the percent of the population that

is 65 years of age or older increases, (2) as the percent of households with incomes of \$30,000 or less increases, and (3) as the number of city employees per 100 residents increases.

With respect to the fiscal variables, cities with relatively high tax burdens contract out more often. The evidence also suggests that as the percentage of city revenues received from federal and state grants increase, the percentage of services contracted out to private sector firms increases. This result is opposite the a priori expectation. Ferris (1986) notes that reliance on intergovernmental revenues may be a proxy for limited fiscal capacity since many grant programs are based on community need. Ferris (1986) also finds that municipalities operating under an overall tax rate limit are more likely to privatize. All fiscal variables are significant. Therefore, variables regarding the financial status of a municipality are important in modeling the municipal decision to privatize RSC.

McGuire, Ohsfeldt and Van Cott

Using cross-sectional data from the 50 states and the District of Columbia for the 1979-80 school year, McGuire, Ohsfeldt and Van Cott, (1987) investigate why some governmental units choose to provide public services with publicly owned and operated production

units, whereas other governmental units choose to provide the same service via contracts with private sector firms. Niskanen's (1971) theory of bureaucracy is employed to develop a model of the decision to contract out school bus transportation in the United States. Niskanen's (1971) theory views bureaucratic decisions as a function of a bureaucrat's attempt to maximize personal utility. The results of the McGuire, Ohsfeldt and Van Cott (1987) study support the theory that bureaucrats behave as utility maximizers.

McGuire, Ohsfeldt and Van Cott (1987) conclude that contracting with private sector firms is more attractive as (1) the degree of labor unionization in the public sector increases relative to the private sector, (2) strike activity in the public sector increases relative to the private sector, and (3) public sector wage rates increase relative to private-sector wage rates.

A bureaucrat behaving as a utility maximizer will opt for the mode of service delivery that is less problematic. Unionization and strike activity are two issues that a utility maximizing bureaucrat tries to avoid. Therefore, as unionization and strike activity in the public sector increase, a utility maximizing bureaucrat is more likely to use privatization as a method of avoiding these issues. The third conclusion is less consistent with Niskanen's (1971) theory.

Budget maximizing bureaucrats are not necessarily concerned with the fact that private sector wages are lower than public sector wages. However, elected officials desiring to remain in office are concerned with the perception of excessive waste in government. If public sector wages are relatively higher than private sector wages, some voter groups may pressure elected officials to be more efficient. Elected officials must then respond by either (1) reducing public sector employee wages or (2) privatizing services to take advantage of the lower costs of production in the private sector.

The theory of bureaucracy guides the McGuire, Ohsfeldt and Van Cott (1987) study. However, the variables are primarily of a socioeconomic nature. The present study employs both public choice theory and the theory of bureaucracy to suggest independent variables of a financial nature to model the municipal decision to privatize RSC.

#### Public Choice Theory

The decision to privatize public services is a public resource allocation decision. Two institutional arrangements dominate democratic societies for making such decisions: (1) direct democracy and (2) representative democracy. A direct democracy is one in which all citizens vote on all issues concerning public

resource allocation. However, larger societies are, of necessity, representative democracies. In a representative democracy, citizens elect representatives to public office. These representatives (public officials) are endowed with the authority to make decisions for their constituents. Because public officials depend on their constituents for election and re-election, they support legislation that will generate the votes necessary for election and re-election (Downs 1957). Therefore, theoretically, representative democracy results in public resource allocation decisions that are in the best interest of the citizenry. However, representative democracy does not always result in public resource allocation decisions that are in the best interest of its citizens. In regard to this point Holcombe (1985, 4) states:

In the U.S. case, at least, it appears that the governmental form was freely chosen by its citizens, and the theoretical challenge is to explain how a government freely chosen by its citizens can act in a way that is not in the best interest of those citizens. Apart from any connection with historical reality, any meaningful theory of government that shows that the government can act against the best interests of its citizens must rest on a foundation theory that the offending institution could have been chosen voluntarily by the governed citizens. It is of relatively little importance to point out that a government imposed upon people could work against those people's best interest. Of far more significance are the cases where governments voluntarily chosen by people can work against their interests.

The dominant theory in the economics literature regarding public sector decision making is public choice theory. Public choice theory uses the tools and analytical methods of economics to study the governmental sector, politics, and the public economy (Buchanan 1984, 13). In defining public choice theory, Buchanan (1984, 13) states:

As with economic theory, the analysis attempts to relate the behavior of persons in their various capacities as voters, as candidates for office, as elected representatives, as leaders or members of political parties, as bureaucrats (all of these are "public choice" roles) to the composite of outcomes that we observe or might observe. Public choice theory attempts to offer an understanding, an explanation, of the complex institutional interactions that go on within the political sector.

To study public resource allocation decisions, a model of governmental decision making is necessary. The median voter model (Hotelling 1929; Bowen 1943; Downs 1957) is the dominant theoretical model used to investigate the determinants of public resource allocation decisions. The median voter model holds that in a democratic setting public resource allocation decisions coincide with those preferred by the voter having the median preference. Since politicians in a representative government, such as the United States, require a majority of the votes to get elected to office, they tend to propose a political platform that appeals to the majority of voters. To be re-elected, a

politician must, while in office, institute policies that appeal to a majority of the voters. Therefore, the median voter is decisive in election outcomes (Downs 1957).

Another area of public choice theory attempts to explain the public resource allocation decisions of bureaucrats. A bureaucrat is ". . . the senior official of any bureau with a separate identifiable budget" (Niskanen 1971, 22). A bureaucrat is an official working within a government's bureaucracy who is not necessarily concerned with generating votes in order to remain in office. Because a bureaucrat does not need to generate votes to remain in office, it is not necessary for him or her to be concerned with the efficiency of the governmental unit. In other words, bureaucrats are not necessarily motivated to implement policies that are in the best interest of society.

If a bureaucrat is not compelled to select policies that are in the best interest of society, what types of policies are bureaucrats likely to implement? To answer this question one must consider the factors that drive bureaucratic decisions. According to Niskanen (1971), a bureaucrat is driven to maximize personal utility. In Niskanen's view, one of the arguments in a bureaucrat's utility function is the size of his or her budget. Accordingly, bureaucrats seek to maximize their budgets.

In his book, Bureaucracy and Representative Government, Niskanen (1971) develops a theory of bureaucracy. He argues that government tends to produce an output level that is greater than the optimal level. One of the basic tenants of this theory is that bureaucrats are motivated by self-interest. The theory of bureaucracy suggests that when a bureaucrat decides to privatize a municipal service, it is done because this decision increases personal utility in some way. Similarly, when a bureaucrat decides not to privatize a municipal service, this decision also increases personal utility in some way. Therefore, a model of the decision to privatize RSC must utilize variables that capture the arguments of a bureaucrat's utility function. Since these arguments are unknown, the present study uses the theory of bureaucracy to guide the selection of independent variables that impact a bureaucrat's decision to privatize RSC.

Bureaucrats serve politicians. Therefore, the actions of bureaucrats are constrained by the politicians and voters they serve. In accordance with the work of Downs (1957) the present study assumes that politicians are vote maximizers and voters are rationally ignorant. Voter ignorance of political issues is rational because of the cost of becoming informed (Downs 1957). Becoming informed is very costly

on an individual level. The phenomenon of rational ignorance provides a range of voter indifference in which voters are apathetic regarding the political process. Within this range of indifference bureaucrats may act as utility maximizers and disregard the best interests of the citizenry. However, outside of this range of indifference voters are motivated to take political action. Two issues that tend to mobilize voters into action are (1) tax increases above some threshold level and (2) the perception of excessive government waste. The results of a study by Ingram and Copeland (1981) suggest that municipal accounting data may be useful in explaining voter behavior. In their study, Ingram and Copeland (1981) use municipal accounting information to predict the outcome of elections for mayor in 113 cities with populations greater than 25,000. According to Ingram and Copeland (1981, 840) municipal accounting data and socio-demographic data provide information that may be useful in predicting mayoral election results. The Ingram and Copeland (1981) study provides some evidence that municipal accounting data reflects policies implemented by politicians. Furthermore, municipal accounting data appears to impound information that is used in voting decisions.

## Determinants of Accounting Choice

Models based on the cumulative logistic probability function (logit) and the cumulative normal probability function (probit) are used extensively by accounting researchers to investigate the determinants of accounting choice. Logit and probit overcome problems associated with ordinary least squares regression when the dependent variable is dichotomous. This section reviews several accounting studies that employ logit or probit.

### Senteney and Strawser

Senteney and Strawser (1990) investigate the association between financial statement effects and the early adoption of Statement of Financial Accounting Standard No. 87 (SFAS 87). A cross-sectional logit model is employed to assess the simultaneous impact of five independent variables on the early adoption decision. The dependent variable in the logit model assumes the value of 1 if a firm elects early adoption of SFAS 87 and 0 if the firm does not elect early adoption. The results indicate that the ratio of accumulated benefit obligation to fair value of plan assets is significant regarding the early adoption of SFAS 87 ( $p = 0.05$ ). The ratio of total debt to total equity is only marginally significant ( $p = 0.15$ ). The remaining three variables are not significantly

different from zero. The overall logit model only exhibits marginal significance. Therefore, in general, the independent variables in this study do not explain management's decision to adopt SFAS 87 prior to the implementation date (Senteney and Strawser 1990).

Elliott et al.

Elliott et al. (1984) use logit to identify characteristics of firms that elect to capitalize research and development (R&D) costs prior to Statement of Financial Accounting Standard No. 2 which requires companies to expense R&D outlays in the year incurred. The model uses 75 capitalizing and 560 expensing firms having average R&D/Sales ratios greater than one percent during the period 1974-76 (Elliott et al. 1984, 94). The findings indicate that capitalizing firms tend to have both negative retained earnings and highly variable R&D expenditures over time.

Bowen, Noreen and Lacey

Bowen, Noreen and Lacey (1981) use probit to study the determinants of the decision to capitalize interest. The dependent variable in this study represents the method of accounting for interest costs that are related to expenditures on assets not yet in service. The two allowable methods prior to SEC Accounting Series Release No. 163 in 1974, are (1) expensing interest costs and

(2) capitalizing interest costs. The dependent variable is therefore dichotomous. Independent variables include: (1) the existence of a management compensation plan explicitly tied to reported earnings (a dummy variable), (2) a dividend constraint dummy variable, (3) interest coverage ratio, (4) leverage ratio, and (5) firm size. According to the results of the probit model, debt covenant variables significantly influence the corporate decision to capitalize interest.

#### Hagerman and Zmijewski

Hagerman and Zmijewski (1979) use probit to study the determinants of accounting policy choices. The data consists of a cross-sectional sample of 300 firms that disclose their choice of accounting methods in their 1975 annual and/or SEC 10-K reports. Four accounting policy choices are investigated: (1) inventory method--LIFO vs. FIFO, (2) depreciation method--accelerated vs. straight line, (3) treatment of the investment tax credit--flow-through vs. deferral, and (4) amortization period of past service pension costs--less than 30 years vs. 30 years or more.

The dependent variable is the effect (i.e., increasing or decreasing) of the policy choice on net income. The dependent variable is therefore dichotomous. The model includes six independent variables: (1) firm size--sales and total assets, (2)

capital intensity--the ratio of gross fixed assets to sales, (3) concentration ratio--the percentage of sales accounted for by the eight largest firms in each four digit standard industrial code category in the sample, (4) the existence of a profit sharing plan (dummy variable), (5) risk--the beta of the firm, and (6) the effective tax rate (used only in the inventory choice models to control for the tax effects of the choice between FIFO and LIFO). The models for depreciation method choice and inventory method choice are statistically significant.

The above studies illustrate the use of logit and probit to investigate the determinants of policy choice decisions when the dependent variable is dichotomous. A dichotomous dependent variable causes the error term in an ordinary least squares regression to be heteroscedastic (Hagerman and Zmijewski 1979, 149-150). Therefore, ordinary least squares parameter estimates are unbiased but inefficient, making the usual tests of statistical inference inappropriate. Probit and logit are techniques specifically designed for qualitative (i.e., dichotomous) dependent variables, such as the decision to privatize RSC.

#### Summary

This chapter presents a review of the literature relevant to the present study. The first section

reviews studies regarding the efficiency of private sector versus public sector production. The main conclusion of this line of literature is that private sector production is less costly than public sector production. The second section discusses studies that investigate the determinants of the decision to privatize public services. These studies suggest that the decision to privatize municipal services is influenced by the interaction of voters, politicians, and bureaucrats. The third section presents public choice theory and the theory of bureaucracy as the theoretical foundation for constructing a model of the decision to privatize RSC. Finally, the fourth section reviews studies that use logit and probit to illustrate the use of these statistical techniques in accounting choice research.

### CHAPTER 3

#### THEORETICAL FRAMEWORK

This chapter formally presents the theoretical framework employed in this study. The framework synthesizes two theories that dominate the economic literature regarding the allocation of public resources: (1) Niskanen's (1971) theory of bureaucracy and (2) public choice theory. The decision to privatize a service financed by government is a public resource allocation decision. Public choice theory and the theory of bureaucracy provide the foundation for a comprehensive theoretical framework useful for analyzing public resource allocation decisions resulting from the interaction of voters, politicians, and bureaucrats.

The first section of this chapter presents the theory of bureaucracy as advanced by Niskanen (1971). Public choice theory is the subject of the second section. The third section synthesizes the theory of bureaucracy and public choice theory into a unified theoretical framework. The fourth section describes the linkage between municipal accounting data, public choice theory, and the theory of bureaucracy. The chapter concludes with a brief summary.

## The Theory of Bureaucracy

In his book, Bureaucracy and Representative Government, Niskanen (1971) develops an economic theory of bureaucracy behavior. One of the basic tenants of this theory is that a bureaucrat is motivated by self-interest. That is, a bureaucrat is a utility maximizer. This tenant implies that the criteria for deciding among alternatives will emphasize the effect of a decision upon the bureaucrat rather than the organization. Clearly, a model of bureaucratic decision processes must then utilize variables that capture the arguments of a bureaucrat's utility function. Niskanen's (1971) theory of bureaucracy provides insight into the arguments of a bureaucrat's utility function.

According to Niskanen (1971), a bureaucrat is an official working in the public sector who does not depend on votes to remain in office. Because bureaucrats do not depend upon votes, it is not necessary for them to be very concerned with the impact of their decisions on voters. This implies that a bureaucrat is not necessarily motivated to implement policies consistent with voter desires. In Niskanen's (1971) view, a bureaucrat makes decisions that enhance his or her personal utility. According to Niskanen (1971, 38) the utility of a bureaucrat is a function of salary, prestige, power, patronage, output of the

bureau, and perquisites of office. All of which ". . . are a positive monotonic function of the total budget of the bureau during the bureaucrat's tenure in office" (Niskanen 1971, 38). Accordingly, a bureaucrat seeks to maximize the size of his or her budget. The remainder of this section provides a graphical presentation of the basic bureaucracy model (Niskanen 1971, 1-52).

#### The Budget-Output Function

Niskanen (1971, 15) defines a bureau as an organization with two distinguishing characteristics: (1) the owners and employees are unable to capture any of the difference between revenues and costs as personal income, and (2) some part of the recurring revenues derive from sources other than the sale of output at a per-unit price. A sponsor organization typically grants a budget to a bureau, and cost efficiency is typically not a concern of the head of a bureau.

In the present study, the sponsor organization is the city council. The maximum budget that the city council (i.e., sponsor) awards a bureau depends upon the expected output of the bureau. Figure 3-1 illustrates a sponsor organization's demand for the output of a bureau. The downward sloping demand curve conveys the notion that the sponsor derives less value from each additional unit of output  $G$  by the bureau. The value of an additional unit of output to the sponsor (i.e., the

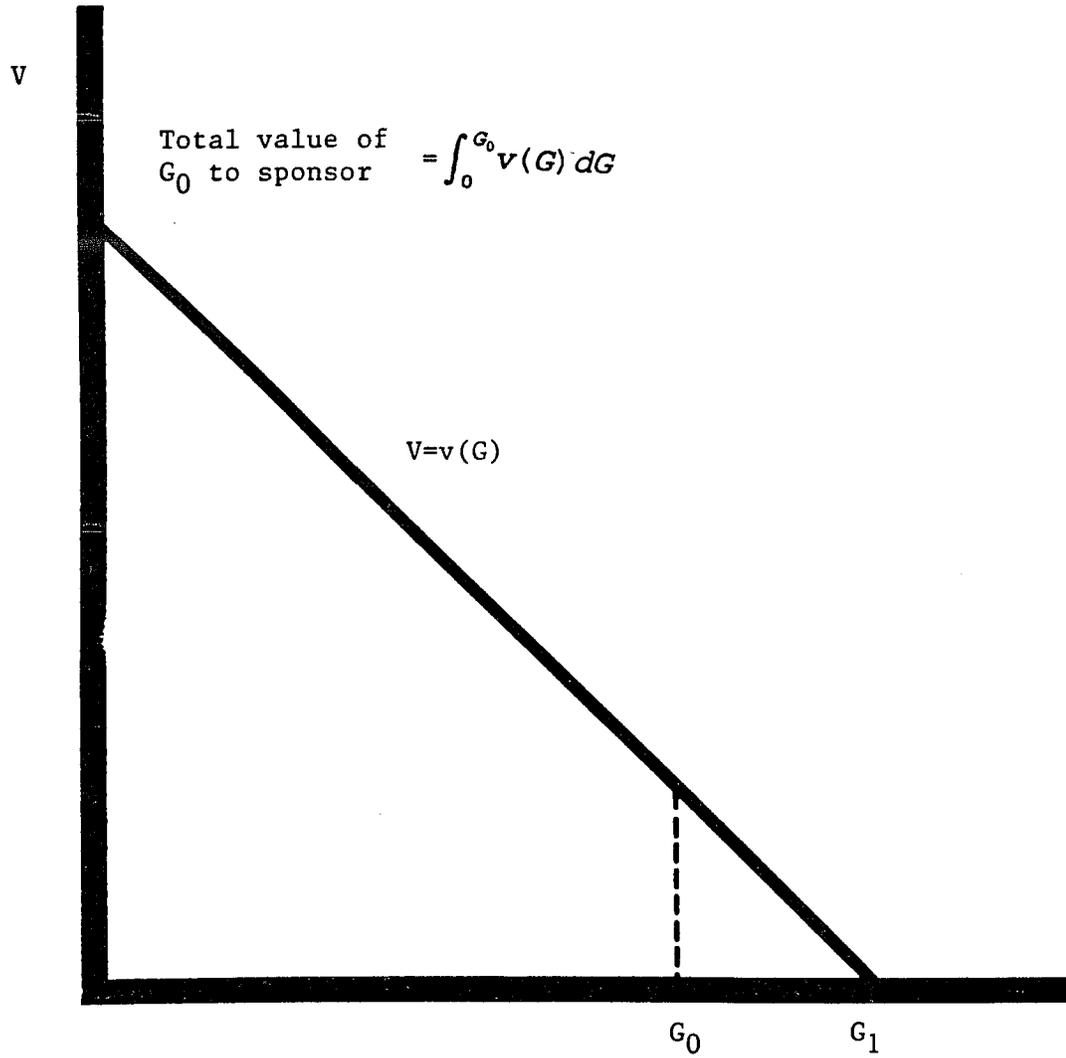


Fig. 3-1. Demand for G by sponsor organization

marginal value) is given by:  $V = v(G)$ .

The area under the demand curve up to  $G_0$ ,  $\int_0^{G_0} v(G) dG$ , represents the total value of  $G_0$  units of  $G$  to the sponsor. This area, therefore, is the maximum budget that the sponsor will award for  $G_0$  units of output  $G$ , the maximum the sponsor will pay to obtain the quantity  $G_0$ .

Since the sponsor values each additional unit of  $G$  less, the size of the budget that a sponsor awards to a bureau will increase at a decreasing rate as the amount of  $G$  increases. Figure 3-2 illustrates the relationship between the amount of output  $G$  expected from a bureau and the size of the budget awarded by the sponsor. This relationship is referred to as the budget-output function and is given by:

$$B = b(G)$$

The budget-output function represents the total value of various amounts of  $G$  to the sponsor (i.e., the maximum budget that will be awarded at different levels of  $G$ ). The maximum budget to be awarded at  $G_0$  amount of  $G$  is:

$$B_q = \int_0^{G_0} v(G) dG$$

#### The Cost-Output Function

The minimum cost of producing output by a bureau can be expressed in a cost-output function, which shows

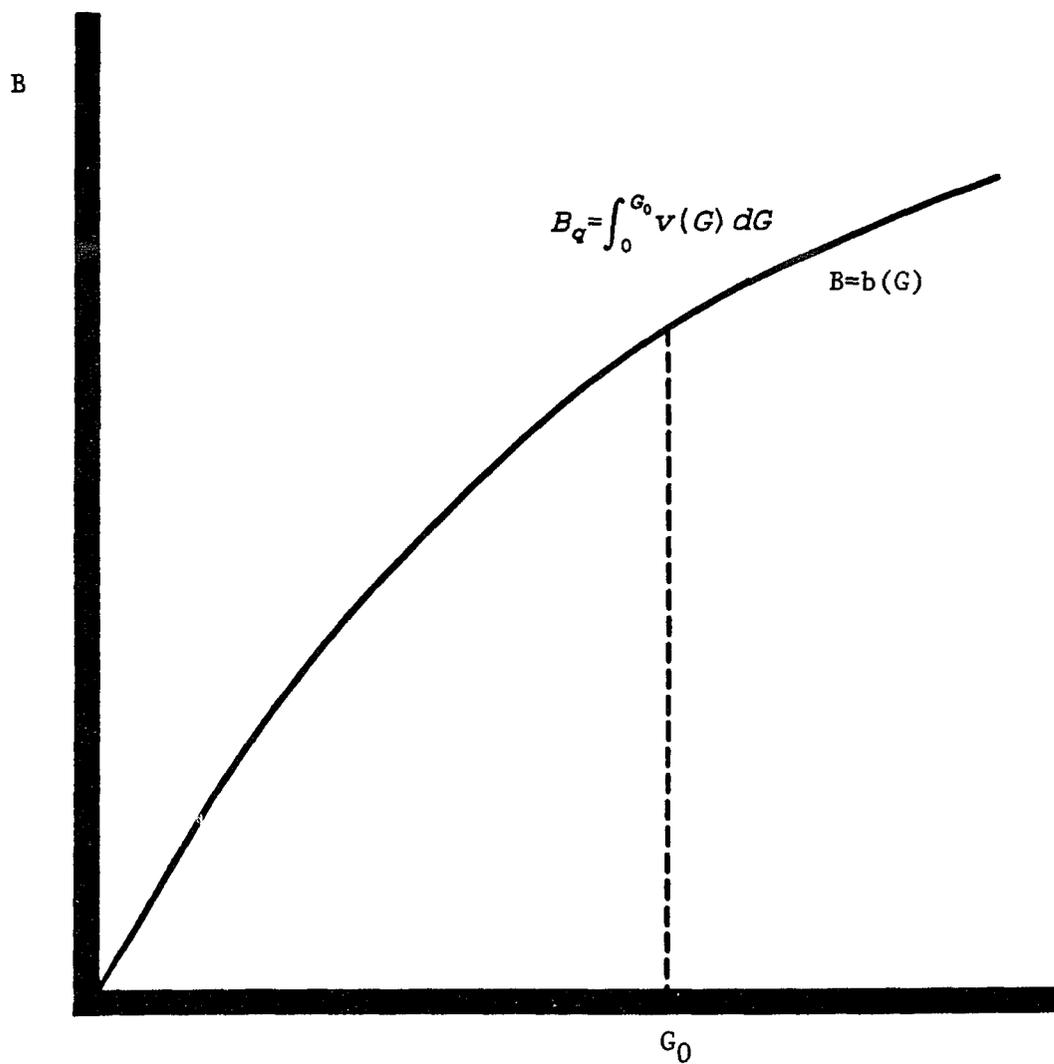


Fig. 3-2. The budget-output function

the total costs of producing various levels of output. That is, total production costs  $C$  are a function of the amount of output  $G$  produced (i.e.,  $C = c(G)$ ). The cost-output function in Figure 3-3 assumes that fixed costs for the bureau are zero, but this can be easily generalized to fixed costs being positive<sup>5</sup>. The cost-output function is also assumed to increase at a constant rate<sup>6</sup>. Therefore, the marginal cost function is a horizontal line (i.e., zero slope) as in Figure 3-4.

Since the operation of a bureau is dependent upon funding from its sponsor, the sponsor must award a budget that is greater than or equal to the total cost of producing output  $G$ . Consequently, a bureau will continue to operate, if and only if,  $B \geq C$ .

---

<sup>5</sup>Fixed costs (FC) are zero in the long run, (since all cost are variable in the long run) but in the short-run we would expect  $FC > 0$ .

<sup>6</sup>In general, as production increases, fixed factors constrain the production process thus causing an increasing marginal cost of variable factors of production. A cost-output function exhibiting increasing marginal costs captures the diminishing marginal productivity of variable factors in the short-run; however, this is not essential to the analysis. Steadily increasing marginal costs of output in conjunction with a positive (or zero) fixed cost component simply implies that unit costs increase as output increases.

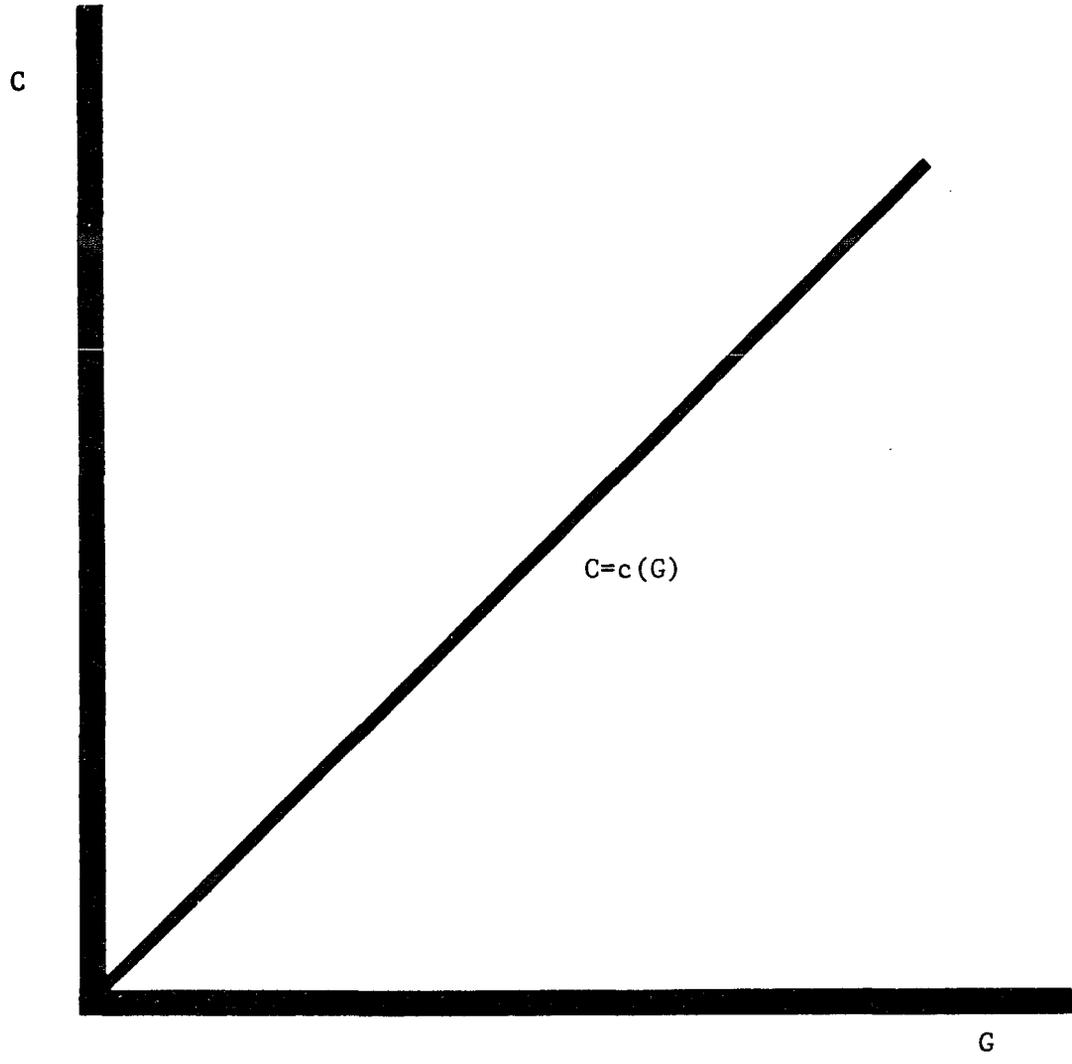


Fig. 3-3. The cost-output function

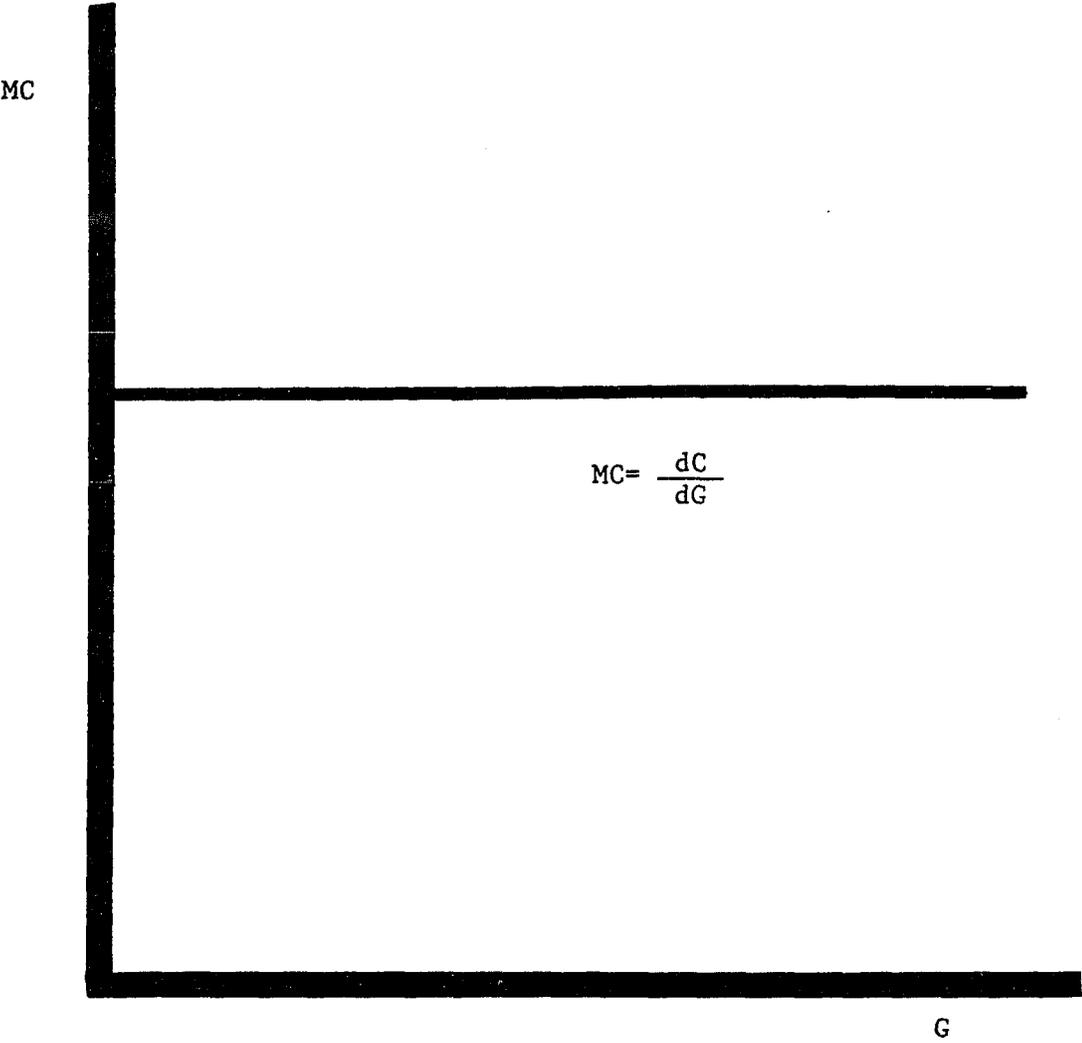


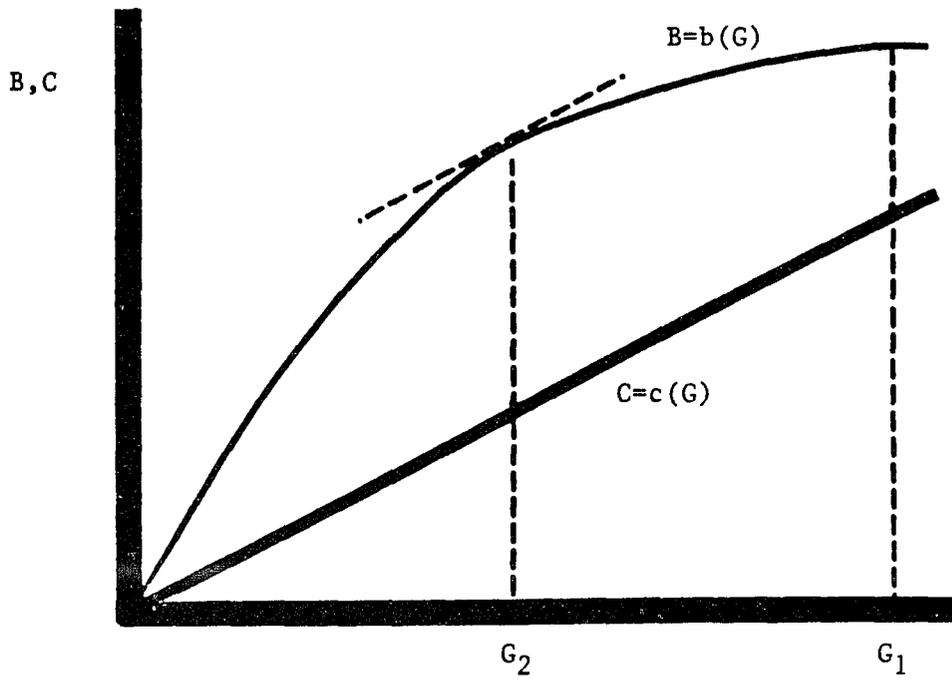
Fig. 3-4. The Marginal cost function

### Bureaucratic Equilibrium

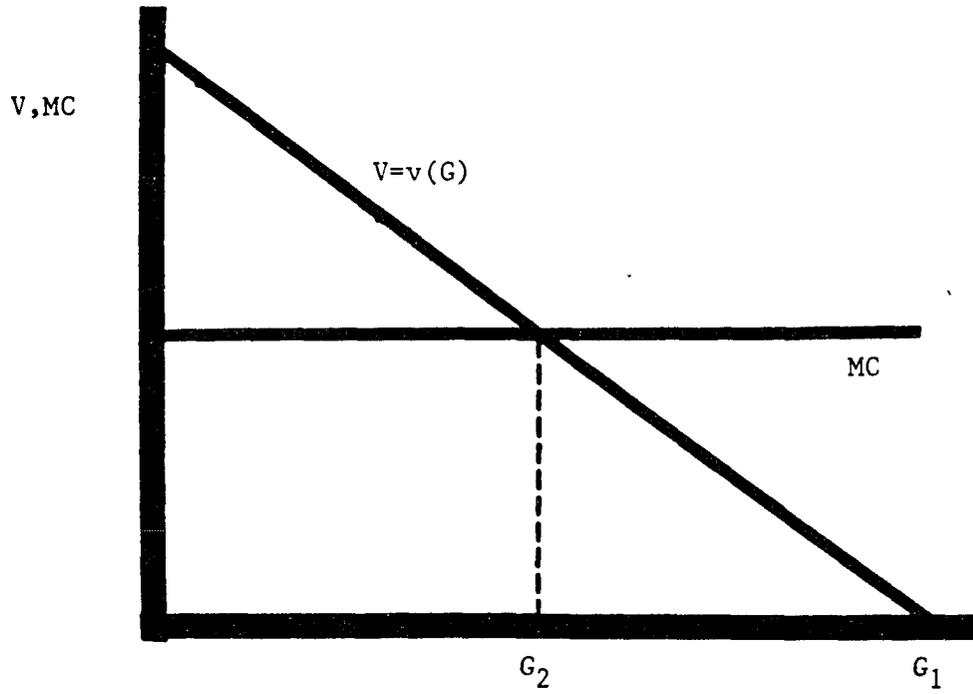
Given that a bureau only operates when  $B \geq C$ , the upper and lower bounds of bureau output  $G$  may be shown by graphing a budget-output function and a cost-output function on the same graph. Figures 3-5a and 3-6a illustrate the equilibrium level of bureau output under two different assumptions.

In Figure 3-5a output level  $G_1$  is the maximum output that a bureau will supply. Beyond  $G_1$  the size of the budget a sponsor organization will award a bureau will start to decrease. Point  $G_1$  is the "demand-constrained" maximum. This phenomenon is seen in Figure 3-5b. Recall that  $V$  is the value of each additional unit of  $G$ . Unit  $G_1$  provides zero value to the sponsor. Units of  $G$  beyond  $G_1$  have a negative "value" to the sponsor. In theory, the bureau must pay the sponsor to accept additional units of  $G$  beyond  $G_1$  (i.e., reduce the size of the bureau's budget). The amount of  $G$  actually supplied will be somewhere between zero and  $G_1$ . According to the theory of bureaucracy (Niskanen 1971), a bureaucrat prefers to supply  $G_1$  because this output level provides the largest budget.

The budget-output function represents the maximum budget a sponsor is willing to award for various levels of output  $G$ . The cost-output function represents the minimum cost of producing various levels of output  $G$ .

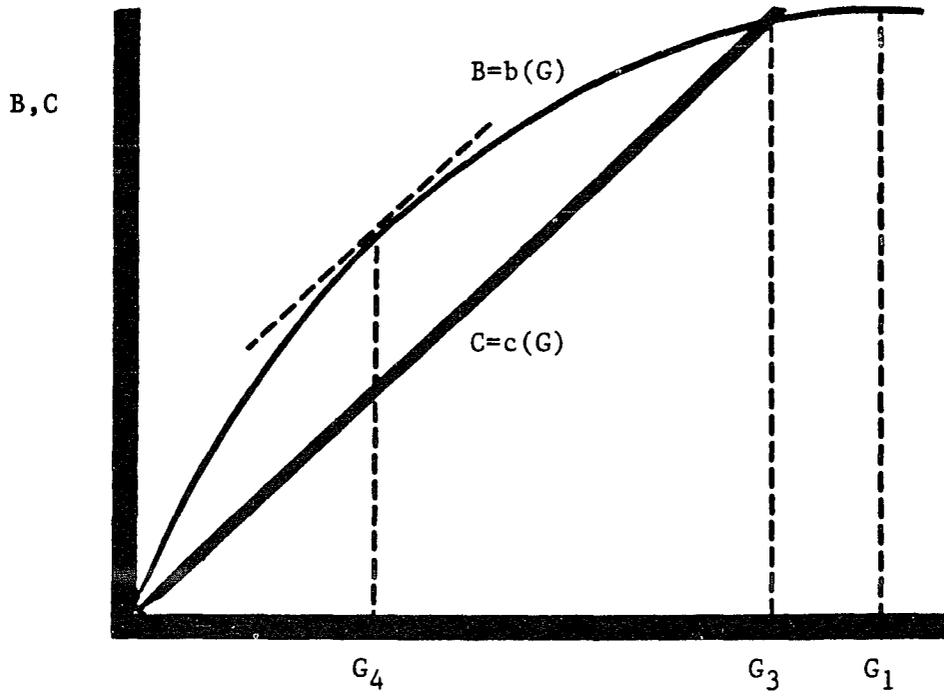


(a)

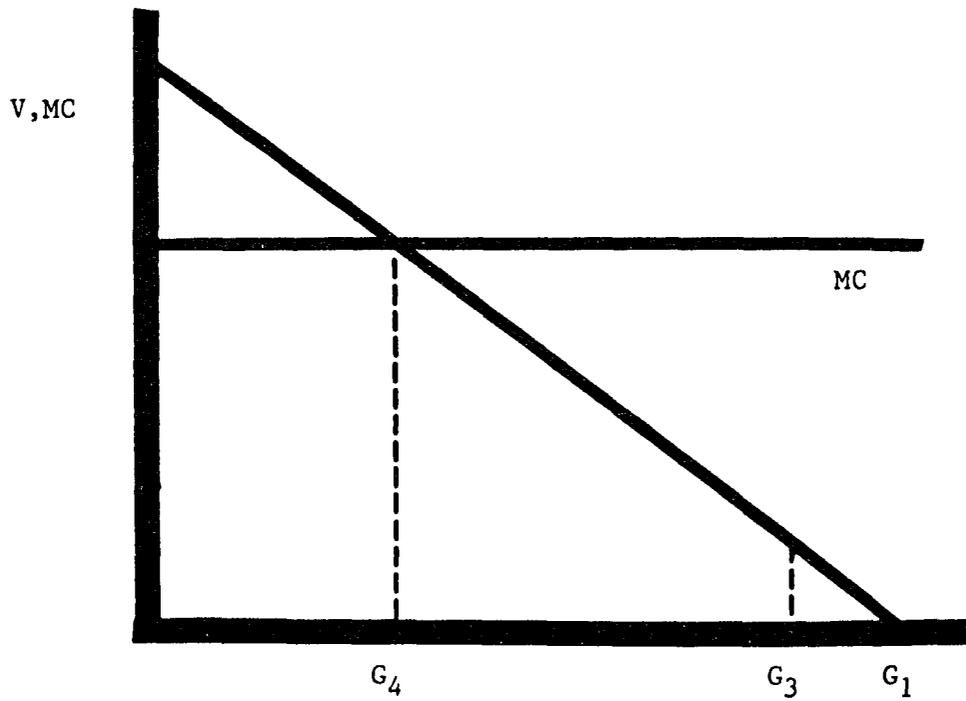


(b)

Fig. 3-5. Demand constrained equilibrium



(a)



(b)

Fig. 3-6. Budget constrained equilibrium

Therefore, the bureau in Figure 3-5a is not motivated to be efficient because  $B \geq C$  at all levels of  $G$  within the relevant range (i.e.,  $0 \leq G \leq G_1$ )<sup>7</sup>. A situation where  $B \geq C$  is very likely since a bureau generally will not reveal its true minimum operating cost to its sponsor. A bureaucrat may exploit this information asymmetry.

Since a sponsor organization is unable to directly monitor a bureau (i.e., know minimum production costs), the sponsor is in the position of having to award a budget based on past bureau behavior. Therefore, a budget maximizing bureaucrat has no incentive to minimize costs since the size of his or her budget will to some extent be based on past expenditure levels. This information asymmetry allows a bureau to operate in an inefficient manner. In fact, according to Niskanen (1971, 48) ". . . it [a bureau] should be expected to seek out expenditures beyond those minimally required in order to exhaust the approved budget."

From society's viewpoint the optimal level of output in Figure 3-5b is  $G_2$ . At  $G_2$  the cost of producing an additional unit of  $G$  is just equal to the

---

<sup>7</sup>Efficiency here refers to the minimizing of costs. Later in the text reference is made to social efficiency. Social efficiency refers to supplying the optimal amount of a good from the viewpoint of society. The socially optimal level of  $G$  is that level where the benefit derived from an additional unit of  $G$  is just equal to the additional (i.e., marginal) cost incurred (i.e., social marginal benefits equal social marginal costs).

additional benefits derived from that unit. That is, at  $G_2$  the social marginal benefits (SMB) are equal to the social marginal costs (SMC). The point at which SMB equal SMC is the socially optimal (efficient) level of production of  $G$ .

Figure 3-6 illustrates a situation in which the cost-output function intersects the budget-output function at a level of  $G$  that is lower than  $G_1$ . Since total costs at  $G_1$  are greater than the maximum amount of budget the sponsor organization is willing to provide at  $G_1$ , the equilibrium output is less than  $G_1$ . The socially optimal level of  $G$  is  $G_4$ , since this is the point at which SMB equal SMC. However, a budget maximizing bureaucrat prefers to supply  $G$  in the amount of  $G_3$  since this is where his or her budget is maximized subject to the constraint that  $B \geq C$ . Because of this budget constraint,  $G_3$  is referred to as the "budget constrained" maximum. Note that if the bureau in Figure 3-6 is operating at  $G_3$  it is efficient (i.e., minimizing costs). However, it is not socially efficient (i.e., operating where  $SMB = SMC$ ).

Figures 3-5 and 3-6 illustrate that a budget maximizing bureaucrat tends to supply more output than is socially optimal. Since expenditures are a positive monotonic function of bureau output, a bureau tends

toward expenditure levels that are greater than the social optima.

### Public Choice Theory

Public choice theory is an economic theory of how governments allocate public resources. The means by which public resource are allocated is the political, or voting, process. Consequently, voter preferences are the starting point for understanding public resource allocation decisions. The dominant framework for studying the impact of voters on public resource allocation is the median voter model.

#### The Median Voter Model

The median voter model (Bowen 1943; Downs 1957) assumes that preferences are single-peaked (Black 1987). Figure 3-7 illustrates the preferences curves of three voters; however, this analysis can be easily generalized to any number of voters. Single-peakedness refers to the notion that each person has some preferred level of government output  $G$ . Each person prefers a level of output closer to his or her peak over levels further away (Boadway and Wildasin 1984, 146). In Figure 3-7, persons A, B, and C will all vote to increase the level of  $G$  from 0 to  $G_A$  since this is closer to their respective peaks. Voters B and C will vote to increase the level of  $G$  from  $G_A$  to  $G_B$ , while voter A will vote

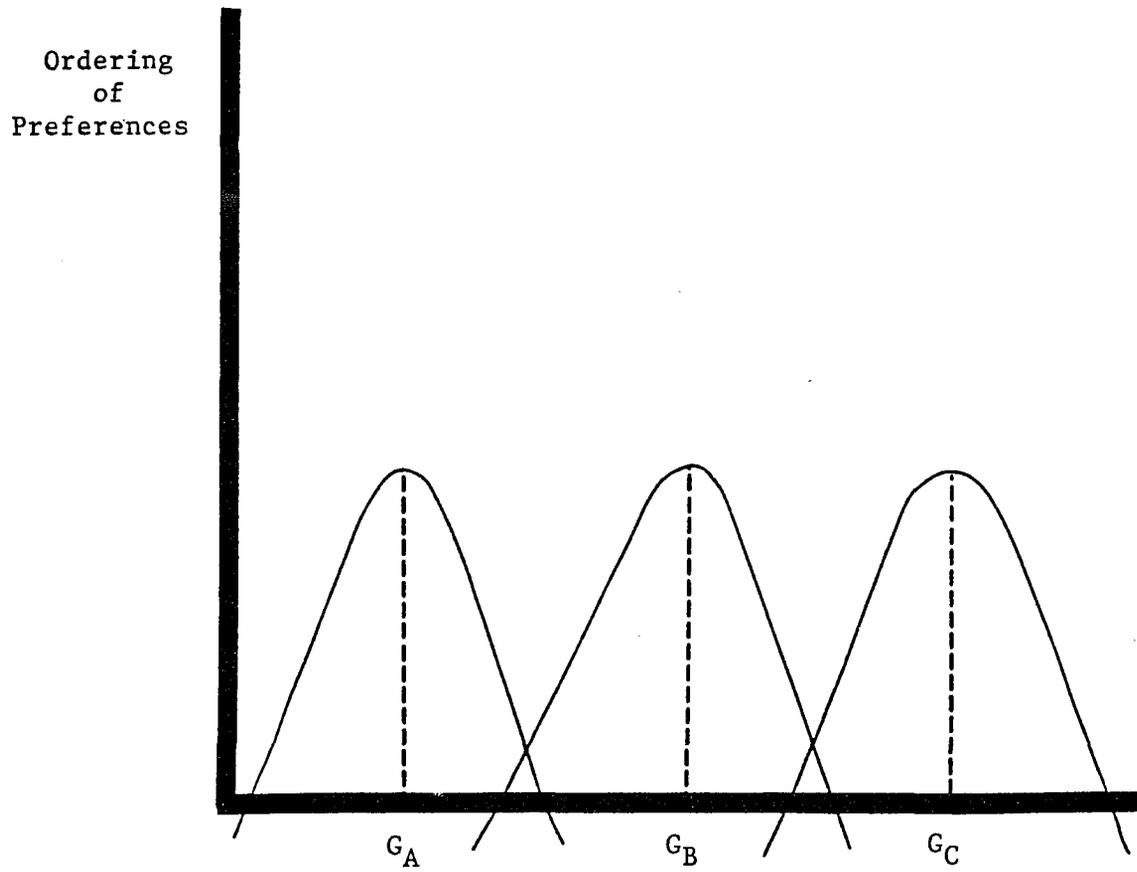


Fig. 3-7. Level of  $G$  desired by voters A, B and C

against such a proposal. In a simple majority rule election, the increase from  $G_A$  to  $G_B$  will win by a two to one margin. A proposition to increase the level of  $G$  from  $G_B$  to  $G_C$  will receive support from voter C but not voters A and B, thus the proposition will be defeated. If preferences are single-peaked, it is clear that the majority of voters prefer the level of  $G$  corresponding to the level preferred by the median voter.

Figure 3-8 illustrates the demand for  $G$  by voters A, B, and C. Note that the demand curves are downward sloping. This represents the notion that each voter values each additional unit of  $G$  less than the previous unit. The marginal cost (MC) divided by the number of voters ( $N$ ) represents the tax price to each voter A, B, and C. Note that each voter prefers a different level of  $G$  at a given tax price. Recall that a demand curve illustrates the total value of each unit to the individual. In the case of Figure 3-8, the individual demand curves represent the marginal value of each additional unit of  $G$  to voter A, B, and C respectively. The most preferred level of  $G$  for each person is the level at which the marginal value of an additional unit of  $G$  equals the marginal cost of obtaining an additional unit of  $G$ . This point corresponds to the peak of each voter's preference curve (see Figure 3-7).

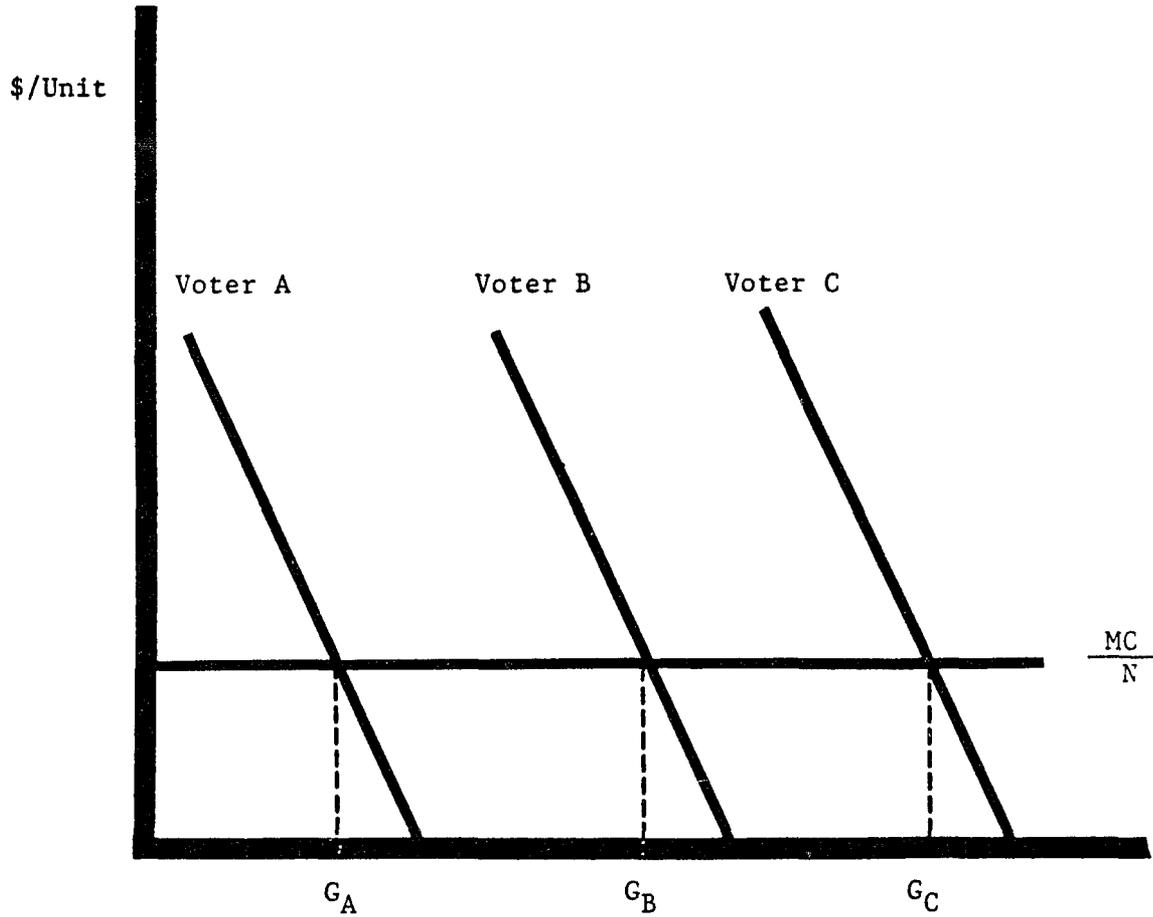


Fig. 3-8. Demand for G by voters A, B and C at various tax prices.

Most empirical tests of the median voter model regress expenditure levels for a community on socioeconomic variables that represent the median voter of the community (e.g., median income). The predictive accuracy of the median voter model is assessed by evaluating the statistical significance of the coefficients in the regression equation. Inman (1978) tests the median voter hypothesis in a study of 58 Long Island school districts using a majority rule referendum for budget approval. His results support the median voter hypothesis.<sup>8</sup> Figure 3-9 illustrates the relationship between voters and public resource allocation decisions in a direct democracy. Assuming single-peaked preference curves and a simple majority rule election, public resource allocation decisions will match the preferences of the median voter. Municipal financial records should reflect these public resource allocation decisions.

#### Voter Utility

Voters derive utility from the consumption of public goods (G) and private goods (X). However, voters are constrained in the amounts of G and X they can consume by personal income (I). If we assume  $p$  to be

---

<sup>8</sup>Many studies empirically test the median voter hypothesis. See for example, Barr and Davis 1966; Borcharding and Deacon 1972; Bergstrom and Goodman 1973; Pommerehne 1978; and Gramlich and Rubinfeld 1982.

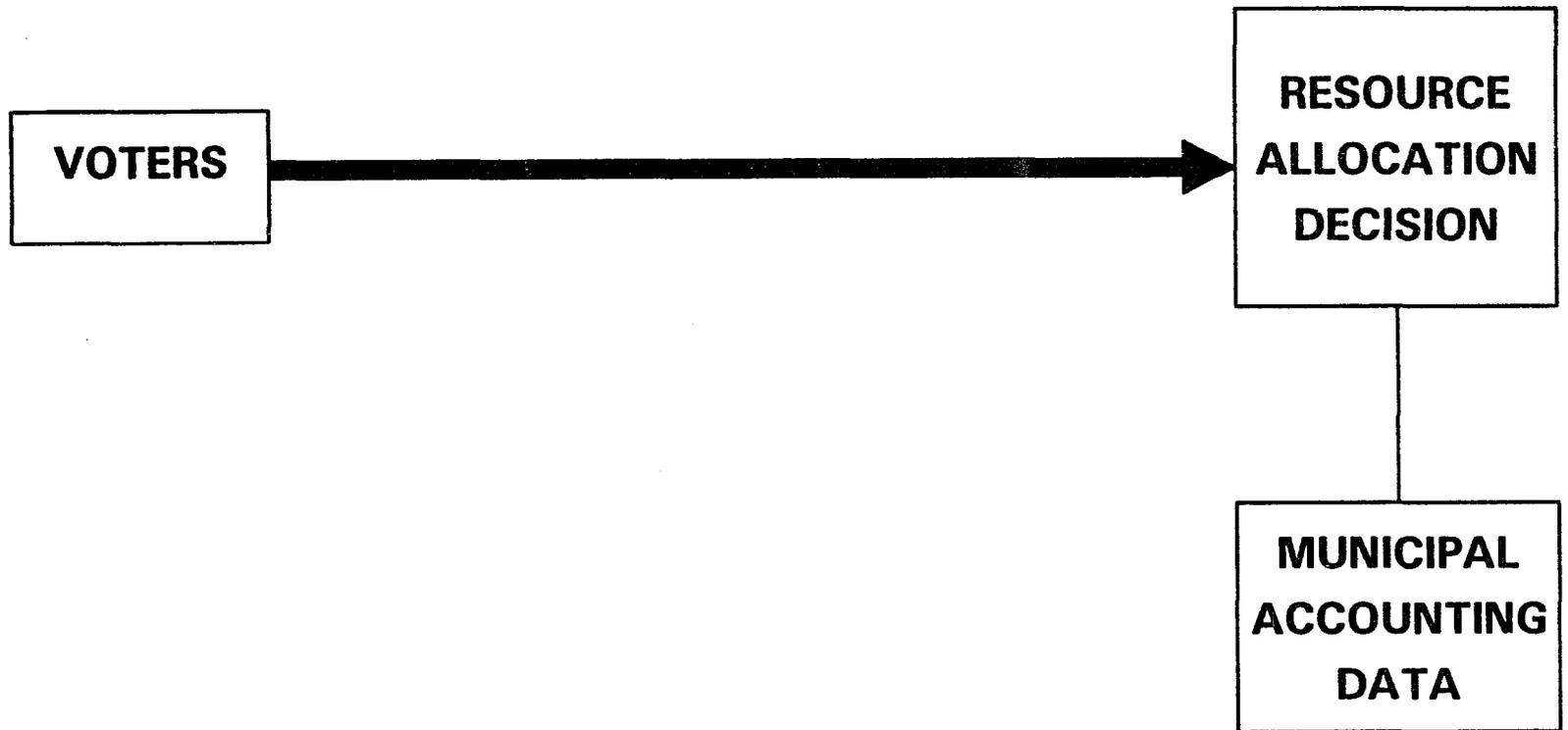


Fig. 3-9. Direct democracy model

the price of  $X$  and  $t$  to represent the tax paid per unit of public good  $G$ , a constrained maximization problem can be stated as follows:

$$\text{MAX } U_v = u(G, X)$$

$$\text{s.t. } I = tG + pX$$

Figure 3-10 illustrates that a voter will prefer a combination of  $G$  and  $X$  in the amounts of  $G_0$  and  $X_0$  when the tax price per unit is  $t_1$ . This combination is preferred because it puts him or her on the highest indifference curve possible subject to his or her budget constraint. Recall that an indifference curve represents the amount of utility derived for various combinations of  $G$  and  $X$ . All points on an indifference curve provide the same utility to the individual. A higher indifference curve, such as  $U_0$ , represents a greater degree of utility than a lower indifference curve, such as  $U_1$ . The most preferred combination of  $G$  and  $X$  is the point at which an indifference curve is just tangent to the budget line. In Figure 3-10, the combination  $G_0$  and  $X_0$  is most preferred at tax price  $t_1$ .

If the tax price per unit is increased from  $t_1$  to  $t_2$  the budget line will rotate clockwise pivoting at  $I/p$ . Now the most preferred combination is  $G_0$  and  $X_1$ . The increased tax price means that the voter will prefer the same amount of  $G$  as before, however, he will only be

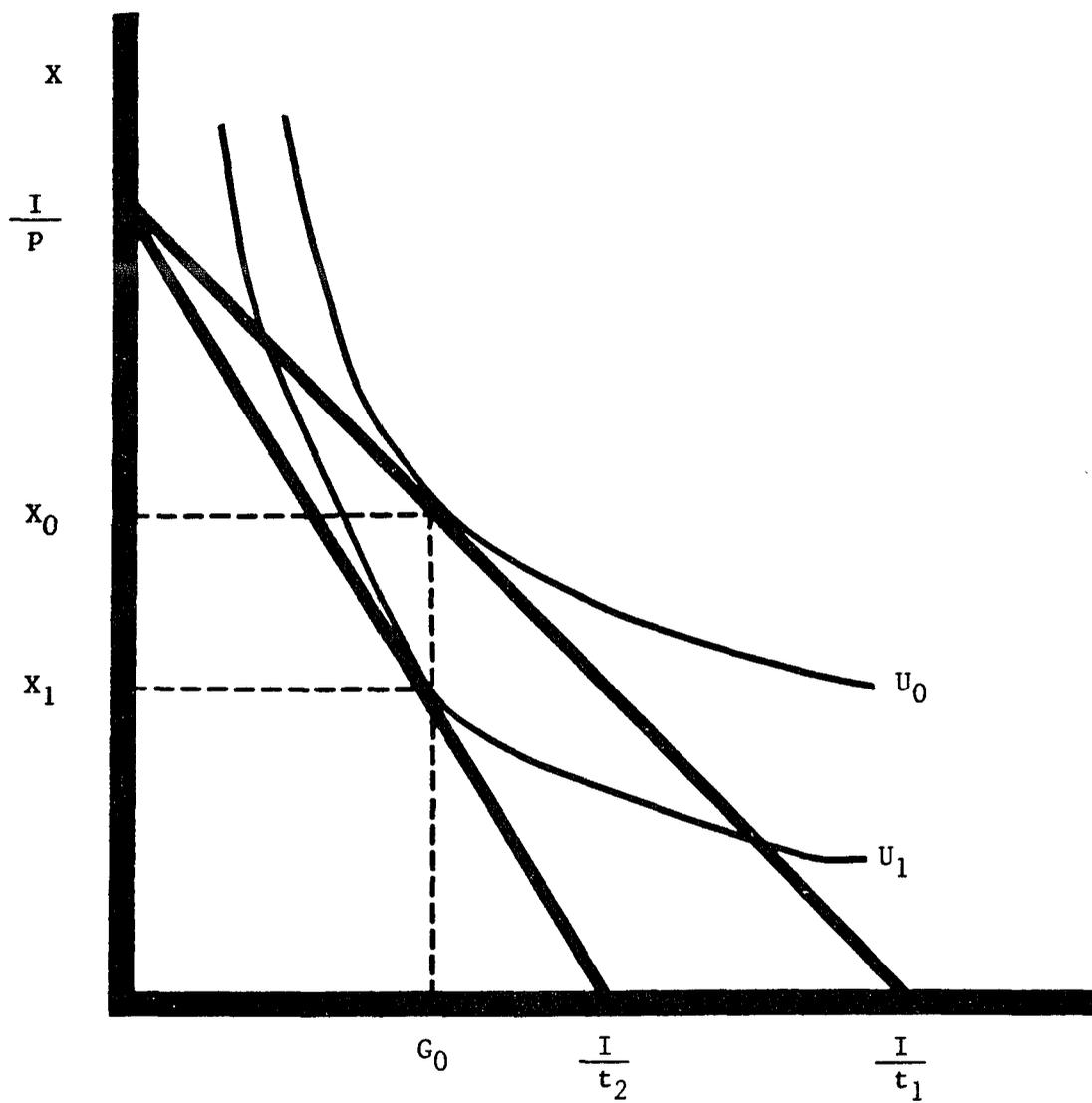


Fig. 3-10. Preferred combination of  $G$  and  $X$  at different tax prices.

able to purchase  $X_1$  of other goods. The increased tax price results in a lower level of utility for the voter. This lower utility level is shown by the indifference curve labeled  $U_1$ . Since  $U_1$  is lower than  $U_0$ , the voter derives less overall utility from the combination  $G_0, X_1$  than from combination  $G_0, X_0$ .

### Representative Democracy

The two dominant institutional arrangements for making public resource allocation decisions in a democratic society are (1) direct democracy and (2) representative democracy. A direct democracy is one in which all citizens vote on all issues concerning public resource allocation via referendum. However, larger societies are, of necessity, representative democracies. In a representative democracy, citizens elect representatives to public office. These representatives (public officials) are endowed with the authority to make decisions for their constituents. Downs (1957) explicitly incorporates representative democracy into the analysis of public sector decision making. Because public officials depend upon their constituents for election and re-election, they support legislation designed to generate the votes necessary for election and re-election (Downs 1957). In a simple majority rule election, a politician who is a member of a two-party system, will propose a political platform designed to

appeal to the majority of the voters (Downs 1957). More specifically, a politician seeks the support of at least one-half plus one of the voters. In other words, the median voter is the decisive vote. Therefore in a representative democracy, just as in a direct democracy, public resource allocation decisions coincide with the preferences of the median voter.

According to Downs (1957), politicians are utility maximizers who derive utility from holding elective office. Therefore, a politician attempts to maximize votes. A politicians objective function can be expressed as:

$$\text{Max } U_p = u(\text{votes})$$

In a two-party system a politician seeking to maximize his or her appeal to the majority of voters will support a political platform that is similar to the preferences of the median voter (Downs 1957). Figure 3-11 illustrates a situation in which the political ideological preferences of voters are single-peaked. Under this assumption a politician attempting to maximize votes will take a position that is near the center of the political spectrum. A politician running on an extremely liberal (conservative) platform stands little chance to win an election since his or her appeal is limited.

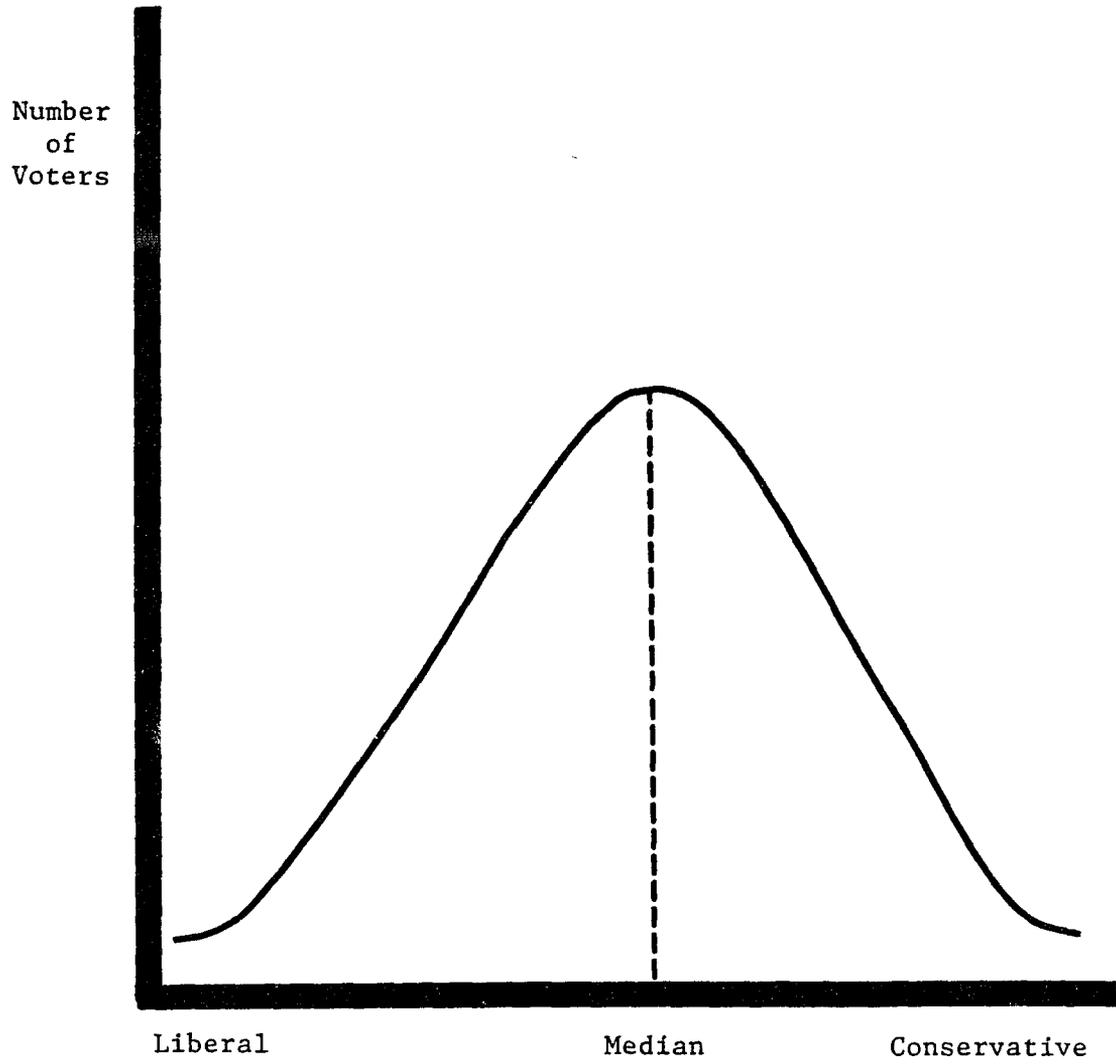


Fig. 3-11. Relationship between political ideology and number of voters.

## Rent Seeking

The above discussion implicitly assumes that voters are politically active. However, not all voters are politically active. Some voters are ignorant of political issues (Downs 1957). A person may be ignorant of political issues for a variety of reasons. One reason is the high cost of becoming an informed voter. Since the probability of a single voter making a difference in the outcome of an election is small, the benefit derived from becoming informed and casting a vote is insignificant to many people (Downs 1957). From a cost-benefit point of view, it is rational to be ignorant of political issues and to forego voting. Such political ignorance is referred to as "rational ignorance" (Downs 1957).

It is less costly for people with a common purpose to form interest groups because the group can share the work of becoming informed. The probability of receiving the benefits of becoming informed is increased for interest groups since the group can cast a block of votes. This block of votes compose a larger percentage of the total votes than a single vote.

The potential to influence the outcome of an election makes interest groups very important to politicians. These interest groups (i.e., lobbyist) lobby legislators to support their cause. On the other

hand, politicians seeking office attempt to generate the support of large interest groups by supporting the agenda of the interest group. The actions of the lobbyist are referred to as "rent seeking" (Tullock 1967). Rent seeking is a wasteful activity from society's viewpoint because it does not increase output. Rather, it simply redistributes who gets the money associated with creating existing output (Varian 1987, 398). One rent seeking interest group in the present study is public employees. Public employees are a very active interest group and can, therefore, find support among politicians. This suggests that public employees may lobby local politicians to forgo privatization of RSC. This aversion to privatization is expected because public employees stand to lose the most (their employment) from privatization.

The relationship between voters, politicians, and public resource allocation decisions is depicted in Figure 3-12. The model in Figure 3-12 illustrates that politicians make public resource decisions for voters. Since politicians depend on voters to get elected or re-elected, public resource allocation decisions reflect the will of the voters. More specifically, in a simple majority rule voting model the median voter's preferences prevail in resource allocation decisions. Therefore, even with politicians in the model, public

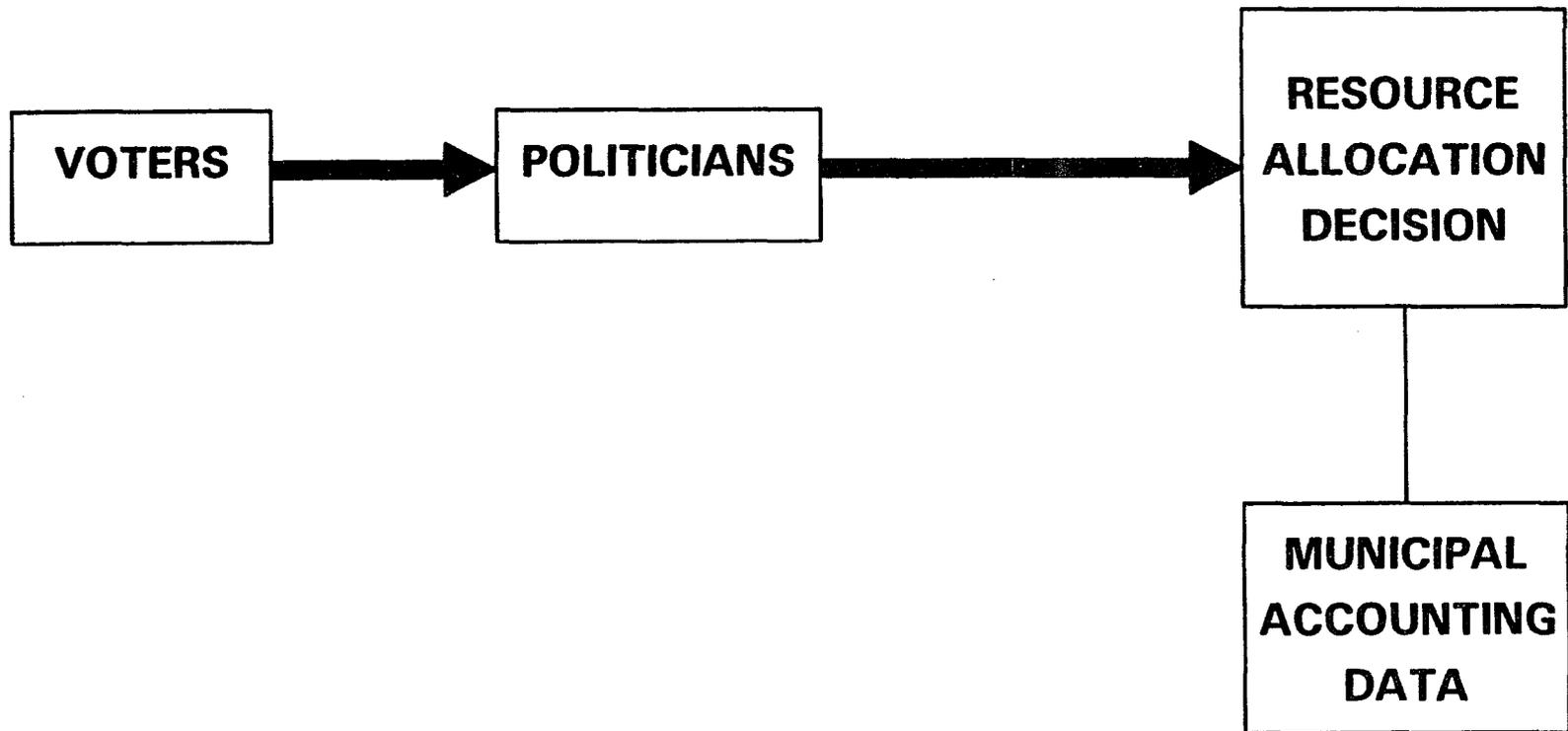


Fig. 3-12. Representative democracy model

resource allocation decisions correspond to those preferred by the median voter.

Public Choice, Bureaucracy Theory  
and the Decision to Privatize

This section presents a theoretical framework to explain the impact of voters, politicians, and bureaucrats on the municipal decision to privatize RSC. The voter model is combined with the bureaucracy model to provide a unified theory of the privatization decision. In this development, bureaucrats are utility maximizers in accordance with Niskanen's theory of bureaucracy (1971), politicians and voters are vote maximizers and rationally ignorant respectively in accordance with Downs (1957). The "rational ignorance" of voters is generally attributed to the notion that the costs associated with becoming an informed voter are greater than the expected benefits. If the benefits of being informed exceed the associated costs, it is beneficial for a voter to become informed and politically active.

In Figure 3-13, budget line 1 ( $BL_1$ ) represents the various combinations of RSC services ( $G$ ) and all other goods ( $X$ ) that can be purchased by the median voter of a community. According to Figure 3-13, the optimal amount of  $G$  for the median voter is  $G_4$ . This level of  $G$  puts the median voter on the highest indifference curve

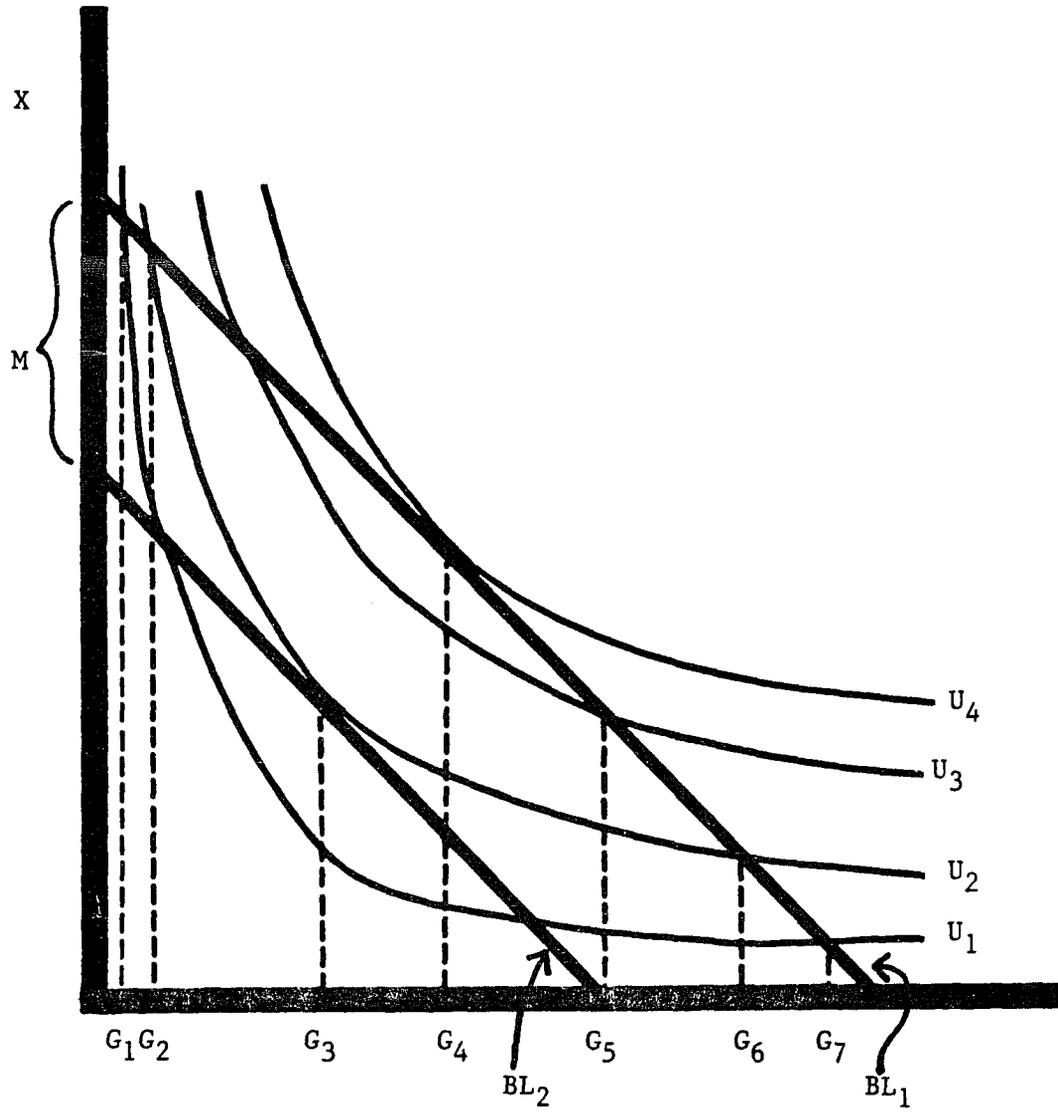


Fig. 3-13. Voter utility levels for various levels of G

possible ( $U_4$ ) given the budget constraint. Any level less than or more than  $G_4$  puts this individual on a lower indifference curve indicating less utility. The distance ( $M$ ) between  $BL_1$  and  $BL_2$  represents the median voter's expected mobilization costs. Mobilization costs include the cost of gathering and processing information (i.e., the costs of becoming informed). If the voter incurs these costs, his or her budget line shifts from  $BL_1$  to  $BL_2$  because mobilization costs reduce net income available for consumption. At  $BL_2$  this voter prefers a level of  $G$  equal to  $G_3$  since this puts him or her on the highest possible indifference curve ( $U_2$ ) given the new budget constraint  $BL_2$ . Therefore, the expected level of  $G$  from incurring mobilization costs,  $M$ , is  $G_3$ .

It is only beneficial for the voter in Figure 3-13 to incur mobilization costs  $M$  when the level of  $G$  is greater than  $G_6$  or less than  $G_2$ . This cost-benefit relationship is apparent after analyzing this voter's utility level at various points on the graph. Assume that the level of  $G$  government provides is  $G_5$ . At this level this voter will be on  $U_3$ . If mobilization costs  $M$  are incurred, the expected level of  $G$  is  $G_3$  resulting in voter utility level  $U_2$ . This voter does not benefit by incurring costs  $M$  since  $U_3$  is higher than  $U_2$ . In other words, the loss in utility ( $U_4$  to  $U_3$ ) from a change in the level of  $G$  from the optimum level  $G_4$  to a level of

$G_5$  does not justify incurring mobilization costs  $M$ , which results in  $U_2$ . However, if  $G$  is set at a level greater than  $G_6$  or less than  $G_2$  this voter attains a utility level that is lower than  $U_2$ , making it beneficial to incur costs  $M$ , which results in utility level  $U_2$ .

Levels of  $G$  between  $G_2$  and  $G_6$  do not motivate this individual to incur mobilization costs  $M$ . The range between  $G_2$  and  $G_6$  is referred to as the "range of voter indifference." This range represents output levels within which this voter remains "rationally ignorant." Outside of the range of voter indifference, we expect this voter to become politically active since the expected gain in utility justifies incurring mobilization costs  $M$ .

Figure 3-14 illustrates the supply side of the model. The cost-output function ( $C$ ) represents the minimum costs of providing various levels of  $G$ . Budget-output function  $B_1$  reflects a sponsor organization who values  $G$  less than the sponsor organizations reflected in  $B_2$ ,  $B_3$  and  $B_4$ . A budget maximizing bureaucrat working for the sponsor organization reflected in  $B_1$  will prefer to supply a level of  $G$  equal to  $G_1$  since this provides the maximum budget subject to the

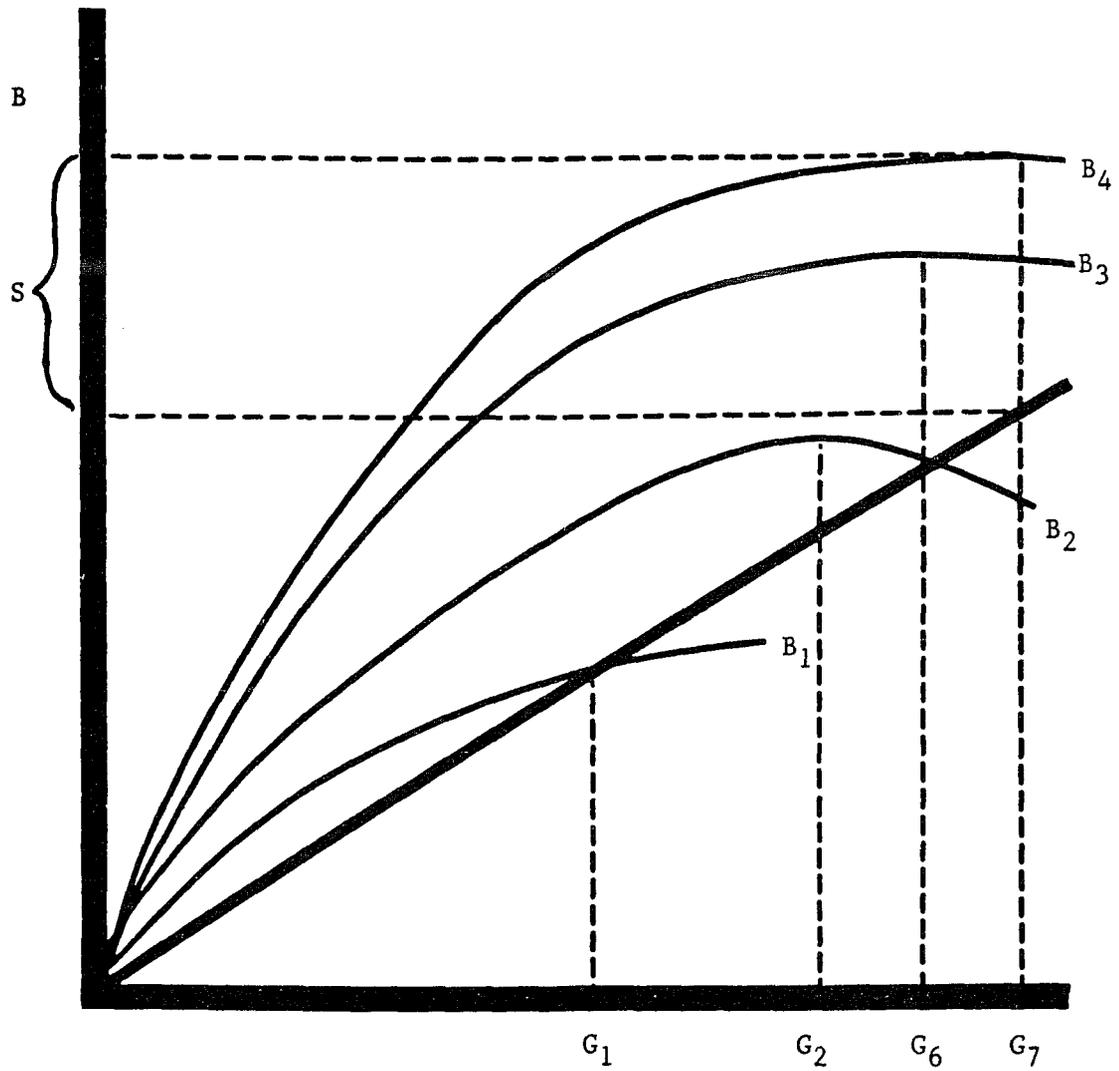


Fig. 3-14. Value of G to sponsors with differing budget-output functions.

constraint that  $B_1 \geq C^9$ . Similarly, a budget maximizing bureaucrat working for the sponsor organization reflected in  $B_4$  will prefer to supply a level of  $G$  equal to  $G_7$  since this provides the maximum budget subject to the constraint that the marginal value of an additional unit must be greater than or equal to 0<sup>10</sup>.

Assuming a budget maximizing bureaucrat, a level of  $G$  equal to  $G_1$  in Figure 3-13 will most likely occur in the budget constrained case (i.e.,  $B_1$  in Figure 3-14). In this situation, privatization does not yield any efficiencies since the bureau is operating at minimum costs. A private sector producer can not under-bid this bureau since his or her minimum cost will equal that of the bureau.

A relatively high level of  $G$  equal to  $G_7$  in Figure 3-13 will most likely occur in demand constrained bureau such as that illustrated by  $B_4$  in Figure 3-14. At this level of  $G$  the bureau is not operating at minimum costs. In fact, there is "slack" or "waste" ( $S$ ) in this bureau equal to the difference between the size of the budget the sponsor is willing to award at that level of  $G$  and the cost of production. At this level of  $G$

---

<sup>9</sup>Recall that this is the "budget constrained" maximum discussed in section one of this chapter.

<sup>10</sup>Recall that this is the "demand constrained" maximum discussed in section one of this chapter.

privatization does yield efficiencies. A private sector company bidding any amount greater than the minimum cost of producing  $G_7$  and less than the budget the sponsor is willing to award at  $G_7$  results in savings to the sponsor and profit for the private sector producer.

Figure 3-15 depicts the relationship between the level of  $G$  provided and the political activity of voters. Within the "range of voter indifference" voters are not politically active. However, when the level of  $G$  is outside this range voters begin to put pressure on politicians to adjust the level of  $G$  to within tolerable limits. Politicians in turn place pressure on bureaucrats to bring the level of  $G$  back into the range of voter indifference.

When the level of  $G$  is low and outside the range of voter indifference, voters incur mobilization costs and pressure politicians to increase the level of  $G$  (e.g., from  $G_1$  to  $G_2$  in Figures 3-13 and 3-14) as the sponsor's demand responds to voter demands. The pressure on politicians to increase the level of  $G$  implies an upward shift in the budget-output function (e.g., from  $B_1$  to  $B_2$  in Figure 3-14). Since the size of the budget the sponsor organization is willing to provide at  $G_2$  is slightly greater than the minimum cost to produce  $G_2$ , a private sector producer can provide some savings for the sponsor. However the savings are small. Therefore, the

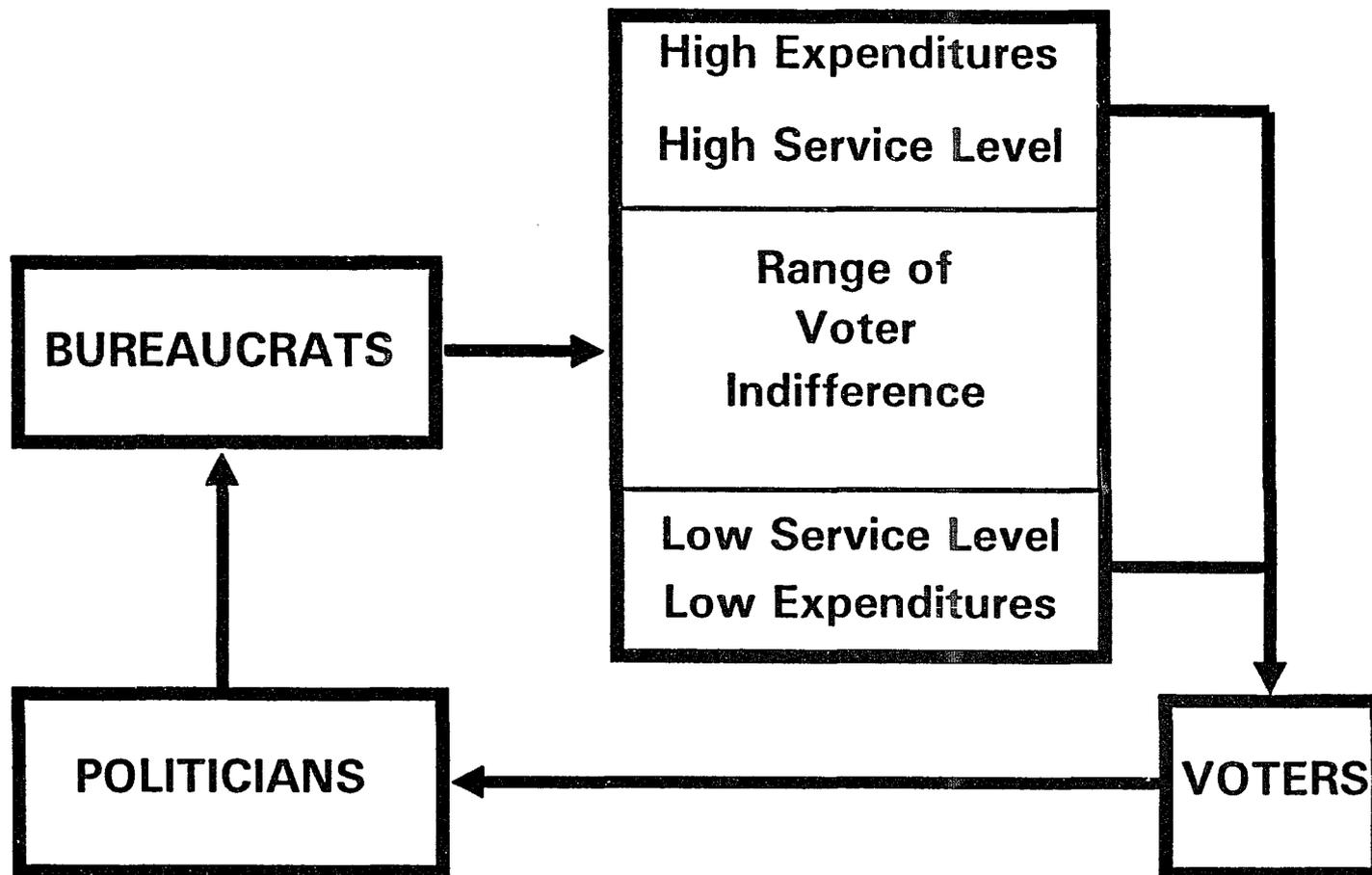


Fig. 3-15. Theoretical model

probability of privatization is greater at  $G_2$  than at  $G_1$ --although not very high.

When the level of  $G$  is high and outside the range of voter indifference, voters incur mobilization costs and put pressure on politicians to decrease the level of  $G$  (e.g., from  $G_7$  to  $G_6$  in Figures 3-13 and 3-14). The demand for a reduction in the level of  $G$  implies a downward shift of the budget-output function (e.g., from  $B_4$  to  $B_3$  in Figure 3-14). Since the size of the budget the sponsor is willing to award at  $G_6$  is substantially greater than the minimum cost of producing  $G_6$ , a private sector producer can provide substantial savings to the sponsor organization. The probability of privatization is greatest at  $G_7$ , less at  $G_6$ , still less at  $G_2$  and approaches 0 at  $G_1$ .

#### Municipal Accounting Data and the Decision to Privatize

Public resource allocation decisions are the result of a complex set of interactions between voters, politicians, and bureaucrats. The previous section models this complex set of interactions by synthesizing public choice theory and the theory of bureaucracy. This framework is used to model the municipal decision to privatize RSC using municipal accounting data. A study by Ingram and Copeland (1981) suggests that municipal accounting information may be useful in

explaining voter behavior. In their study, municipal accounting information is used to predict the outcome of mayoral elections in 113 cities with populations greater than 25,000. Their results suggest that the combination of municipal accounting data and socio-demographic data may be useful in predicting election results (Ingram and Copeland 1981, 840). The Ingram and Copeland (1981) study provides some empirical evidence that municipal accounting data reflects the policies implemented by politicians (via bureaucrats). Furthermore, municipal accounting information appears to impound information used by voters in casting their votes.

The model constructed in the previous section illustrates that voters only become politically active when government output is outside the range of voter indifference. Two issues that tend to mobilize voters to become politically active are (1) tax increases above some threshold level and (2) the perception of excessive government waste. Each of these issues is discussed below.

Figure 3-10 illustrates that an increase in taxes, results in a decrease in voter utility. Therefore, voters are tax adverse. Municipal accounting data can measure the tax burden placed on voters. As tax levels increase voters become politically active and advocate cost cutting measures. The amount of total tax revenues

per household provides a measure of the tax burden upon the voters of a community. A priori, as the amount of tax revenues per household increase, the probability of privatization will increase.

Figure 3-14 shows that privatization produces efficiencies when the budget of a bureau exceeds the cost of production (i.e., when there is slack in the budget). As discussed in the previous section, budgetary slack is more likely to occur at higher output levels rather than lower levels. RSC expenditures per household can proxy for excessive government waste, or slack. Voters become politically active as the level of government waste increases. Therefore, as RSC expenditures per household increase, the probability of privatization increases.

According to the theoretical framework presented in this chapter, bureaucrats, *ceteris paribus*, prefer municipal RSC to contract RSC. Prior research suggests that municipal RSC is more costly than contract RSC (Kitchen 1976; Savas 1977; Stevens 1978; Bennett and Johnson 1979; McDavid 1985; Berenyi and Stevens 1988). However, voters prefer the least costly method of RSC since this decreases their tax burden. Therefore, bureaucrats can only act on their preference when voters do not perceive that they are bearing the cost of the more expensive municipal RSC. While voters are aware

that they bear the cost of tax revenues available to bureaucrats (e.g., local sales taxes), they are generally unaware that they bear the cost of certain non-tax revenue sources available to the bureaucrat (e.g., general obligation bond proceeds). General obligation bonds are a source of revenue that allows a governmental unit to shift payment for current consumption into the future; for example, current levels of  $G$  may be increased without a corresponding increase in taxes. Consequently, voters do not perceive the costs associated with general obligation debt. Therefore, as the amount of general obligation bonds outstanding increase, the probability of privatization will decrease.

Intergovernmental revenues are another source of funds available to the bureaucrat. If intergovernmental revenues are an unrestricted source of funds, a bureaucrat is able to increase the level of  $G$  without a corresponding increase in taxes. Since the tax price to voters remains unchanged, they are indifferent to the increased level of  $G$  (i.e., they are in the range of indifference). This allows a bureaucrat to continue to use municipal RSC rather than contract RSC. Therefore, as intergovernmental revenues per household increase, the probability of privatization decreases.

However, intergovernmental revenues may be awarded on the basis of financial need. If these revenues are a proxy for financial need, the level of G cannot be increased without a corresponding increase in taxes. An increase in taxes causes the level of voter utility to decrease. This in turn causes voters to put pressure on politicians to reduce taxes. Bureaucrats are then pressured by politicians to reduce costs. Privatization is an attractive means of reducing costs. Therefore, as intergovernmental revenues per household increase, the probability of privatization increases. From the above discussion, the effect of intergovernmental revenues on the privatization decision is ambiguous and is tested empirically.

The range of voter indifference is greater for affluent communities. This is because of the opportunity costs of becoming informed (i.e., mobilization costs). Becoming informed regarding political issues is a time consuming process as is voting. This makes it more expensive for high income individuals to become informed. Therefore, bureaucrats in affluent communities are less likely to privatize RSC. The average household's assessed valuation multiplied by the property tax millage rate is a measure of the property taxes paid by the average household in a community. This provides a measure of the wealth of a

community. Wealthy communities are less likely to privatize RSC.

Politicians are subject to pressure from special interest or rent seeking, groups. One special interest group that is against privatization is public employees. Public employees stand the most to lose (i.e., their jobs) from privatization. A priori, as municipal employees as a percent of total population increase, the probability of privatization decreases.

According to the theoretical framework in the previous section, voters are more likely to become politically active when the costs of becoming informed are low. The use of a user fee for RSC provides information to voters at little or no cost. A user fee makes the cost of RSC explicit to the voter. This information allows voters to compare the cost of RSC in their community to the cost in other communities. Since the cost of contract RSC is lower, voters are likely to become politically active and pressure politicians to privatize RSC (if not already privatized) when a user fee is assessed.

### Summary

This chapter presents the theoretical framework used in this study. The first section describes the theory of bureaucracy as advanced by Niskanen (1971). The second section discusses public choice theory. The

third section synthesizes the theory of bureaucracy and public choice theory into a unified theoretical framework. The fourth section describes the linkage between municipal accounting data, public choice theory, and the theory of bureaucracy.

## CHAPTER 4

### METHOD

The purpose of this chapter is to describe the research method of this study. The first section presents the research question, this is followed by a discussion of the research hypotheses in the second section. The third section presents the formal model, while the fourth section describes the method of data collection. The fifth section describes the statistical procedures used to analyze the data. The chapter concludes with a brief summary.

#### Research Question

The Governmental Accounting Standards Board Concepts Statement No. 1, "Objectives of Financial Reporting," states that a government's financial reports should allow citizens to assess the accountability of public officials (GASB 1987, 27). This implies that municipal accounting data should allow citizens to evaluate public resource allocation decisions made by public officials. The purpose of this study is to evaluate the extent to which municipal accounting data is useful for modeling a specific public resource

allocation decision: the decision to privatize RSC. The primary research question is:

Is municipal accounting data useful for modeling the municipal decision to privatize RSC?

This study provides empirical evidence regarding whether municipal accounting data provides information useful for assessing the accountability of public officials--a stated objective of GASB Concepts Statement No. 1.

Prior research suggests that contract RSC is less costly than municipal RSC (Kitchen 1976; Savas 1977; Stevens 1978; Bennett and Johnson 1979; McDavid 1985; Berenyi and Stevens 1988). However, there are many municipalities that do not use contract RSC. Therefore, minimizing costs does not appear to be a primary concern of public sector decision makers (i.e., bureaucrats) when deciding whether to privatize RSC. The synthesis of public choice theory and the theory of bureaucracy presented in the previous chapter provides a theoretical framework for modeling public resource allocation decisions resulting from the interaction of voters, politicians, and bureaucrats. Hypotheses derived from public choice theory and the theory of bureaucracy are used to investigate the research question above. Municipal accounting data is used to operationalize the hypotheses.

### Research Hypotheses

Given the general conclusion of prior research that private sector production is less costly than public sector production, it is curious that public sector production remains popular in so many municipalities. One possible explanation for the persistence of public sector production, when private sector alternatives exit, is that public sector production increases the size of the budget under the control of a bureaucrat. According to Niskanen (1971, 38), the variables that enter into a bureaucrat's utility function are a positive monotonic function of the size of the budget controlled by a bureaucrat. Therefore, a larger budget enhances the utility of a bureaucrat. The increase in utility may be in the form of the prestige that comes from being a part of a large organization or the increase in salary that comes with the additional responsibilities associated with a larger span of control. In Niskanen's (1971) view, bureaucrats are motivated by their own self-interest, rather than the interest of the citizenry. Cost efficiency, therefore, becomes a secondary objective in bureaucratic decision making. As discussed in the previous chapter, voters constrain bureaucrats by putting pressure on politicians. When expenditure levels increase beyond some threshold level (i.e., force voters outside their

range of indifference), voters mobilize into action. Voters then exert pressure upon politicians to reduce government spending. One method to reduce the level of government expenditures is to provide services in a less costly manner (e.g., privatization). This leads to the following hypothesis (stated in the alternative form):

H<sub>1</sub>: Ceteris paribus, as total RSC expenditures per household increase, the probability of privatization will increase.

Tax revenues represent a significant proportion of total municipal revenues. For fiscal 1984-85 total taxes accounted for 54.1% of Louisiana local government total own-source revenues (Cohen 1988, 69). Total tax revenues per household represent the tax burden upon voters. If the tax burden increases above some threshold level, voters become politically active (i.e., forced outside their range of indifference). A politician attempting to levy taxes higher than this threshold level, will lose the support of the voters. To avoid raising taxes beyond this threshold, a politician will advocate aggressive cost cutting measures. One method to reduce costs is to use less costly service delivery arrangements for public services. One such arrangement is the privatization of RSC. Stated in the alternative form, it is hypothesized that:

H<sub>2</sub>: Ceteris paribus, as total tax revenues per

household increase, the probability of privatization will increase.

A rational person will not take the time to become informed (or to vote) unless the benefits outweigh the associated costs (Downs 1957). Therefore, the range of voter indifference is greater in wealthy communities because of the greater opportunity costs of becoming informed and taking the time to vote. These opportunity costs make it possible for bureaucrats (and politicians) to be less concerned with minimizing the cost of services provided to residents (e.g., RSC). Hence, affluent communities are less likely to privatize RSC. The average household's assessed valuation multiplied by the property tax millage rate is a measure of the property taxes paid by the average household in a community. This is a proxy for the wealth of a community. This leads to the following hypothesis (stated in the alternative form):

H<sub>3</sub>: Ceteris paribus, as the amount of property taxes paid by the average household increase, the probability of privatization will decrease.

General obligation bonds are long-term debt instruments backed by the full faith and credit of the issuing municipality. General obligation debt provide a means of financing current consumption with future tax revenues. Therefore, general obligation bond proceeds represent an additional source of revenue available to

the bureaucrat. These additional revenues make it possible for a bureaucrat to engage in inefficient activities (e.g., municipal RSC rather than contract RSC). This leads to the following hypothesis (stated in the alternative form):

H<sub>4</sub>: Ceteris paribus, as the amount of general obligation debt outstanding per household increases, the probability of privatization will decrease.

Voters and bureaucrats may view state and federal grants as "free money." This influx of free money reduces the need for efficient government spending and allows bureaucrats to keep RSC in the public domain. However, eligibility for state and federal grants may be based on financial need. If this is the case, grant monies are a proxy for fiscal crises. A municipality experiencing fiscal crises tends to aggressively pursue less costly means of service delivery (e.g., privatization). Both of these arguments are reasonable. Theoretically, the level of intergovernmental revenues received should impact on the decision to privatize RSC, however, a priori, the direction of the relationship is not definite. This leads to the following hypothesis (stated in the alternative form):

H<sub>5</sub>: Ceteris paribus, the amount of intergovernmental revenues per household will impact on the decision to privatize RSC.

Politicians compete for votes. According to the median voter model, politicians advocate policies to

generate the support of the voter with the median preference (Downs 1957). However, not all voters are politically active. Many voters are "rationally ignorant" of political issues (Downs 1957). Being ignorant of political issues is rational because of the costs of becoming informed on an individual basis. It is cost efficient for groups of individuals with common interests to form a coalition in order to spread the cost of becoming informed across more individuals, thereby decreasing the cost per individual. These coalitions or special interest groups disseminate information to members and non-members to generate support for their cause. This gives a special interest group substantial political clout. Politicians tend to support the causes of special interest groups because of the vote power these groups possess. Vote power refers to the percentage of votes in an election that a group of voters control (Borcherding, Bush, and Spann 1977). One group of voters identified as having a disproportionate effect on election results are public employees (Bennett and Orzechowski 1983). Public employees have a vested interest in the privatization decision (i.e., job security), therefore, they tend to lobby against privatization. According to Niskanen's (1971) view of bureaucracy, budget maximizing bureaucrats will support public employees in their quest

to retain RSC in the public domain. Stated in the alternative form, it is hypothesized that:

H<sub>6</sub>: *Ceteris paribus*, as the ratio of the number of municipal employees (less RSC employees) to total population increases, the probability of privatization will decrease.

Another factor that may impact on the decision to privatize RSC is service level. Currently, measures of outcome and efficiency of RSC services are not reported on a regular basis (Rubin 1990, 265). According to the Governmental Accounting Standards Board (GASB) service efforts and accomplishments reporting project, the frequency of RSC indicates the level of service provided to residents and is readily available (Rubin 1990, 269). Therefore, this study uses the frequency of RSC as a proxy for service level.

Private sector employees operate in a competitive environment. The competitive environment makes it necessary for a private sector firm to provide a high level of services or face losing customers to the competition. Municipal employees operate from a monopoly position. The lack of competition in the public sector makes it possible to provide a lower level of service without the fear of losing customers to a competitor. This leads to the following hypothesis (stated in the alternative form):

H<sub>7</sub>: *Ceteris paribus*, as the frequency of RSC increases, the probability of privatization increases.

When voters are the beneficiaries of many governmental services financed by tax revenues they are unable to determine the cost of each service separately. However, when a user charge is assessed for a particular service the cost of that service is made explicit. This puts the voter in a position to evaluate the costs and benefits of the service. Many studies suggest that contract RSC is less costly than municipal RSC.<sup>11</sup> Therefore, communities that assess a user fee are more likely to privatize RSC. This leads to the following hypothesis:

H<sub>3</sub>: Municipalities that assess a user fee for RSC are more likely to privatize RSC.

In Louisiana, New Orleans is the largest metropolitan area and therefore may possess characteristics that are different from other municipalities in the state. A dummy variable is included in the model to capture any systematic differences between municipalities in the New Orleans area and those outside the New Orleans area. One characteristic of metropolitan areas is high population density. Metropolitan areas tend to have more people per square mile than rural areas. This puts a

---

<sup>11</sup>Kitchen (1976), Savas (1977), Stevens (1978), Bennett and Johnson (1979), McDavid (1985), and Berenyi & Stevens (1988) all find contract RSC to be less costly than municipal RSC.

tremendous strain on the ability of government to provide services. One means to alleviate this strain is to contract out services to the private sector.

Therefore, it is hypothesized that:

H<sub>9</sub>: Ceteris paribus, municipalities located in the metropolitan New Orleans area are more likely to privatize RSC.

The current study extends the existing literature by developing a model of the decision to privatize RSC using financial and demographic variables. Prior research typically uses socioeconomic independent variables to model this decision. One of the limitations of socioeconomic data is its availability. For example, some data available through the U.S. Census Bureau is only published every five years. Another limitation of socioeconomic data is that it generally is used as a proxy for the data actually used in the decision to privatize public services. The present study combines internal municipal accounting data with current demographic data to model the decision to privatize RSC. This data is more representative of the type of data used in the privatization decision. Table 4-1 provides a summary of the null hypotheses tested in this study.

TABLE 4-1

## SUMMARY OF NULL HYPOTHESES TESTED

- H<sub>1</sub>: Ceteris paribus, RSC costs per household do not affect the decision to privatize RSC.
- H<sub>2</sub>: Ceteris paribus, total tax revenues per household do not affect the decision to privatize RSC.
- H<sub>3</sub>: Ceteris paribus, the amount of property taxes generated by the average household does not affect the decision to privatize RSC.
- H<sub>4</sub>: Ceteris paribus, the amount of general obligation bonded debt outstanding per household does not affect the decision to privatize RSC.
- H<sub>5</sub>: Ceteris paribus, the amount of intergovernmental revenues per household do not affect the decision to privatize RSC.
- H<sub>6</sub>: Ceteris paribus, the ratio of the number of municipal employees (less RSC employees) to total population does not affect the decision to privatize RSC.
- H<sub>7</sub>: Ceteris paribus, the frequency of RSC does not affect the decision to privatize RSC.
- H<sub>8</sub>: Ceteris paribus, the assessment of a RSC user fee does not affect the decision to privatize RSC.
- H<sub>9</sub>: Ceteris paribus, the geographic proximity of a municipality to the metropolitan New Orleans area does not affect the decision to privatize RSC.

## The Model

Financial and demographic data operationalize the hypotheses outlined above. The dependent variable in the model is the method of RSC. This study investigates two methods of RSC:

1. Municipal--where RSC is provided by municipal employees, and

2. Contract--where RSC is provided by a private sector firm under contract with a municipality. The qualitative nature of the dependent variable in the model creates certain statistical problems. However, techniques are available to handle these problems. Probabilistic regression analysis (probit) and logistic regression analysis (logit) are two statistical techniques available for managing the problems associated with a dichotomous dependent variable. Logit is based on a cumulative logistic probability function, while probit is based on a cumulative normal probability distribution. These two models are very similar:

The logistic and normal curves are so similar as to yield essentially identical results. In practice they yield estimated choice probabilities that differ by less than .02 and which can be distinguished, in the sense of statistical significance, only with very large samples. The choice between them, therefore, revolves around practical concerns such as the availability and flexibility of computer programs and personal preferences and experience (Aldrich and Nelson 1984, 34).

Logit is used in this study. A chi-square test is used to evaluate the overall significance of the model as well as the statistical significance of the individual coefficients. The alpha level used for determining statistical significance in this study is .10. The following logit model is estimated:

$$\text{METHOD} = \alpha + \beta_1\text{REFUSE} + \beta_2\text{TAXREV} + \beta_3\text{PROPERTY} + \beta_4\text{DEBT} + \\ \beta_5\text{GRANTS} + \beta_6\text{PCTEMP} + \beta_7\text{FREQ} + \beta_8\text{USERFEE} + \beta_9\text{NEWORL}$$

where **METHOD** is a dichotomous variable that assumes the value of 1 for contract RSC and 0 for municipal RSC.

The independent variables consist of municipal accounting information obtained by means of a survey of all Louisiana municipalities. Table 4-2 presents, for each hypothesis tested, a brief description of the relevant variable and the expected sign of its coefficient.

#### Data Collection

The data for this study was obtained via a survey of all Louisiana municipalities. The survey instrument, reproduced in Appendix A, ascertains the method of RSC, the cost of providing RSC, and other data necessary for the study. The survey was mailed in three bulk mailings each approximately one month apart. In the first mailing, a survey was sent to all 301 Louisiana municipalities. Municipalities not responding to the first mailing within one month were sent a second survey. A third and final survey was sent out one month after the second mailing to those municipalities not responding to the first two mailings.

**TABLE 4-2**  
**HYPOTHESES, VARIABLE DEFINITIONS, AND**  
**EXPECTED SIGN FOR COEFFICIENTS**

<u>Hypo-thesis</u>	<u>Independent Variable</u>	<u>Expected Sign</u>
H <sub>1</sub> :	REFUSE--total RSC expenditures per household.	(+)
H <sub>2</sub> :	TAXREV--total tax revenues collected per household.	(+)
H <sub>3</sub> :	PROPERTY--property tax rate times the total assessed valuation per household.	(-)
H <sub>4</sub> :	DEBT--general obligation bonds outstanding per household.	(-)
H <sub>5</sub> :	GRANTS--intergovernmental revenues per household.	(?)
H <sub>6</sub> :	PCTEMP--ratio of municipal employees (less RSC employees) to total population.	(-)
H <sub>7</sub> :	FREQ--number of RSC's per week.	(+)
H <sub>8</sub> :	USERFEE--dummy variable coded "1" if a RSC user fee is assessed, "0" otherwise.	(+)
H <sub>9</sub> :	NEWORL--dummy variable coded "1" if a municipality is located in the metropolitan New Orleans area, "0" otherwise.	(+)

Louisiana municipalities file audited financial reports with the Office of the State Legislative Auditor, Baton Rouge, Louisiana every four years, two years, or annually depending upon the size of the municipality. These reports were consulted when surveys were returned incomplete. Additionally, information supplied via the survey was verified when possible.<sup>12</sup>

#### Data Analysis

Descriptive statistics (mean, standard deviation, minimum and maximum values) for each of the financial and demographic variables are calculated for the two groups of municipalities (i.e., municipal and contract). A t-test is used to determine if the differences between the means of the two groups with respect to each financial and demographic variable are statistically significant.

The logit model is used to test the extent to which municipal accounting data is useful for modeling the municipal decision to privatize RSC. Logit is an appropriate statistical technique to use when the dependent variable is dichotomous. A chi-square test is used to assess how well the model fits the data, as well

---

<sup>12</sup>Not all data could be verified because of the different filing schedules. If all municipalities were required to file a report with the Legislative Auditor's Office for the same reporting period the survey instrument could have been shortened considerably.

as, to test the statistical significance of the individual coefficients. The hypotheses outlined above are tested by determining the sign and statistical significance of the individual coefficients in the logit model.

Multicollinearity among the independent variables in a logit model can make interpretation of the individual coefficients difficult. Therefore, two tests for multicollinearity are conducted. First, Pearson Product Moment Correlation Coefficients and associated significance levels are calculated to determine the extent to which one independent variable is correlated with another. Second, each independent variable is regressed, in turn, on the remaining independent variables. This is an effective technique to determine if an independent variable can be expressed as a linear combination of the remaining independent variables. A high coefficient of multiple determination ( $R^2$ ) for any of these multiple regressions would indicate the existence of multicollinearity among the independent variables.

#### Summary

This chapter presents the method used to test the extent to which municipal accounting data is useful for modeling the decision to privatize RSC. The research question and research hypotheses are outlined. The

logit model used to test the individual hypotheses is also presented. Finally, the method used to collect the data, as well as, the statistical analyses are discussed.

## CHAPTER 5

### DATA ANALYSIS

This chapter reports the results of the study. The first section summarizes the procedures used to collect the data. The second section reports descriptive statistics on each of the demographic and independent variables. The third section presents inferential statistics regarding the financial and demographic characteristics of the two groups of municipalities (i.e., municipal and contract). The fourth section reports the results of the logistic regression (logit) model. The chapter concludes with a summary of the empirical findings.

#### Data Collection

The population of interest for this study includes all municipalities in the State of Louisiana. According to the Statistical Abstract of the United States (U.S. Bureau of the Census 1989), Louisiana contains 301 municipalities. Specific data for this study include financial and demographic data as well as information regarding the method (i.e., municipal or contract) of RSC. Current data of this type are not readily

available for small municipalities (population less than 10,000). Because the majority of Louisiana municipalities are small, a mail survey was used to collect the data. Mailing labels addressed to the city clerk of each Louisiana municipality were secured from the Governmental Services Institute of Louisiana State University. A survey instrument, reproduced in the Appendix, was designed to collect the data necessary to test the hypotheses set forth in the previous chapter. The survey was mailed in three separate bulk mailings, each approximately one month apart. The first mailing consisted of all 301 municipalities. A second survey was mailed to those municipalities that had not responded within one month of the first mailing. A third and final survey was mailed one month after the second mailing to those municipalities that had not responded to either of the first two mailings.

When surveys were returned incomplete, the missing data was obtained by consulting several alternative sources. Parish and municipal sales tax rates were obtained from the State of Louisiana Department of Revenue and Taxation. Six of the surveys returned were missing data regarding the number of households. For these municipalities the number of households was estimated using a two-step procedure. First, the 1980 population was divided by the 1980 number of households

to obtain the average number of persons per household. Second, the current population was divided by the number of persons per household calculated in the first step to obtain an estimate of the number of current households.

#### RSC Arrangements in Use

The results of the survey indicate that there are three primary RSC arrangements used by Louisiana municipalities:

1. Municipal--where RSC is provided by municipal employees,

2. Contract--where RSC is provided by a private sector firm under contract with the municipality, and

3. Parish--where RSC is provided by a private sector firm under contract with the parish government.

Typically, when the parish government contracts out RSC (option 3 above) to a private sector firm, the parish government levies a parish-wide sales tax to cover the cost of RSC. Under the parish option there is no transfer of monies between the municipal government and the parish government. Because there is no transaction reflected in the municipal accounting records under the parish arrangement, municipalities using this mode of RSC are not considered in this study.

A total of 184 municipalities (61%) responded to the survey. Table 5-1 shows the breakdown of the responding municipalities by RSC arrangement. Municipal

and contract account for 52% of the responding municipalities. Of the 184 responding municipalities 96 fall into the two groups of interest (i.e., municipal and contract). Thus a 32% usable response rate was obtained.

**TABLE 5-1**  
**BREAKDOWN OF RESPONDENTS BY RSC ARRANGEMENT**

<u>Arrangement</u>	<u>Number</u>	<u>Percent of All Surveys Returned</u>	<u>Percent of Usable Returns</u>
Municipal	43	23%	45%
Contract	53	29%	55%
Parish	72	39%	-
Other	<u>16</u>	<u>9%</u>	=
Totals	<u>184</u> ===	<u>100%</u> =====	<u>100%</u> =====

#### Descriptive Statistics

Descriptive statistics aid in identifying the location, spread, and shape of the underlying distribution of a variable. Tables 5-2 and 5-3 present descriptive statistics for demographic and independent variables respectively. From these tables it is evident that there is much variation in the data. Also, many of the variables appear to come from skewed distributions. Prior to formal testing, it appears that municipalities that privatize RSC are larger in terms of population,

the number of households, and the number of municipal employees.

**TABLE 5-2**  
**DESCRIPTIVE STATISTICS FOR DEMOGRAPHIC VARIABLES**

<u>Variable</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>Min.</u>	<u>Max.</u>
<b>Population</b>				
Municipal	12,738	36,055	430	217,842
Contract	25,608	91,524	438	556,913
<b>Households</b>				
Municipal	4,215	11,630	97	70,000
Contract	8,602	31,426	154	200,000
<b>Employees</b>				
Municipal	147	411	1	2,382
Contract	251	952	4	5,991

From Table 5-3, total tax revenues per household (TAXREV) appear higher in municipalities that contract RSC. In addition, the cost of RSC per household is considerably lower in contract municipalities. This result is to be expected since one of the most cited reasons for privatization is the cost savings generated. It is interesting to note that the standard deviation for REFUSE under the municipal arrangement is quite a bit larger than under the contract arrangement. This finding suggests that the price charged by private sector firms is relatively more stable than RSC costs under the municipal arrangement. This price stability under the contract arrangement is probably due to the

TABLE 5-3

## DESCRIPTIVE STATISTICS FOR INDEPENDENT VARIABLES

<u>Variable</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>Min.</u>	<u>Max.</u>
<b>TAXREV</b>				
Municipal	333.08	282.01	16.37	1,410.10
Contract	486.62	294.47	37.84	1,220.83
<b>REFUSE</b>				
Municipal	82.14	44.59	13.80	212.68
Contract	67.34	25.99	6.81	144.09
<b>PROPERTY</b>				
Municipal	83.96	124.50	0.00	734.83
Contract	101.47	193.43	0.00	1,403.28
<b>DEBT</b>				
Municipal	318.74	575.30	0.00	2,631.06
Contract	389.49	566.71	0.00	2,718.52
<b>GRANTS</b>				
Municipal	154.96	321.94	0.00	2,026.17
Contract	145.59	449.98	0.00	3,158.74
<b>PCTEMP</b>				
Municipal	0.92	0.51	0.13	2.41
Contract	0.88	0.40	0.22	2.53
<b>FREQ</b>				
Municipal	1.51	0.55	1.00	3.00
Contract	1.70	0.46	1.00	2.00
<b>USERFEE</b>				
Municipal	0.79	0.41	0.00	1.00
Contract	0.87	0.34	0.00	1.00
<b>NEWORL</b>				
Municipal	0.07	0.26	0.00	1.00
Contract	0.25	0.43	0.00	1.00

competitive market environment that private sector firms operate in. That is, private sector firms are "price takers." The variability observed under the municipal arrangement may be due to the lack of competition in the governmental environment. Bureaucrats are able to set their "prices" without the influence of the competitive market. Therefore, the cost of a particular service (e.g., RSC) in different municipalities may vary considerably.

Intergovernmental revenues per household (GRANTS) are about the same for both contract and municipal communities. The same is true for the number of municipal employees expressed as a percentage of total population (PCTEMP). In the next section a t-test is used to formally compare municipal and contract communities with respect to each of the demographic and independent variables.

#### Inferential Statistics

Inferential statistics are concerned with making generalizations about a population from the results obtained from a sample (Lang and Heiss 1977, 2). In this section, municipal and contract communities are compared with respect to each of the demographic and independent variables. The hypotheses tested in this section seek to determine if municipalities that privatize RSC exhibit demographic and financial

characteristics that are significantly different from those that do not privatize RSC. The alpha level for determining statistical significance in this study is .10.

A two-sample t-test is a powerful technique for testing the hypothesis that the difference between the means of two groups is statistically significant. The accuracy of the two-sample t-test is dependent upon two key assumptions: (1) each of the populations are normally distributed, and (2) the variance for each of the populations are equal (Hays 1981, 286). According to Hays (1981, 287) the t-test is generally robust against departures from normality. However, the lack of homogeneity of variance is critical when comparing groups of unequal size. When unequal sample sizes are compared and the equality of population variances cannot be assumed, a correction for the number of degrees of freedom is recommended (Hays 1981, 287). The SAS TTEST procedure provides an F-test of the null hypothesis that the population variances are equal. In addition, a t-statistic and corresponding significance level is calculated under the assumption of equal variances as well as under the assumption of unequal variances. The t-statistic under the assumption of unequal variances incorporates a calculation for the number of degrees of

freedom similar to the correction recommended by Hays (1981, 287).

T-test results for each of the demographic variables are shown in table 5-4. The results indicate that the two groups are not significantly different with respect to: (1) total population, (2) the number of households, and (3) the number of municipal employees.

**TABLE 5-4**  
**T-TEST RESULTS FOR DEMOGRAPHIC VARIABLES**

<u>Variable</u>	<u>N</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>T</u>	<u>p-Value</u>
Population					
Municipal	43	12,738	36,055	-0.9380	0.3515
Contract	53	25,608	91,524		
Households					
Municipal	43	4,215	11,630	-0.9401	0.3505
Contract	53	8,602	31,426		
Employees					
Municipal	43	147	411	-0.7148	0.4770
Contract	53	251	952		

Table 5-5 presents the t-test results for all independent variables included in the logit model. The results indicate that municipalities that privatize RSC have significantly higher tax revenues per household (TAXREV), significantly lower RSC costs per household (REFUSE), receive a significantly higher level of RSC services (FREQ), and are more likely to be from the metropolitan New Orleans area (NEWORL).

**TABLE 5-5**  
**T-TEST RESULTS FOR INDEPENDENT VARIABLES**

<u>Variable</u>	<u>N</u>	<u>Mean</u>	<u>Standard Deviation</u>	<u>T</u>	<u>p-Value</u>
<b>TAXREV</b>					
Municipal	43	333.08	282.01	-2.5889	0.0112
Contract	53	486.62	294.47		
<b>REFUSE</b>					
Municipal	43	82.14	44.59	1.9271	0.0584
Contract	53	67.34	25.99		
<b>PROPERTY</b>					
Municipal	43	83.96	124.50	-0.5363	0.5931
Contract	53	101.47	193.43		
<b>DEBT</b>					
Municipal	43	318.74	575.30	-0.6042	0.5472
Contract	53	389.49	566.71		
<b>GRANTS</b>					
Municipal	43	154.96	321.94	0.1187	0.9057
Contract	53	145.59	449.98		
<b>PCTEMP</b>					
Municipal	43	0.92	0.51	0.4081	0.6843
Contract	53	0.88	0.40		
<b>FREQ</b>					
Municipal	43	1.51	0.55	-1.8014	0.0748
Contract	53	1.70	0.46		
<b>USERFEE</b>					
Municipal	43	0.79	0.41	-1.0044	0.3178
Contract	53	0.87	0.34		
<b>NEWORL</b>					
Municipal	43	0.07	0.26	-2.4565	0.0160
Contract	53	0.25	0.43		

The findings indicate that the voters in municipalities that privatize RSC face a greater tax burden (TAXREV) than voters in municipalities using municipal RSC. This result is consistent with the a priori notion that voters faced with higher tax levels become politically active and pressure politicians to reduce government spending levels (e.g., privatize services).

The t-test of the difference in the cost of RSC per household (REFUSE) for the two groups of municipalities indicates that contract RSC is significantly less costly than municipal RSC. This result supports the a priori notion that private sector production is less costly than public sector production. However, this statistical test does not hold constant other factors that may influence the cost of RSC. For example, higher municipal RSC could be caused by the provision of a higher level of services than contract RSC. Therefore, it is inappropriate to conclude from a t-test alone that private sector production is necessarily less costly than public sector production.

T-test results indicate that municipalities that privatize RSC receive a higher level of services (FREQ) than those that do not privatize RSC. This is consistent with the a priori notion that private sector producers provide higher service levels than public

sector producers. Combining the findings for REFUSE and FREQ leads to the conclusion that private sector firms provide a higher level of RSC services at lower costs (including profit) than public sector employees.

In Louisiana, New Orleans is the largest metropolitan area and therefore may possess characteristics that are different from other municipalities in the state. The dummy variable NEWORL is included in the model to capture any systematic differences between municipalities in the New Orleans area and those outside the New Orleans area. The results indicate that contract RSC is more likely for municipalities in the metropolitan New Orleans area.

A t-test comparing communities that privatize RSC to those that do not privatize RSC indicates that no statistically significant differences exist with respect to: (1) the amount of property tax revenues generated by the average household (PROPERTY), (2) the amount of general obligation bonds outstanding per household (DEBT), (3) the amount of intergovernmental revenues per household (GRANTS), (4) the ratio of municipal employees (minus RSC employees) to total population (PCTEMP), and (5) the use of RSC user fees (USERFEE).

These results indicate that the amount of additional funds available to the bureaucrat (PROPERTY, DEBT, and GRANTS) are not significantly different in

municipal vs. contract communities. The finding that the difference in PCTEMP is not significantly different suggests that municipal employees in municipal RSC communities possess no more political clout than municipal employees in contract RSC communities. A dummy variable, USERFEE, is included in the model to represent the existence of a RSC user fee. A user fee makes the cost of RSC explicit to voters. T-test results indicate that contract RSC communities are no more likely to assess a RSC user fee than municipal RSC communities.

#### Tests of the Model

In this study, the dependent variable is the method of RSC. Two RSC arrangements are considered: (1) municipal RSC, and (2) contract RSC. Nine hypotheses are tested regarding the extent to which municipal accounting data is useful for modeling the municipal decision to privatize RSC. Logit is an appropriate method of determining the simultaneous effect of several independent variables upon a dichotomous dependent variable. As in ordinary least squares (OLS) regression analysis, multicollinearity among the independent variables included in a logit model can cause significant problems in the interpretation of the results. Therefore, the first step in the analysis is

to assess the degree of multicollinearity among the independent variables in the logit model.

Two methods are used to assess the degree of multicollinearity among the independent variables. First, Pearson product moment correlations are used to evaluate whether the independent variables in the model are highly correlated with each other (i.e., bivariate correlations). Second, to assess whether one independent variable can be expressed as a linear combination of several of the others, each independent variable is regressed, in turn, on the remaining independent variables.

#### Tests for Detecting Multicollinearity

Stone and Rasp (1991, 173) identify collinear predictor variables as one problem typically encountered in accounting research. While collinearity among independent variables is prevalent in accounting studies, the correlations need to be fairly high (i.e., 0.70 or larger) before they present a serious problem. Table 5-6 presents the Pearson product moment correlation coefficients and associated significance levels for all continuous independent variables in the logit model. While several of the correlations are statistically significant, the correlation coefficients are low to moderate. None of the correlations in Table 5-6 are close to 0.70.

TABLE 5-6

## PEARSON'S PRODUCT MOMENT CORRELATION COEFFICIENTS

	REFUSE	PROPERTY	DEBT	GRANTS	PCTEMP
TAXREV	0.2956 (.0035)	0.5595 (.0001)	0.4636 (.0001)	-0.0505 (.6254)	0.1975 (.0537)
REFUSE		0.1637 (.1111)	0.1308 (.2041)	-0.0047 (.9635)	0.0872 (.3981)
PROPERTY			0.4246 (.0001)	-0.0149 (.8855)	0.1402 (.1732)
DEBT				-0.0450 (.6636)	0.1152 (.2638)
GRANTS					0.0327 (.7520)

TABLE 5-7

RESULTS OF MULTIPLE REGRESSION  
TESTS FOR MULTICOLLINEARITY

Dependent Variable	df	F-Value	p-Value	R-Square
TAXREV	87	8.58	.0001	.4410
REFUSE	87	1.24	.2850	.1025
PROPERTY	87	5.99	.0001	.3552
DEBT	87	4.76	.0001	.3044
GRANTS	87	0.45	.8887	.0396
PCTEMP	87	0.55	.8145	.0483
FREQ	87	1.49	.1723	.1205
USERFEE	87	1.18	.3229	.0976
NEWORL	87	1.78	.0921	.1406

Table 5-7 presents the coefficient of multiple determination ( $R^2$ ) for the multiple regressions when each independent variable is regressed on the remaining independent variables. An  $R^2$  close to 1.00 for any of these multiple regression equations would indicate significant multicollinearity. While several of the multiple regressions are statistically significant, the  $R^2$ s are low to moderate. Therefore, the estimated coefficients of the logit model do not appear to be impaired by the effects of multicollinearity.

#### Logit Results

Public choice theory and the theory of bureaucracy are used to derive hypotheses concerning the municipal decision to privatize RSC. Municipal accounting information is used to operationalize these hypotheses. A logit model is used to test the extent to which municipal accounting data is useful for modeling the decision to privatize RSC. The dependent variable in the logit model is the method of RSC (METHOD). The usefulness of municipal accounting data for modeling the decision to privatize RSC is judged by a chi-square test of the null hypotheses that all coefficients for the independent variables included in the model equal zero. Rejection of this hypothesis is empirical evidence that at least one, and possibly all, of the independent variables is related to the privatization decision.

Each of the individual coefficients are tested for statistical significance using a chi-square test. In addition, the sign of each coefficient is compared to the a priori predicted sign. A sign in the predicted direction suggests that the theoretical model is capable of not only identifying variables but also predicting the direction of their effect on the privatization decision. Table 5-8 summarizes the results of the logit model.

The statistical significance of the overall model is determined by the value of the -2 Log L.R. statistic. This statistic is interpreted in the same manner as an F-test in an ordinary least squares regression. That is, the null hypothesis is that all of the coefficients in the model are equal to zero. The value of the -2 Log L.R. statistic ( $p = .0003$ ) leads to a rejection of the null hypothesis and indicates that the overall model is useful for explaining the decision to privatize RSC. To draw more conclusive inferences regarding the usefulness of municipal accounting data for modeling the decision to privatize RSC, the null hypothesis that each coefficient equals zero is tested. An interpretation of the sign and significance of each of the independent variables in the model follows.

The variable TAXREV (total tax revenues divided by the number of households) is a measure of the tax burden

**TABLE 5-8**  
**SUMMARY OF LOGIT RESULTS**

<u>Variable</u>	<u>Expected Sign</u>	<u>Coefficient</u>	<u>Std. Error</u>	<u>Chi-Square</u>	<u>p-Value</u>
TAXREV	+	0.0047	0.0014	10.75	0.0010
REFUSE	+	-0.0277	0.0095	8.55	0.0035
PROPERTY	-	-0.0031	0.0019	2.68	0.1016
DEBT	-	-0.0008	0.0006	1.91	0.1671
GRANTS	?	-0.0001	0.0006	0.01	0.9212
PCTEMP	-	-0.6561	0.5772	1.29	0.2557
FREQ	+	0.9118	0.5226	3.04	0.0810
USERFEE	+	0.7518	0.6870	1.20	0.2738
NEWORL	+	2.1745	0.9083	5.73	0.0167
CONSTANT	?	-0.8881	1.0152	0.77	0.3817

Value of chi-squared statistic for model: 30.62 df.= 86  
(-2 Log L.R.) p = .0003

Classification Table For the Logit Model

		Predicted		Total
		Municipal	Contract	
Actual	Municipal	29	14	43
	Contract	12	41	53
Total		41	55	96

False positive rate: 25.5%  
False negative rate: 29.3%

upon voters. The notion that voters respond to an increasing tax burden by pressuring politicians to implement more efficient methods of service delivery (e.g., privatization) is supported by the positive sign and statistical significance of the coefficient for TAXREV. The positive sign for this coefficient suggests that the probability of privatization increases as the tax burden per household increases. This result is consistent with the a priori expectation based on the public choice model that states voters become politically active when faced with an increasing tax burden. The null hypothesis that the coefficient for this variable is equal to zero is rejected ( $p = .0010$ ).

The coefficient for the variable REFUSE (cost of RSC per household) is significant ( $p = .0035$ ). However the sign of this variable is opposite that of the a priori predicted direction. That is, the empirical results indicate that the probability of privatization decreases as the cost of RSC increases. This finding is unexpected since one of the most common reasons for considering privatization is the expected cost savings. A possible reason for this finding is that higher RSC costs are associated with municipal collection<sup>13</sup>.

---

<sup>13</sup>The unexpected sign of this coefficient may be due to the possible endogeneity of REFUSE to the model. That is, the cost of RSC may influence the decision to privatize, and privatization may impact on the cost of RSC. Therefore, the relationship between REFUSE and the

DEBT (general obligation bonds outstanding divided by the number of households) is a proxy for additional funds available to the bureaucrat. As the level of debt outstanding increases, bureaucrats have more funds with which to engage in "empire building" and other inefficient activities. Therefore, a priori, as DEBT increases, the probability of privatization decreases (i.e., the sign for this coefficient should be negative). The results indicate that the coefficient for this variable is negative but insignificant ( $p = .1671$ ). Therefore, the null hypothesis that this coefficient is equal to zero cannot be rejected.

There are two possible reasons for DEBT not being statistically significant. First, DEBT may not be a good proxy for additional funds available to the bureaucrat. Second, additional funds available to the bureaucrat may not impact on the privatization decision. If DEBT is not a good proxy for additional funds available to the bureaucrat a better proxy must be found. However, if additional funds available to the bureaucrat do not impact on the privatization decision, the theoretical framework needs to be re-examined. Additional research is necessary to gain a better

---

decision to privatize RSC may be mutually dependent. To account for this possibility, the equation is re-estimated using an instrumental variable (IV) procedure. The results of the IV procedure are reported in Table 5-9.

understanding of how (if) this variable influences the privatization decision.

The coefficient for the variable GRANTS (intergovernmental revenues divided by the number of households) is negative but insignificant ( $p = .9212$ ). No prediction was made a priori regarding the direction of the sign for this variable. The negative sign suggests that as revenues received from intergovernmental sources increase the probability of privatization decreases. This is consistent with the notion that GRANTS is a proxy for additional funds available to the bureaucrat. Because these funds do not come from the local taxpayers, a bureaucrat is able to engage in "empire building" (e.g., employ municipal workers for RSC) and other inefficient activities without political pressure. As stated above for DEBT, two possible reasons exist for GRANTS not being significant. First, GRANTS may not be a good proxy for additional funds available to the bureaucrat. Second, additional funds available to the bureaucrat may not influence the decision to privatize RSC. Additional research is necessary to determine how (if) GRANTS impacts the privatization decision.

Municipal employees represent a group of voters with a vested interest in thwarting any attempt to privatize municipal services. The variable PCTEMP is

calculated by dividing the number of municipal employees (less RSC employees) by the total population of the municipality. The coefficient for this variable is negative but insignificant ( $p = .2557$ ). The negative sign suggests that the probability of privatization decreases as the proportion of the population composed of municipal employees increases. The insignificance of PCTEMP may be due to the exceptionally small percentages obtained for PCTEMP. The highest value for PCTEMP (2.5%), is associated with contract RSC. However, the next two highest values for PCTEMP (2.4% and 2.1%), are associated with municipal RSC. It is difficult for such a small group of voters to have much influence on local politicians. The value of PCTEMP may need to be greater than some threshold level before it becomes statistically significant.

The variable FREQ is equal to the number of residential sanitation collections per week and is a proxy for service level. This variable is included in the model to control for any systematic differences in RSC service level. The results support the a priori prediction that communities requiring a higher level of RSC service are more likely to privatize RSC. The results also support the notion that service level is a factor in the privatization decision since the null hypothesis that the coefficient for this variable is

equal to zero is rejected ( $p = .0810$ ).

A dummy variable representing the use of a RSC user fee (USERFEE) is included in the model to capture the effect of making the cost of RSC explicit to the voters. Voters are more likely to demand efficient operations if they are aware of the cost of those operations. The results indicate that USERFEE does not impact the decision to privatize RSC. One explanation for this finding is that most (85%) of the municipalities in the sample assess a RSC userfee (90% of contract and 79% of municipal). Another possible explanation for this finding is that taxpayers do not pressure politicians to engage in cost reduction measures (e.g., privatization) based on the cost of a single service. That is, voters look at the size of the government as a whole, not the individual parts when deciding to become politically active. The null hypothesis that the coefficient for this variable is equal to zero cannot be rejected ( $p = .2738$ ).

NEWORL is a dummy variable assigned a value of 1 if a municipality is located in the metropolitan New Orleans area and assigned a value of 0 otherwise. New Orleans is the largest metropolitan area in Louisiana. It is possible that municipalities within the New Orleans metropolitan area possess characteristics that are systematically different from other municipalities

within Louisiana. Therefore, the variable NEWORL is included in the model to capture any systematic differences that may exist because of a municipality's proximity to the New Orleans area.

The coefficient for NEWORL is positive and significant ( $p = .0167$ ). Therefore, cities that are located in the metropolitan New Orleans area are more likely to privatize RSC than those outside the New Orleans area. This result may be an indication that there are some economies of scale available to private sector firms operating in large metropolitan areas. Economies of scale may exist because private sector firms do not need to recognize political boundaries (Spann 1977, 89). Therefore, private sector firm can choose an optimal level of operation in an area with a large number of potential customers. Another reason for a higher propensity to privatize RSC in metropolitan areas may be the level of demand for public services that is characteristic of large metropolitan areas. That is, the demand for public sector services in large metropolitan areas may be greater than the capacity of the public sector service system. One method to alleviate this strain is to contract services out to private sector firms. The empirical results support the a priori prediction for this coefficient.

The results of the logit analysis indicate that the

overall model is significant ( $-2 \text{ Log L.R. } p = .0003$ ). This is interpreted as evidence that municipal accounting data is useful for modeling the municipal decision to privatize RSC. Further, rejection of the null hypothesis for individual coefficients is possible for five of nine independent variables. These results should be considered in the context of a recent study by Stone and Rasp (1991) that used a Monte Carlo simulation to evaluate the effect of sample size, the distribution of data, and collinearity among independent variables on logit error rates. Their results indicate that when sample sizes are small (less than 200 observations), and data is skewed, the null hypothesis for individual parameter estimates are falsely rejected less frequently than the alpha level indicates. However, the null hypothesis that the overall model has no explanatory power is falsely rejected more often than the alpha level indicates. This leads to the conclusion that when sample size is small and data is skewed (as in the present study), tests of the individual coefficients tend to be conservatively biased, while a test of the overall model may produce a result that is overly optimistic.

The classification table included in Table 5-8 indicates that 72.9% of the observations in the original data set are classified correctly by the logit model.

This is better than the rate resulting from the use of a naive model that classifies all municipalities as contract (55.2%). Caution must be used when interpreting this result however. If this model is applied to a new data set, a similar level of accuracy may or may not be achieved.

REFUSE may, to some degree, be determined by the dependent variable METHOD. To address the possibility of REFUSE being endogenous, the logit model is re-estimated using an instrumental variable (IV) procedure. The IV technique is a two-stage process. In the first stage, an ordinary least squares regression is performed with REFUSE as the dependent variable. The independent variables (i.e., instruments) consist of data obtained from the survey instrument. In the second stage, the predicted values from the first stage ordinary least squares regression (REFUSE2) are entered into the original logit model. Table 5-9 presents the results of the IV procedure.

A comparison of the re-estimated logit results with the original logit results suggests that REFUSE is not endogenous to the model. In the original model the coefficient of REFUSE is negative and significant ( $p = .0035$ ). In the re-estimated model, the coefficient of REFUSE2 is also negative and significant. In

TABLE 5-9

## SUMMARY OF RE-ESTIMATED LOGIT RESULTS

Variable	Expected Sign	Coefficient	Std. Error	Chi-Square	p-Value
TAXREV	+	0.0044	0.0015	8.76	0.0031
REFUSE2	+	-0.0333	0.0194	2.95	0.0859
PROPERTY	-	-0.0027	0.0019	1.91	0.1673
DEBT	-	-0.0006	0.0005	1.43	0.2317
GRANTS	?	-0.0000	0.0006	0.00	0.9775
PCTEMP	-	-0.4550	0.5428	0.70	0.4019
FREQ	+	0.8451	0.4927	2.94	0.0863
USERFEE	+	0.5578	0.6702	0.69	0.4053
NEWORL	+	1.8667	0.8229	5.15	0.0233
CONSTANT	?	-0.3809	1.2605	0.09	0.7625

Value of chi-squared statistic for model: 21.26 df.= 84  
 (-2 Log L.R.) p = 0.0115.

## Classification Table For the Logit Model

		Predicted		Total
		Municipal	Contract	
Actual	Municipal	27	15	42
	Contract	15	37	52
Total		42	52	94

False positive rate: 28.8%  
 False negative rate: 35.7%

addition, all insignificant variables in the original model remain insignificant in the re-estimated model. All significant variables in the original model retain their algebraic sign in the re-estimated model. Only one significant variable (PROPERTY) in the original model ( $p = .1016$ ) becomes insignificant in the re-estimated model (it does however retain the same algebraic sign).

The results of the re-estimated model are reassuring. The endogeneity of REFUSE would be suggested if: (1) the magnitude of the coefficients in the re-estimated model changed radically from the coefficients in the original model, (2) the algebraic sign of the coefficients in the original model changed in the re-estimated model, and (3) significant (insignificant) coefficients in the original model became insignificant (significant) in the re-estimated model. The results of the IV procedure suggest that the estimates obtained from the original model are robust with respect to the possibility of REFUSE being endogenous to the model.

#### Summary

This chapter presents the results of this study. The evidence suggests that municipal accounting data is useful in modeling the municipal decision to privatize RSC. More generally, the theoretical framework that is

used in this study may be useful for suggesting municipal accounting data to model a variety of public resource allocation decisions. Table 5-10 presents a summary of the results of the hypotheses tested in this study.

TABLE 5-10

## SUMMARY OF HYPOTHESES TEST RESULTS

	<u>Null Hypothesis</u>	<u>Results</u>
H <sub>1</sub> :	Ceteris paribus, RSC costs per household do not affect the decision to privatize RSC.	REJECT (p = .0035)
H <sub>2</sub> :	Ceteris paribus, total tax revenues per household do not affect the decision to privatize RSC.	REJECT (p = .0010)
H <sub>3</sub> :	Ceteris paribus, the amount of property tax revenues generated by the average household does not affect the decision to privatize RSC.	REJECT (p = .1016)
H <sub>4</sub> :	Ceteris paribus, the amount of general obligation bonded debt outstanding per household does not affect the decision to privatize RSC.	FAIL TO REJECT
H <sub>5</sub> :	Ceteris paribus, the amount of inter-governmental revenues per household do not affect the decision to privatize RSC.	FAIL TO REJECT
H <sub>6</sub> :	Ceteris paribus, the ratio of the number of municipal employees (less RSC employees) to total population does not affect the decision to privatize RSC.	FAIL TO REJECT
H <sub>7</sub> :	Ceteris paribus, the frequency of RSC does not affect the decision to privatize RSC.	REJECT (p = .0810)
H <sub>8</sub> :	Ceteris paribus, the assessment of a RSC user fee does not affect the decision to privatize RSC.	FAIL TO REJECT
H <sub>9</sub> :	Ceteris paribus, the geographic proximity of a municipality to the metropolitan New Orleans area does not affect the decision to privatize RSC.	REJECT (p = .0167)

## CHAPTER 6

### SUMMARY AND CONCLUSIONS

This chapter summarizes the study and describes the contribution it makes to the existing body of accounting literature. The first section provides a brief overview of the study. The second section discusses the implications of the empirical results. The third section outlines the limitations of the study. The final section offers suggestions for future research.

#### Summary of the Study

This study investigates the determinants of the municipal decision to privatize residential sanitation collection (RSC). Louisiana municipalities were surveyed to obtain data regarding the method of RSC as well as certain financial and demographic information. This study examines two methods of RSC: (1) municipal--where RSC is carried out by municipal employees, and (2) contract--where RSC is carried out by a private sector firm under contract with a municipality. Public choice theory and the theory of bureaucracy guide the selection of municipal accounting data useful for modeling the municipal decision to privatize RSC. Nine hypotheses

derived from public choice theory and the theory of bureaucracy are tested using logistic regression (logit) analysis. The logit model is statistically significant. In addition, five of the nine independent variables are statistically significant. These results indicate that municipal accounting data is useful for modeling the municipal decision to privatize RSC.

#### Implications

One of the most common reasons for privatizing RSC is the cost savings that result from private sector production. Many studies find support for the hypothesis that contract RSC is less costly than municipal RSC (Kitchen 1976; Savas 1977; Stevens 1978; Bennett & Johnson 1979; McDavid 1985; and Berenyi & Stevens 1988). However, most of these studies investigate municipalities with more than 25,000 residents. The effect of privatizing RSC in small municipalities (population under 10,000) has received little attention in the literature, primarily due to the lack of data availability for small municipalities. The present study uses data from Louisiana municipalities, the majority of which are small (population under 10,000). The results of this research are consistent with prior research indicating that the cost of RSC is significantly lower for contract RSC.

Prior research regarding public resource allocation decisions uses public choice theory and/or the theory of bureaucracy to guide the selection of independent variables. Typically, these studies use socioeconomic data to operationalize the independent variables. One problem with socioeconomic data is that it is not always available on a timely basis (e.g., Census of Government data is only published every five years). In general, municipal accounting data is prepared at least annually. Therefore, municipal accounting data provide a more timely source of information for researchers investigating public resource allocation decisions.

In the present study public choice theory and the theory of bureaucracy guide the selection of municipal accounting data useful for modeling the decision to privatize RSC. The results indicate that municipal accounting data are useful for modeling the municipal decision to privatize RSC. Therefore, public choice theory and the theory of bureaucracy appear to provide a useful theoretical framework for accounting researchers interested in investigating public resource allocation decisions.

The results of this study support the notion that voters react to the burden of taxation. When the tax burden per household increases, the probability of privatization increases. This finding suggests that

voters become politically active and put pressure upon politicians to reduce taxes as their tax burden increases. To decrease the tax burden upon their constituents, politicians may attempt to lessen the need for additional tax revenues by reducing the level of government expenditures. One method to reduce public expenditures is to provide services at the lowest possible cost, and privatization of RSC is one method of reducing the cost of RSC. The empirical results suggest that municipal accounting data reflect the behavior of voters faced with an increase in their tax burden. Furthermore, municipal accounting data also reflects the behavior of politicians faced with dissatisfied voters.

The opportunity costs of becoming informed about political issues and of voting are higher for wealthy individuals. Therefore, a greater degree of perceived government waste and a higher level of tax burden is necessary before voters in wealthy communities become politically active. Bureaucrats in wealthy communities are able to exploit this political apathy by engaging in "empire building" and other inefficient activities (e.g., municipal RSC instead of contract RSC). The results of this study support the notion that wealthy communities require a greater level of discontent before becoming politically active.

The assessment of a user fee makes the cost of RSC explicit to the voter. A priori, it was expected that knowledge of the cost of RSC would motivate voters to become politically active and demand that RSC be provided at minimum cost (i.e., privatized). However, the results suggest that the existence of a user fee does not impact the decision to privatize RSC. The reason for this situation may be that the cost of a single service (e.g., RSC) is not enough to motivate voters to become politically active (i.e., it does not force them out of their range of indifference). This finding suggests that voters base their evaluation of local officials on overall performance rather than on a particular issue.

In general, the population density of municipalities in large metropolitan areas is higher than those outside of large metropolitan areas. Higher population density puts a strain on service providers (i.e., municipal governments). One way to alleviate this strain is to contract out certain services to the private sector (e.g., RSC). The results show that large metropolitan areas are more likely to privatize RSC.

The results of this study support some conclusions of prior research and refute others. Ferris (1986) finds that as the tax burden upon residents increases, the percentage of publicly provided services contracted

out increases. The present study supports this finding. Alternatively, Ferris (1986) finds that as intergovernmental revenues (e.g., state and federal grants) as a percent of total revenues increase, the percentage of municipal services contracted out increases. According to the present study, intergovernmental revenues do not significantly affect the decision to privatize RSC.

Ferris (1986) also finds municipal employees as a percent of total population significant in the decision to contract out services; as the ratio of public employees to total population increases, the percentage of services contracted out decreases. This finding suggests that public employees are able to thwart attempts to privatize municipal services as their political clout increases (i.e., as the ratio of municipal employees to total population increases).

The present study does not support the contention that public employees possess a significant amount of political clout. This finding is probably due to the small size (population under 10,000) of the municipalities in the sample. Some municipalities have so few public employees that even if they vote as a group, they possess no more political clout than a single voter.

From a theoretical perspective, public employees possess more political clout than the average resident because they tend to be more politically active (Bennett and Orzechowski 1983). This by itself does not guarantee political power however, since the number of individuals in the group needs to be sufficiently large to render the group politically effective. Additional research is necessary to determine how large a group must be, relative to all voters, before it can effectively wield political power in privatization decisions.

A factor not in the model of the decision to privatize RSC is the effect of municipal employee unions. Theoretically, municipal employee unions oppose privatization on the grounds that privatization causes municipal employees to lose their jobs. However, the number of unionized employees must be sufficiently large to wield any political power. While it is proper to include a union variable in the model on theoretical grounds, Louisiana municipalities have very little unionization.

The major conclusion of this study is that public resource allocation decisions are impounded in the municipal accounting numbers, making it possible to assess the accountability of public officials. Therefore, municipal accounting data meet one of the

three broad objectives set forth in GASB Concepts Statement No. 1, Objectives of Financial Reporting. Furthermore, public choice theory and the theory of bureaucracy provide the theoretical underpinnings necessary to develop models of public resource allocation decisions using municipal accounting data.

One of the major functions of municipal accounting is to accurately report financial transactions affecting a municipality. One of the major functions of government accountants is to decide which information to report. According to GASB Concepts Statement No. 1 (GASB 1987, 27), "Financial reporting should assist in fulfilling government's duty to be publicly accountable and should enable users to assess that accountability." Accordingly, government accountants must report information that allows users to assess the performance of public officials. Public choice theory and the theory of bureaucracy are both well established models of how decisions are made in the public sector. Therefore, governmental financial reports should reflect public resource allocation decisions that are consistent with public choice theory and the theory of bureaucracy. The statistical analyses of the present study demonstrate that municipal accounting data does indeed, for the privatization decision, reflect relevant information underlying public resource allocation

decisions. The main contribution of this study lies in establishing public choice theory and the theory of bureaucracy as the critical linchpin that connects municipal accounting data to public resource allocation decisions.

The results of this study may be useful to the GASB in setting governmental accounting standards. The GASB can look to public choice theory and the theory of bureaucracy to guide the development of reporting standards which accurately reflect public resource allocation decisions. Accounting academicians will also benefit from the methodological contributions of this study. Academicians investigating public resource allocation decisions should consider using public choice theory and the theory of bureaucracy to link those decisions to specific accounting variables.

The results of this study suggest that municipal accounting data may be useful to private sector firms attempting to target municipalities that are good prospects (i.e., "ripe") for privatization. For example, a private firm may use the level of total taxes per household as an indicator of communities that are more likely to privatize. Alternatively, the logit model developed in this study may be used to identify prospects for privatization. The logit model calculates the probability that a municipality privatizes RSC.

This probability is then used to classify each municipality as either privatized or municipal. Municipalities incorrectly classified as privatized are those that, according to the model, should be privatized. Therefore, municipalities incorrectly classified as privatized represent good prospects for privatization.

The results of this study also suggest that municipal accounting data provide information useful to users such as bond underwriters and bond rating agencies. Bond underwriters and bond rating agencies need data that accurately reflects the financial dealings of a municipality. The results of this study suggest that municipal accounting data reflect decisions that impact the financial status of a municipality. Further, the results suggest that the decision to privatize RSC may be a signal regarding the quality of management in a municipality. That is, it appears that the decision to privatize RSC is typically made in response to voters becoming politically active. Political activity by voters is typically motivated by the tax burden placed upon voters. Therefore, bond rating agencies and bond underwriters may view privatization as a signal that voters will not be favorably disposed to future tax increases necessary to service general obligation debt.

Finally, the results of this study suggest that municipal accounting data provides information useful to government officials who are considering whether or not to privatize government services. Since municipal accounting data provides indicators or signals regarding when privatization is likely, the financial characteristics of one municipality can be compared to those of another municipality to aid in deciding when to engage in privatization.

#### Limitations

One limitation of this study is that the results may not be generalizable to municipalities outside Louisiana. To the extent that the political structure and decision making approach used in Louisiana differ systematically from municipalities outside Louisiana, the results of this study are not relevant to municipalities outside Louisiana. However, the findings of this study are consistent with the theoretical model. Therefore, the application of the model used in this study to a different data set should yield similar results.

Another limitation is that the research design of this study is by necessity quasi-experimental. Two important characteristics of quasi-experimental research are (1) the absence of random assignment of subjects to experimental and control groups, and (2) the inability

of the researcher to manipulate independent variables. In this study, municipalities self-select themselves into one of two groups (i.e., municipal RSC or contract RSC). Therefore, self-selection bias may have been present. In addition, the degree of causality that can be attributed to the independent variables is limited because the independent variables were not manipulated by the researcher in this study.

#### Suggestions for Future Research

The results of this study provide many directions for future accounting research. First, the model used in this study should be employed to investigate the municipal decision to privatize other municipal services. This would provide empirical evidence of the robustness of the model. Second, public choice theory and/or the theory of bureaucracy should be used to suggest municipal accounting data useful for modeling public resource allocation decisions other than privatization.

In this study, the amount of additional funds available to the bureaucrat (GRANTS and DEBT) was not a significant factor with respect to the municipal decision to privatize RSC. Future research should attempt to determine whether GRANTS and DEBT are simply poor proxies for additional funds available to the bureaucrat, or if additional funds available to the

bureaucrat do in fact impact on the privatization decision.

According to the theoretical framework employed in this study, the probability of privatization should increase as the cost of RSC per household (REFUSE) rises. However, the empirical findings are the opposite of the a priori expectation. Future research should attempt to determine whether the negative sign of the REFUSE coefficient is an anomalous result.

According to Millar (1983, 192) a significant number of municipalities abandon contract RSC and return to municipal RSC. Future research should attempt to determine why municipalities abandon privatization. In addition, future research should compare the financial characteristics of municipalities that abandon privatization with the financial characteristics of those that do not abandon privatization. Public choice theory and/or the theory of bureaucracy may be useful for investigating these questions.

Savas (1979) suggests that municipalities understate the "true" cost of municipal RSC. Future research should investigate how municipal accounting systems can be modified so that all relevant costs are included in the calculation of the cost of municipal services. A study of the true costs of providing

municipal services would presumably be useful to GASB in the standard setting process.

Private sector firms sometimes submit low bids (i.e., low ball) to secure government contracts. After the initial contract period, the contract price is then increased. Future research should attempt to determine whether the cost savings associated with privatization decrease over time and whether the existence of competition in the private sector provides a measure of control for the phenomenon of low balling.

## REFERENCES

- Ahlbrandt, R. 1973. Efficiency in the provision of fire services. Public Choice 16: 1-15.
- Aldrich, J. and F. Nelson. 1984. Linear Probability, Logit, and Probit Models Beverly Hills: Sage Publications.
- Bails, D. 1979. Provision of transportation services. Public Choice 34(1): 65-68.
- Barr, J. L. and O. A. Davis. 1966. An elementary political and economic theory of local governments. Southern Economic Journal (October): 149-165.
- Bennett, J. and M. Johnson. 1979. Public versus private provision of collective goods and services: garbage collection revisited. Public Choice 34:55-63.
- Bennett, J. and W. Orzechowski. 1983. The voting behavior of bureaucrats: Some empirical evidence. Public Choice 41: 371-383.
- Berenyi, E., and B. Stevens. 1988. Does privatization work? A study of the delivery of eight local services. State and Local Government Review (Winter): 11-20.
- Bergstrom, T. and R. Goodman. 1973. Private demands for public goods. American Economic Review (June): 280-296.
- Black, D. 1987. The Theory of Committees and Elections. Boston, MA: Kluwer Academic Publishers.
- Boadway, R., and D. Wildasin. 1984. Public Sector Economics. Boston, MA: Little, Brown and Company.
- Borcherding, T. and R. Deacon. 1972. The demand for the services of non-federal governments. American Economic Review (June): 891-901.

- Borcherding, T., W. Bush, and R. Spann. 1977. The effects on public spending of the divisibility of public outputs in consumption, bureaucratic power, and the size of the tax sharing group. In T. E. Borcherding (Ed.), Budgets and Bureaucrats: The Sources of Governmental Growth. Durham, NC: Duke University Press: 211-228.
- Bowen, H. 1943. The interpretation of voting in the allocation of economic resources. Quarterly Journal of Economics (November): 27-48.
- Bowen, R., E. Noreen, and J. Lacey. 1981. Determinants of the corporate decision to capitalize interest. Journal of Accounting and Economics 3: 151-179.
- Buchanan, J. 1984. Politics without romance: a sketch of positive public choice theory and its normative implications, pp. 11-22. In J. M. Buchanan and R. D. Tollison (Eds.), The Theory of Public Choice-II. Ann Arbor, MI: The University of Michigan Press.
- Cohen, C. 1988. The Louisiana state and local tax structure. Louisiana's Fiscal Alternatives. Baton Rouge, LA: Louisiana State University Press.
- Cornia, G., and C. Usher. 1981. The institutionalization of incrementalism in municipal budgeting. SRPA (Spring): 73-90.
- David, I. 1988. Privatization in America. The Municipal Year Book. Washington D.C.: International City Management Association 43-55.
- Deacon, R. 1979. The expenditure effects of alternative public supply institutions. Public Choice 34:381-397.
- Downs, A. 1957. An Economic Theory of Democracy. New York, NY: Harper and Row.
- Elliott, J., G. Richardson, T. Dyckman, and R. Dukes. 1984. The impact of SFAS 2 on firm expenditures on research and development: replications and extensions. Journal of Accounting Research (Spring): 85-102.
- Ferris, J. 1986. The decision to contract out: an empirical analysis. Urban Affairs Quarterly (December): 289-311.

- Ferris, J. 1988. The public spending and employment effects of local service contracting. National Tax Journal (June): 209-217.
- Governmental Accounting Standards Board. 1987. Concepts Statement No. 1 Objectives of Financial Reporting. Stamford, CT: Financial Accounting Foundation.
- Gramlich, E., K. Rubinfeld. 1982. Micro estimates of public spending demand functions and tests of the Tiebout and median voter hypotheses. Journal of Political Economy (June): 536-560.
- Hagerman, R., M. Zmijewski. 1979. Some economic determinants of Accounting policy choice. Journal of Accounting and Economics 1:141-161.
- Hay, L. 1989. Accounting for Governmental and Nonprofit Entities. Homewood, IL: Richard D. Irwin, Inc.
- Hays, W. 1981. Statistics. New York, NY: CBS College Publishing.
- Holcombe, R. 1985. An Economic Analysis of Democracy. Carbondale: Southern Illinois University Press.
- Hotelling, H. 1929. Stability in competition. Economic Journal (March): 41-57.
- Ingram, R. and R. Copeland. 1981. Municipal accounting information and voting behavior. Accounting Review (October): 830-843.
- Inman, R. 1978. Testing political economy's "as if" proposition: is the median income voter really decisive? Public Choice 33: 45-65.
- Kitchen, H. 1976. A statistical estimation of an operating cost function for municipal refuse collection. Public Finance Quarterly (January): 56-76.
- Lang G., and G. Heiss. 1977. A Practical Guide to Statistics for Research and Measurement. Upper Montclair, NJ: Montclair State College.
- McDavid, J. 1985. The Canadian experience with privatizing residential solid waste collection services. Public Administration Review (September/October): 602-608.

- McGuire, R., R. Ohsfeldt and T. Van Cott. 1987. The determinants of the choice between public and private production of a publicly funded service. Public Choice 54:211-230.
- McGuire, R. and T. N. Van Cott. 1984. Public versus private economic activity: A new look at school bus transportation. Public Choice 43: 25-43.
- Miller, A. 1983. Residential solid waste collection. The Municipal Year Book. Washington D.C.: International City Management Association 191-198.
- Niskanen, W. 1971. Bureaucracy and Representative Government. Chicago, IL: Aldine-Atherton.
- Pindyck, R. and D. Rubinfeld. 1981. Econometric Models and Economic Forecasts. New York, NY: McGraw-Hill Company.
- Pommerehne, W. 1978. Institutional approaches to public expenditure. Journal of Public Economics 9: 255-280.
- Rubin, Marc A. 1990. Sanitation Collection and Disposal, pp.263-286. In H.P. Hatry, J.R. Fountain, Jr., J.M. Sullivan, L. Kremer (Eds.), Research Report: Service Efforts and Accomplishments Reporting: Its Time Has Come. Norwalk, CT: Governmental Accounting Standards Board.
- Savas, E. 1977. Policy analysis for local government: public vs. private refuse collection. Policy Analysis (Winter): 49-74.
- Savas, E. 1979. How much do government services really cost? Urban Affairs Quarterly (September): 23-42.
- Senteney, D., and J. Strawser. 1990. An investigation of the association between financial statement effects and management's early adoption of SFAS 87. Review of Business and Economic Research (Spring): 12-22.
- Sonenblum, S., J. Kirlin and J. Ries. 1975. Providing Municipal Services: The Effect of Alternative Structures. Los Angeles, CA: UCLA Institute of Government and Public Affairs.

- Sonenblum, S., J. Kirlin and J. Ries. 1977. How Cities Provide Services. Cambridge, MA: Ballinger Publishing Company.
- Spann, R. M. 1977. Public versus private production of governmental services. In T. E. Borcharding (Ed.), Budgets and Bureaucrats: The Sources of Governmental Growth. Durham, NC: Duke University Press: 71-89.
- Stallings, R., and J. Ferris. 1988. Public administration research: Work in PAR, 1940-1984. Public Administration Review (January/February): 580-587.
- Stevens, B. 1978. Scale, market structure, and the cost of refuse collection. The Review of Economics and Statistics (August): 438-448.
- Stone, M. and J. Rasp. 1991. Tradeoffs in the choice between logit and OLS for accounting choice studies. Accounting Review (January): 170-187.
- Tullock, G. 1967. The welfare cost of tariffs, monopolies, and theft. Economic Inquiry (June): 224-232.
- U.S. Bureau of the Census. 1989. Statistical Abstract of the United States. 109th Ed. Washington, DC: U.S. Government Printing Office.
- Varian, H. R. 1987. Intermediate Microeconomics A Modern Approach. New York, NY: W. W. Norton & Company.

**APPENDIX**  
**SURVEY INSTRUMENT**



DANIEL G. KYLE, Ph.D., CPA  
LEGISLATIVE AUDITOR

OFFICE OF  
LEGISLATIVE AUDITOR  
STATE OF LOUISIANA  
BATON ROUGE, LOUISIANA 70804-9397

July 9, 1990

1800 RIVERSIDE N  
P.O. BOX 94397  
TEL (504) 342-7237  
FAX (504) 342-7144

TO CITY CLERKS/MUNICIPAL FINANCE DIRECTORS

The Office of the Legislative Auditor is cooperating with a Louisiana State University graduate student in conducting a study of residential solid waste (i.e., household garbage) collection. This study is for a doctoral dissertation designed to help in understanding the methods and costs of residential solid waste collection in use in Louisiana. Data for this study is being compiled (at no cost to the state) by Mr. Rich Brooks at Louisiana State University.

Mr. Brooks requests that you refer to the enclosed one page "Explanation of Terms" which defines terms as they are used in this study. Reference to this page will assure that the data submitted by all municipalities will be comparable. Please complete this report and forward directly to Mr. Brooks by July 31, 1990. Simply fold the report as indicated and staple once so that the postage-paid business reply address is showing.

Any questions regarding this report should be directed to Rich Brooks at (504) 388-6221 or (504) 769-7096. If you would like a summary copy of the results of this study, place an "X" in the space below. Thank you very much for your assistance.

Sincerely,

  
Daniel G. Kyle, CPA  
Legislative Auditor

DGK/db

Attachment

3984b

Please send me a summary copy of the results of this study.

**Solid Waste Collection Report  
Explanation of Terms**

A brief explanation of selected terms used in the enclosed Residential Solid Waste Collection (hereafter RSWC) Report is provided below so that the information reported will be comparable. Please do not return this page.

**Accrual Basis of Accounting**--revenues are recorded when earned and expenditures (or expenses) are recorded in the period in which they are incurred.

**Cash Basis of Accounting**--revenues are recorded when cash is received and expenditures are recorded when cash paid out.

**Capital Outlays**--expenditures for purchase and replacement of equipment, purchase of land and existing structures, and construction.

**Contract Out**--when a local government hires and pays a private firm or other government unit (e.g., parish) to collect residential solid waste.

**General Obligation Bonded Indebtedness**--the amount of general obligation bonded indebtedness outstanding at fiscal year end that is subject to the GOB debt limit (see GOB Debt Limit below).

**GOB Debt Limit**--the maximum amount of general obligation debt outstanding allowable for your municipality under Louisiana State Law.

**Intergovernmental Revenues**--includes grants, entitlements, and shared revenues from all sources (i.e., federal, state, parish); exclude your share of a parish general sales tax as this should be reported as part of sales tax revenues.

**Modified Accrual Basis of Accounting**--revenues are recorded in the period in which they become measurable and available, and expenditures are recorded at the time a liability is incurred.

**Payroll Expenditures**--wages, salaries and related fringe benefit costs.

**Residential Solid Waste**--discarded solid materials originating in residences (i.e., household garbage, household refuse).

**Revenues**--do not include bond proceeds and/or operating transfers.

**RSW**--residential solid waste.

**RSWC**--residential solid waste collection.

**Sales Tax Revenues**--include your share of a parish general sales tax.

**Total RSWC Expenditures**--includes salaries and wages of RSWC employees; fringe benefit costs for RSWC employees; operation and maintenance of RSWC vehicles; depreciation on RSWC vehicles; landfill fees; the portion of supervisors, clerks and other support workers which can properly be attributed to RSWC; and that portion of overhead expenditures that can be properly attributed to RSWC. Municipalities that contract out RSWC should report the amount paid to the parish and/or private firm for RSWC.

## RESIDENTIAL SOLID WASTE COLLECTION REPORT

Please type or print the name, title, and phone number of the person completing this report:

Name: \_\_\_\_\_

Title: \_\_\_\_\_ Phone Number: \_\_\_\_\_

## Part I: General Information

Please use the most recent data available to answer the following questions. All items relate to your municipality.

1. Name of municipality \_\_\_\_\_ 2. Population of municipality \_\_\_\_\_
3. Number of households \_\_\_\_\_ 4. Total land area (square miles) \_\_\_\_\_
5. Total assessed valuation \$ \_\_\_\_\_ 6. Property tax rate (mills) \_\_\_\_\_
7. Combined parish/city sales tax rate \_\_\_\_\_ % 8. City sales tax rate \_\_\_\_\_ %
9. Number of municipal employees \_\_\_\_\_ 10. Number of RSWC employees \_\_\_\_\_
11. Number of municipal employees in collective bargaining units \_\_\_\_\_ 12. Most current bond rating \_\_\_\_\_  
 Moody's or Standard & Poor's (please circle one)
13. Does the municipality collect a user fee from residents for RSWC? (please circle appropriate response) YES NO
14. If a user fee is collected, it is billed: (please check appropriate response)

- \_\_\_\_ As a separate item on the tax bill
- \_\_\_\_ As a separate item on a utility (e.g., water, sewer, etc.) bill
- \_\_\_\_ Separately from all other bills
- \_\_\_\_ Other (please describe) \_\_\_\_\_

15. Which of the following funds do you use to account for RSWC revenues & expenditures? (please check appropriate response)

- \_\_\_\_ General fund
- \_\_\_\_ Enterprise fund
- \_\_\_\_ Other fund (please describe) \_\_\_\_\_

16. What basis of accounting is used for RSWC revenues & expenditures? (please check appropriate response)

- \_\_\_\_ Accrual basis
- \_\_\_\_ Modified accrual basis
- \_\_\_\_ Cash basis

17. Which of the following RSWC arrangements is (are) used in your municipality? (please check appropriate response(s))

- \_\_\_\_ Municipal employees collect RSW
- \_\_\_\_ Private sector employees collect RSW (municipality contracts either directly or via parish government)
- \_\_\_\_ Parish government employees collect RSW (municipality contracts with parish government)
- \_\_\_\_ Citizens hire private haulers or dispose of solid waste themselves
- \_\_\_\_ Other (please describe) \_\_\_\_\_

18. If RSW is contracted out, please provide the name of the parish and/or private firm, and the year in which contracting out was initiated:

Parish/Firm \_\_\_\_\_ Year \_\_\_\_\_

**Part II: Expenditures**

Please use the most recent annual data available to answer the following questions.

I am using data from the 12 month period ending: Month \_\_\_\_\_ Year \_\_\_\_\_

- |  |          |  |          |
|--|----------|--|----------|
| 19. Total expenditures<br>(all governmental fund types)            | \$ _____ | 20. Total general fund expenditures<br>excluding capital outlays | \$ _____ |
| 21. Total expenses<br>(all proprietary fund types)                 | \$ _____ | 22. Total RSVC expenditures<br>excluding capital outlays         | \$ _____ |
| 23. Total payroll (all employees)                                  | \$ _____ | 24. Total RSVC payroll   | \$ _____ |
| 25. General obligation bonded<br>indebtedness (at fiscal year end) | \$ _____ | 26. GOB debt limit   | \$ _____ |

**Part III: Revenues**

Please use the most recent annual data available to answer the following questions.

I am using data from the 12 month period ending: Month \_\_\_\_\_ Year \_\_\_\_\_

- |                                  |          |   |          |
|----------------------------------|----------|---|----------|
| 27. Total property tax revenues  | \$ _____ | 28. Intergovernmental revenues<br>(All governmental fund types) | \$ _____ |
| 29. Total sales tax revenues     | \$ _____ | 30. Total revenues<br>(All governmental fund types)             | \$ _____ |
| 31. Other tax revenues           | \$ _____ | 32. Intergovernmental revenues<br>(All proprietary fund types)  | \$ _____ |
| 33. Total tax revenues           | \$ _____ | 34. Total revenues<br>(All proprietary fund types)              | \$ _____ |
| 35. Revenues from RSVC user fees | \$ _____ | 36. Total general fund revenues                                 | \$ _____ |

**Part IV: Past Revenues**

37. 1980 sales tax revenues \$ \_\_\_\_\_

**Part V: Additional Information**

Please provide the following information if available.

38. RSF is collected at the (please circle)                      CURB                      ALLEY                      BACKDOOR
39. Are residents required to use plastic or paper bags as garbage containers (as opposed to garbage cans)?      YES                      NO
40. Frequency of RSVC (number of pick-ups per week): \_\_\_\_\_
41. The maximum number of containers that a household may put out per collection is: \_\_\_\_\_

THANK YOU FOR YOUR COOPERATION IN COMPLETING THIS REPORT

## VITA

RICHARD C. BROOKS  
Louisiana State University  
Baton Rouge, Louisiana 70803

### EDUCATION

PhD in Accounting with Minor in Economics, Louisiana State University, Baton Rouge, Louisiana, May 1991.

MA in Teaching, Montclair State College, Upper Montclair, New Jersey, May 1985, with New Jersey Certification to teach accounting, data processing, general business, and mathematics.

BS in Business Administration, Montclair State College, Upper Montclair, New Jersey, May 1981, cum laude.

### INSTRUCTIONAL EXPERIENCE

#### Teaching

Teaching Assistant, Louisiana State University, Baton Rouge, Louisiana, January 1987 to May 1991.  
Managerial Accounting.

Instructor, William Paterson College, Wayne, New Jersey, summer session 1989. Managerial Accounting.

Instructor, Fairleigh Dickinson University, Madison, New Jersey, summer session 1988. Accounting Principles II.

#### Other

Coordinator-Managerial Accounting, Louisiana State University, Baton Rouge, Louisiana, January 1989 to May 1991.

### PROFESSIONAL EXPERIENCE

Accountant/Auditor, City of Flagstaff, Arizona, October 1985 to January 1987.

Accountant, Clifton Board of Education, Clifton, New Jersey, November 1981 to January 1983.

Full Charge Bookkeeper, Novel Knit, Inc., Clifton, New Jersey, June 1980 to November 1981.

## GRANTS

Exxon Outstanding Graduate Student Grant, Louisiana State University, Baton Rouge, Louisiana, Spring 1989.

## PROFESSIONAL ORGANIZATIONS

## Memberships

American Accounting Association (AAA)  
American Accounting Association GNP Section  
Association of Government Accountants (AGA)  
National Association of Accountants (NAA)

## Offices Held

President, Louisiana State University Accounting Graduate Student Association, January 1988 to August 1989.

DOCTORAL EXAMINATION AND DISSERTATION REPORT

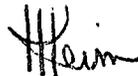
Candidate: Richard C. Brooks

Major Field: Accounting

Title of Dissertation: An Investigation of the Determinants of the Municipal Decision to Privatize Residential Sanitation Collection

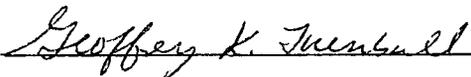
Approved:

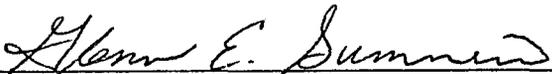
  
Major Professor and Chairman

  
Dean of the Graduate School

EXAMINING COMMITTEE:











Date of Examination:

April 22, 1991