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THIS DISSERTATION HAS BEEN MICROFILMED EXACTLY AS RECEIVED.
THE THEORY OF SUPPLY BY BUREAUS:
A CRITICAL EVALUATION

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By
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1975

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PUBLICATIONS


FIELDS OF STUDY

Major Field: Public Administration

Studies in Public Finance. Professors Frederick D. Stocker and Arthur D. Lynn

Studies in Human Resource Policy. Professors Samuel C. Kelley and Herbert S. Parnes
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CHAPTER I

INTRODUCTION

This study concentrates on William A. Niskanen's theory of supply by bureaus presented in Bureaucracy and Representative Government. It explains and evaluates Niskanen's theory in the context of modern public administration. The importance of this undertaking derives from two sources. First, in part the theory formalizes the "New Public Administration" critique of the pluralist model of government. Second, the theory implies that traditional public administration reorganization remedies for the federal bureaucracy may have been self-defeating. Hence, public administrators should be aware of the theoretical and practical implications derived from Niskanen's model.

The political theory of pluralism has been attacked by proponents of the New Public Administration. Perhaps the most devastating indictment of pluralism has been written by Theodore Lowi, a political scientist, in The End of Liberalism. Essentially, Lowi argued that the oligopolistic representation mechanism in American government limits participation to only a few well organized special interest groups.

groups in specific functional areas. Ultimately, Lowi argued that this has led to inferior governmental solutions. Likewise, Niskanen used a similar description of the government environment to build a formal mathematical model of this process. Indeed, both authors conclude that the present organization of the federal bureaucracy leads to inferior solutions.

This chapter first draws the striking analogies between Niskanen's model and the contemporary critique of the pluralist model of government. Then it discusses the remainder of the study by briefly introducing and summarizing each chapter.

A Mathematical Model of Interest Group Liberalism?

Niskanen's theory of supply by bureaus constitutes at least a partial formalization of the basic elements of Lowi's interest group liberalism. This section briefly examines Lowi's argument, notes the common elements between Lowi's argument and the Niskanen model, and finally discusses the difference in their solutions.

Theodore Lowi argued that interest group liberalism evolved from the ideologies of capitalism, statism, and pluralism. The capitalist model viewed individuals pursuing their self-interest in a competitive market place where Adam Smith's "hidden hand" directed market forces toward a desirable equilibrium. When these market forces failed during the Great Depression, the ideology of statism became a popular way in which to justify government intervention in the market place. The

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4 Ibid., p. 71.
5 Ibid., p. 29.
increased collective activities of labor unions and corporations seemed to suggest that groups had supplanted individuals in the market place. Moreover, in many cases the implementation of statism had apparently replaced the private market place with government activities.

Pluralism evolved from the rise in importance of groups and government coupled with the relative decline of the individual and the market place. Basically, pluralism presumed that the competition among special interest groups surrounding government programs would lead to a desirable equilibrium solution. Thus, as in the case of capitalism, pluralism postulated a "hidden hand" which guided political forces to the desired equilibrium.

Lowi argued that pluralism has failed to reach a desirable equilibrium solution. In other words, its "hidden hand" has not worked. Competition among many interest groups has been diminished to an oligopolistic representation structure. Bargaining among the few powerful interests has replaced competition. Moreover, the institutions of popular control have atrophied to the extent of ineffectiveness. Hence, Congress has lost control over the bureaucracy. Finally, the end result of this interest group liberalism is an inferior solution to the problems of power and government.

Niskanen's model of supply by bureaus contains striking similarities to Lowi's interest group liberalism. First, Niskanen viewed factors of production and beneficiaries of a bureau's services as the limited participants in the representation mechanism. Second, Niskanen defined a "market" to exist between the bureau producing an output and the sponsor buying its output. This market is a bilateral monopoly in which
a solution can be reached by bargaining. Third, the sponsor or Congress is assumed to have atrophied so much that it is "passive" in its bargaining relations with the bureau. Finally, by comparing the bureau's equilibrium solution with that of the competitive norm, Niskanen concluded that bureaus produce inferior equilibrium solutions.

One can readily discern four common elements between these two arguments. First, both postulate a limited representation mechanism dominated by a few special interests. Second, both assume that bargaining has replaced competition. Third, both hypothesize that institutions of popular control (e.g., Congress) have atrophied to the extent of virtual passivity. Fourth, both conclude that this characterized governmental process leads to an inferior governmental solution.

Lowi recommended "juridical democracy" to solve the problems created by interest group liberalism. His prescription was two-fold. First, he suggested that Congress "restore the rule of law" by passing legislation which specified not only public goals, but also the means to achieve these goals. Second, he argued that we should return to a system of regional government. Thus, somehow juridical democracy would improve upon the inferior solutions now provided by interest group liberalism.

Niskanen's prescription to remedy the inferiority of the current system was a competitive bureaucracy. Thus, instead of one monopoly bureau dominated by special interests, there would be many bureaus providing the same or similar services. However, this competitive bureaucracy must be accompanied by the measurement of benefits and

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costs and an incentive structure that rewards net benefit maximization by bureaucrats. As long as the sponsor remains captured by special interests, competitive bureaucracy will not be implemented. If the competitive bureaucratic ideal could be implemented, then the theory implies that it would produce more efficient outputs than monopoly bureaus.

In conclusion, the common elements of limited representation, bargaining, sponsor passivity, and inferior solutions renders Niskanen's model similar to Lowi's argument. Indeed, it is one possible way to formalize the New Public Administration critique of pluralism. Consequently, it is an extremely important theory in the field of public administration.

Organization of the Study

Chapter II establishes the relevance of Niskanen's theory to public administration. First, it diagnoses the theory as a symptom of the intellectual crisis in public administration. Second, it reviews the literature relevant to the main elements of Niskanen's theory. Third, it traces the historical rise of the doctrine of consolidation by purpose in the federal executive branch. Fourth, it demonstrates the policy relevance of the theory. Ultimately, this chapter arrives at the following four conclusions about Niskanen's theory: (1) it challenges the conventional public administration ethos; (2) it corresponds with much of the literature on bureaucratic politics; (3) it implies that past reorganization policies may have been self-defeating; and (4) it contradicts modern public administration policies on reorganization.
Chapter III represents the primary contribution of this study. First, it reiterates Niskanen's presentation of his model. Second, it then presents a new graphical exposition of the theory. This exposition permits a full understanding of all the theoretical concepts and the comparative argument that monopoly bureaus are inefficient, too large, and grow too fast. Third, under the assumed conditions the exposition demonstrates the validity of Niskanen's deductions. Ultimately, this exposition presents Niskanen's theory more explicitly than has been accomplished previously.

Chapter IV evaluates Niskanen's model. First, it establishes a set of both formal and informal evaluation criteria. Second, it then applies these criteria to Niskanen's model. Third, it concludes that one important assumption restricts the generality of the theory and that very few of the implications are testable with readily available data.

Chapter V derives an empirically testable hypothesis related to the alleged inefficiency created by the doctrine of consolidation. Then, it operationalizes this theoretical hypothesis and designs a simple statistical test.

Chapter VI presents four case studies in which the derived statistical test was performed. Only one case significantly supported the hypothesis. Another case was in the hypothesized direction, but was insignificant. The remaining two cases showed results opposite from the hypothesis. Thus, only one case out of four supported the statistical hypothesis. The results are then discussed in relation to some
competing hypotheses for the same or very similar phenomena. Ultimately, the difficulty of empirically testing Niskanen's model is well demonstrated in these cases.

Finally, Chapter VII draws conclusions about the theory of supply by bureaus and the previous evaluation. Since the theory treats only the two polar extremes of monopoly or pure competition, it is difficult to infer the degree of competition that would be necessary to render the federal bureaucracy more efficient. More theoretical and empirical work needs to be accomplished before one can pass judgment on the applicability of this theory to the federal bureaucracy.
CHAPTER IX

THE RELEVANCE OF NISKANEN'S THEORY TO PUBLIC ADMINISTRATION

This chapter establishes the public administration context in which one can examine Niskanen's theory of supply by bureaus. It accomplishes this goal in a four-fold manner. First, it diagnoses Niskanen's theory as a symptom of the "intellectual crisis in American public administration." Second, it reviews the relevant literature. Third, it traces the historical rise of the doctrine of consolidation by purpose to achieve efficiency in the executive branch. Fourth, it establishes the policy relevance of Niskanen's theory. Thus, this chapter ultimately demonstrates the importance of Niskanen's theory to the field of public administration.

A Symptom of the Intellectual Crisis

Vincent Ostrom has recently argued that the field of public administration exhibits the following symptoms of an intellectual crisis:

1. Proliferation of numerous versions of the prevailing theory;
2. Willingness of scholars to engage in methodological experimentation;
3. Expressions of explicit discontent;
4. Recourse to philosophical speculation; and
5. Debate over fundamental epistemological issues.

Niskanen's theory of supply by bureaus exemplifies the second and third symptoms of this crisis. First, Niskanen has experimented with an extension of a basic economics paradigm. Second, Niskanen's theoretical argument expresses discontent with the way in which the executive branch has been formally organized. This section examines the concepts relevant to this crisis and places Niskanen's theory in this frame of reference.

The linkage between the concepts of efficiency and consolidation in traditional public administration theory has never been explicitly demonstrated. Instead, efficiency was presumed to follow from the application of such intuitively appealing notions as span of control, unity of command, specialization, and consolidation. This presumption was necessary due to the "insufficiency of the paradigm inherent in the traditional theory of public administration." Ostrom's "Proposition 7" essentially states this relationship between the perfection in hierarchical organization and efficiency as follows:

Proposition 7: Perfection in hierarchical organization will maximize efficiency as measured by least cost expended in money and effort. This proposition has been consistently applied in practice without any evaluation of its consequences.

Perhaps the foremost notion derived from this public administration paradigm is that the elimination of overlapping jurisdictions and fragmentation of authority will increase the efficiency of the executive branch. Implicitly, this apparently means that the bureaucracy

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2Ibid., p. 17.
3Ibid., p. 29.
can produce a given output with a smaller budget than previously.
However, this principle has never been empirically tested. Do con-
solidated bureaus produce a given output at a cheaper cost than the
previously overlapped and fragmented bureaus? Indeed, the difficulty
of measuring public outputs renders the answer extremely difficult
to discover. Public administration theory has only assumed the
answer to this question is, "yes." This presumption stands challenged
by Niskanen's theory of supply by bureaus.

Niskanen's theory of supply by bureaus implies that the consolida-
tion of bureaus to eliminate overlaps of jurisdiction and fragmentation
of authority has led to exactly the opposite effects from those intended
by public administrators. That is, the application of the principle of
consolidation has rendered the executive branch less, rather than more
efficient. Hence, the presumption of efficiency contained in public
administration principles may have guided the field to prescribe the
wrong organizational framework for the executive branch.

Consolidation by purpose has become very well accepted among
public administrators. It has been virtually institutionalized as a
reorganization policy. If the traditional public administration
paradigm is insufficient and Niskanen's theory provides a viable
alternative, then executive reorganization policy may require a com-
plete reversal in principle. What was previously viewed as destructive
competition and wasteful duplication of effort may ultimately be
encouraged as the new means to achieve efficiency in the executive
branch.
A Review of the Relevant Literature

A review of the literature relevant to Niskanen's theory of supply by bureaus requires a definition of relevance. Initially, one might propose that the entire set of literature on "bureaucracy" is relevant. However, "bureaucracy" is not a very discriminating category. This definition would include a vast body of knowledge contained in the disciplines of sociology, psychology, social psychology, political science, organization theory and economics. Instead, the main elements of Niskanen's theory provide a more useful set of categories. These categories permit one to select relevant elements on bureaucracy from each of the above disciplines.

The main elements of Niskanen's theory are the bureau, the sponsor (Congress), and the clientele. Chapter III discusses the formal definitions of these elements, but for the purposes of this section one only needs to know some of their basic characteristics. Niskanen views the bureau as an extremely powerful, autonomous agent in the budgetary process. It possesses a monopoly over the provision of its services. Furthermore, the bureau contains an incentive structure that motivates bureaucrats to maximize their budgets. In contrast, the Congress is passive and cooperative toward the bureau. Its review committees virtually have a proprietary interest in their respective bureaus. Finally, the clientele consists of various interest groups who support and benefit from the expansion of the bureau's budget.

This section discusses the literature related to the bureau, the Congress, the clientele, and the ultimate impact their relations may have on society. First, this section examines several topics related
to the bureau: (1) Private Firms Versus Public Bureaucracies; (2) Cognitive Approaches to Bureaucratic Behavior; (3) The Motivational Basis of Bureaucratic Behavior; and (4) Competitive Bureaucracy. Second, it reviews bureaucratic relations with both Congress and its clientele. Third, it concludes with a consideration of the impact of bureaucracy on society.

The Bureau

Private Firms Versus Public Bureaucracies

Profit maximization and the pursuit of the public interest delineate the most fundamental difference between private firms and public bureaucracy. Economists have developed highly useful analytical models of the private sector based on the assumption that a private firm maximizes profits. However, the economic optimization techniques have not been very applicable to the public sector. Since one cannot objectively define the concepts of public interest or social welfare, the analysis of public bureaucracies has been less formally accomplished from various perspectives. This proliferation of approaches represents another symptom of Ostrom's intellectual crisis in American public administration.

A review of the relevant literature must begin with a consideration of the various public interest viewpoints. Glendon Schubert in The Public Interest outlined three basic categories of public interest theories. First, rationalists view norms as given. It is then the

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function of the bureaucrat to choose the means to achieve these norms. Second, idealists regard norms as ill-defined. Thus, bureaucrats must clarify norms. Third, realists regard norms not only as ill-defined, but also in dispute. Hence, bureaucrats must resolve disputes about norms. Niskanen's theory of supply by bureaus follows the rationalist public interest viewpoint.

If economists subscribe to the rationalist approach to the public interest, then they must have adopted a well-defined norm as given. Economists refer to this norm as "Pareto optimality," or simply "efficiency." C.E. Ferguson offered the following definition:

Any organization (point) is said to be Pareto optimal or Pareto efficient when every reorganization that augments the value of one variable necessarily reduces the value of another.⁵

Given the rational assumptions that individuals maximize utility and firms maximize profits, economists have demonstrated that the perfectly competitive market leads to a Pareto optimal equilibrium solution. In other words, perfect competition provides the rational means through which a society can achieve the norm of efficiency.

There exists a high degree of consensus about the conditions under which a society can achieve efficiency. However, the norm of efficiency alone is a limited concept of the public interest. The concept of social welfare better characterizes the global nature of the public interest, but this leads to some difficult theoretical problems, which the economist cannot adequately answer in his role as purely a social scientist.

The central difficulty related to the economist's concept of efficiency as a given norm derives from the fact that it is a necessary, but not sufficient condition for welfare maximization. Thus, besides efficiency, one must incorporate other norms into the definition of welfare or the public interest. For example, a welfare function must specify the distribution of income and wealth in a society. There exist an infinite number of social welfare functions from which society can choose. Since the choice of a social welfare function steps beyond the realm of efficiency in economic processes, other processes must ultimately help to make the choice.

David Easton has defined public policy as "the authoritative allocation of values for the whole society." In essence, the specification of a social welfare function authoritatively allocates values for the whole society. In part, it expresses what Harold Lasswell has argued that politics determines. That is, "who gets what, when, how"? Since a social welfare function at least specifies "who gets what," politics must play a role in the choice of this function. Thus, a theory that specifies a social welfare function becomes a political theory by Lasswell's definition.

The inadequacy of the economics paradigm as a source of a global public interest definition permits the consideration of additional norms besides efficiency. This leads one away from a rationalist to
an idealist public interest viewpoint. Again, the idealist views the bureaucrat as clarifying norms. A clarification of norms requires a more micro-level discussion than previously pursued. Hence, the next section focuses on approaches to the behavior of bureaucrats in decision-making situations.

Cognitive Approaches to Bureaucratic Behavior

Buchanan and Tullock in *The Calculus of Consent* have illuminated the fundamental theoretical gap, which necessitates the movement away from the rationalist public interest theories. This gap consists of the difference between individual and collective decision making. One could assume that society acts as if it were an individual. Then one could examine efficiency in collective decision making in a manner similar to individual decision making. Indeed, the salience of efficiency in the set of American values seems to support this application of the individualist approach. However, the result would be an organic theory of the state, which includes only the norm of efficiency. Since unanimity has not been reached on the singular importance of the norm of efficiency, the public bureaucrat must also consider other social norms.

Given a lack of consensus on relevant social norms, the idealist public interest theories suggest that public bureaucrats determine the relevant social norms through a process of introspection. Unfortunately,

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when one considers these additional social norms, he also confronts more theoretical problems. For example, one must answer three important questions: (1) Is the public bureaucrat rational? (2) Does the public bureaucrat maximize? and (3) What does the public bureaucrat maximize? The relevant literature provides some tentative answers.

Anthony Downs and Gordon Tullock in addition to Niskanen represent the foremost proponents of individual rationality in bureaucracy. Downs in *Inside Bureaucracy* postulated three central hypotheses in his theory as follows:

1. Bureaucratic officials (and all other social agents) seek to attain their goals rationally. In other words, they act in the most efficient manner possible given their limited capabilities and the cost of information. Hence all the agents in our theory are utility maximizers...

2. Bureaucratic officials in general have a complex set of goals including power, income, prestige, security, convenience, loyalty (to an ideal, excellent work, and desire to serve the public interest...

3. Every organization's social functions strongly influence its internal structure, and vice versa.  

Furthermore, Tullock in *The Politics of Bureaucracy* asserted that "People who argue that men are not rational are, in a sense, contradicting themselves." That is, if men are not rational, then men could not rationally argue that they are not rational. Thus, Downs and Tullock both conclude that men are rational.

One can avoid a polarized debate in logic between rationality and irrationality by briefly examining the formal definition of


economic rationality presented by Downs in *An Economic Theory of Democracy* as follows:

A rational man is one who behaves as follows:

1. He can always make a decision when confronted with a range of alternatives;
2. He ranks all the alternatives facing him in order of his preference in such a way that each is either preferred to, indifferent to, or inferior to each other;
3. His preference ranking is transitive;
4. He always chooses from among the possible alternatives that which ranks highest in his preference ordering; and
5. He always makes the same decision each time he is confronted with the same alternatives.13

Given this definition, one can return to the original question, "Are public bureaucrats rational"?

The definition of rationality suggests one criticism leveled at the conventional theory of the firm by Cyert and March in *A Behavioral Theory of the Firm*. Cyert and March argued that the rationality definition contained unrealistic cognitive and motivational assumptions.14 In particular, the definition requires perfect knowledge of the alternatives and an ability to rank them according to one's preference. The lack of knowledge confronted by public bureaucrats has led some analysts to conclude that bureaucrats may not be irrational, but they certainly do not make perfectly knowledgeable decisions.

The answer to the question depends on the degree of knowledge available. One can agree with Tullock's logical ploy, but recognize that they do

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not always face perfect knowledge about the range of alternatives available to them.

Charles E. Lindblom, David Braybrooke and Charles E. Lindblom, and James G. March and Herbert A. Simon have all thoroughly described the cognitive limits on rationality. As more realistic alternatives to rationality, they offered "Successive Limited Comparisons," "Disjointed Incrementalism," and "satisficing," respectively. All of their analyses deny that public bureaucrats maximize. Instead, they argued that bureaucrats proceed to make small, limited, successive, and comparative decisions that appear satisfactory in the face of imperfect knowledge about both norms and the means to achieve these norms. Thus, the lack of knowledge about both means and ends severely limits their ability to make rational decisions.

The lack of knowledge and disagreement about norms leads one to the realist viewpoint on the public interest. V.O. Key and others have decried the lack of an adequate budget theory. Many have attributed this inadequacy to the various imperfections of rational theory previously discussed. To the contrary, Norton Long has argued in *The Polity*, "It (the lack of a budget theory) more likely stems from


16 V.O. Key, "The Lack of a Budgetary Theory," *The American Political Science Review*, XXIV (December, 1940), 1137-1144.
a fastidious distaste for the frank recognition of the budget as a politically expedient allocation of resources." 17 Moreover, Aaron Wildavsky's *The Politics of the Budgetary Process* has thoroughly documented the role of politics in the budgetary process. Regardless of its origins, the absence of a budget theory has permitted politics to play a vital role in the budgetary process. The political process resolves the realist's dispute about the appropriate social norms.

There exists wide consensus in the literature that the lack of clarity and disagreement about social norms does not permit the public bureaucrat to maximize the public interest. Disjointed incrementalism, successive limited comparisons, and satisfying all seem to describe the bureaucrat's daily behavior accurately, but they yield few testable hypotheses. Can one assume that bureaucrats maximize their budgets? This assumption requires rationality, but no definition of the public interest. The next section examines the motivational bases for bureaucratic behavior that might render such an assumption plausible.

**The Motivational Bases of Bureaucratic Behavior**

The absence of clearly defined social norms renders the evaluation of the effectiveness of public bureaus quite difficult. Katz and Kahn have noted that the organization theory literature "...is studded with references to efficiency, productivity, absence, turnover,


and profitability...." However, they further asserted that such literature seems insightful, but is often too judgmental. Etzioni avoided these concepts by defining organizational effectiveness in terms of goal attainment. Furthermore, he suggested that survival, adaptation, growth, and prosperity also indicate organizational effectiveness. Schein basically concurred with Etzioni in his "adaptive-coping cycle," which emphasizes organizational survival, adaptation, maintenance and growth.

Daniel Katz has enumerated a set of six motivational patterns that seem relevant to both bureaucratic behavior and effectiveness as follows: (1) conformity to legal norms or rule compliance; (2) instrumental system rewards; (3) instrumental individual rewards; (4) intrinsic satisfaction from role performance; (5) internalization of organizational goals and values; and (6) involvement in primary group relationships. If these incentive systems link rewards for behavior with increases in goal attainment, growth, survival, adaptation, maintenance, and prosperity, then they could have a substantial effect on organizational effectiveness.


21Ibid., p. 544.

Conformity to legal norms or rule compliance was one of the pillars of Weberian bureaucracy. Robert K. Merton in his classic work, "Bureaucratic Structure and Personality," noted two important dysfunctions of bureaucracy related to this motivational pattern. First, rule compliance often leads to overconformity, which impedes system adaptation. Second, adherence to rules leads to goal displacement. That is, "an instrumental value becomes a terminal value." For example, one can value a bureau's budget instrumentally as a means to achieve the bureau's goals. However, the rigid adherence to a preference for always higher budgets could displace the original organizational goal. The new goal could easily become budget maximization. Indeed, Wildavsky has noted that some bureaucrats argue that their programs are virtually priceless. This implies that their programs will always produce additional benefits to society with higher budgets. Thus, through the operation of goal displacement rule compliance could lead to budget maximizing behavior in public bureaus.

Instrumental system rewards include fringe benefits and across-the-board pay increases. These rewards do not always lead to a higher quantity or quality of work than the minimum required to remain in the bureau. Hence, these rewards probably contribute to the maintenance and survival of an organization, but only a satisfactory level of goal attainment.

24 Ibid., pp. 364-371.
25 Wildavsky, op. cit., p. 94.
26 Daniel Katz, op. cit., p. 464.
Instrumental individual rewards appeal to the economist, because they are consistent with their theory of economic man. Incentive pay provides the most explicit example of this type of reward. For example, Niskanen would reward bureaucrats for net benefit maximization. However, the conditions conducive to the effective use of this type of reward do not always prevail in public organizations. First, because individuals' tasks are so complex, there exists no adequate measure of individual productivity. Second, there is no ultimate measure of effectiveness, such as profitability in the private sector. Consequently, individual instrumental rewards would have limited utility in the public sector.

The importance of intrinsic satisfaction from role performance has been well discussed by a number of authors. For example, Rensis Likert has evolved a comprehensive theoretical and empirical management theory recognizing this motivational pattern. Essentially, Likert proposed four management systems ranging from the exploitive (System 1) to the participative (System 4). The empirical work on private firms reported by Likert demonstrated that if one manages using the participative system, then organizations tend to be more productive. This effect occurs through the recognition of such intervening variables as group loyalty, communication, leadership, motivation, and control. Although the work reported by Likert examined only private sector


organizations, its formal application in the public sector has grown. However, organizations still face the ultimate problem that productivity in the public sector remains difficult to measure.

Internalization of organizational goals and values represents an extremely important system for public bureaucracies. Individuals' value orientations often guide them to bureaus serving values consistent with their own. Moreover, the socialization process within the bureau results in further internalization of the bureau's goals. Involvement in primary group relationships within the bureau further enhances this process. Thus, if the original goals have been displaced by budget maximization, then these behavioral systems will further entrench budget maximizing behavior.

Since there exists no clearly defined norm to follow in public bureaucracies, the bureau cannot effectively use instrumental individual rewards alone to encourage productivity. Conformity to legal norms and instrumental system rewards encourage the minimum necessary productivity. Intrinsic satisfaction from role performance, internalization of organizational goals and values, and involvement in primary relationships all seem to enhance greater group loyalty. Given that public bureaus' goals often are stated in such unattainable terms as "the eradication of the paradox of poverty amidst plenty," one can easily understand why such goals could become displaced by budget maximization. Since budget maximization would enhance a bureau's stability, maintenance, and growth, it would seem that such behavior is a rational response to these criteria of organizational effectiveness. Therefore, budget maximization seems quite plausible.
Competitive Bureaucracy

Few analysts have recommended competition among bureaus producing similar services in the federal executive branch. The rigid adherence to the principle of consolidation by purpose in American public administration led reorganizers to eliminate competition wherever possible. The next major section of this chapter discusses the history of thought behind this practice. This section considers only the few who have advocated competition.

Ironically, President Franklin D. Roosevelt used a form of competition to organize New Deal Programs. He believed that it would help retain the power to make decisions in the Presidency. Richard E. Neustadt in Presidential Power quoted the following observation by Arthur Schlesinger:

The result of this competitive theory of administration was often confusion and exasperation on the operating level, but no other method could so reliably insure that in a large bureaucracy filled with ambitious men eager for the decisions, and the power to make them, would remain with the President.29

In contrast, administrative management theorists viewed Roosevelt's practices as chaotic. Hence, the first Hoover Commission attempted to eliminate much of the duplication of effort that had evolved during the Roosevelt Administration.

Since public administrators have rejected bureaucratic competition, one must wonder whether it has any advantages. For example, if two bureaus were acting as a duopoly, then one bureau's budgetary gain

would equal the loss of the other bureau. Competition is often viewed as this type of zero-sum game in the budgetary process. In contrast, Miskanen's model implies that competitive bureaus would be more efficient than monopoly bureaus. In addition, Arthur Schlesinger has argued that adequately controlled competition would mean exceptional creativity, but anarchy if not adequately controlled. Moreover, Hyneman has argued that "...bureaucratic fragmentation provides a useful check against the arbitrary or irresponsible use of official power." More recently, Samuel P. Huntington attacked the notion that interservice rivalry in the military "necessarily undermines economy, efficiency and effective control in the military establishment." Despite these arguments, the principle of consolidation by purpose has dominated public organizations.

The application of the conventional public administration wisdom has led to monopolization and control of the federal bureaucracy by selected posts of government. This bureaucratic structure permits bureaus to establish autonomy. Francis E. Rourke observed, "A monopolistic or near monopolistic control of 'facts' thus provides tremendous reinforcement to the power that bureaucrats possess from specialized


and continuous attention to a particular set of responsibilities."

In order to counteract bureau autonomy Congress has passed legislation limiting the employment of "publicity experts," but it has been ineffective. Thus, monopoly bureaus can become autonomous from both the President and Congress.

Although Niskanen's suggestion of a competitive bureaucracy is not necessarily new, the idea certainly has become lost in zealous pursuit of hierarchical simplicity. Certain forms of bureaucratic competition could stimulate innovation, curb abuses and arbitrary uses of power, and constrain the trend toward bureau autonomy. For example, the Office of Economic Opportunity created many innovative programs such as Headstart, Upward Bound, and comprehensive health services, which competed with programs in both the Departments of Labor and Health, Education and Welfare. However, competition has been swept aside by the application of the doctrine of consolidation by purpose in an effort to enhance efficiency.

Congress and the Clientele

The role of Congress as a passive supporter and the clientele as an aggressive supporter of a bureau's services in Niskanen's theory is very consistent with the literature. Critics have long lamented the absence of unified Congressional control over the federal budget. Fragmentation of the budgetary process has permitted powerful


interest groups to influence Congressmen sympathetic to their causes. The President through the Office of Management and Budget cannot entirely control the process, because lenient committees in the Congress often restore its budgetary cuts. Moreover, uncontrollable budget items have mounted to about three-fourths the budget. This section discusses some of the relevant literature and concludes that Niskanen's perceptions of the process are fairly accurate.

Calvin Coolidge once said, "Nothing is easier than the expenditure of public money. It does not appear to belong to anybody. The temptation is overwhelming to bestow it on somebody." This temptation manifests in the form of Richard F. Fenno's "interest-sympathy-leniency syndrome):

More than likely, interest will produce sympathy; and sympathy on the part of the appropriating committee will more than likely produce clientele-oriented appropriations decisions. ...but clientele-oriented decisions...are likely to produce larger rather than smaller budgets.

Niskanen's model incorporates this same syndrome and arrives at a similar conclusion. Ultimately, the syndrome leads to larger, rather than smaller budgets.

The House Appropriations Committee has attempted to thwart the development of this interest-sympathy-leniency syndrome by assigning members to subcommittees reviewing bureaus toward which they appear critical. Despite this practice, the syndrome prevails in the

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36 Ibid., p. 141.
budgetary process. Two possible reasons exist for the failure to impede this syndrome. First, the subcommittee assignment procedures within the House Appropriations Committee may have failed to obstruct the development of sympathy. Second, the clientele may have circumvented the appropriations process. The literature suggests that both events may have occurred.

The conflict between a House Appropriations Committee member's goals of economy versus service to his constituents in part explains the failure to eliminate the interest-sympathy-lenience syndrome. When Fenno interviewed one member, this conflict became very apparent. At one point the member complained of the "...constant criminal waste by the billions in almost every department of our federal government..." Later, the same member prided himself in supporting all appropriations for the Rural Electrification Program. Ultimately, service to the clientele seems to win this conflict and budgets continue to grow.

Bureau autonomy established through the effective use of secrecy and publicity also enhances this syndrome. Bureaus can leak supportive information or finance Congressional junkets to influence potentially sympathetic members. Arthur A. Maas noted in the case of the Army Corps of Engineers that Congressmen develop a proprietary interest.

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Ibid., p. 109.
Ibid., p. 312.
In contrast, bureaucrats vehemently proclaim, "We never put padding in our budget." On the other hand, appropriations committee members complain that "the representatives from the executive branch...come up here and have their stories so well in hand that you cannot out-argue them." Thus, one can easily view Congress as relatively powerless, but also sympathetic to both the bureau and the clientele.

The bureau and its clientele must also succeed in the executive branch, but Niskanen ignores the role of the Office of Management and Budget (OMB). If the President through the OMB enforces economy measures on the bureaucracy, then the bureau's budget request to Congress may be substantially cut from its request to OMB. This places the bureaucrat in an awkward position at the appropriations hearings. However, the House Appropriations Committee can help by soliciting support for increases through an ex parte proceeding. That is, individuals outside the government testify in favor of an increase in the bureau's budget. Since this blatantly violates the committee's economy goal, it is not used frequently. Hence, the clientele must also employ other methods.

Since the ex parte proceeding has limited value, interest groups have also sought other means to support their favorite programs. Fenno observed that "...clientele groups are much more active in the authorizing than the appropriations process." This phenomenon

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40 Richard F. Fenno, op. cit., p. 269.
41 Ibid., p. 346.
42 Ibid., p. 329.
43 Ibid., p. 342.
initially seems unrelated to budgets, until one considers the recent rapid growth in uncontrollables. The fiscal year 1975 budget contained almost seventy-five percent uncontrollables compared to only fifty-nine percent in 1967. These uncontrollables arise from "backdoor financing," which includes permanent appropriations, contract authority, mandatory spending, and loan authority. Weidenbaum, Larkins, and Marcus have described the purpose of backdoor financing as follows: "the programs involved do not have to be justified to the appropriations committees but only to what often are more sympathetic subject matter committees." Thus, the interest groups have found the means through which they can increase their influence over budgets.

The relationships between the bureau, Congress, and the interest groups have been well documented. Wildavsky, Rourke, and J.L. Freeman have all depicted the sympathetic avenues through which a bureau and its clientele can advance their causes. More recently, Don Allensworth has analyzed public policy with particular attention to the benefits derived by the clientele. His analysis of transportation policy

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particularly relates well to Niskanen's model, since he identifies the highway interests that have benefited from increases in the Federal Highway Administration budget. However, the literature also indicates that bureaus do not necessarily grow when they align themselves with a clientele. S.P. Huntington in "The Marasmus of the ICC" demonstrated that bureaus can choose the wrong clientele.48 Certainly, the clientele must have the sympathy and power to stimulate the requisite budgetary leniency, or the bureau's budget will not necessarily grow.

In conclusion, the perceptions of the budgetary process incorporated into Niskanen's model seem quite consistent with the facts documented in the literature. Hence, this part of Niskanen's model seems to describe the relationships that actually exist fairly well.

The Impact of Bureaucracy on Society

Max Weber helped bring to prominence the term "bureaucracy" at the turn of the twentieth century.49 "Bureaucracy" can at least mean either a "government characterized by specialization of function, adherence to fixed rules, and a hierarchy of authority" or "a system of administration marked by officialism, red tape, and proliferation."50


The former definition describes the Weberian emphasis on bureaucratic efficiency, while the latter suggests the more contemporary connotation. Niskanen's theory of supply by bureaus provides another example of the "proliferation" and waste alleged to exist in bureaucracies. This final section indicates where one can classify Niskanen's theory in this large body of literature.

Warren Bennis outlined the following characteristics of Weberian bureaucracies:

1. A division of labor based on functional specialization;
2. A well-defined hierarchy of authority;
3. A system of rules covering the rights and duties of employees;
4. A system of procedures for dealing with work situations;
5. Impersonality of interpersonal relations; and
6. Promotion and selection based on technical competence.51

Although many found these characteristics quite appealing, others soon observed the flaws in Weber's bureaucracy. For example, Merton, Selznick, and Gouldner noted the unanticipated effects of rigidity of behavior, bifurcation of interests, and minimum acceptable behavior, respectively.52 The list of criticisms of this form of bureaucracy is impressive.53 Niskanen's theory of supply by bureaus adds to this list.


Much of the literature on the inefficiency of bureaucracy focuses on the impact of bureaucracy on the individual within the organization. This literature does not closely relate to Niskanen's theory. In contrast, many economists such as Ludwig von Mises and Friedrich Hayek, have deplored the rapid growth of government spending. As a result, they have tried to explain the apparent disproportionate growth of the public sector during economic development. Niskanen's theory directly relates to this literature.

Richard M. Bird categorized the literature related to the growth of the public sector into demand and supply side explanations. First, the demand side provides two possibilities: (1) the aggregate demand for public expenditures is income elastic; and (2) as economic development proceeds the incidence of market failure increases. Second, the supply side offers four possibilities: (1) the productivity of public inputs increases more slowly than in the private sector; (2) wars and social upheavals cause total public expenditures to increase, but they do not decrease after the crisis is over (Displacement Effect); (3) highly elastic revenue structures yield proportionately more revenue as development proceeds; and (4) supply creates its own demand (Says Law). Although these effects have been offered as singular explications for the disproportionate growth of the public sector, Bird concluded that they all influence public expenditures simultaneously. Therefore, one cannot readily select the most important factor.


Niskanen's theory emphasized the supply side. It seems most consistent with Says Law, Parkinson's Law, or Peacock and Wiseman's "inspection effect." Says Law suggests that after a program has existed for a while, bureaucrats become familiar enough with their environments to identify additional problems. Thus, the employees become a new pressure group advocating increased expenditures. Alternatively, C. Northcote Parkinson humorously noted that once one establishes a bureau, the employees always seem to find more work to do. Finally, Peacock and Wiseman less cynically observed that once one creates a program in a new area, inspection by the employees soon identifies further unmet needs that were previously unknown. Regardless of which viewpoint one prefers, all three of these approaches seem consistent with budget maximization behavior.

One cannot validly choose between the supply and demand side explanations, because the effects of each occur simultaneously. Thus, Niskanen's theory of supply by bureaus may have overlooked the important demand side considerations of market failure and income elasticity of demand. The search for an explanation of the disproportionate growth of the public sector should continue. Niskanen's model contributes valuable insight to that search.

The Rise of the Doctrine of Consolidation by Purpose

Economy and efficiency first became a salient issue in the decade following the Civil War. Reformers demanded neutrally competent

administrators to replace political hacks. This pressure eventually led to the enactment of the Pendleton Act in 1883, which established the United States Civil Service. Thereafter, a long series of events occurred, which culminated in President Nixon's plan for executive reorganization. This section traces the rise of consolidation by purpose as a federal reorganization policy during public administration's continuous quest for economy and efficiency.

Woodrow Wilson's 1887 article, "The Study of Administration," symbolized the incipient stages of the rise of the doctrine of consolidation by purpose. It forcefully persuaded Wilson's public administration contemporaries that politics and administration were dichotomous processes. For example, Wilson said,

The field of administration is a field of business. It is removed from the hurry and strife of politics; ...It is a part of political life only as the methods of the counting house are a part of the life of society; only as machinery is a part of the manufactured product.57

Living in a predominately industrialized society, the public administrators at the turn of the twentieth century found this machine analogy quite appealing. Moreover, they began to believe that scientific techniques could be used to make government more efficient, regardless of the politics involved. Thus, the politics-administration dichotomy provided the foundation on which public administrators could build scientific management in government.

The turn of the century marked the burgeoning popularity of Frederick Taylor's Scientific Management Movement. Typified by the

57Woodrow Wilson, "The Study of Administration," Political Science Quarterly, II (June, 1887), 197-222.
assumption that one could generally organize work in a machine-like fashion, the movement soon had its impact on the federal executive branch. The Taft Commission on Economy and Efficiency and the Executive Budget of 1907 recommended the establishment of a bureau of the budget as the center of executive branch operations. Theodore Roosevelt wholeheartedly supported the commission by expressing a need for presidential authority to reorganize the executive branch. The principle of unity of command seemed to emerge as a means to increasing presidential control of the executive branch. This notion gathered support as the proponents of scientific management moved into government employment.

The Taft Commission's recommendations languished until the Budget and Accounting Act of 1921 became law. It established the Bureau of the Budget (BOB) and focused attention on the presidency as the apogee of the federal executive branch hierarchy. Herbert Hoover (Secretary of Commerce 1921-1927) attempted to apply business administration techniques to reorganize the Department of Commerce. When he proposed that the Bureau of Labor Statistics' functions be transferred to the Census Bureau, organized labor effectively blocked the move. Clientele politics triumphed over scientific management. In other words, the informal organization prevailed over the formal organizational principles. The politics-administration dichotomy did not apply. However, this was only a momentary roadblock as the


reorganization movement gathered momentum with the onset of the Great Depression.

The diminished national income during the early 1930s yielded insufficient tax revenue to cover growing public expenditures.60 Moreover, the country feared budget deficits would worsen the already disastrous monetary crisis. This prospect of further budget deficits created strong pressures for either a tax increase or an expenditure cut. The situation seemed to require drastic measures. Hence, one very important precipitant of this nationwide crisis was the Economy Act of 1932. It aimed at reducing government expenditures and increasing efficiency by declaring the following policies of Congress:

(a) to group, coordinate, and consolidate executive and administrative agencies of the government, as nearly as may be, according to purpose;
(b) to reduce the number of such agencies by consolidating those having similar functions under a single head; and
(c) to eliminate overlapping and duplication of effort.61

Thus, the principle of consolidation had become solidly entrenched as a policy of Congress.

The President's Committee on Administrative Management of 1937 (Brownlow Committee) applied administrative management techniques in the first major executive branch reorganization. Luther Gulick summarized the principles that implicitly guided the Brownlow Committee

as organization by: (1) Purpose; (2) Clientele; (3) Process; and (4) Place. Although each had its advantages and disadvantages, organization by purpose tended to prevail in the executive branch. The Committee apparently believed that the application of these principles would lead to a more efficient government. Accordingly, they recommended only twelve major departments with the delegation of authority by Congress to the President for transferring, consolidating, or abolishing functions within the twelve departments. However, soon the application of an apparently apolitical administrative management theory transformed into a political bone of contention. The press accused President Roosevelt of trying to establish a monarchy by usurping the powers of Congress. Again, the politics-administration dichotomy failed to apply.

During the decade of 1940 the administrative management principles were attacked. First, Dwight Waldo in The Administrative State argued that the application of the "canon of integration" (principle of consolidation) confused scientific fact with values. Moreover, he argued that the net result had not been efficiency, but rather the aggrandizement of the executive branch. Second, Herbert Simon in Administrative Behavior asserted that the four most readily identifiable principles in public administration were more like proverbs than


63Herbert Emmerich, op. cit., p. 54.

principles. These four common principles were specialization, unity of command, span of control, and consolidation by process, function, clientele and purpose. Simon demonstrated that when one attempted to apply these principles as a comprehensive theory, they implied contradictory choices between alternative forms of organization. Both of these important works dramatically affected the intellectual mainstream of public administration, but had surprisingly little impact on public administration practice.

The 1947 Hoover Commission did not heed the warnings of Waldo and Simon. The Commission's first report stated that "...we must reorganize the executive branch to give it simplicity of structure, the unity of purpose, and the clear line of executive authority that was originally intended under the Constitution." Again, the intuitively appealing principles of orthodox public administration theory were applied. Even the Constitution was invoked in their support. The linkage to efficiency had become almost indisputable. Herbert Hoover claimed reorganization would save American taxpayers millions of dollars. The very same principles applied by the Brownlow Committee and challenged as an attempt at usurpation of the Constitutional power of Congress were now accepted. This time the reorganization merely faced a more politically receptive environment. The

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66 Herbert Emmerich, op. cit., p. 88.

67 Ibid., p. 94.
politics-administration dichotomy in this case did not impede implementa-
tion.

The belief that consolidation leads to efficiency remained entrenched in public administration theory during the 1950s. It received some important stimulus around 1946 when the first English translations of Max Weber's work appeared in America. 68 Essentially, Weber described the pure bureaucratic form of organization as the most efficient way to produce government services. Indeed, this Weberian ideal was very similar to the conventional public administration theory. That is, the employment of neutrally competent technicians in a hierarchically perfected organization to achieve efficiency was consistent with both theories. Consequently, the popularization of Weber's works in America buttressed the briefly embattled administrative management beliefs of public administration in the 1950s.

The Second Hoover Commission ignored Herbert Simon's challenges to public administration theory and continued the application of the principle of consolidation. However, it focused most of its attention on reducing the number of government agencies apparently competing with private enterprise. 69 It presumed that private enterprise could produce these goods and services more efficiently than government. Moreover, it trimmed alleged bureaucratic fat where possible, but left the principle of consolidation unchallenged as a government reorganiza-
tion policy.

68Vincent Ostrom, op. cit., p. 9.

69Herbert Emmerich, op. cit., p. 104.
Reorganization continued to be studied in the 1960s, but in a more secretive atmosphere. The findings of the Price Task Force in 1964, the Heineman Task Force in 1967, and Lindsay Task Force in 1968 were not revealed. Although these reports are not available, they do seem to have continued the consolidation tradition. For example, Joseph Califano, former special assistant to President Johnson, recently testified before the Senate Government Operations Committee that both the Price and Heineman Task Forces recommended a large Department of Natural Resources. This was very similar to that later recommended by President Nixon. Since this could not be achieved without considerable consolidation of various agencies, it appears that the principle still thrived in the 1960s.

Today consolidation by purpose remains a fully entrenched policy of federal reorganization. The preoccupation with redesigning the formal organization structure without regard to informal relationships continues to plague reorganization policy. Even the United States Code binds the President to the following purpose for executive reorganization:

(a) The President shall from time to time examine the organization of all agencies and shall determine what changes therein are necessary to accomplish the following purposes:

(4) to group, coordinate, and consolidate agencies and functions of the Government,


Thus, the goal or purpose of executive reorganization seems to have been displaced. That is, the original goal of efficiency seems to have been displaced by the apparent means to that goal. The means to efficiency, consolidation, is now an expressed purpose or goal of executive reorganization. The linkage between consolidation and efficiency has been so well accepted that public administrators now seem to believe that efficiency will necessarily follow from consolidation. This belief remains at the very foundation of executive reorganization policy.

Policy Relevance

President Richard M. Nixon transmitted to Congress a plan to reorganize the executive branch on March 25, 1971. His message to Congress used the old machine analogy in much the same fashion that Woodrow Wilson had used nearly a century earlier. The President said,

...the major cause of the ineffectiveness of government is not a matter of men or money. It is principally a matter of machinery. It will do us little good to change personnel or to provide more resources unless we are willing to undertake a critical review of government's overall design.73

This "critical review" was accomplished by the Ash Commission. Essentially, the Commission proposed the creation of four new super departments to replace the Departments of Agriculture, Commerce, Health, Education and Welfare, Housing and Urban Development, Interior, Labor, 725 Stat. 901 (1970).

73Executive Office of the President, Office of Management and Budget, Papers Relating to the President's Departmental Reorganization Program: A Reference Compilation, pp. 3-4.
and Transportation. These new departments were the Departments of Natural Resources, Human Resources, Economic Affairs, and Community Development. Indeed, this was the most comprehensive consolidation ever proposed.

The rationale behind this sweeping proposal was not unfamiliar:

1. Whenever possible, the executive branch should be organized around major purposes of Government. This will allow for clearer lines of authority and responsibility.

2. Each department's mission should be defined broadly enough to allow the department to set policy and resolve conflicts concerning a wide range of issues. This will minimize the need for interagency coordination and reduce the number of issues which surface at the presidential level for resolution.

3. Similar and interdependent programs should be brought together whenever possible so that there is a single organizational location for a given social or economic objective. Officials who are addressing common problems should work together in a single chain of command. This will bring together in one plan the relevant information, resources, and authority needed to set intelligent priorities in a given area.

4. The number of agency heads directly accountable to the President should be reduced in order to increase meaningful contact between the President and the major line officials of his administration.74

One can readily observed that the first basis essentially reiterates the principle of organization by purpose. The second restates that consolidation is a means to efficiency. The third elaborates the principle of unity of command. Finally, the fourth applies the

74 Executive Office of the President, The Domestic Council, The President's Proposals for Executive Reorganization, p. 6.
principle of span of control. The application of these principles led the Ash Commission to recommend and the President to adopt the reorganization plan ultimately presented to Congress.

The President's comprehensive reorganization plan immediately encountered strong political opposition from the clientele agencies. Soon the Administration dropped the Department of Agriculture from its list of abolished agencies and exempted it from reorganization. Again, the apolitical rationale for reorganization appeared to have serious political implications. The criterion of efficiency seemed to give way to the demands of special interests. Political resistance steadfastly held and the plan languished in Congress.

The policy relevance of Niskanen's theory derives from its implications for the policy promulgated above by President Nixon. If Congress had approved the four major departments, then the executive branch would have become less efficient, larger, and would grow more rapidly than if it continued in its disorganized form. This conclusion stems from the increased monopoly power these super departments would have after consolidation. Despite the application of those intuitively appealing principles of consolidation by purpose, unity of command, and span of control, the executive branch would be less efficient.

The question of how to achieve efficiency in government still remains unanswered. Traditional public administration theory offered answers that now stand challenged by Niskanen. Does Niskanen's theory hold? Under what conditions does it hold? Does the evidence support
it? Should we apply it now to executive branch reorganization policy? Will executive branch reorganization policy reverse and advocate competition rather than monopoly in government? The next few chapters attempt to at least partially answer these questions.
CHAPTER III

A SUMMARY OF NISKANEN'S ARGUMENT

This chapter summarizes Niskanen's argument through which he concluded that bureaus are inefficient, too large, and will usually grow more rapidly than other alternative forms of economic organization. By uncritically accepting Niskanen's approach one can quickly proceed through the basic premises and conclusions of his argument using analytic geometry and the calculus. The theory of supply by bureaus contains three distinct portions. Niskanen distinguished these by the types of questions they answer, which he designated as constructual, behavioral, and normative. Conforming to this approach, one can readily depict his entire formal argument.

One can answer Niskanen's constructual questions with assumptions or premises. In the theory of supply by bureaus Niskanen included the definitions of a bureau, a bureaucrat, the bureau's environment, and the central motivational assumption as the premises in his argument. According to the positive economic methods to which Niskanen subscribes, one should not question the truth or realism of these assumptions. For his purposes the truth or falsehood of assumptions remains quite irrelevant to the empirical test of his theory. Indeed, one could empirically falsify a conclusion deduced from these assumptions despite the fact that one could demonstrate that the assumptions were

1William A. Niskanen, op. cit., pp. 10-12.

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true or realistic. In this case one would have disconfirmed the theory even though all of its assumptions were true. Thus, an assumption's value derives from its usefulness in deducing empirically testable hypotheses and not from its realistic or unrealistic nature.

One answers Niskanen's behavioral questions with conclusions or hypotheses deduced from the premises in the deductive theoretical argument. This chapter concentrates on the following three behavioral questions: (1) Are bureaus inefficient?; (2) Are bureaus too large?; and (3) Do bureaus grow faster than other alternative forms of economic organization? Appendix A lists the entire set of behavioral hypotheses deduced from Niskanen's premises. This chapter uses analytic geometry and some calculus to explain all of these hypotheses, but the entire study focuses on the three main questions listed above.

Niskanen's normative questions have structural answers. Using the standard Pareto criterion, Niskanen prescribes a competitive bureaucracy to alleviate the alleged problems created by a monopolistic bureaucracy. He predicates this prescription on the American belief in private enterprise and the concomitant preference for proportionately less, rather than more, government. The theoretical issues of internal consistency, logical form, empirical content, and empirical support loom extremely important to the acceptability of these prescriptions. Hence, an evaluation of the theory and these issues can help

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2 The reader should not confuse the specific meaning attached to the word "behavioral" in this theory with its meaning in "behavioral science." In this theory the word "behavioral" denotes only the different equilibrium solutions resulting for the alternative forms of economic organization in response to differing motivational assumptions and changes in variables.
to determine whether one can apply this theory to the federal bureaucracy.

The Model

Niskanen defined three critical elements in his theory of supply by bureaus: (1) the definition of bureaus; (2) the description of their environment; and (3) the central motivational assumption. This section examines the formal aspects of these three critical elements.

The Bureau

"Bureaus are nonprofit organizations which are financed, at least in part, by a periodic appropriation or grant." As an indicator of the relative role of government bureaus, Niskanen observed that the government expenditure share of GNP has risen from 10.0 percent in 1929 to 31.1 percent in 1969. A bureaucrat is "the senior official of any bureau with a separate and identifiable budget." The theory requires no pejorative connotation of this term. "Bureaucrats as individuals are neither more or less efficient, honest, hard-working, thorough, public spirited, and generally worth of admiration than non-bureaucrats." The theory does not require vast conspiracies of bureaucrats and special interests against the public interest. Instead,

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3 Ibid., pp. 15-42.
4 Ibid., p. 42.
5 Ibid., p. 16.
6 Ibid., p. 22.
7 Ibid., p. 23 (a quote from Downs).
it presumes that the potential for excessive size and growth thrives under the ideal conditions of a monopolistic bureaucracy.

The Bureau's Environment

A bureau's environment contains three components: (1) the organization that provides the recurring grant or appropriation, which Niskanen designated as the sponsor; (2) suppliers of labor and other factors of production; and (3) customers for the output produced at a per unit price or beneficiaries for the output not produced at a per unit price. The bureau operates in two markets. First, the bureau offers a set of activities associated with an expected output in the product market to the sponsor organization (e.g., Congress) in exchange for a total budget. This product market operates as a bilateral monopoly in which there exists one producer that has an output monopoly (the bureau) and only one monopoly buyer for the product (the sponsor). The case of bilateral monopoly leads to an indeterminate solution in price and quantity. Thus, the solution depends not only upon demand and supply conditions, but also on the bargaining power of the participants. If there exist no substitutes from which the sponsor can choose and the sponsor does not choose to forego its services, then the distribution of bargaining power will favor the monopoly bureau. Second, the bureau also purchases factors of production in factor markets. In factor markets it either operates as either a discriminating or non-discriminating monopsonist. In the monopsony factor market the bureau

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8 Ibid., p. 24.
9 Ibid.
is sole buyer of a particular service. For example, the military is the sole buyer of infantry soldiers. The theory implies that the budget maximizing monopsonist bureau may discriminate against these monopsonized factors of production, which leads to lower remuneration than would exist with uniform factor prices. In some cases, however, the monopsonized factor owners can increase their remuneration by lobbying with the sponsor organization and increasing the sponsor's demand for the bureau's output.

The budget-output function expresses the preferences of the sponsor. Any point on the budget-output function represents the maximum budget the sponsor will grant for a given level of output. Niskanen chooses a function with the following mathematical properties:

\[ B = f(Q) \]
where \( f'(Q) > 0 \) and \( f''(Q) < 0 \)
or more specifically,

\[ B = aQ - bQ^2 \quad 0 \leq Q \leq a/(2b) \]

where: \( B \) is the maximum budget the sponsor is willing to grant during a specific time period.

\( Q \) is the expected level of output by the bureau during any specific time period.

\( a \) and \( b \) are nonnegative constants.

The budget-output function reflects the outcome of bargaining between the legislature and executive branch. The resulting "demand function" is the first derivative of the budget-output function. Since one cannot draw a perfect analogy between the conventional market demand function and the first derivative of the budget-output function,

\[ \text{Ibid., p. 25.} \]
Niskanen used quotations around the bureau's "demand function." More accurately, one may call this function the marginal valuation function, but then this term is slightly more cumbersome. Remaining aware of this important caveat, one may very loosely refer to it as a "demand function" in the following form:

11 Niskanen's exposition does not consistently designate either the marginal valuation function or the budget output function as the sponsor's "demand function." For example, on page 59 of Bureaucracy and Representative Government he noted that "The collective organization's demand for some service is represented by the budget-output function..." However, on page 67 he stated that "A uniform shift in the demand or marginal valuation function for a service is represented by a change in the parameter a." Then he proceeded to analyze the "general effects of a shift in the demand for a service on the output and budget of a bureau and competitive industry" beginning on page 67. Thus, it is not clear whether the budget-output function or the marginal valuation function is the sponsor demand function.

On August 23, 1974 Niskanen replied to a letter requesting clarification of the problem discussed above. In part, he said, "A bureau faces a market for its output defined by a budget-output function, not a demand function, because it exchanges its output for a budget and not at a per unit price. ...A unique marginal valuation function (but not a "demand" function in the strictest sense) can then be defined for each budget-output function;..." Hence, strictly speaking neither function is a "demand function."

Confusion arises when one begins to analyze changes in "demand." This confusion derives from two sources. First, the theory contains a mathematical identity between the competitive industry demand function and the sponsor's marginal valuation function. Thus, shifts or changes in elasticity of the competitive industry demand function are exactly analogous to shifts or changes in elasticity of the marginal valuation function by definition. Second, differences between some of the economic values derived from these two functions also exist, however. Since the bureau offers an output for total budget rather than an output at a per unit price, the product of price times quantity does not equal total revenue available to the bureau. Instead, the area under the demand curve equals total budget or benefits available to the bureau. Consequently, when one refers to changes in "demand," one must remain aware of both the assumed mathematical identity of these two functions and also their economic differences.
(3) \[
\frac{d\mathbb{E}}{dQ} = v = a - 2bQ \quad 0 \leq Q \leq a/(2b)
\]

where: \(V\) is the maximum price per unit of output that the sponsor is willing to pay.

This "demand function" is not operationally relevant to most bureaus, because they usually do not sell their services at a per unit price. However, it does loom relevant to the sponsor. If there exists a competitive industry also supplying these services, then the sponsor could use the competitive industry's cost structure for comparative purposes in the review process. The "demand" somehow relates to the aggregate demand of the constituencies represented by the officers of the sponsor organization. The public communicates such information about its preferences through voting, public opinion, constituent influences, interest group activities, changes in sponsor composition, and previous budget review processes. In contrast, the sponsor receives very little information about the bureau's cost structure. Consequently, one can analyze the bilateral monopoly in terms of a passive sponsor and fully exploitive monopoly bureau. 12

The cost-output function represents "the minimum total payment necessary to produce an output level, given the factor prices and technology." 13 It takes the following form:

\[
TC = g(Q) \quad \text{where } g'(Q) > 0 \text{ and } g''(Q) \geq 0
\]

or more specifically,

12 The passive sponsor assumption is equivalent to assuming that the monopoly buyer (the sponsor) acts as if it buys in a competitive market.

13 Ibid., p. 32.
(5) \[ TC = cQ + dQ^2 \quad 0 \leq Q \]

where: \( TC \) is the minimum total payment to factors during a specific time period.

\( c \) is a nonnegative constant and \( d \) is a constant that can be positive, negative, or zero (this parameter is not to be confused with the symbol "\( d \)" used to indicate derivatives).

The first derivative of the cost-output function takes the following form:

(6) \[ \frac{d(TC)}{dQ} = MC_c = c + 2dQ \quad 0 \leq Q \]

where: \( MC \) is the minimum marginal payment to factors during a specific time period.

The cost structure characterized by these functions will be known within the bureau, but not communicated outside to the sponsor organization.

**The Central Motivational Assumption**

The central motivational assumption states that "Bureaucrats maximize the total budget of their bureau during their tenure, subject to the constraint that the budget must be equal to or greater than the minimum total costs of supplying the output expected by the bureau's sponsor."\(^{14}\) This constitutes the third and final critical element in the theory of supply by bureaus. It radically differs from vague notions about public servants maximizing the general welfare or the public interest. Niskanen argued that public servants are motivated by similar factors that motivate individuals in private bureaucracies and that they certainly are not solely motivated by the public interest.

As economists assume, individuals, including bureaucrats, maximize utility in a rational fashion. Consider the job variables that enter into a bureaucrat's utility function. Niskanen asserted that salary, perquisites of the office, public reputation, power, patronage, output of the bureau, ease of making changes, and ease of bureau management all positively enter the bureaucrat's utility function. In addition, he asserted that all but the last two of these variables are a positive, monotonic function of the budget. Consequently, budget maximization can serve as a proxy objective for all bureaucrats, including those with low pecuniary motivation.

Implications

Niskanen's Presentation of the Budget-Output Equilibrium

The basic model of a single service bureau that confronts a passive sponsor in the assumed bilateral monopoly market can be described as follows:

\[ \text{(13) Maximize: } B = aQ - bQ^2 \quad 0 \leq Q \leq a/(2b) \]

Subject to:

\[ \text{(14) } TC = cQ + dQ^2 \quad 0 \leq Q \]

\[ \text{(15) } B \geq TC \]

In other words the bureaucrat attempts to maximize the expected approved budget subject to the constraint that the budget must be more than or equal to the total costs incurred in producing the bureau's output. To find the unconstrained maximum of the budget-output function

\[ ^{15} \text{Ibid., pp. 38-39.} \]
one must differentiate with respect to output and set the first
derivative equal to zero. Then one solves for $Q$ as follows:

\begin{align*}
(13) \quad B &= aQ - bQ^2 \quad 0 \leq Q \leq a/(2b) \\
(16) \quad \frac{dB}{dQ} &= a - 2bQ = 0 \\
Q &= a/(2b) \\
\frac{d^2B}{dQ^2} &= -2b < 0
\end{align*}

Thus, the unconstrained, or in Niskanen's terminology, the demand-constrained solution of output ($Q_d$), where the bureaucrat maximizes his budget is:

\begin{equation}
(17) \quad Q_d = a/(2b)
\end{equation}

One finds the budget-constrained solution by equating $B$ and $TC$:

\begin{equation}
(13) = (14) \quad aQ - bQ^2 = cQ + dQ^2
\end{equation}

Solving for $Q$ one gets the budget-constrained output ($Q_b$):

\begin{equation}
(18) \quad Q_b = (a-c)/(b+d)
\end{equation}

The threshold between these two solutions is derived from setting $Q_b = Q_d$ and solving for $a$, the "demand" shift parameter.

\begin{align*}
Q_b &= Q_d \\
(a-c)/(b+d) &= a/(2b) \\
(19) \quad a &= (2bc)/(b-d)
\end{align*}

Thus, one can summarize the output solution as:

\begin{equation}
Q = \begin{cases} 
\frac{a - c}{b + d} & \text{for } a < \frac{2bc}{b-d} \\
\frac{a}{2b} & \text{for } a \geq \frac{2bc}{b-d}
\end{cases}
\end{equation}

\begin{array}{ll}
\text{Demand Level} & \text{Region} \\
\frac{a - c}{b + d} & \text{Budget-Constrained} \\
\frac{a}{2b} & \text{Demand-Constrained}
\end{array}
This solution is shown graphically in Figure 3.1. When the area \( a_1gh \) under the function \( V_1 \) equals the area \( ecfh \) under the function \( MC_e \), the bureau is in the budget-constrained equilibrium. Mathematically, one can express this as:

\[(20) \quad B = TC\]

Now, if \( a \geq \frac{(2bc)}{(b-d)} \), then \( B \geq TC \). Then, the bureau is in the demand-constrained region. This condition exists at the point \( a_2/(2b) \) in Figure 3.1.

In the budget-constrained equilibrium the ratio of total benefits to (budget) total costs equals unity. However, the minimum marginal payment to factors, \( hf \), exceeds the maximum price per unit of output, \( hg \), at \( Q_b = \frac{(a_1-d)}{(b+d)} \). Consequently, since marginal costs exceed the marginal budget (benefits), the budget-constrained equilibrium is inefficient.

In the demand-constrained region at \( Q_d = a_2/(2b) \) the marginal value of output is zero and the minimum payments to factors of production exceeds the maximum per unit price of output by exactly \( ji \). At this point the demand-constrained bureau's budget far exceeds the minimum necessary payments to factors of production necessary to produce the equilibrium output \( Q_d \). Thus, no small change in costs will affect the bureau's budget, because the budget already exceeds the minimum necessary payments to factors of production to produce the given output. In this region there exists no incentive to allocate the bureau's resources efficiently. The demand-constrained bureau contains organizational slack. That is, the resources appropriated exceed what is
Figure 3.1: Equilibrium Output of A Bureau

\[ V_1, V_2, MC_c \]


Note: \( MC_c = C \) in Niskanen's graph.
necessary to efficiently produce the given output. Hence, both types of bureaus operate at inefficient levels of output.

An Analytic Expansion of Niskanen's Presentation

To understand Niskanen's concept of bureaucratic or organizational slack, one must expand the graphical exposition presented in Figure 3.1. One can achieve this by using equations in Figure 3.2. First, the functions in the upper graph are:

\[
\begin{align*}
(21) & \quad B_1 = a_1Q - b_1Q^2 & 0 \leq Q \leq a_1/(2b_1) \\
(22) & \quad TC_c = cQ + dQ^2 & 0 \leq Q \\
(23) & \quad B = \tilde{a}Q - \tilde{b}Q^2 & 0 \leq Q \leq \tilde{a}/(2b) \\
(24) & \quad B_2 = a_2Q - b_2Q^2 & 0 \leq Q \leq a_2/(2b_2)
\end{align*}
\]

In the lower graph one can see the first derivatives of these functions (25, 26, 28, and 29, respectively) and the long-run supply function of a competitive industry (27) as follows:

\[
\begin{align*}
(25) & \quad V_1 = a_1 - 2b_1Q & 0 \leq Q \leq a_1/(2b_1) \\
(26) & \quad MC_c = c + 2dQ & 0 \leq Q \\
(27) & \quad C = c + dQ & 0 \leq Q \\
(28) & \quad \tilde{V} = \tilde{a} - 2\tilde{b}Q & 0 \leq Q \leq \tilde{a}/2\tilde{b} \\
(29) & \quad V_2 = a_2 - 2b_2Q & 0 \leq Q \leq a_2/(2b_2)
\end{align*}
\]

where: \( a_1 < \tilde{a} < a_2 \) and \( b_1 = \tilde{b} = b_2 \).

\( V_1, \tilde{V} \) and \( V_2 \) represent low, threshold, and high "demand" situations facing the bureau. Holding costs constant, one can define two regions relevant to the bureau facing a sponsor with either low "demand" (\( V_1 \)) or high "demand" (\( V_2 \)). Depending on the demand of the sponsor, the bureau will be in one or the other of these two regions.
Figure 3.2: Bureau-Sponsor Exchange Equilibria
The functions \( V_1 \) and \( C \) appear in the lower graph of Figure 3.2. At their intersection the marginal valuation to the sponsor \( (V_1) \) equals the long-run supply function of a competitive industry \( (C) \) and the bureaucratic competitive equilibrium output \( (Q_c) \) is defined on the \( Q \) axis. Note that in the upper graph at \( Q_c \) the budget \( (B_1) \) exceeds the total minimum factor payments \( (TC_c) \) by \( W \). This represents the maximum net benefit produced by the competitive bureaucracy. Now, because of the monopolistic nature of bureaucracy assumed by Niskanen, the bureaucrat can conceal his cost structure and induce the sponsor to provide him with a budget where \( B_1 = TC_c \) in the upper graph. This defines the point, \( Q_b \), in the lower graph. Thus, \( Q_b \) is the budget-constrained equilibrium where \( TC_c = B_1 \) in the upper graph. The point \( Q_b \) exactly corresponds with \( (a_1 - c) / (b + d) \) in Niskanen's graph shown in Figure 3.1. Beyond \( Q_b \), *ceteris paribus*, the total minimum costs exceed the budget, which violates the constraint expressed in equation (15). In essence, this depicts the meaning of the term "budget-constrained."

To define the budget-constrained region one must exogenously increase the "demand" for the bureau's services by increasing the "demand" shift parameter, while holding costs constant. One achieves this by shifting \( V_1 \) in the lower graph outward to \( V \). In effect, this increases \( a_1 \) to \( a \), while holding \( b \) constant. At this level of demand \( (V) \) the demand-constrained equilibrium at \( Q \) in the lower graph, where \( B = TC_c \) in the upper graph, exactly corresponds to the maximum of \( \bar{B} \). Thus, this level of "demand" \( (V) \) defines the threshold between the budget-constrained
(Q < \bar{Q}) and demand-constrained (Q ≥ \bar{Q}) regions. An exogenous increase in "demand" above \bar{V} propels the bureau into the demand-constrained region (Q ≥ \bar{Q}).

Again, shift the threshold "demand" (\bar{V}) to the high "demand" (V_2) in the lower graph by increasing the exogenous shift parameter from \bar{a} to a_2, while still holding b constant. Now, because the bureau exploits its monopoly power relative to the passive sponsor, it can expand its output to Q_d, where V_2 = 0 in the lower graph and B_2 exceeds \text{TC}_c by S in the upper graph. Thus, the bureau is now in the demand-constrained region at Q_d in the lower graph. The bureau facing a high sponsor "demand" (V_2) can expand its output until the additional value to the sponsor of one more unit of output equals zero, which occurs at Q_d in the lower graph. Through time a monopoly bureau in the demand-constrained situation can continue to expand its budget by stimulating exogenous increases in sponsor demand through various promotional activities. Thus, the demand-constrained bureau will continuously search for ways to justify the expansion of its "priceless" services in order to maximize its budget.

Where is the organizational slack, i.e., the disparity between total resources (B) and the total necessary payments (\text{TC}_c)? The budget-constrained bureau contains no slack. Notice at \text{Q_b} slack apparently equals zero where \text{TC}_c = B_1. At \text{Q_b} all of the budget is used to produce an output that exceeds the bureaucratic competitive output by (\text{Q_b} - \text{Q_c}). Now, at Q_d one notes that B_2 exceeds \text{TC}_c by S, the

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demand-constrained organizational slack. At this point the bureau has maximized its budget and has the amount of $S$ to spend in a discretionary manner, such as on promotional activities. Also, scrambling to spend unused funds at the end of the budget period would exemplify this solution. During future years a bureau in this position will promote its activities even more in order to expand its budget further. This concludes the proof of the first two primary points of Niskanen's theory. Clearly, the model implies that bureaus are inefficient and too large.

Comparison of Organizational Forms

Method for Comparisons

To inject a sense of verisimilitude into the theory of supply by bureaus Niskanen used a specific arithmetic example to explain the relationships between various forms of economic organization. This section expands his approach by indicating how these organizational forms compare both arithmetically and graphically. It attempts to provide a better understanding of the concepts Niskanen used and the hypotheses generated by his premises. Later sections present and discuss the fourteen hypotheses contained in the theory of supply by bureaus using this arithmetic example and its graphic presentation.

In the introduction to the "Comparison of Organizational Forms" Niskanen presented a one paragraph justification for this approach.

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Since it establishes the core of his comparative argument, a lengthy quotation seems justified:

A better understanding of the consequences of the bureaucratic organization of economic activity can be gained by comparing them with the consequences of other forms of organization that face the same demand and cost conditions. The relevance of this comparison, of course, is based on the assumption that a collective organization could potentially purchase the desired service from any one of the several types of profit-seeking firms and bureaus. The potential use of profit-seeking firms to supply these services is primarily dependent on contracting and monitoring problems rather than on any inherent limitation of the type of goods and services that can be supplied by such firms. For this comparison also, the sponsor organization is assumed to be unable to exercise its power as monopoly buyers of these services. 18

This chapter accepts this basis for comparison and proceeds with an expanded analysis of the relevant comparisons.

Table 3.1 presents the general and specific form of equations necessary to compare equilibria of eight possible economic forms of organization. Given the above quotation, one can compare four forms of monopoly with four forms of pure competition in the product market. The monopolies consist of two firms and two bureaus that are delineated by whether they face uniform (U) or discriminating (D) factor prices. Likewise, the competitive forms consist of two industries and two bureaucracies that are faced with either competitive (C) or uniform monopsonistic (M) factor prices. The specific equilibrium solutions for these eight economic forms appear in Table 3.2.

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18 Ibid., p. 59.
### TABLE 3.1

**EQUATIONS NEEDED FOR A COMPARISON OF ORGANIZATIONAL FORMS**

<table>
<thead>
<tr>
<th>General Form</th>
<th>1. B = ( aQ - bQ^2 ) ( 0 \leq Q \leq a/(2b) )</th>
<th>1. B = ( 200Q - .5Q^2 ) ( 0 \leq Q \leq 200 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. ( TC_c = cQ + dQ^2 ) ( 0 \leq Q )</td>
<td>2. ( TC_c = 75Q + .25Q^2 ) ( 0 \leq Q )</td>
<td></td>
</tr>
<tr>
<td>3. ( TC_m = cQ + (d/2)Q^2 ) ( 0 \leq Q )</td>
<td>3. ( TC_m = 75Q + .125Q^2 ) ( 0 \leq Q )</td>
<td></td>
</tr>
<tr>
<td>4. ( V = a - 2bQ ) ( Q \leq a/(2b) )</td>
<td>4. ( V = 200 - 1.0Q ) ( Q \leq 200 )</td>
<td></td>
</tr>
<tr>
<td>5. ( R = 2Q - 2bQ^2 ) ( 0 \leq Q \leq a/(2b) )</td>
<td>5. ( R = 200Q - 1.0Q^2 ) ( 0 \leq Q \leq 200 )</td>
<td></td>
</tr>
<tr>
<td>6. ( C = c + dQ )</td>
<td>6. ( C = 75 + .25Q )</td>
<td></td>
</tr>
<tr>
<td>7. ( MR = a - 4bQ )</td>
<td>7. ( MR = 200 - 2.0Q )</td>
<td></td>
</tr>
<tr>
<td>8. ( MC_c = c + 2dQ )</td>
<td>8. ( MC_c = 75 + .5Q )</td>
<td></td>
</tr>
</tbody>
</table>

**Definitions:**

- Collective Surplus (CS) = \( B-R \)
- Profits (\( \Pi \) ) = \( R-TC \)
- Factor Surplus (FS) = \( TC_c - TC_m \)

**Note:** The most crucial relationship in these equations is "The average cost function of a profit-seeking monopoly which is not a discriminating monopsonist, the marginal cost function of a discriminating monopsonist, and the long-run supply function of a competitive industry is \( C = c + dQ. \)" (p. 60)

### Table 3.2

**Alternative Forms of Economic Organization Facing Same Demand and Cost Conditions**

<table>
<thead>
<tr>
<th>Basic Organisational Form</th>
<th>Nonbureaucratic*</th>
<th>Bureaucratic*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivational Assumptions</td>
<td>Profit Maximizers</td>
<td>Net Benefit Maximizers</td>
</tr>
<tr>
<td>Product Market</td>
<td>Monopoly</td>
<td>Competitive</td>
</tr>
<tr>
<td>Factor Price</td>
<td>U D C M</td>
<td>C M U D</td>
</tr>
<tr>
<td>Output (Q)</td>
<td>50 55.6 100 83.3</td>
<td>100 83.3 166.7</td>
</tr>
<tr>
<td>Budget (B)</td>
<td>8,750 9,575 15,000 13,190.5</td>
<td>15,000 13,190.5 19,444.4</td>
</tr>
<tr>
<td>Average Budget (B/Q)</td>
<td>175 172.2 150 158.4</td>
<td>150 158.4 116.7</td>
</tr>
<tr>
<td>Marginal Budget (V)</td>
<td>150 144.4 100 116.7</td>
<td>100 116.7 33.3</td>
</tr>
<tr>
<td>Revenue (R = VQ)</td>
<td>7,500 8,029 10,000 9,721.1</td>
<td>10,000 9,721.1 5,551.1</td>
</tr>
<tr>
<td>Average Revenue (AR)</td>
<td>150 144.4 100 116.7</td>
<td>100 116.7 33.3</td>
</tr>
<tr>
<td>Marginal Revenue (MR)</td>
<td>100 88.8 100 116.7</td>
<td>100 116.7 -133.4</td>
</tr>
<tr>
<td>Costs (TC)</td>
<td>4,375 4,556 10,000 7,114.9</td>
<td>10,000 7,114.9 19,444.4</td>
</tr>
<tr>
<td>Average Costs (AC)</td>
<td>87.5 81.9 100 85.4</td>
<td>100 85.4 116.7</td>
</tr>
<tr>
<td>Marginal Costs (MC)</td>
<td>100 88.9 100 116.7</td>
<td>100 116.7 158.4</td>
</tr>
<tr>
<td>Basic Organizational Form</td>
<td>Nonbureaucratic*</td>
<td>Bureaucratic*</td>
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<tr>
<td>--------------------------</td>
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<td>--------------</td>
</tr>
<tr>
<td>Motivational Assumptions</td>
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<td>Net Benefit Maximizers</td>
</tr>
<tr>
<td>Product Market</td>
<td>Monopoly</td>
<td>Competitive</td>
</tr>
<tr>
<td>Factor Price</td>
<td>U D C M</td>
<td>C M</td>
</tr>
<tr>
<td>Collective Surplus (CS)</td>
<td>1,250 1,546 5,000 3,469.4 5,000 3,469.4 0 0</td>
<td></td>
</tr>
<tr>
<td>Profits (Π)</td>
<td>3,125 3,473 0 0 0 0 0 0</td>
<td></td>
</tr>
<tr>
<td>Factor Surplus (FS)</td>
<td>3,125 0 1,250 2,606.2 1,250 2,606.2 3,472.2 0</td>
<td></td>
</tr>
</tbody>
</table>

Definitions: U = Uniform  
D = Discriminating  
C = Competitive  
M = Monopsonies (uniform)

*A bureaucratic organizational form is any organization financed, at least in part, by a period grant or appropriation. All other organizations are nonbureaucratic.

The Specific Comparisons

This section discusses each organizational form separately. First, it notes the motivational assumption that determines the particular organizational form's specific solution. Second, it discusses the unique characteristics of the solution related to the variables contained in the rows of Table 3.2 and the specific form solutions depicted on the basic graph shown in Figure 3.3. This discussion concentrates on the primary questions of size, efficiency, and growth as specifically demonstrated on the basic graph. Size is graphically examined by using both output and budget. In addition to size, one can assess efficiency with the values for consumer surplus, profits, and factor surplus. Finally, since this analysis is static, it presents an analysis of growth in a later section using comparative static analysis. Thus, given these five measures of size and efficiency, one can proceed with a graphic comparison of the alternative forms of economic organization.

Competitive-Competitive Industry

Among economists and those familiar with basic economics the formal proof that perfect competition leads to an efficient market equilibrium provides the foundation on which to assess the efficiency of alternative forms of economic organization. This section will not reiterate that proof. However, since the competitive industry represents the norm about which Niskanen evaluates monopoly bureaus, 

Figure 3.3: Basic Graphs for Analyzing Organizational Forms
this presentation does require a brief digression on the conditions necessary and sufficient for the existence of a perfectly competitive market. Henderson and Quandt have succinctly provided these conditions:

A perfectly competitive commodity market satisfies the following conditions: (1) firms produce a homogeneous commodity, and consumers are identical from the sellers' point of view, in that there are no advantages or disadvantages associated with selling to a particular consumer; (2) both firms and consumers are numerous, and the sales or purchases of each individual unit are small in relation to the aggregate volume of transactions; (3) both firms and consumers possess perfect information about the prevailing price and current bids, and they take advantage of every opportunity to increase profits and utility respectively; (4) entry into and exit from the market is free for both firms and consumers.20

For comparative purposes the key condition resides in the requirement of numerous firms. In the following comparisons there exist two polar types of markets to analyze. First, one can examine competitive industries or bureaucracies in which there exist numerous firms or bureaus in the market. Second, one can examine monopoly firms or bureaus of which there exists only one in each product market. Remaining cognizant of these polar types one can now proceed to establish the normative criteria embodied in the perfectly competitive solution.

Figure 3.4 depicts a competitive industry containing numerous profit maximizing firms facing competitive factor prices. The

Figure 3.4: Competitive Industry Facing Competitive Factor Prices
competitive market solution results from the intersection of supply (C) and demand (V) in the lower graph, where output (Q) equals one hundred. Given these supply and demand conditions, this defines the one and only one efficient level of output. One can note this solution in column three of Table 3.2 and compare the various relevant concept values in the rows to the graphs in Figure 3.4. The size of a competitive industry under the given conditions measures one hundred units of output and 15,000 units of total benefits (budget). Moreover, it generates a collective surplus (CS-B-R) of 5,000 units, zero profits (M=R-TCc), and a factor surplus (FS=TCc-TCm) of 1,250 units. Any organizational form deviating from these values produces inefficiently and is either too small or too large. Thus, it remains to compare the other types of organizational forms to this norm for both size and efficiency.

Competitive-Monopsony Industry

Figure 3.5 graphs the solution for a competitive industry containing profit maximizing firms each of whom are monopsonistic buyers of factors of production and face uniform factor prices. This means that each firm is the sole buyer of its specialized factor inputs into its production process. The intersection of the industry's marginal expense curve (MCc) and the demand curve (V) determines the output equilibrium of 83.3 units. This implies the total benefits of 13,190.5 units listed in column four of Table 3.2. When compared with the competitive norm both the output and budget in this case are too
Figure 3.5: Competitive Industry Facing Monopsonistic Factor Prices (Uniform)
Consumer surplus is also less than the competitive norm at 3,469.4 units. Moreover, it generates a factor surplus of 2,606.2 units compared to 1,250 for the competitive norm. Clearly, this case is too small and inefficient when compared to the competitive norm.

Monopoly-Uniform Industry

Figure 3.6 shows the solution for a profit-maximizing monopolist facing uniform factor prices. To maximize profits, the monopolist equates marginal revenue (MR) to marginal cost (MC). This results in too little output of only 50 units and too little total benefits of only 8,750 units. Certainly, the monopoly produces at too small of a scale. Moreover, it generates too little factor surplus of 312.5 units and too little collective surplus of only 1,250 units. Finally, it reaps monopoly profits of an excessive 3,125 units. Therefore, the organizational form of monopoly is too small and inefficient.

Monopoly-Discriminating Industry

Figure 3.7 demonstrates the case of a monopoly seller with discriminating factor prices. It is also too small and inefficient. This form also maximizes profits at marginal revenue (MR) equals marginal cost (C). The resulting production level leads to a slightly larger output of 55.6 units and total benefits of 9,575 units than the previous case. However, the scale of production remains too small. In addition, it generates a larger collective surplus than the previous case of 1,546 units, but captures all of the factor surplus in higher profits of 3,474 units. Hence, this case is also too small and inefficient.
Figure 3.6: Profit Maximizing Monopoly Facing Uniform Factor Prices
Figure 3.7: Profit Maximizing Monopoly with Discriminating Factor Prices
Monopoly-Uniform Bureau (Budget-Constrained)

Figure 3.8 portrays Niskanen's budget-constrained monopoly bureau facing uniform factor prices. As discussed earlier, the solution results from the equation of the budget with total costs. It produces an excessive output of 166.7 units and requires a swollen budget of 19,444.40 units. Moreover, it produces no collective surplus and factor surplus of 3,472.2 units. Hence, this type of monopoly bureau is too large and inefficient. Because bureaucrats maximize their budgets, the monopoly bureau can confiscate the collective surplus that would be generated at a lower output level.

Monopoly-Discriminating Bureau (Demand-Constrained)

In Figure 3.9 the demand-constrained monopoly bureau with discriminating factor prices can expand its budget to a maximum at the point where the marginal value (V) to the sponsor equals zero. Thus, it produces an output equal to 200 units and requires a budget of 20,000 units. At this point the bureau is also too large. In addition, it has confiscated the factor surplus in the previous case in order to expand its budget further. Given that factor surplus and collective surplus are zero in this case, one can again conclude that this type of bureau is not only too large, but also inefficient. Clearly, the fact that its marginal costs (C) exceed the marginal value to the sponsor (V) by 125 units demonstrates this inefficiency.

Competitive-Monopsony Bureaucracy

Niskanen recommended a competitive bureaucracy to reduce the size and inefficiency attendant to a monopolized bureaucracy. Figure 3.10
Figure 3.8: Budget Maximizing Monopoly Bureau Facing Uniform Factor Prices (Budget-Constrained)
Figure 3.9: Budget Maximizing Monopoly Bureau with Discriminating Factor Prices (Demand-Constrained)
Figure 3.10: Competitive Bureaucracy with Monopsonistic Factor Prices (Uniform)
diagrams the equilibrium solution for a competitive bureaucracy facing uniform monopsonistic factor prices. The equilibrium occurs where marginal benefit (V) equals marginal cost (MC_L), which determines an output level of 83.3 units. Contrary to the monopoly bureaus, this output level is too small. Also, it requires a smaller budget than monopoly bureaus of 13,190.50 units. Therefore, this type of competitive bureaucracy is smaller and less efficient than the competitive norm.

Competitive-Competitive Bureaucracy

Figure 3.11 delineates a competitive bureaucracy facing competitive factor prices. Its equilibrium solution is equivalent to the competitive-competitive industry. Thus, it also maximizes consumer surplus at 5,000 units. Consequently, it is both efficient and the appropriate size in terms of output and budget.

An Interpretation of the Static Hypotheses

Reconsider the solutions represented in Table 3.2 and the hypotheses in Appendix A. One can interpret many of these hypotheses by examining Table 3.2 and the graphical solutions preceding this section. This section restates the relevant hypothesis to be discussed and then indicates its meaning in the context of Table 3.2 and the graphs in Figures 3.2 through 3.11. Finally, it interprets the word "bureau" in these hypotheses to mean only the two types of budget maximizing monopoly bureaus in Niskanen's theory of supply.

21 The reader may note the page number in parentheses after the hypotheses refers to the location of the quote in Niskanen's book.
Figure 3.11: Competitive Bureaucracy with Competitive Factor Prices
H1: Given the demand for services represented by the collective organization, all bureaus are too large, that is both the budget and output of all bureaus will be larger than that which maximizes the net value to the sponsor. (p. 49)

The "net value to the sponsor" is defined as collective surplus. In the arithmetic example it reaches a maximum of 5,000 units at the output level of 100 units. This equilibrium point identifies two forms of economic organization, which maximize consumer surplus. First, the competitive-competitive industry yields 5,000 units of consumer surplus, but zero profits to the industry. Second, the competitive-competitive bureaucracy also yields 5,000 units of consumer surplus, but zero units of profit. Thus, in the case of a competitive bureaucracy the sponsor could distribute the collective surplus as rewards to individual bureaus that had maximized net benefit. Since the output level of 100 units and the budget level of 15,000 units of these two forms of economic organization are substantially less than the output and budget levels of either type of monopoly bureau, the hypothesis H1 is valid.

H2: As a consequence of the overly large equilibrium output, all bureaus which purchase factors on a competitive market with rising supply prices generate a larger net value to the owners of specific factors used in the production of the bureau's services than would be the case at a lower, optimal output level. (p. 50)

If one treats the monopoly bureau facing discriminating factor prices in the last column of Table 3.2 as a monopoly bureau facing competitive factor prices instead, then one can demonstrate H2. In this case all of the data in the last column would be correct for a
monopoly bureau facing competitive factor prices, except factor surplus ($TC_c - TC_m$). When one recalculates factor surplus, one gets 5,000 units (25,000-20,000). Since this exceeds the factor surplus of 1,250 units at the optimal level of output, the example supports this hypothesis.

H3: Some bureaus, particularly new ones (for which the demand has only recently become higher than the minimum cost) and bureaus that are faced by a substantial exogenous increase in costs, supply the equilibrium level of services at the minimum possible budget. In contrast, other bureaus, particularly older ones (for which demand has continuously increased relative to costs) and bureaus that are faced by a substantial exogenous reduction in costs, supply the equilibrium level of services at a budget higher than the minimum necessary costs. (p. 50)

This hypothesis requires a return to Figure 3.2. Clearly, the budget-constrained bureau graphed in Figure 3.2 produces at the minimum possible budget where $B = TC_c$. Given the low demand condition ($V_1$), any output beyond $Q_b$ would violate the constraint $B > TC_c$, because $TC_c$ would exceed $B$. However, in the higher demand situation ($V_2$) the demand-constrained bureau clearly supplies output with a budget exceeding total costs ($TC_c$) by $S$, the organizational slack. Thus, H3 seems quite correct.

H4: Some bureaus, specifically those that operate in the budget-constrained region and face increasing prices for specific factors, may exercise factor price discrimination. They have a larger budget and output of services (and a lower average budget per unit of output) than other bureaus with similar demand and cost conditions that pay competitive factor prices. Such factor price discrimination is most likely to be used on those specific factors which are weakly represented by the officers of the sponsor organization. (p. 52)
This hypothesis compares the two types of monopoly bureaus. As one can gather from Table 3.2, the discriminating monopsonist produces a larger output of 200 units with a larger budget of 20,000 units than the monopoly bureau facing uniform factor prices. Indeed, its average budget of 100 units is also lower. If the sponsor does not strongly represent these specialized factors of production, then the bureau will maximize its budget and expand output by exercising factor price discrimination. Hence, the example also supports this hypothesis.

H5: Some bureaus, specifically those in the budget-constrained output region, seek out and use the minimum cost combination of the available factors and processes to supply the equilibrium output. Factors or processes will be used in a combination such that the marginal cost per unit of output for all factors used will be the same. Improvements in efficiency lead to both a higher budget and output, but to a lower average budget per unit of output. At the efficient combination of factors or processes relatively more of those processes for which the marginal costs increase less rapidly are used, compared to the use of only one process. Improvements in efficiency may generate either more or less factor surplus. (pp. 57-58)

One can use Figure 3.8 to analyze this hypothesis relevant to a budget-constrained bureau. If this bureau initially using productive techniques implying a total cost curve of \( T_C \) found a more efficient technology with a total cost curve of \( T_{C_m} \), then it would adopt that new technology. This improvement in productive efficiency would expand output to 200 units and the budget to 20,000 units and reduce its average budget to 100 units. Depending upon how far the new discriminating monopsonist's total cost curve would be below the old \( T_{C_m} \), the increased efficiency for the bureau may or may not increase
factor surplus. In this specific case factor surplus would decline to 2,500 units. Certainly, the most startling conclusion of this hypothesis resides in the implication that by becoming more productively efficient through adopting a better technology, the budget-constrained bureau can become even larger and generally less efficient relative to the competitive norm in the market.

H6: Some bureaus, specifically those in the demand-constrained output region, are characterized by indeterminate production behavior. These bureaus may or may not use efficient combinations of factors or processes, but there is no incentive inherent in the bureaucratic form that leads them to seek out and use efficient combinations. For these bureaus, more efficient factor combinations will not lead to any change in their budget, output, or factor surplus. (p. 58).

Again, one can use Figure 3.2. Clearly, if total costs \(TC_c\) for the demand-constrained bureau operating at \(Q_d\) shifted downward due to increased productive efficiency, the bureau would still operate at \(Q_d\) with the same budget. Moreover, organizational slack \(S\) would increase, but this would have no effect on the static budget maximum. Hence, since more efficient factor combinations do not lead to higher budgets, demand-constrained bureaus may or may not use efficient technologies.

H7: A bureau will supply an output up to twice that of a competitive industry faced by the same demand and cost conditions. (p. 64)

Table 3.2 indicates that the output of a monopoly bureau facing discriminating factor prices exceeds the competitive norm by exactly twice the competitive norm output. This represents the highest
extreme at which the marginal value (V) to the sponsor equals zero.

Therefore, H7 follows from the example.

H8: At the equilibrium level of output, a bureau will generate smaller net benefits than a competitive industry but, in the absence of factor price discrimination, a larger factor surplus. This suggests that the owners of specific factors will be stronger advocates of the bureaucratic supply of a service than will most beneficiaries of the service. (p. 64)

Table 3.2 shows that the monopoly bureaus do not generate any net benefit (W-B-TC), while the competitive norm generates 5,000 units of net benefit. However, the monopoly bureau facing uniform factor prices produces more factor surplus (3,472.20 units) than the competitive norm (1,250 units). Holding all other variables constant, the factors of production will prefer the monopoly bureau to provide the output. Hence, the factors of production may be stronger advocates of the bureau's output than the beneficiaries.

H9: At the equilibrium level of output, a bureau may appear to be nearly as efficient as a competitive industry (in terms of average costs per unit of output), but this average cost is realized only at the higher output level, where the marginal value of the service is less than the marginal cost. (p. 64)

In Table 3.2 the average cost of a monopoly bureau facing uniform factor prices is 116.7 units, while the average cost for the competitive norm is 100 units. Indeed, the average cost for a monopoly bureau facing discriminating factor prices is exactly equal to the competitive norm at 100 units. However, in each case the monopoly bureaus' marginal value (V) was substantially less than marginal cost. Clearly, the example supports this hypothesis.
H10: The minimum marginal cost function of a bureau, like that of a profit-seeking monopoly, will not be revealed by its budget and output proposals. The budget and output combinations proposed by a bureau will suggest that the marginal costs decline with output, regardless of the shape of the minimum marginal costs. (p. 65)

As output grows larger, the marginal budget (V) decreases. Since the bureau only reveals budget-output proposals to the sponsor, the sponsor apparently confuses marginal budget for marginal costs. Since this declines with increases in output, it will appear that marginal costs decrease with output to the sponsor.

An Interpretation of the Comparative Static Hypotheses

"Comparative statics is a method of employing static models analytically by imposing changes upon the data of the model and tracing the changes upon the specific solutions..." Niskanen employed this method of comparative statics to deduce the last set of hypotheses (H11-H14). By holding all other variables constant one can shift or twist the "demand" and "supply" curves to denote the impact such changes have on the important output and budget variables. Thus, in this manner one can assess the effects of certain policy-relevant changes on the monopoly bureau's budget.

This section presents some of the comparative static hypotheses in mathematical form and others in graphical form. Where possible, they are presented graphically. However, one can explain some of

these implications more clearly with a mathematical argument. Hence, some of the following hypotheses will be presented in mathematical form.

**H11:** The output and the budget of the bureau operating in the budget-constrained region will grow faster than those of a competitive industry faced by the same increase in demand. For constant costs, the rate of increase of both output and budget will be twice that of a competitive industry. The output of a bureau operating in the demand-constrained region will generally grow faster than a competitive industry; when marginal costs are constant, however, the rate will be the same. In this region the budget of a bureau will grow proportionately with the square of the demand increase. (p. 77)

This hypothesis contains seven distinct subhypotheses. By restating them in a more simplified form, one can readily examine each one separately. Given the same uniform increase in demand, it follows that:

**H11.1** The output of a budget-constrained bureau will grow faster than the competitive norm.

**H11.2** For constant costs ($d=0$) the output of a budget-constrained bureau will grow at twice the rate of a competitive industry.

**H11.3** The output of a demand-constrained bureau will grow faster than the competitive norm.

**H11.4** When marginal costs are constant ($d=0$) the growth rate of a demand-constrained bureau will be equal to the competitive norm.

**H11.5** The budget of a budget-constrained bureau will grow faster than the competitive norm.

**H11.6** For constant costs ($d=0$) the budget growth rate of a budget-constrained bureau will be twice the competitive norm.

**H11.7** The demand-constrained bureau's budget will grow proportionately with the square of the demand increase.
HI1.1 and HI1.2 pertain to the budget-constrained bureau. It operates at an output level of \( Q_b = \frac{(a-c)}{(b+d)} \). Likewise, the competitive norm supplies an output of \( Q_c = \frac{(a-c)}{(2b+d)} \), where supply \((C)\) equals demand \((V)\). One can analyze an increase in "demand" with a change in "a," the "demand" shift parameter as follows:

<table>
<thead>
<tr>
<th>Budget-Constrained Bureau</th>
<th>Competitive Norm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ( Q_b = \frac{(a-c)}{(b+d)} )</td>
<td>1. ( Q_c = \frac{(a-c)}{(2b+d)} )</td>
</tr>
<tr>
<td>2. ( \frac{\delta Q_b}{\delta a} = \frac{1}{(b+d)} )</td>
<td>2. ( \frac{\delta Q_c}{\delta a} = \frac{1}{(2b+d)} )</td>
</tr>
<tr>
<td>3. Since ( 1/(b+d) &gt; 1/(2b+d) ),</td>
<td></td>
</tr>
<tr>
<td>4. it follows that ( \frac{\delta Q_b}{\delta a} &gt; \frac{\delta Q_c}{\delta a} ).</td>
<td></td>
</tr>
</tbody>
</table>

That is, if "demand" increases, then the output of a budget-constrained bureau will increase more than it would for a competitive industry facing the same demand and cost conditions. Furthermore, for constant cost conditions \((d=0)\), this rate of output growth for a budget-constrained bureau will be twice that of a competitive industry. Hence, the first two statements, HI1.1 and HI1.2 with respect to output are valid.

Now consider HI1.3 and HI1.4. The effect on output of an increase in "demand" for a demand-constrained bureau is not quite as unambiguous. Using the same analytical method as above the comparison follows:

<table>
<thead>
<tr>
<th>Demand-Constrained Bureau</th>
<th>Competitive Norm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ( Q_d = \frac{a}{(2b)} )</td>
<td>1. ( Q_c = \frac{(a-c)}{(2b+d)} )</td>
</tr>
<tr>
<td>2. ( \frac{\delta Q_d}{\delta a} = \frac{1}{(2b)} )</td>
<td>2. ( \frac{\delta Q_c}{\delta a} = \frac{1}{(2b+d)} )</td>
</tr>
<tr>
<td>3. Since ( 1/(2b) \geq 1/(2b+d) ),</td>
<td></td>
</tr>
<tr>
<td>4. it follows that ( \frac{\delta Q_d}{\delta a} \geq \frac{\delta Q_c}{\delta a} ).</td>
<td></td>
</tr>
</tbody>
</table>

Certainly, if the competitive industry operates with increasing cost conditions \((d > 0)\), then the demand-constrained bureau's output will
grow faster. In contrast, the output growth rates will be equal if the competitive industry faces constant costs (d=0) and the competitive industry's output will even grow faster if it is a decreasing cost industry (d < 0). However, in the case of a decreasing cost industry the market usually degenerates into a "natural monopoly." Niskanen does not mention this last possibility, which could lead to substantially different policy conclusions for public utilities. Regardless of this case, one must still recognize that this derivation supports HII.

Niskanen demonstrated that HII.5 is valid for his specific example. However, he did not mathematically demonstrate the general validity of this hypothesis. Assuming the market exists (a > c) and there exist increasing or constant costs (d > 0), one can prove HII.5. Given the equilibrium output for a budget-constrained bureau of \( Q_b = \frac{a-c}{b+d} \), one can substitute this solution for Q into the budget-output function to get:

\[
B_b = \frac{(a^2 - ac)}{(b+d)} - \frac{(a^2 - 2abc + bc^2)}{(b^2 + 2bd + d^2)}
\]

Partially differentiating this with respect to the increase in "demand" (a) one gets:

\[
\frac{\delta B_b}{\delta a} = \frac{(2a - c)}{(2b + d)} - \frac{(2ab - 2bc)}{(b^2 + 2bd + d^2)}
\]

Then, following the same procedure for the competitive norm by substituting \( Q_c = \frac{a-c}{2b+d} \) for Q in the budget-output function and partially differentiating with respect to a, one gets:

\[
\frac{\delta B_c}{\delta a} = \frac{(2a - c)}{(2b + d)} - \frac{(2ab - 2bc)}{(b^2 + 2bd + d^2)}
\]

---

(32) \[ \frac{\delta B}{\delta a} = \frac{(2a - c)}{(2b + d)} - \frac{(4ab - 4bc)}{(4b^2 + 4bd + d^2)} \]

Now, Hll.5 states that equation (31) exceeds equation (32). By combining terms and factoring (see Appendix B) this results in the following expressions:

**Budget-Constrained Bureau**

1. \[ \frac{d(2a-c)}{2bc(b+d)^2} + \frac{1}{b/2+bd+d^2/2} > \frac{d(2a-c)}{2bc(2b+d)^2} + \frac{1}{4b^2+4bd+d^2} \]

2. Therefore, \[ \frac{\delta B_b}{\delta a} > \frac{\delta B_c}{\delta a} \]

Thus, following the argument in Appendix B leads to a proof of the validity of Hll.5.

Now one can graphically examine Hll.1, Hll.3 and Hll.5 in Figure 3.12. The shift outward indicated by the arrows in the lower graph from V to V' characterizes a uniform increase in "demand" of 25 units (\( \Delta a = 25 \)). In response to this shift the budget-constrained bureau's output increases from 166.7 to 200 units (\( \Delta Q_b = 33.3 \)). In contrast, the competitive norm output increases from 100 to 120 units (\( \Delta Q_c = 20 \)). Since the change in the budget-constrained bureau's output exceeds that of the competitive norm, the specific example is consistent with Hll.1. Likewise, the output of the demand-constrained bureau moves from 200 to 225 units (\( \Delta Q_d = 25 \)), which supports Hll.3. Finally, the implied increase in the budget-constrained bureau's budget (\( \Delta B_b = 5,555.6 \)) exceeds that of the competitive norm (\( \Delta B_c = 4,800 \)), which supports Hll.5.
Figure 3.12: Output-Budget Responses to An Increase in Demand
To prove H11.6 one again sets equation (31) to exceed equation (32) and \( d \) equal to zero. This yields the following simplified logic (see Appendix C):

\[
\begin{align*}
\text{Budget-Constrained Bureau} & \\
\frac{2a - c}{b} & > \frac{2ab - 2bc}{b} \\
\text{Competitive Industry} & \\
\frac{2a - c}{2b} & > \frac{4ab - 4bc}{4b}
\end{align*}
\]

1. \[ \frac{2a - c}{b} \quad > \quad \frac{2ab - 2bc}{b} \]

2. \[ \frac{c}{b} \quad > \quad \frac{c}{2b} \]

3. Therefore, \[ \frac{\delta B_b}{\delta a} \quad > \quad \frac{\delta B_c}{\delta a} \]

Since the numerators are equal in step 2, but the denominator on the right side is twice as large as on the left side of the inequality, the budget-constrained bureau facing constant costs \((d=0)\) will grow twice as fast as the competitive norm. H11.6 is a valid statement.

Finally, one can conclude that the specific example derived from the equations in Table 3.1 also supports H11.7. Assume that the parameter "a" increases by 25 units. This implies that \( Q_d \) increases from 200 to 225 units. Substituting this new demand-constrained output into the budget-output function results in a total budget of 25,312.5 units. Thus, the change in the budget was 5,312.5 \((25,312.5 - 20,000)\) units from the initial solution. Clearly, this amount is more than proportionate to the square of the demand increase of 625 units.

**H12:** The output and budget of a bureau operating in the budget-constrained region will increase in response to a reduced elasticity of demand for its service. In the demand-constrained region the output will decrease, but the budget will increase in response to a reduced elasticity of demand. Bureaus in either region should be expected to engage in promotional activities to reduce the elasticity of demand for their service. (p. 77)
To analyze H12 one must first define the concept of elasticity of "demand" for bureau-sponsor exchange.

\[ \eta = \frac{-dQ}{dV} / \frac{Q}{V} = \frac{-dQ}{dV} \cdot \frac{V}{Q} \]

Now a change in the elasticity of sponsor "demand" for a bureau's output implies changes also in quantity of output and the budget the bureau requires. This is accomplished graphically in Figure 3.13.

In Figure 3.13 one can change the elasticity of "demand" by holding the competitive norm constant at \( Q_c \) and rotating \( V_1 \) around the point where it intersects with \( C \). Niskanen argued that the application of the public administration canon of consolidation in the federal bureaucracy has served to increase the monopoly power of bureaus. Since consolidated bureaus face less competition than they do prior to reorganization, their monopoly power increases. This implies a decrease in elasticity of "demand" for a bureau's output because the sponsor has less substitutes from which to choose after consolidation. Graphically, one can depict this by a clockwise rotation of the "demand" function about the pivotal intersection \( V_1 \) and \( C \) in the lower graph. Parametrically, one achieves this by treating the variables \( (Q & V) \) as constants and the constants \( (b & b) \) as variables, while simultaneously increasing both \( a \) and \( b \).

If consolidation increases the monopoly power of bureaus, then the elasticity of "demand" for their services will become more inelastic. Figures 3.13 and 3.14 demonstrate H12 for bureaus in both regions. In Figure 3.13 the output increases to \( Q^* \) from \( Q_b \) and the budget also increases to \( B^* \) from \( B_1 \), where \( TC_c = B^* \) in the upper graph.
Figure 3.13: Effect of A Decrease in Elasticity of "Demand" on A Budget-Constrained Bureau
Figure 3.1: Effect of A Decrease in Elasticity of "Demand" on A Demand-Constrained Bureau (Parkinson's Law)
Figure 3.14 shows what happens to demand-constrained bureaus. Quantity actually decreases to $Q^*_{d}$ from $Q_d$, while the budget increases to $B^*$ from $B_2$. The demand-constrained bureau exhibits Parkinson’s Law, which in essence says that through time the bureau requires progressively more budget to produce progressively less output. Finally, Table 3.3 summarizes H12, which indeed is supported by the above graphical analysis.

**TABLE 3.3**

**SUMMARY OF H12**

<table>
<thead>
<tr>
<th>Demand Regions</th>
<th>Budget-Constrained</th>
<th>Demand-Constrained</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in $Q$</td>
<td>$B$</td>
<td>$Q$</td>
</tr>
<tr>
<td>More Elastic</td>
<td>Decrease</td>
<td>Decrease</td>
</tr>
<tr>
<td>Less Elastic</td>
<td>Increase</td>
<td>Increase</td>
</tr>
</tbody>
</table>

The following statement of H13 represents another complex set of hypotheses:

**H13** The output and budget of a bureau operating in the budget-constrained region will always increase at a faster rate than for a competitive industry faced by the same uniform reduction in marginal costs. For constant marginal costs, the rate of increase of output will be twice that of a competitive industry. The budget of a bureau will increase quite rapidly in response to an initial reduction in marginal costs and then less rapidly to equal successive reductions. Bureaus operating in this region have an incentive to identify and implement cost-reduction practices. In the demand-constrained region, the output and budget of a bureau are invariant to the level of marginal costs. (p. 77)
One can separate five basic subhypotheses from the above:

**H13.1** The output of a budget-constrained bureau will increase at a faster rate than the competitive norm facing the same uniform reduction in marginal costs.

**H13.2** For constant costs the rate of increase in output for a budget-constrained bureau will be twice that of the competitive norm facing the same uniform reduction in marginal costs.

**H13.3** The budget of a budget-constrained bureau will increase faster than the competitive norm facing the same uniform reduction in marginal costs.

**H13.4** The budget of a budget-constrained bureau will increase at a decreasing rate in response to equal successive reductions in marginal costs.

**H13.5** The demand-constrained bureau's output and budget are invariant to the level of marginal costs.

Using similar methods applied to H12, one can devise the following proof for H13.1:

<table>
<thead>
<tr>
<th>Budget-Constrained Bureau</th>
<th>Competitive Norm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ( Q_b = \frac{(a-c)}{(b+d)} )</td>
<td>( Q_c = \frac{(a-c)}{(2b+d)} )</td>
</tr>
<tr>
<td>2. ( \frac{\delta Q_b}{\delta c} = \frac{-1}{(b+d)} )</td>
<td>( \frac{\delta Q_c}{\delta c} = \frac{-1}{(2b+d)} )</td>
</tr>
</tbody>
</table>

Now, if the change in the marginal cost curve is uniformly downward (\( \Delta c \)), then output (Q) will increase in both cases. Since the denominator on the right side is larger than on the left side, one can conclude that the budget-constrained bureau's output will increase by more than the competitive norm. Therefore, H13.1 is valid. Moreover, if constant costs exist (d=0), then step two above reduces to the following step 3:
3. \(-\frac{1}{b}\) > \(-\frac{1}{2b}\)

Hence, H13.2 is also valid.

To analyze H13.3 one must follow a procedure similar to the analysis of H11.5. Equations (36) and (37) represent changes in the budgets of a budget-constrained bureau and the competitive norm with respect to a uniform change in marginal costs, respectively.

\[
\frac{\delta B_b}{\delta c} = \frac{-a}{b+d} + \frac{2ab-2bc}{(b+d)^2}
\]

\[
\frac{\delta B_c}{\delta c} = \frac{-a}{2b+d} + \frac{4ab-4bc}{(2b+d)^2}
\]

First, one must set equation (36) to exceed equation (37), as in inequality (38):

\[
\frac{-a}{b+d} + \frac{2ab-2bc}{(b+d)^2} > \frac{-a}{2b+d} + \frac{4ab-4bc}{(2b+d)^2}
\]

Second, by factoring and reducing one can eventually prove this inequality valid. Since the final step of this proof is so complex, it is not presented in the text. However, the reader can observe that H13.3 is proved valid in Appendix D.

Figure 3.15 demonstrates H13.1. A uniform shift downward in the budget-constrained bureau's marginal cost function from MC\(_c\) to MC'\(_c\) implied by a decrease in parameter "c" by 25 units, leads to an increased output from 166.7 to 200 units. The attendant shift downward in the competitive industry's supply curve from C to C' leads to an increase in its output from 100 to 120 units. Since 33.3 exceeds 20 units, the example supports H13.1. Finally, in this case the budget-constrained bureau becomes a demand-constrained bureau (V=0) as a result of this cost reduction. One could demonstrate H13.3 on this graph, but the cost decrease must be small enough to maintain the
Figure 3.15: Effects of A Uniform Reduction in Marginal Costs on A Budget-Constrained Bureau Compared to A Competitive Industry
budget-constrained status of the bureau. In Figure 3.15 the budget of the bureau does not increase by more than the competitive industry, but H13.3 is not falsified because the bureau becomes demand-constrained at the output level of 200.

To prove H13.4 one must take the second derivative of the budget-constrained bureau's budget-output function with respect to \(c\). Thus, one can differentiate its first derivative in equation (36) again with respect to \(c\) to get:

\[
(39) \quad \frac{\delta^2 B}{\delta c^2} = \frac{-2b}{(b+d)^2}
\]

Now, since \(b > 0\) and \((b+d)^2 > 0\), the entire expression is less than zero. Consequently, the budget-constrained bureau's budget will increase at a decreasing rate in response to equal reductions in marginal costs.

To prove H13.4 one need only to realize that any variation in marginal costs will only increase or decrease the organizational slack \((S)\) contained in the demand-constrained bureau's budget. Reconsidering Figure 3.2, one can discern that a shift upward in \(MC_c\) would reduce \(S\) and a shift downward would increase \(S\). Regardless of which direction marginal cost shifts, the demand-constrained bureau will still operate at the output level where the marginal value \((V)\) to the sponsor is zero. Hence, H13.5 is also valid.

The final hypothesis (H14) is stated as follows:

H14  The output and budget of a bureau operating in the budget-constrained region will increase in response to an increased elasticity of minimum marginal cost function. Bureaus in
this region should be expected to choose production processes with a lower marginal cost at higher output levels. In the demand-constrained region, both the output and budget of a bureau are invariant to the slope of the minimum marginal cost function. (p. 77)

To consider the last hypothesis (H14) one can again simplify it into three subhypotheses:

**H14.1** The output of a budget-constrained bureau will increase in response to an increased elasticity of minimum marginal cost function.

**H14.2** The budget of a budget-constrained bureau will increase in response to an increased elasticity of minimum marginal cost function.

**H14.3** The demand-constrained bureau budget and output are invariant to the slope of the minimum marginal cost function.

To examine these hypotheses one must first define the elasticity of the minimum marginal cost function ( ):

\[
\varepsilon = \frac{dQ/Q}{d(MC_c)/(MC_c)} = \frac{dQ}{dMC_c} \cdot \frac{MC_c}{Q^2}
\]

Hypotheses relating to this elasticity are depicted graphically in a manner similar to those relating to the elasticity of "demand."

Figure 3.16 follows a method similar to that used in examining H12. It twists the competitive supply curve (C) around its intersection with the demand curve (V). A clockwise twist in C implies a concomitant clockwise twist in MC. This results from an increase in the parameter "c" and a decrease in the parameter "d." Thus, Figure 3.16 characterizes a reduction in the elasticity of the minimum marginal cost function from MC to MC. This implies a decrease in TC in the upper graph to TC. The new budget-constrained bureau's output is determined at B=TC. At this point output increased in the
Figure 3.16: Effect of An Increased Elasticity of Supply on a Budget-Constrained Bureau
specific solution from 166.7 to 183.3. Moreover, the budget increased to 19,860.50 units from 19,444.40 units. Hence, the example supports both H14.1 and H14.2.

The validity of H14.3 requires another look at Figure 3.2. As in H13.4 one needs only to see that any variation in the level or slope of $MC_c$ will not affect the demand-constrained bureau's output or budget. Indeed, such variations will only increase or decrease its organizational slack ($S$).

**Prescriptions**

The following three questions have been the central focus of this analysis: (1) Are bureaus inefficient?; (2) Are bureaus too large?; and (3) Do bureaus grow faster than alternative forms of economic organization? The previous sections of this chapter demonstrated that the answer to these questions under certain conditions is, "yes." As a result, Niskanen offered competitive bureaucracy to remedy these problems. The competitive-competitive bureaucratic equilibrium corresponds exactly to the competitive norm. Hence, it is theoretically preferable to monopoly bureaus.

A competitive bureaucracy would require an incentive system in which the profits would be distributed as rewards for net-benefit maximization. This creates two practical problems. First, this type of instrumental individual reward may not provide enough motivation to overcome other powerful motivators encouraging budget maximization. For example, rule compliance, instrumental system rewards, and internalization of such organizational goals as maintenance, stability, survival,
and growth might interfere with net-benefit maximizing behavior. Given the literature on the motivational bases for organizational behavior, it is not clear that an incentive pay structure would lead to net benefit maximizing behavior. Second, it is very difficult to measure benefits and costs. Thus, competitive bureaucracy may be very difficult to implement.

Since the theory analyzes two polar forms of economic organization, pure competition and monopoly, it is difficult to assess the effects of a limited amount of competition. Several bureaus competing in a functional area may not constitute pure competition, but neither is this arrangement necessarily less efficient than a monopoly bureau. Several bureaus could create unanticipated costs resulting from the lack of coordination. Alternatively, they could operate more efficiently than a monopoly bureau. Niskanen's theory of supply by bureaus does not provide an answer to this controversy. However, it does suggest that some degree of competition might constrain the problems of excess size, inefficiency, and growth. On the basis of this theory some experimentation with bureaucratic competition is warranted.
CHAPTER IV

METHODOLOGICAL EVALUATION

The primary objective of this chapter is to evaluate Niskanen's theory of supply by bureaus. First, it introduces a framework for the evaluation of theories. Second, it examines the formal structure of Niskanen's theory. Third, it evaluates the implications. Finally, it identifies the consolidation hypothesis as an empirically testable implication. Then, a foundation on which one can base empirical tests of this theory will have been constructed.

Framework

Johan Galtung has developed an eclectic, but rigorous approach to evaluating theories. Although there exist other works in the area by such eminent scholars as Paul Diesing, Karl C. Hempel, and Karl R. Popper, Galtung's framework seems the most useful for the purposes of this chapter. It is clear and simple. Thus, it requires no elaborate epistemological exposition. Rather, one can briefly discuss this framework and then directly apply it to Niskanen's theory. This

section defines the methodological concepts and discusses an interpretation of Galtung's criteria for evaluating theories. 3

Theoretical Structure

The first concept one must define in order to discuss the structure of a theory is an hypothesis:

An hypothesis is a statement about how a set of units, $S$, is distributed in a space of variables $X_1, X_2, \ldots X_n$. 4

In the social sciences this often takes the form of a correlation between two variables. For example, one might hypothesize that $X$ is positively correlated with $Y$. Such an hypothesis allows for three possible cases: (1) $X$ is positively correlated with $Y$; (2) $X$ is not correlated with $Y$; or (3) $X$ is negatively correlated with $Y$. Now, the occurrence of the last two cases would disconfirm the hypothesis. Obviously, the first case would be a confirmation. Successive replications of the experiment finding the first case would add to the degree of confirmation of this hypothesis.

One can state the definition of a theory as follows:

A theory, $T$, is a structure $(H, I)$ where $H$ is a set of hypotheses and

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3 Since I view these concepts as tools only, I have relied on Galtung almost solely for my methodological criteria. I do not view this section's purpose as the development of my own set of criteria. Rather, I see it merely using Galtung's tools as a valuable way in which to evaluate Niskanen's theory. Hence, this section is my interpretation of Galtung, particularly his chapters 4 and 6 in Part II. Any errors or misinterpretations are my own and in no way reflect on Galtung's presentation. Given this statement, I will proceed to footnote only direct quotes and important paraphrases.

4 Johan Galtung, op. cit., p. 310.
I is a relation in \( H \) called 'implication' or 'deducibility,' so that \( H \) is weakly connected by I.\(^5\)

In other words, a theory is a deductive argument in which hypotheses are premises and validly deduced conclusions are implications. The term "weakly connected" means that there exists no other hypothesis or set of hypotheses linked to the set \( H \). If there were, then they would form another theory.\(^6\) Thus, in a theory there is a transfer of truth from the hypotheses to the implications, but not vice versa.

For example, if \( H \) implies \( I \) and one establishes \( H \), then \( I \) follows by modus ponens. However, if \( H \) implies \( I \) and one establishes \( I \), then \( H \) does not follow. More importantly, if \( H \) implies \( I \) and one establishes that \( I \) is not the case, then we can conclude that \( H \) is not the case by modus tollens. This last argument forms the very core of the scientific verification process. If one can falsify the implication set, then by modus tollens one can reject the set of hypotheses, \( H \). Empirically, this would mean one had disconfirmed the theory. Successive replications leading to more disconfirmations could eventually lead one to conclude that the theory is untenable.

Galtung enumerated four concepts that illuminate the implication relation:

(1) **Formalization** means the explicitation of the structure of the theory into \((H,I)\) form.

(2) **Symbolization** means the use of abbreviations such as letters, rather than terms or expressions.

(3) **Mathematization** means the use of symbols, relations, operations, or a calculus to establish a deductive system.

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\(^5\)Ibid., p. 451.

\(^6\)Ibid.
Axiomatization means the explicitation of the axiom set in \( \mathbb{H} \) in contrast to the condition set. The axiom set contains statements that imply, but are not implied. The condition set neither implies or is implied. It merely sets limits on the theory's generality.

Axioms must be noncontradictory, independent, and complete. "Of these requirements the first two are trivial and the third largely unobtainable, however—but they are heuristically very useful in directing efforts to axiomatize sociological theories." These requirements will help in the explicitation of Niskanen's theory.

In summary, this section establishes the required logical form of a theory, \((\mathbb{H}, I)\), and some concepts one can use to describe and evaluate that form. In addition, Galtung listed some concepts which prove very useful as communication tools. Since these concepts are used later, the list is reproduced here:

1. An hypothesis is said to be tenable if it is confirmed, and is then called a proposition.


8 Galtung defines these concepts on page 463 of his book. His exact definitions follow:

(a) If it is possible to derive both \( H \) and \( \bar{H} \) from \( A \), then \( A \) is said to be contradictory. The absence of this condition is the first requirement.

(b) If it is possible to derive a subset of \( A \) from another subset of the axioms in \( A \) are said to be dependent. The absence of this is the second requirement, and follows from the definition above of \( A \) as the set of the highest level hypotheses, i.e., hypotheses that are not derived.

(c) If it is possible to decide for any hypothesis \( H \) formulated in the terms used in \( T \) (i.e., used in \( \mathbb{A} \)) whether it can be deduced from \( A \) or not, \( A \) is said to be complete. This is the third requirement.

(2) An hypothesis is said to be valid if it is 
deducible, and is then called a theorem.
(3) A system of tenable hypotheses is called an 
inductive system.
(4) A system of valid hypotheses is called a 
deductive system.
(5) An Inductive-deductive (hypothetico-deductive) 
system or scientific theory is a system where 
some valid hypotheses are tenable, and (almost) 
none are untenable.
(6) An hypothesis describes a phenomenon if the 
phenomenon confirms the hypothesis (a low 
level hypothesis 'describes').
(7) A theory explains a phenomenon if it implies 
an hypothesis that describes the phenomenon 
(a high level hypothesis 'explains').

The completion of this list and discussion of theoretical structure 
now permits one to examine Galtung's criteria for evaluating hypotheses.

Criteria for Evaluating Hypotheses

Informal Criteria

"An hypothesis is communicable to the extent its meaning can be 
transmitted to others." These "others" mean colleagues, a particular 
field, or competence group. Although this informal criterion is not 
necessary, it protects against proffering of theories that nobody 
understands. However, sometimes a genius cannot communicate with his 
contemporaries, but is later understood. This renders this criterion 
rather vague, but at a point in time it can be useful. Certainly, a 
theory not communicable today could become communicable in the future.

"An hypothesis, or rather, a scientific process, is reproducible 
to the extent it can be repeated with the same conclusion." If an

10 Ibid., p. 453.
11 Ibid., p. 334.
12 Ibid., p. 335.
individual or individuals other than the same investigator can proceed through a theory and not only understand it, but also agree with it, then the theory is *intersubjectively reproducible*. It is *intersubjectively* rather than *intrusubjectively reproducible*, because more than one individual agrees with it. Thus, if more than one individual had worked through a complex theory and completely understood and agreed with it, then the argument would have been intersubjectively reproduced. Moreover, if in the verification process different investigators use new data to reproduce the phenomenon, then this is called *replication*. Again, reproducibility is a desirable informal criterion, but not necessary.

**Predictability** relates to the investigator's time-ordering of three events: (1) the formation of the hypothesis; (2) the states of the world to which the data refer; and (3) the knowledge of the data.\(^{13}\) 

**Prediction** exists when (1) precedes (2), which precedes (3). **Postdiction** exists when (2) precedes (1), which precedes (3). **Description** or **explanation** exists when (2) precedes (3), which precedes (1). Prediction and postdiction are *ex ante*. That is, the formation of the hypothesis precedes the knowledge of the data. When the reverse exists, the analysis is *ex post*. Both approaches are valuable for accumulating scientific knowledge. There exist no informal criteria for definitely determining a preference for one of these approaches over the other. However, the formal criterion of falsifiability does lead to a preference for the *ex ante* over *ex post* approaches. The following

discussion of formal criteria will clarify this distinction. Again, predictability is desirable, but not necessary.

**Formal Criteria**

**Desiderata**

The formal criteria that are desirable, but not necessary are generality, complexity, specificity, and determinacy. Increases in generality and complexity increase specificity. However, increases in specificity may reduce determinacy. Hence, there sometimes is a trade-off between specificity and determinacy. Indeed, one can achieve a high degree of both only under certain conditions. No formal criteria exist for choosing between the two. Again, here the choice also depends on what the investigator deems desirable. Ideally, one would prefer both a high degree of specificity and determinacy. The following examination of each criterion clarifies this relation.

**Generality** simply means the number of units of analysis in the theory. In other words, the generality of a theory establishes its intended field of tenability. For example, *ceteris paribus*, an hypothesis about the federal bureaucracy is less general than one about bureaucracies as a whole. In this case the unit of analysis is a bureaucracy defined by the condition set. The intended fields of tenability are the federal government versus all bureaucracies. Thus, the condition set establishes the degree of generality. If one wishes a more general theory, then he must relax the restrictions contained in the condition set. In the above example, this could be done by adding the condition that the federal bureaucracy is a microcosm of
all bureaucracies. If the argument behind this condition is intersubjectively reproducible, then one could generalize conclusions about the federal bureaucracy to bureaucracies as a whole.

**Complexity** means the number of variables in the theory. For example, *ceteris paribus*, an hypothesis explaining the variation of a dependent variable will be more complex than another explaining the same dependent variable, if it contains more independent variables. Again, complexity is desirable, but not necessary.

**Determinacy** relates by contrast to probability. A deterministic hypothesis has conditions so well specified that units of analysis fall with certainty into either a true or false set. If uncertainty exists and one can say that units of analysis only probably fall in the true or false set, then one has a probabilistic hypothesis. *Ceteris paribus*, determinacy is preferred to probability. This follows from a preference for less, rather than more uncertainty.

Assume that $X$ is a set of variables with $R$ cells predciting values to a set of units of analysis, $S$, which contain $N$ elements. Then, **Specificity**, $E$, is "the number of discriminations that can be made in the empirical outcomes for the given combinations of $X$ and $S". \footnote{Ibid., p. 319.} If $X$ has $R$ cells ($n$-tuples, combinations of values) and the set of units of analysis, $S$, has $N$ elements, then specificity is given as the number of distributions, i.e.,

$$ E = \binom{N+R-1}{R-1} $$
more specified than a probabilistic hypothesis. Intuitively, this holds because the number of discriminations in empirical outcomes that can be made for the deterministic categories is two (true or false), which is greater than one probability distribution. If the number of units of analysis exceeds or is equal to the number of cells in X, then the probabilistic hypothesis is more specified than the deterministic hypothesis.

Ideally, one should specify an hypothesis as well as is possible without losing determinacy. For example the physics equation, 
$s = (1/2)gt$, is an excellent illustration. Given a certain constant gravitational force ($g$), it expresses a functional relationship between the distance a given object will fall ($s$) in a specified time ($t$). One may use many different units of analysis, which in this case are falling objects. Also, the number of measurable values of distance ($s$) and time ($t$) predicated to these units of analysis are many. However, there is no loss of the determinacy of the hypothesis embodied in the equation as a result of this high specificity. Of course, in social science this ideal type has not been possible. The investigator often must hypothesize a mere correlation between two variables predicated to a small number of units of analysis. The results usually leave much unexplained variation. Thus, hypotheses in the social sciences very often lack both determinacy and specificity.

Necessary Criteria

The necessary criteria are falsifiability, testability, and tenability. One can subsume the concept of empirical import under

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tenability. Later, these criteria are applied to Niskanen's hypotheses to determine which ones could be empirically tested with readily available data.

If one assumes that all possible outcomes of the hypothetical phenomenon are equally probable, then falsifiability (F) is the a priori ratio of the number of possible falsifying outcomes to the total number of possible outcomes. Ceteris paribus, one prefers the hypothesis which is more falsifiable. This preference relates back to the desirability of ex ante over ex post theories or hypotheses. Since the states of the world and the knowledge of the data precede the hypothesis in the ex post approach, the hypothesis is not falsifiable. That is, it was formulated from only one outcome, which was the true outcome. Hence, one can reject the ex post hypothesis on the methodological ground that it is not falsifiable.

Testability (T) refers to the a priori distribution of possible outcomes in the true (t), false (f), and undecidable (u) sets. The sum of these three sets compose the total number of possible outcomes. Table 4.1 lists the distribution of outcomes for which zero testability exists. These extreme cases are very useful in evaluating hypotheses.

Very often in the social sciences hypotheses are stated so equivocally that they are non-falsifiable. That is, on a priori grounds one cannot imagine a falsifying outcome, while others are either true or undecidable. For example, the theory of incrementalism in decision making is so vague that without an operational definition

16 Ibid., p. 323.
17 Ibid., p. 325.
### TABLE 4.1

**ZERO TESTABILITY**

<table>
<thead>
<tr>
<th>Case</th>
<th>Distribution of Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Tautology</td>
<td>t=1</td>
</tr>
<tr>
<td>(2) Contradiction</td>
<td>t=0, f=1</td>
</tr>
<tr>
<td>(3) Indecision</td>
<td>t=0, f=0, u=1</td>
</tr>
<tr>
<td>(4) Non-verifiability</td>
<td>t=0, f=0, u=0</td>
</tr>
<tr>
<td>(5) Non-falsifiability</td>
<td>t=0, f=0, u=0</td>
</tr>
</tbody>
</table>

of an "incremental" it is difficult to conceive of a decision that is not incremental. Most decisions seem to be either incremental or undecidable.

Galtung provides an excellent heuristic guide to maximizing testability of an hypothesis in Figure 4.1.

![Testability Function Diagram](image)

**FIGURE 4.1**

**THE TESTABILITY FUNCTION**

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19 Ibid., p. 326.
The numbers adjacent to each axis correspond to the cases of zero testability listed in Table 4.1. The negatively sloped line indicates the case where the undecidable set is a null set and the true and false sets a non-empty. Ideally, one would like to follow this line and approach, but not achieve, a universal false set. The arrow pointed at case (2) indicates this aim. This strategy maximizes testability.

For example, if out of one hundred possible outcomes the undecidable set is a null set, the false set contains 99 possible outcomes, and the true set contains one outcome, then the hypothesis is highly testable.

In contrast, if again the undecidable set is empty, but the false set contains only one outcome and the true set contains 99 outcomes, then the hypothesis is not very testable. In fact, it would be a near-tautology. Incrementalism seems to fall in this category. That is, on a priori grounds it appears true in virtually all possible outcomes.

It follows from the above discussion of testability that the ideal hypothesis should satisfy three criteria:

1. Minimize the true-set, but not to the zero-set.
2. Minimize the undecidable-set, if possible to the zero set.
3. Maximize the false set, but not to the universal set.20

Thus, this establishes an ideal form to which hypotheses over the same outcome spaces can be compared.

"The raison d'être of the hypothesis is not to remain an hypothesis but to be confronted with data,..."21 Table 4.2

20 Ibid., p. 327.

21 Ibid., pp. 336-337.
indicates a continuum on which hypotheses confronted with data would lay.\(^{22}\)

**TABLE 4.2**

<table>
<thead>
<tr>
<th>Degree of Confirmation (DC)</th>
<th>-1</th>
<th>.0</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Falsified</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Untenable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disconfirmed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undecidable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confirmed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verified</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tenability rests on this notion of degree of confirmation. A simple, but naive definition of the degree of confirmation (DC*) would be the ratio of the outcomes empirically found to be true to the total number of replications of the same conditions. However, this naive definition of the degree of confirmation does not account for the degree of falsifiability. Clearly, by virtue of the previous discussion on falsifiability if two hypotheses have the same DC*, then one should prefer the one with the higher degree of falsifiability. A better measure of the degree of confirmation is required.

Galtung presented the following better measure, which accounts for both the naive degree of confirmation (DC*) and falsifiability (F):\(^{23}\)

\[
(1) \quad DC = \frac{DC* - (1-F)}{1 - (1-F)} = 1 - \frac{1-DC*}{F}
\]

\(^{22}\)Ibid., p. 337.

\(^{23}\)Ibid., p. 338.
In the second expression, *ceteris paribus*, an increase in falsifiability will increase DC. Also, *ceteris paribus*, an increase in DC* increases DC. Now, increases in falsifiability may actually cause decreases in the naive degree of confirmation. However, there is no guaranteed way one can discover this trade-off to maximize DC. A high degree of naive confirmation is desirable, but not if one sacrifices falsifiability. The investigator can only examine the *a priori* falsifiability and then empirically test the hypothesis. Then, one can discover the degree of confirmation and tenability.

One final concept remains to be defined. **Empirical import** rests on the concept of testability in principle. 24 Consider again the hypothesis that \( s = (1/2)gt^2 \). However, instead of referring to the planet Earth, assume it refers to the planet Pluto. Now, in principle one knows this hypothesis to be testable, but one cannot as yet measure the time \((t)\) or the distance \((s)\) of a falling object on Pluto. In contrast, an hypothesis that is not at least testable in principle has no empirical import. Hempel calls the hypothesis with no empirical import a pseudo-hypothesis. 25 The investigator at the very least must be able to conceive of an empirical finding that would either confirm or deny the hypothesis.

This concludes the development of the methodological framework, which the next section applies to Niskanen's theory of supply by bureaus. Again, the most important criteria are falsifiability,

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testability, and tenability. Indeed, these are the most important in the evaluation to follow.

**Logical Form**

This section briefly discusses the logical form of Niskanen's theory. Table 4.3 presents the theory in \((H,I)\) form. It has one basic axiom, six conditions, and forty-seven separate implications. The axiom \((A1)\) consists of the "central motivational assumption." The conditions \((C1-C6)\) consist of the definitions of the bureau, the bureaucrat, the bureau's environment, the product and factor markets, and the "demand" conditions. The implications are the set of statements deduced from the axiom and condition sets. This explication of Niskanen's theory is useful in the evaluations to follow.

**Evaluation**

**Informal Criteria**

**Communicability**

In a 1972 review of Niskanen's book Gordon Tullock said, "With any luck, this book will set off a burst of empirical testing." 26

Three years later this "burst of empirical testing" has not been forthcoming. One possible explanation for this apparent lack of empirical testing is that the theory is not very communicable. Indeed, this section cites examples of misunderstandings about this theory by both Stephen Enke and Gordon Tullock. Since these men are in a sense colleagues of Niskanen's, one would have expected clearer understanding

| **Axiom Set** |  
A1 | Bureaucrats maximize the total budget of their bureau during their tenure, subject to the constraint that the budget must be equal to or greater than the minimum total costs of supplying the output expected by the bureau's sponsor. Mathematically, Niskanen specified this axiom as follows:  
Maximize: \[ B = aQ - bQ^2 \quad 0 \leq Q \leq a/(2b) \]  
Subject to: \[ TC = cQ + dQ^2 \quad 0 \leq Q \quad B \geq TC \] |
| **Condition Set** |  
C1 | Bureaus are nonprofit organizations which are financed, at least in part, by a periodic appropriation or grant.  
C2 | A bureaucrat is "the senior official of any bureau with a separate and identifiable budget."  
C3 | A bureau's environment contains three elements: (1) a passive sponsor; (2) suppliers of factors of product; and (3) customers or beneficiaries.  
C4 | The product market is a bilateral monopoly containing the bureau as the seller and the sponsor as the buyer.  
C5 | Factor markets are either competitive or monopsonistic.  
C6 | Alternative forms of organization face the same demand conditions. |
| **Implication Set** |  
I1.1 | The budget of all bureaus will be larger than that which maximizes the net value to the sponsor.  
I1.2 | The output of all bureaus will be larger than that which maximizes the net value to the sponsor. |
TABLE 4.3 cont'd

I2 All bureaus which purchase factors on a competitive market with rising supply prices generate a larger net value to the owners of specific factors used in the production of the bureau’s services than would be the case at the optimal level.

I3.1 A new bureau will be a budget-constrained bureau.
I3.2 A bureau faced with a substantial exogenous increase in costs will be a budget-constrained bureau.
I3.3 An older bureau for which demand has continuously increased relative to costs will be a demand-constrained bureau.
I3.4 A bureau faced with a substantial reduction in costs will be demand-constrained.
I4.1 Budget-constrained bureaus facing increasing factor prices for specific factors and exercising factor price discrimination will have a larger budget than bureaus facing competitive factor markets.
I4.2 Budget-constrained bureaus facing increasing factor prices for specific factors and exercising factor price discrimination will have an output larger than other bureaus facing competitive factor markets.
I4.3 Budget-constrained bureaus facing increasing factor prices for specific factors and exercising factor price discrimination will have a lower average budget per unit of output than bureaus facing competitive factor markets.
I5.1 Budget-constrained bureaus will seek out and use more efficient technologies.
I5.2 After a budget-constrained bureau implements a more efficient technology its budget will actually be higher than previously.
I5.3 After a budget-constrained bureau implements a more efficient technology its output will actually be higher than previously.
I5.4 A budget-constrained bureau will use factors of production in such a way that the marginal cost per unit of output for all factors used will be equal.
I6.1 If a demand-constrained bureau implements a more efficient productive technique, then its budget will not change as a direct result.
TABLE 4.3 cont'd

16.2 If a demand-constrained bureau implements a more efficient productive technique, then its output will not change as a direct result.

16.3 If a demand-constrained bureau implements a more efficient productive technique, then factor surplus will not change as a direct result.

1*6 Factors of production used in demand-constrained bureaus will not advocate changes in technology.

16.4 If a demand-constrained bureau discovers a more efficient technology, then it probably would not adopt it because an increase in its budget would not follow.

17 A bureau will supply an output up to twice that of a competitive industry faced by the same demand and cost conditions.

18.1 A bureau will generate smaller net benefits than a competitive industry.

18.2 A bureau will generate a larger factor surplus than a competitive industry.

1*8 Owners of factors of production will be stronger advocates of the bureau's services than the beneficiaries.

19 At its higher level of output the bureau's average costs will be less than those for a competitive industry.

110 The budget-output proposals of a bureau will suggest that marginal costs decline with output.

111.1 The output of a budget-constrained bureau will grow faster than the competitive norm facing the same uniform demand increase.

111.2 For constant costs (d=0) the output of a budget-constrained bureau will grow at twice the rate of a competitive industry facing the same uniform demand increase.

111.3 The output of a demand-constrained bureau will grow faster than the competitive norm facing the same uniform demand increase.

*Indicates an ancillary implication. That is, it is an implication implied by an implication.
TABLE 4.3 cont'd

111.4 When marginal costs are constant (d=0) the output growth rate of a demand-constrained bureau will be equal to the competitive norm facing the same uniform demand increase.

111.5 The budget of a budget-constrained bureau will grow faster than the competitive norm facing the same uniform demand increase.

111.6 For constant costs (d=0) the budget growth rate of a budget-constrained bureau will be twice the competitive norm facing the same uniform demand increase.

111.7 The demand-constrained bureau's budget will grow proportionately with the square of the demand increase.

112.1 In response to a reduced elasticity of demand a budget-constrained bureau's output will increase.

112.2 In response to a reduced elasticity of demand a budget-constrained bureau's budget will increase.

112.3 In response to a reduced elasticity of demand a demand-constrained bureau's output will decrease.

112.4 In response to a reduced elasticity of demand a demand-constrained bureau's budget will increase.

112*12 The proportionately more promotional activities in which a bureau engages the more it should be able to reduce its elasticity of demand and the more its budget should increase.

113.1 The output of a budget-constrained bureau will increase at a faster rate than the competitive norm facing the same uniform reduction in marginal costs.

113.2 For constant costs the rate of increase in output for a budget-constrained bureau will be twice that of the competitive norm facing the same uniform reduction in marginal costs.

113.3 The budget of a budget-constrained bureau will increase faster than the competitive norm facing the same uniform reduction in marginal costs.

113.4 The budget-constrained bureau will increase at a decreasing rate in response to equal successive reductions in marginal costs.

*Indicates an ancillary implication. That is, it is an implication implied by an implication.
TABLE 4.3 cont'd

<p>| | |</p>
<table>
<thead>
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<tbody>
<tr>
<td>I13.5</td>
<td>The demand-constrained bureau's output is invariant to the level of marginal costs.</td>
</tr>
<tr>
<td>I13.6</td>
<td>The demand-constrained bureau's budget is invariant to the level of marginal costs.</td>
</tr>
<tr>
<td>I14.1</td>
<td>The output of a budget-constrained bureau will increase in response to an increased elasticity of minimum marginal cost function.</td>
</tr>
<tr>
<td>I14.2</td>
<td>The budget of a budget-constrained bureau will increase in response to an increased elasticity of minimum marginal cost function.</td>
</tr>
<tr>
<td>I14.3</td>
<td>The demand-constrained bureau's output is invariant to the slope of the minimum marginal cost function.</td>
</tr>
<tr>
<td>I14.4</td>
<td>The demand-constrained bureau's budget is invariant to the slope of the minimum marginal cost function.</td>
</tr>
</tbody>
</table>

from them. This lack of communication in part was the motivation behind the further explicitation of the theory presented in Chapter III.

Niskanen first presented the model at the December, 1967 meetings of the American Economic Association. While discussing the fact that the budget-constrained equilibrium was larger than the Pareto-optimal level, he erroneously claimed that at the budget-constrained equilibrium the area under the demand curve equaled the area in the rectangle demarked by the marginal cost curve. Then, in the discussion that followed Stephen Enke agreed with this mistaken equality. Moreover, Enke proceeded to erroneously disagree with Niskanen's assertion that monopoly bureaus produce no collective surplus. Clearly, from Table 3.2 one can see that Niskanen was quite correct. This first presentation and discussion indicates a less than satisfactory level of communicability.

While reviewing Niskanen's book Gordon Tullock claimed that he had found an inconsistency in Niskanen's theory. Since this represents an important misunderstanding, a lengthy quote to illuminate the dispute is justified.

Turning now to my effort to use a further development of the Niskanen model for an attack upon part of Bureaucracy and Representative Government, any discussion of bureaucracy must

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28 Ibid., p. 295.

face the fact that in the United States and a number of European democracies, the governmental sector has steadily increased its share of the national product. Several explanations for this have been offered, and Niskanen accepts the view that the government services are a superior good, i.e. as total income increases, the portion of it spent on government services also increases. It is a little hard to fit this view with the Niskanen model of bureaucracy which offers no real benefit to any one except the suppliers of factors. Indeed it is a little hard to see why his bureaucracies do not squeeze out the profits of the factor suppliers as well as the profits of the recipients of the service. 30

This quotation contains two important misinterpretations, which one can readily examine.

Tullock's argument is not clear. What does the phrase "no real benefit to anyone except suppliers of factors" mean? Table 3.2 demonstrated that the two types of monopoly bureaus generate no net benefits, but large amounts of total benefits to society. Hence, Tullock must have meant net benefits. The important point is that the monopoly bureau does generate large benefits to society in addition to factor surplus, but society simply must pay too much in terms of total costs to receive them. These benefits are real benefits that may or may not be positive net benefits to the target beneficiaries of the bureau's service. The theory of supply by bureaus says nothing about how these benefits and costs are distributed among beneficiaries in society. Instead, it merely implies that society as a whole receives no net benefits from the bureau's services.

The mistaken notion that the theory implies "no real benefit to anyone except suppliers of factors" has been recently labeled the

30 Gordon Tullock, op. cit., p. 120.
"Niskanen Effect" by Richard S. Sterne, Alvin Rabushka, and Helen A. Scott. The authors mistakenly believed that Niskanen's theory implies no benefits for the target beneficiaries and that the factors of production confiscate all the benefits generated by production. In so doing the authors made two errors. First, the theory implies that society receives a large amount of total benefits, but no net benefit. They do not make this distinction. Second, they confuse the targeted beneficiaries of their program (the elderly) with society as a whole. The fact that the alleged beneficiaries of a program may not receive total or net benefits from the production of the bureau's service does not imply that society as a whole receives no total or net benefits. Again, the theory of supply by bureaus does not distinguish separate beneficiaries from society as a whole.

Tullock's second query was equally puzzeling as the confusion discussed above. Indeed, one should not find it hard to see why bureaucracies do not also squeeze the "profit" of the factor suppliers as well as the "profits" of the beneficiaries. If Tullock had noted the relevant deduction (H8 in Appendix A), then he would have found the answer. In the absence of factor price discrimination the bureau generates a higher factor surplus than the competitive norm, but lower net benefits. This implies that factor suppliers will be stronger advocates of the bureau's services than the beneficiaries. Hence, the bureaucrat can gain an even larger budget by not squeezing the factor

Richard S. Sterne, Alvin Rabushka, and Helen A. Scott, "Serving the Elderly?--An Illustration of the Niskanen Effect," Public Choice, XIII (Fall, 1972), 81-90.
suppliers, because they will conspire with the bureaucrat to stimulate the demand for the bureau's services. Since the bureaucrat strives to maximize his budget, Tullock's suggestion that the bureaucrat "squeeze" factor suppliers would be irrational as long as these factor suppliers could stimulate sponsor demand. Only under the condition that the factor suppliers have no control over sponsor "demand" would it be in the interest of the bureaucrat to "squeeze" these factor suppliers. Certainly, Niskanen explained this question under his hypothesis designated H8 in Appendix A.

In conclusion, the above misinterpretations appearing in the recent literature referring to Niskanen's theory indicates that the theory may not as yet be very communicable. In part, this lack of communication motivated the work embodied in Chapter III, which inter-subjectively replicated Niskanen's deductions.

Reproducibility and Predictability

Chapter III reproduces Niskanen's argument. It demonstrated that under the assumed conditions his deductions were valid. Also, since the hypotheses precede any knowledge of the state of the world or data on the theoretical phenomena, the theory is an ex ante theory. In other words, it has a high degree of predictability. Hence, one may conclude that the theory has both a high degree of reproducibility and predictability.
Formal Criteria

Desiderata

Generality

The condition set determines the generality of a theory. Table 4.3 lists the six basic conditions in Niskanen's theory. This section considers each of the first five conditions briefly and then focuses attention on the last condition, C6.

The first two conditions are purely definitional. C1 implies that any organization which is not financed, at least in part, by a periodic grant or appropriation is not a bureau. Hence, a public utility financed solely by user charges is not a bureau by definition. This condition excludes many "natural monopolies" that have decreasing marginal costs, which are financed solely by profits. C2 identifies the individual responsible for the bureau and its budget. Observations about budget maximizing behavior would relate to this individual.

The third condition, C3, defines the bureau's environment in a way consistent with interest group theory. Interest group theorists often conceive of a triangular, symbiotic relationship between the bureau, its review committee, and its clientele. The clientele consists of both beneficiaries and factor suppliers. Very often the clientele move in and out of the bureau with changes in the administration.

Moreover, the clientele often have strong political ties with representatives on the review committee. In general, this third condition seems to correspond well to the actual bureaucratic environment.

The fourth and fifth conditions merely specify the structure of the product and factor markets. C4 characterizes the bureau-sponsor relationship as a bilateral monopoly in which the sponsor is passive (C3). This permits the bureau to fully exert its monopoly power. For example, because the sponsor is passive the bureau can conceal unfavorable policy analysis and reveal only that analysis which supports further budget increases. This also seems consistent with the well documented and troublesome practice of bureaucratic secrecy. The use and abuse of the now familiar doctrine of executive privilege exemplifies this notion.

The condition C6 restricts the generality of the theory more than any other condition. As one can discern from Figure 4.2, both the bureaucratic and nonbureaucratic forms of economic organization face the same "demand" conditions. The function V represents this "demand" condition. Now, Niskanen recognized this identity when he stated, "The theory developed here starts with the demands for services as expressed by the collective organization in order to address the supply of services by bureaus." However, the "demand" function with which the theory starts is that of a competitive industry. If the reasons for the existence of government bureaus are that competitive markets failed to exist or public good problems exist, then the competitive

33William A. Niskanen, *Bureaucracy and Representative Government*, p. 27.
Figure 4.2: Basic Graphs for Analyzing Organizational Forms
norn is an inadequate normative criterion. Since these are well-accepted reasons for government intervention into the market place, the theory has a limited intended field of tenability. Indeed, it applies only to those bureaus that one could validly evaluate with the competitive norm.

Complexity

Complexity means the number of variables in the theory or hypothesis. Initially, from the axiom it appears that there are only three variables: (1) budget; (2) output; and (3) total costs. However, these three variables lead to ten additional variables. All of these appear in Table 3.2. The forty-seven implications deduced from the theory contain these thirteen variables. Although the model initially appears simple, one can conclude that it is actually complex. In contrast, as one examines each implication separately, he can conclude they are fairly simple. Usually, an hypothesis contains only one variable in which a comparison is made between one unit of analysis and a norm. Thus, the theory is fairly complex, but its separate implications are quite simple.

Specificity

One can understand the specificity of Niskanen's implications in the context of the determinacy of the model. Each of the forty-seven implications has been deduced mathematically and expressed in the form of an inequality. For example, consider 17:

17 A bureau will supply an output up to twice that of a competitive industry faced by the same demand and cost conditions.
This implication has one variable (output) and one unit of analysis (the bureau). Either a bureau supplies an output more than and up to twice that of a competitive industry or it does not. It is highly deterministic, because it hypothesizes a certain outcome that is either true or false.

Since there is only one unit of analysis in 17, one actually gets more specificity out of the deterministic rather than the probabilistic hypothesis. "The reason is simple enough: in the deterministic hypothesis we do not ask for the distribution of elements within the true-region or false-region, only for how many possible true-regions we can define."\(^\text{34}\) As discussed earlier, this holds as long as the number of units of analysis is less than the number of discriminations that can be made in empirical outcomes. Since Niskanen's implications have one unit of analysis and two possible discriminations in empirical outcomes (true or false), the deterministic form is better specified than the probabilistic form. Therefore, Niskanen's implications are well specified, when compared to possible probabilistic implications.

Conclusion

Niskanen's theory seems to fare well on the criteria of complexity, determinacy, and specificity. However, when one closely examines the condition set, C6 reveals a lack of generality. The comparative argument that bureaus are inefficient, too large, and grow too fast does not hold for any bureau producing output that at least partially satisfies social wants. Since consumers do not accurately reveal their

\(^{34}\text{Johan Galtung, op. cit., p. 319.}\)
preferences for these wants in the market place, one cannot always use the competitive industry equilibrium as the ultimate and unique norm.

**Necessary Criteria**

**Falsifiability, Testability, and Tenability**

All forty-seven implications are quite falsifiable. They each are either true or false. Therefore, falsifiability of these hypotheses is equal to 1/2. Since it is difficult to conceive of an *a priori* reason to believe the two possible outcomes are other than equally probable, one can assume that they are equally probable. Thus, the rules for maximizing testability have been followed:

1. The true set has been minimized to one element.
2. The undecidable set is the null set.
3. The false set has been maximized to one element.

Given the high degrees of falsifiability and testability, one must turn to tenability. This requires an examination of empirical import. All of the forty-seven implications are testable in principle. That is, they are not "pseudo-hypotheses." However, due to theoretical and measurement problems, some are more readily testable than others. Table 4.4 indicates a sequential classification of implications from least to most testable. It contains three sets of implications. The first set one can reject on theoretical grounds. The second set one can reject on measurement grounds. The remainder are implications one can readily formulate empirically.
TABLE 4.4

SELECTION OF EMPIRICALLY TESTABLE IMPLICATIONS

(I). Rejected on Theoretical Grounds


B. In most cases it will be very difficult to find a competitive industry facing the same demand and cost conditions. (I11.1, I11.2, I12, I17, I18.1, I18.2, I11.1, I11.3, I11.5, & I11.6)

(II). Rejected on Measurement Grounds


B. Requires same demand and cost conditions for a comparison. (I4.1)

C. It is difficult to identify a demand-constrained bureau from a budget-constrained bureau, but not necessarily vice versa. (I6.1, I*6, I6.4 & I11.7)

D. Even if one could identify beneficiaries from factor suppliers, differentials in advocacy would be hard to measure due to bureaucratic secrecy. (I*8)

E. Promotional activities are difficult to measure due to bureaucratic secrecy. (I*12)

(III). Empirically Testable Implications

(I12.2 & I12.4)
Set (I) lists the implications rejected on theoretical grounds. First, one can reject subset A, because they are cost implications. Niskanen argued that bureaus do not reveal their true cost structures outside the bureau. Hence, cost estimates will not be available to outside investigators. Second, one can reject subset B, because it would be virtually impossible to find a competitive industry producing the same output under the same demand and cost conditions. Now, in principle, if one could get accurate cost estimates from bureaus and there existed competitive industries producing under the same cost and demand conditions, then these implications would be empirically testable. Since these environmental states appear only remotely possible, one can reject them for some more readily testable implications.

The implications rejected on measurement grounds are in set (II). The difficulty of measuring the output of government bureaus is well-known. Most attempts merely use input measures or activity levels. The existing degree of sophistication in public output measurement suggests that set A contains implications far from readily testable. Subset B requires the unlikely condition that two bureaus face the same demand and cost conditions. Subset C indicates that it is not easy to identify demand-constrained bureaus. By I3.1 one could argue that all new bureaus are budget-constrained. However, this does not imply that all old bureaus will be demand-constrained. Old bureaus

will be either budget- or demand-constrained. Eventually, investigators may develop proxy measures for organizational slack that would permit this needed distinction. Until then, it will be difficult to discriminate between old demand-constrained and old budget-constrained bureaus. Subset D is also difficult to test. Since the advocacy process transpires largely in secrecy, one would find it difficult to measure differentials in advocacy. Finally, subset E contains similar problems. Levels of promotional activities would also be hard to measure, due to bureaucratic secrecy.

The remaining implications that are readily testable are the following:

I12.2 In response to a reduced elasticity of demand a budget-constrained bureau's budget will increase.

I12.4 In response to a reduced elasticity of demand a demand-constrained bureau's budget will increase.

Observing the similarities between the two, one can conjoin them into one hypothesis as follows:

(I12.2 & I12.4) In response to a reduced elasticity of demand a bureau's budget will increase.

Chapter V formulates this implication both graphically and empirically. Then, with the relevant variables operationalized one can at least begin the scientific verification process.

Conclusion

Niskanen's theory has many methodological strengths, but a few weaknesses. First, Niskanen's theory is reproducible and predictive,
but somewhat less communicable. Second, it is complex, deterministic, and well-specified, but lacks generality. These weaknesses in communicability and generality may lead to reluctant acceptance in some fields. Third, it is falsifiable and testable. Finally, tenability rests on the degree of ease with which future investigators can devise empirical tests. The next chapter begins the scientific verification process by formulating a statistical test.
This chapter focuses on the effect of consolidation on bureaus' budgets. First, it develops the consolidation hypothesis, which is most important to public administration. Second, it operationalizes this hypothesis. This will further illuminate difficulties involved in testing Miskanen's theory. Ultimately, it prepares for the presentation of some empirical findings testing this hypothesis in the next chapter.

Theoretical Derivation of the Hypothesis

One must use the technique of comparative statistics to derive an empirically testable hypothesis. First, if one conjoins II2.2 and II2.4 listed in Table 4.3, then he eliminates the troublesome need to distinguish between a budget- and a demand-constrained bureau. Since there is no easy way to distinguish these two types of bureaus, this is a very important step. The fact that consolidation affects both types of bureaus' budgets in the same direction enables one to make this conjunction (see Table 3.3). Second, one must assume that consolidation renders the demand for a bureau's services less elastic due to a decrease in the number of competitors. Third, all other variables except the ones affected by consolidation must be held constant. Then, one can hypothesize the following relationship:
H: *Ceteris paribus*, a bureau's budget will grow more rapidly immediately after consolidation than immediately before consolidation.

Figure 5.1 graphically derives this consolidation hypothesis. It contains the same basic graphic presentation of Niskanen's model as discussed in Chapter III. Prior to consolidation the bureau faces a "market" with a demand of \( V_1 \) and a minimum marginal cost function of \( C \) in the lower graph. The upper graph isolates the budget-output function by excluding the total cost function. This clearly displays the effects on the bureau's budget. Now, in the time period immediately after consolidation two effects will occur. One can designate these effects as the primary and secondary effects. When summed, the total effect leads to larger budgets after consolidation for a given output up to the maximum budget.

The primary effect results from a reduced elasticity of demand for a bureau's services. This derives from the diminished competition caused by consolidation. In the lower graph one can examine this by a clockwise rotation of the demand curve \((V_1)\) at its intersection with \( C \) to the demand curve after consolidation \((V_2)\). The arrows closest to the intersection of \( V_1 \) and \( C \) indicate this movement. In effect, this holds the competitive bureaucracy's equilibrium output level constant at \( Q_c \) for comparative purposes. Now, in the upper graph one can see that consolidation has increased the budget for a given output up to the budget-output function's maximum. This is indicated by the shift from \( B_1 \) to \( B_2 \). Therefore, after consolidation
Figure 5.1: Effect of Consolidation on the Budget
the bureau will require a larger budget at any given level of output up to the maximum of the budget-output function.

The secondary effect states that the bureau will be able to promote or stimulate shifts outward in its demand function much better than before consolidation. This stems from the diminished competition. It enables the bureau to devote more of its budget slack to advertising and promotional activities. The shift from $V_2$ to $V^*_2$ depicts this capability. The arrows from $V_2$ to $V^*_2$ indicate the direction of this shift. Again, in the upper graph this will increase the budget required to produce a given output everywhere up to a maximum as shown in the shift from $B_2$ to $B^*_2$. Hence, the secondary effect augments the primary effect.

The total effect derived by the summation of the primary and secondary effects of consolidation on a bureau's budget means that a bureau's budget should grow more immediately after than before consolidation. Observe in Figure 5.1 that at a given output, say $Q^*_2$, the bureau requires $\Delta B$ more budget after consolidation than before. Hence, if a bureau produced the same output, say $Q^*_2$, in the time period after consolidation as before, then the increase in budget required by the consolidated bureau would be $\Delta B$. Thus, the incremental growth of the bureau's budget should reflect this effect in its growth rate after consolidation.

Operationalization of the Hypothesis

The concepts of bureau, budget, consolidation, the growth of the budget, and ceteris paribus crucially affect the operationalization of
the consolidation hypothesis. This section defines these concepts and formulates a statistical hypothesis that one can test. The next chapter then presents the results of some statistical tests of this hypothesis.

The Concepts

Bureau

The operationalization of the concept of bureau is fairly easy, because the definition is so broad. "Bureaus are nonprofit organizations which are financed, at least in part, by a periodic appropriation or grant." Thus, any agency financed solely out of user charges would not be a bureau. Also, any agency in the executive branch that receives annual appropriations will be considered a bureau. For example, the Federal Aviation Administration in the Department of Transportation is a bureau. Moreover, at a more aggregate level the Department of Transportation could be considered a bureau. Therefore, any of the executive branch agencies meeting the definition above and having separate and identifiable budgets in the U.S. budget are considered bureaus.

Consolidation

One can define a consolidation as the transfer of an agency or its functions to another agency with a similar purpose. This notion is consistent with executive reorganization policy as stated in Chapter 9 of Title 5 of the United States Code. The United States

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1William A. Niskanen, op. cit., p. 42.
Government Manual 1973/74 provides an extensive list of such consolidations since 1933. The search for consolidated agencies relied upon this list.

Consolidation results from efforts to reorganize the executive branch in the interests of economy and efficiency. Congress grants consent to reorganize in three basic ways: (1) statutory delegation; (2) express statutory action; and (3) reorganization plan. All three of these means have been used since 1933.

If an act establishing an agency delegates reorganization authority to its head or his superior, then reorganization by statutory delegation is available. Very often this power resides in the secretary's office of the particular executive department. Thus, it often appears in the form of a secretarial letter, memorandum, or agency circular. For example, the Secretary of Health, Education, and Welfare (HEW) had the statutory power to transfer St. Elizabeth's Hospital to the National Institute of Mental Health within HEW. This transfer was accomplished in a Secretary's order on August 9, 1967.

Congress can delegate complete reorganization authority to the President. It has resorted to this only during national emergencies. The Overman Act of 1917, the Economy Act of 1932, and the War Powers Act of 1941 are the only times the President has been delegated such authority.

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4 Office of the Federal Register, op. cit., p. 694.
sweeping authority. When granted, the President can implement this authority through executive order.

Reorganization by express statutory action occurs when Congress directly passes a law to reorganize some agency or agencies. For example, the Federal Aviation Agency was transferred to the Secretary of Transportation by the Department of Transportation of October 15, 1966.

The President also has temporary, but renewable authority to submit reorganization plans to Congress under the Reorganization Act of 1949 and its amendments. For example, St. Elizabeth's Hospital was transferred from the Department of Interior to the Federal Security Agency by Reorganization Plan IV, effective June 30, 1940. The Reorganization Act of 1949 is codified in Chapter 9 of Title 5 of the United States Code. Under Section 906 it provides for a legislative veto of Presidential reorganization plans:

(a) Except as otherwise provided under subsection (c) of this section, a reorganization plan is effective at the end of the first period of 60 calendar days of continuous session of Congress after the date on which the plan is transmitted to it unless, between the date of transmittal and the end of the 60-day period, either House passes a resolution stating in substance that the House does not favor the reorganization plan.

5 Harvey C. Mansfield, op. cit.
6 Office of the Federal Register, op. cit., p. 652.
7 Ibid., p. 694.
Thus, a simple majority in either house of Congress can veto a presidential reorganization plan by passing a resolution of disapproval.

Reorganization plans based on efficiency considerations alone ignore other important values. For example, reorganizations often imply substantial reallocations of bureaucratic, congressional, and special interest power. Perhaps because of the legislative veto power, reorganizations have been implemented more by statute than plan. "A count made by the Legislative Reference Service of the Library of Congress lists 157 statutory reorganizations from 1945 to 1962 as opposed to 52 approvals of presidential plans." This is not surprising, since it would be easy for interest groups opposing a given reorganization plan to mobilize a simple majority in either House of Congress. Thus, the avenues to reorganization implementation seem to require political acceptance in addition to economy and efficiency.

Budget

The concept of budget in Niskanen's theory closely relates to the concepts of output and minimum total costs. A bureau that has produced a final output in a given fiscal year will have one budget figure and one total cost figure associated with that output. Three possible budget figures exist, which one could use to operationalize the concept of budget. These concepts are budget authority, obligations, and outlays. Each figure does not fit the theory perfectly, but outlays appears to be the best measure of the three.

9Herbert Emmerich, op. cit., p. 263.
"Budget authority permits obligations to be incurred, and for most accounts the amount of authority is related to the obligations expected to be incurred during the year."\(^\text{10}\) It usually takes the form of appropriations.\(^\text{11}\) Appropriations permit a bureau to incur obligations and subsequently liquidate them. They usually are for a one-year time period, but some are multi-year. When Congress provides budget authority in the form of appropriations to an agency, then the agency can obligate that amount during the specified time period. Any remaining funds left unobligated at the expiration of the fiscal year cannot without further Congressional action be obligated in the next fiscal year. If the agency wished to obligate these funds in the next fiscal year, then it would need a reappropriation.

Obligations are merely commitments to pay liabilities accrued during the operation of the agency. For example, accrued liabilities for salaries and wages, contracts for supplies, construction, and land are all obligations.\(^\text{12}\)

Outlays result from the liquidation of obligations by the issuance of checks or the disbursement of cash.\(^\text{13}\) They may arise from budget authority and obligations from previous years or the same year.

\(^{10}\)\textit{Ibid.}, p. 162.


\(^{12}\)\textit{Ibid.} It also can take the form of contract authority and authority to spend debt receipts.

\(^{13}\)\textit{Ibid.}, p. 279.
The choice between these three concepts is difficult. Perhaps the most important factor in making a choice is output. Theoretically, the budget must be associated with an output. This output in turn can be produced at a minimum total cost. The budget is at least equal to and perhaps greater than this minimum total cost. Thus, in order to identify this budget one must, theoretically at least, have an observed output.

One cannot even theoretically identify an observed output associated with budget authority. Since no funds at the beginning of the fiscal year have been obligated as yet from budget authority, an output could not have been produced. Thus, one could not calculate the minimum total costs for the given output, because it has not been produced. Therefore, budget authority is not a suitable operationalization of the Niskanen budget concept.

Either obligations or outlays remain as possibilities. Recommended governmental accounting practice would suggest that obligations should be preferred over outlays.

In general, use of accrual accounting is recommended for governmental units as well as for profit-seeking businesses. Accrual accounting means (1) that revenues should be recorded in the period in which the service is given, although payment is received in a prior or subsequent period, and (2) that expenditures should be recorded in the period in which the benefit is received, although payment is made in a prior or subsequent period. ... In government, use of the accrual basis enables a better comparison between actual expenditures and revenues and the budget authority approved by the legislative body. 14

For example, if a bureau receives benefits from the service of an input in the same fiscal year as when the obligation is incurred but not liquidated, then obligations would be a better measure of the budget concept. However, obligations are not readily obtainable for an agency in the accounts of the United States Budget. The federal program by agency and account contained in the U.S. Budget provides actual outlay figures. Obligations could be obtained from the appendix to the U.S. Budget, but this process would require a substantial aggregation process to obtain figures at the agency level. Since this may lead to an inaccurate estimation of the agency's budget, outlays is probably the best concept to use.

Outlays can originate from current or past budget authority. As actual expenditures for a given fiscal year, they presumably have flowed into the bureau's production process as an input. However, not all of these outlays may have been used to produce a final product in the current fiscal year. Some outlays may have liquidated obligations from previous years. There exists no obvious way to circumvent this flow problem. Outlays have at least been used to produce some final output during the fiscal year. Hence, one must assume that the outlays for a given year represent the budget used to produce an output for the same year.

Growth of the Budget

Theoretically, it would appear that one could test the consolidation hypothesis by comparing the annual budget increment before versus after consolidation. However, any attempt to do this leads to several
questions. First, when does consolidation take effect? Second, over what time period does consolidation affect the bureau's budget? Third, should one adjust for inflation? Fourth, what measures the growth of the budget? One must answer each of these questions before he can test the consolidation hypothesis.

When does consolidation take effect? Arbitrarily, one can assume that consolidation takes effect the year immediately after the year in which the reorganization is effective. For example, if the reorganization was effective on August 1, 1967, then the consolidation takes effect in fiscal year 1969. In other words, the primary and secondary effects of consolidation on the budget should begin to appear in the fiscal year following the consolidation.

What time period should be used? If one uses only the year before and the year after consolidation, then there are not enough degrees of freedom remaining to perform a statistical test. Indeed, the effects of consolidation do continue in the future, but as the time period grows longer it is more likely that exogenous influences obscure the pure effect of consolidation. Thus, one would like a time period long enough for a statistical test, but not so long that exogenous influences become too great. Where possible, five years before and after the consolidation have been used.

Should one adjust for inflation? Inflation is an exogenous influence that may be separate from the effects of budget maximization and consolidation. For example, if coincidently a period of rapid inflation corresponds with the period immediately after consolidation, then in current dollars it would appear that rapid growth occurred.
However, when adjusted for inflation, the constant dollar budget may not have grown faster after consolidation at all. Thus, a fiscal year GNP deflator has been applied to adjust all bureaus' outlays to constant dollars.

One would like to adjust for other exogenous influences that are separate from consolidation. For example, the rapid exogenous increase in the Department of Defense (DOD) outlays during the Vietnam War would most certainly swamp any effect consolidation might have on agencies in DOD. Although this rise may not be apart from the general forces arising from bureaucratic budget maximization, it is separate from effects solely caused by any consolidation during the period. However, indices that one could use to adjust for these other exogenous influences do not exist. Hence, one must regretably resort to holding such influences constant by assumption.

What measures the growth of the budget? The annual budget increment does not adequately measure growth, because it does not adjust for the changing size of the bureau. For example, the change in a bureau's budget could be absolutely larger after consolidation merely because the bureau has grown larger. The percentage change in a fiscal year over the previous fiscal year adjusts for increasing size. Hence, it is a better measure of growth. Thus, according to the consolidation hypothesis, a bureau's budget should grow proportionately more after than before consolidation.

Ceteris Paribus

The ceteris paribus assumption is the most limiting requirement of all. As mentioned above, it holds exogenous influences constant.
Also, it holds costs constant over the test period. This is particularly tenuous during periods when the cost of inputs such as labor are increasing. As a result, this renders falsification of the theory quite difficult. If one falsified the consolidation hypothesis, then it may be that the ceteris paribus assumption simply did not hold in that particular case. Thus, the hypothesis may hold constant too many important variables.

The Statistical Hypothesis

Bureaus are examined during a ten-year period. Table 5.1 characterizes this time period.

TABLE 5.1

<table>
<thead>
<tr>
<th>CONSOLIDATION TIME PERIOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \begin{array}{cccccccccc} r_o &amp; C &amp; r_c \ \hline \hline \text{Fiscal} &amp; \hline \text{Years} &amp; r_1 &amp; r_2 &amp; r_3 &amp; r_4 &amp; r_5 &amp; r_6 &amp; r_7 &amp; r_8 &amp; r_9 &amp; r_{10} \end{array} )</td>
</tr>
</tbody>
</table>

Where \( r_i \) equal real annual percentage growth rates of actual outlays (i=1,2,...,10)

\( r_{oc} \) equal the mean real annual percentage growth rates of actual outlays before and after consolidation (C), respectively.

Now, the effective date of consolidation is represented by the point, C. The \( r_i \)'s represent the real annual percentage growth rates of the bureau's budget. Thus, \( r_1 \) through \( r_5 \) represent the real annual percentage growth rates of outlays immediately prior to consolidation. Likewise, \( r_6 \) through \( r_{10} \) represent the real annual percentage growth rates immediately after consolidation. This time framework is amenable to a statistical test.
One can design a statistical test by comparing the mean growth rates before and after consolidation. Suppose the mean growth rates before and after consolidation are $r_o$ and $r_c$, respectively. Then, one can state the following statistical hypothesis.

$$H_0: \quad r_o = r_c$$

$$H_A: \quad r_o < r_c$$

Thus, if the evidence rejects the null hypothesis, $H_0$, in a one-tailed test using Student's $t$ distribution, then one has found support for Niskanen's consolidation hypothesis. To the contrary, if one accepts the null hypothesis, then he has falsified the consolidation hypothesis. The next chapter presents the evidence.

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15 Murray R. Spiegel, Theory and Problems in Statistics (New York: Schaum Publishing Co., 1961), p. 195. Under the hypothesis $H_0$, \[ t = \frac{r_o - r_c}{\sigma \sqrt{\frac{1}{N_1} + \frac{1}{N_2}}} \]

$$\sigma = \sqrt{\frac{\sum_{i=1}^{N_1} (r_i - r_o)^2}{N_1} + \frac{\sum_{i=1}^{N_2} (r_i - r_c)^2}{N_2}}$$

$$r_o = \frac{\sum_{i=1}^{N_1} r_i}{N_1}$$

$$r_c = \frac{\sum_{i=1}^{N_2} r_i}{N_2}$$

and

$$N_1 = N_2 = 5$$
CHAPTER VI

A RUDIMENTARY TEST OF THE CONSOLIDATION HYPOTHESIS

The literature on the politics of the budgetary process often suggests that budgeting is incremental. That is, budgets usually change at an annual rate of plus or minus ten percent. Niskanen's theory provides a framework in which one can analyze such annual growth rates. This chapter has two purposes, which relate to this "theory" of incrementalism. First, it tests the consolidation hypothesis, which could provide an explanation for significant differences in budgetary growth rates between bureaus. Second, it uses Niskanen's theory as a framework in which to construct explanations of some budgetary phenomena. Ultimately, Niskanen's theory may provide plausible explanations for apparently non-incremental budgetary phenomena.

Four Case Studies

Selection of Consolidation Case Studies

The process through which the four consolidation cases were selected was determined by two factors. First, the United States Government Manual 1973/74 contains almost one hundred pages of various executive reorganizations dating back to 1933. Second, a large data set from the Mershon Center, The Ohio State University provided
budgetary data from 1952 through 1971 for thirty-nine agencies in the federal executive branch. Thus, the process attempted to identify the agencies within the Mershon Center data set that had been consolidated during the years 1952 through 1971.

Several constraints inherent in the data ultimately limited the number of consolidations to only four. First, the list of consolidations contained in the U.S. Government Manual 1973/74 was dominated by depression and war stimulated reorganizations prior to 1952. Second, the Mershon data set often did not contain actual outlays of the consolidated bureau's predecessor agencies. Third, some interesting consolidations for which one could readily collect data from the U.S. Budget, such as ACTION, occurred so recently that an adequate time period after consolidation for actual outlays still is not available. Fourth, sometimes consolidations occur so closely together in time that an adequate time period to test the hypothesis is not available. Finally, the stimulative effects of the Vietnam War discouraged consideration of Department of Defense agencies, such as the Air Force. Consequently, only four consolidated agencies are considered in the empirical test.

The Four Selected Cases

The following agencies in the federal government were included in the empirical test: (1) The Social and Rehabilitative Service (SRS) in the Department of Health, Education, and Welfare (HEW); (2) The National Institute of Mental Health (NIMH), also in HEW; (3) The Agency for International Development (AID) in the Department of State; and
The Federal Aviation Administration (FAA) in the Department of Transportation.

The four selected agencies conceptually fit two interpretations of consolidation. First, the SRS, AID, and FAA are consistent with the interpretation that consolidation means that a new agency has been created out of several previously existing agencies. Second, the NIMH is consistent with the interpretation that consolidation can be the transfer of an agency or functions into an existing agency.

Table 6.1 summarizes the real fiscal year growth rates for these four agencies. For example, the SRS predecessor agencies had aggregate growth rates of 7, 0, 11, and 16 percent prior to consolidation. Then, after consolidation the SRS exhibited growth rates of 23, 10, 14, 22, and 28 percent. These data are then analyzed in Table 6.2, which simply summarizes the statistical test performed. Again, as stated in the previous chapter the consolidation hypothesis is

\[ H: \text{Ceteris paribus, a bureau's budget will grow more rapidly immediately after consolidation than immediately before consolidation.} \]

Observe in column one that the case of the SRS supports the consolidation hypothesis, because the evidence refutes the null hypothesis, \( H_0 \). As one can see, this is the only case in which the consolidation hypothesis, \( H_A \), is supported by the analysis. Finally, these tables will be used in the discussion of each case study that follows this section.

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1The growth rates for predecessor agencies were derived from the summation of the predecessor agencies' budgets.
### TABLE 6.1

Real Fiscal Year Growth Rates in Four Federal Agencies' Actual Outlays

<table>
<thead>
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<th></th>
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</thead>
<tbody>
<tr>
<td><strong>Pre-consolidation time periods</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1)</td>
<td>0.29</td>
<td>(3)</td>
<td>-0.15</td>
<td></td>
</tr>
<tr>
<td>0.07</td>
<td>0.32</td>
<td>(3)</td>
<td>-0.13</td>
<td></td>
</tr>
<tr>
<td>0.00</td>
<td>-0.08</td>
<td>0.04</td>
<td>0.19</td>
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</tr>
<tr>
<td>0.11</td>
<td>0.08</td>
<td>0.04</td>
<td>0.17</td>
<td></td>
</tr>
<tr>
<td>0.16</td>
<td>0.29</td>
<td>0.09</td>
<td>0.49</td>
<td></td>
</tr>
<tr>
<td><strong>Post-consolidation time periods</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.23</td>
<td>0.03</td>
<td>0.01</td>
<td>0.57</td>
<td></td>
</tr>
<tr>
<td>0.10</td>
<td>0.18</td>
<td>0.10</td>
<td>0.13</td>
<td></td>
</tr>
<tr>
<td>0.14</td>
<td>0.14</td>
<td>-0.04</td>
<td>0.24</td>
<td></td>
</tr>
<tr>
<td>0.22</td>
<td>0.00</td>
<td>0.01</td>
<td>0.08</td>
<td></td>
</tr>
<tr>
<td>0.28</td>
<td>(2)</td>
<td>0.03</td>
<td>0.03</td>
<td></td>
</tr>
</tbody>
</table>

**Definitions:**

- **SRS** - Social and Rehabilitative Service
- **NTMH** - National Institute of Mental Health
- **FAA** - Federal Aviation Administration (4)
- **AID** - Agency for International Development

**Notes:**

- (1) Data unavailable, because the predecessor agencies did not exist prior to 1962.
- (2) Data not used, because another consolidation occurred. The new agency is now called the Alcohol, Drug Abuse, and Mental Health Administration.
- (3) Data earlier than FY 1958 unavailable for predecessor agencies.
- (4) Predecessor data includes only the Civil Aeronautics Board (CAB).
### TABLE 6.2

**STATISTICAL TEST SUMMARY**

<table>
<thead>
<tr>
<th>SRS</th>
<th>NIMH</th>
<th>AID</th>
<th>FAA</th>
</tr>
</thead>
<tbody>
<tr>
<td>(r_o)</td>
<td>10%</td>
<td>18%</td>
<td>6%</td>
</tr>
<tr>
<td>(r_c)</td>
<td>19%</td>
<td>8%</td>
<td>2%</td>
</tr>
<tr>
<td>d.f.</td>
<td>7</td>
<td>(1)</td>
<td>(1)</td>
</tr>
<tr>
<td>(t_{.95})</td>
<td>1.90</td>
<td>(1)</td>
<td>(1)</td>
</tr>
<tr>
<td>(\hat{t})</td>
<td>2.14</td>
<td>(1)</td>
<td>(1)</td>
</tr>
</tbody>
</table>

- **Ho** Reject Accept Accept Accept
- **HA** Accept Reject Reject Reject

Where:
- \(r_o\) = Mean real annual growth rate of actual outlays before consolidation
- \(r_c\) = Mean real annual growth rate of actual outlays after consolidation
- d.f. = Degrees of freedom
- \(t_{.95}\) = .95 significant t value for relevant d.f.
- \(\hat{t}\) = Estimated t value
- \(H_o\) = \(r_o = r_c\)
- \(H_A\) = \(r_o > r_c\)

(1) No statistical test was required, because \(r_c < r_o\). This supports \(H_o\) without any calculations in the one-tailed test.
160

Social and Rehabilitative Service

A Secretary's reorganization of August 15, 1967 created the Social and Rehabilitative Service (SRS) within the Department of Health, Education, and Welfare (HEW). This action consolidated the following predecessor agencies within HEW: (1) Welfare Administration; (2) Bureau of Family Services; (3) Vocational Rehabilitation Administration; and (4) Administration on Aging. Although these agencies' programs were sometimes aimed at different target populations, they seem to provide the same or very similar social service outputs. Therefore, one can reasonably assume that they competed for scarce budgetary resources to produce very similar services prior to the consolidation.

The consolidation into the SRS reduced the amount of competition in this social service market. This market includes the SRS programs "providing technical, consultative, and financial support to States, local communities, other organizations, and individuals in the provision of social, rehabilitative, income maintenance, medical, families and child welfare, and other necessary services to the aged and aging, children and youth, the disabled, and families in need."² All of these functions now fall under the direction of the SRS and its four component agencies. These agencies are the Assistance Payments Administration, Community Services Administration, Medical Services Administration, and Rehabilitation Services. Currently, the SRS holds a monopoly over the services of these component agencies, which were

previously provided in a more competitive environment by its predecessor agencies.

The four component agencies of the SRS provide fairly familiar services. First, the Assistance Payments Administration supervises the income maintenance program under the public assistance titles of the Social Security Act (SSA). Second, the Community Service Administration assists the States in providing social services to current, former, or potential welfare recipients. Third, the Medical Services Administration administers grants to the States for medical services to the needy. Fourth, the Rehabilitation Services Administration provides vocational rehabilitation services for the disabled. The history of the programs provided by these component agencies can reveal effects on the budget which may not have been solely the result of the consolidation in question.

As indicated in Table 6.1, the test period for the SRS consists of the years 1963 through 1972. This period exhibited a large expansion in the AID to Families with Dependent Children (AFDC) program. For example, in 1964 the average monthly number of recipients was 4,118,000 compared to 6,706,000 in 1969. This is an increase of about 63 percent in a period of only five years. In addition, total expenditures in the AFDC program burgeoned from $1,496,525,000 in 1964 to $3,546,668,000 in 1969. This was an increase of about 137 percent. Clearly, this phenomenon would have a dramatic impact on

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4 Ibid.
the growth of actual outlays of the Assistance Payments component within the SRS.

Another dramatic development during the test period consisted of the passage of the Kerr-Mills bill establishing the Medicaid Program effective January 1, 1966. (PL 89-97). Since the impact of this program coincides more closely with the consolidation in 1967, the effects on budget growth of consolidation may have been swamped by this event. Indeed, at the time it was signed into law by President Johnson on July 30, 1965 experts estimated that Medicaid would benefit about eight million needy persons. Certainly, the Medicaid Program has caused rapid expansion in the budget for the Medical Assistance function of the SRS.

Tables 6.1 and 6.2 display the evidence on the SRS. The year of consolidation, FY 68, exhibited a large 23 percent increase in real actual outlays. Also, the next four years indicate a continuing rapid growth pattern with real actual outlays growing at 10, 14, 22, and 28 percent in the following four consecutive years. This results in an average annual growth rate of 19 percent for the post-consolidation period compared to only 10 percent for the pre-consolidation period. Indeed, when one tests the hypothesis formulated in Chapter V, one must reject the null hypothesis, $H_0$, and accept the alternative, $H_A$, at the 95 percent significance level. 

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7 The estimated $t$ statistic was 2.14, which exceeds that for seven degrees of freedom at a .95 level of 1.90. This implies a rejection of $H_0$. 
Table 6.2, column one, summarizes the relevant data on this test. In other words, the real actual outlays for the SRS grew significantly more after than before consolidation. Therefore, the evidence on the SRS consolidation supports, or at least does not falsify, the consolidation hypothesis.

The facts that AFDC and Medicaid were rapidly growing programs during the test period casts doubt on the veracity of this empirical test. That is, the assumption that exogenous influences were constant may not have been strictly applicable. Hence, although the evidence supports the consolidation hypothesis, exogenous influences may account for the rapid real growth rates rather than consolidation. Because the Medicaid program had its primary impact after the consolidation of 1967, one must seriously doubt that consolidation alone accounted for the dramatic increased real growth in actual outlays for the SRS. Consequently, one must regard this supportive case with some caution.

Certainly, one must consider this result rather tenuous at this point in rudimentary empirical testing.

National Institute of Mental Health

The National Institute of Mental Health currently does not exist as a separate agency. A recent consolidation by the Secretary of HEW created an even larger bureau called, the Alcohol, Drug Abuse, and Mental Health Administration. However, the National Institute of Mental Health did exist as a bureau over the relevant test period from 1962 to 1971. During this period it provided

...national leadership for the improvement of mental health through the conduct and support of programs for the discovery and
demonstration of new knowledge, the development of specialized manpower, and the inauguration, demonstration, and support services to promote and sustain mental health, prevent mental illness, and treat and rehabilitate mentally ill persons.8

Thus, the National Institute of Mental Health was primarily research and development oriented.

A Secretary's reorganization order on August 9, 1967 redelegated St. Elizabeth's Hospital to the National Institute of Mental Health.9 St. Elizabeth's Hospital was established in 1855 as a U.S. Government Hospital for the Insane. It was transferred to HEW in 1953 by Reorganization Plan 1. Since it was a hospital, its services were not exactly the same or even closely similar to the research and development services provided by the NIMH. Hence, one must question whether these two agencies were competing for budgetary funds aimed at the same services. Indeed, the consolidation in question may not have reduced the elasticity of "demand" for the NIMH services. This particular consolidation may not fit the derived hypothesis very well, but the test does illuminate some important points.

The NIMH was established in 1948 to provide further understanding of mental illness and improve mental health.10 Under Title V of the Health Amendments Act of 1956 the NIMH provided not only research, training and community services, but also grants for experiments, demonstration and research that would lead to improved care, treatment and rehabilitation of the mentally ill. Interest in this area grew

8 U.S. General Services Administration, op. cit., p. 228.
9 Ibid., p. 694.
The NIMH case exemplifies two important exogenous influences on the budget. First, a Presidential indorsement to Congress can have a tremendous stimulative effect on a bureau's budget. For example, the NIMH growth rates in real actual outlays during fiscal years 1963 and 1964 were 29 and 32 percent, respectively. President Kennedy's recommendation on February 5, 1963 could partially account for these increases. Second, the fiscal pressures related to simultaneously financing both the "War on Poverty" and the War in Vietnam seriously restrained rapid expansion in such social program areas as mental health. This budget crunch could account for the smaller growth rates from 1967 through 1971. In conclusion, if the hypothetical effect actually occurred, then it must have been obscured by these dominating factors.

Agency for International Development

Executive Order (EO) 10973 of November 3, 1961 directed the Secretary of State to establish an agency, the Agency for International Development (AID), to implement the provisions in the Foreign Assistance Act of 1961 (75 Stat. 424). Today, "AID carries out assistance programs designed to help the people of the less developed countries develop their human and economic resources, increase productive capacities, and improve the quality of human life." These programs include development loans, technical cooperation, housing guaranties,


12 Ibid.
slowly as a five year study group, the Joint Commission on Mental Illness and Health, reported to Congress in a volume entitled, Action for Mental Health, on December 31, 1960. President Kennedy became interested in this area early in his Administration. Then on February 5, 1963 he recommended a national program on mental health in a message to Congress. Thus, it appears that the early period prior to the consolidation in question represents a fairly rapidly rising "demand" for NIMH services.

The period after the consolidation of St. Elizabeth's Hospital into the NIMH does not appear substantially different. Interest in the mental health field continued at a high level. The Narcotic Addiction Rehabilitation Act of 1966 (PL 89-793) emphasized treatment rather than punishment for offenders. This expanded the NIMH domain into the areas of drug addiction and alcoholism. Probably, this continued the growth of the NIMH budget beyond the year of consolidation, 1967.

The brief history of the mental health field indicates a growing demand for the NIMH services. Moreover, this demand appears slightly higher before consolidation. Therefore, one can reasonably expect that exogenous events prior to consolidation may conceal the hypothetical stimulative effect of consolidation on the budget.

Tables 6.1 and 6.2 display the evidence in their second columns. The NIMH exhibited an extremely high growth rate prior to consolidation of 18 percent and only 8 percent after consolidation. Since the growth rate after is smaller than before consolidation, this case requires no statistical test. Clearly, it falsifies the consolidation hypothesis.
development research, Alliance for Progress, utilization of democratic institutions, population programs, Food for Peace, and security supporting assistance.

The consolidation occurred on November 3, 1961. On this date the Foreign Assistance Act of 1961 and EO 10973 redelegated the function of the International Cooperation Administration and the Development Loan Fund to AID. This was a classic reorganization in which two agencies aiming to facilitate mutual cooperation between the United States and favored countries were brought together in a monopolistic fashion. The previous budgetary competition for mutual cooperation funds had been substantially reduced. This action should have reduced the elasticity of "demand" for mutual cooperation services.

The United States initially entered into the area of foreign assistance through participation in the United Nations Relief and Rehabilitation Agency (UNRRA) established in 1943. Later, the U.S. implemented the Marshall Plan in 1948. Both of these programs were considered temporary. However, the Mutual Defense Assistance Act of 1949 and the formation of the North Atlantic Treaty Organization (NATO) set the United States on a course of continuous bilateral foreign aid. This aid was defense oriented and primarily concerned with impeding the world-wide growth of communism.

The decade of 1950 was marked by very little attention to Latin American countries until around 1958 and the rise to power of Fidel

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13 Ibid., p. 645 and 664.

Castro in Cuba. The fear that communism would spread to the Americas stimulated new interest in less developed countries of Latin America. Around 1960 disillusionment pervaded Washington about our foreign aid program. This feeling centered around the following key factors: (1) Disorganization in our aid efforts; (2) Aid programs were not obviously successful; (3) Our bilateral aid did not stimulate a multi-lateral aid effort; (4) Countries receiving our aid seemed ungrateful; and (5) Concern was rising over our balance of payments situation. All of these factors encouraged a reevaluation of the U.S. foreign aid program.

President Kennedy recommended the following sweeping changes in the foreign aid program early in 1961: (1) Aid agencies should be consolidated into one super agency; (2) Emphasis should be shifted from anti-communism to economic development of less developed countries; (3) The program should emphasize self-help; (4) Foreign aid should be separate from military aid; and (5) The long-range should be emphasized over the short-range. Then, on March 13, 1961 President Kennedy initiated a program that became known as the "Alliance for Progress." He stated, "I propose that the American Republics begin on a vast new Ten Year Plan for the Americas--a plan to transform the 1960s into an historic decade of democratic progress..." Thus, presidential impetus launched a new aid program to Latin America with a new direction toward economic development.

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15 Ibid., p. 43.
16 Ibid., pp. 44-46.
The stimulation of aid programs in the early 1960s did not last very long. The lessons of the abortive Cuban invasion in 1961 and the Cuban missile crisis in late 1962 led to diplomatic efforts to ease East-West tensions. As a result, the perceived threat of communism to the Western Hemisphere seemed to diminish and congressional resistance to foreign aid mounted. For example, in 1963 Congress cut the Administration's foreign aid request by 34 percent. This was the largest cut since the program's inception in 1948. Thus, the aid program had a very brief period of rising expectations around 1961 and 1962, but this growth in "demand" was certainly short-lived.

The evidence over the test period of 1958 through 1966 does not support the consolidation hypothesis. One can readily gather this from Table 6.2. In fact, the real mean growth rate of actual outlays prior to consolidation was 6 percent, which was actually more than the 2 percent after consolidation. Consequently, no statistical test was even required. The jump of 10 percent in fiscal year 1963 must in part represent the beginning of the Alliance for Progress and perhaps the stimulative effects of the AID consolidation. However, the remaining period after the 1961 consolidation just does not support the hypothesis.

The case of foreign aid is rather unique in the sense that the AID clientele consists of foreign countries. As a result, one might expect them to be unable to stimulate "demand" for the AID programs as well as domestic interest groups. Also, this means that the

\[\text{Ibid.}, \text{p. 183.}\]
interest group linkages with the Congress will not be as powerful. Furthermore, since the fear of world-wide communism had diminished, factors of production such as the military could no longer stimulate AID "demand" as well as previously. Thus, one might conjecture that the primary and secondary effects of consolidation did not impact very dramatically on the AID budget.

The Federal Aviation Administration

The Federal Aviation Administration (FAA), formerly the Federal Aviation Agency, performs the following functions: (1) regulates air commerce to foster aviation safety; (2) promotes civil aviation; (3) promotes efficient use of airspace; and (4) operates a system of air traffic control for both civilian and military aircraft. It was created in 1958 to meet the complex needs of a rapidly expanding civilian and military airspace system.

Executive Order (EO) 10786 on November 1, 1958 consolidated the Airways Modernization Board (AMB) and the Civil Aeronautics Authority (CAA) into the new agency, the Federal Aviation Agency. Previously, the Civil Aeronautics Authority mainly regulated and promoted air commerce. Also, the CAA administered the rules and regulations promulgated by the Civil Aeronautics Board (CAB). Thus, the CAA was generally concerned with the operation of the nation's airways. In contrast, the Airways Modernization Board was established "to provide

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19U.S. General Services Administration, **op. cit.**, p. 356.
20**Ibid.**, pp. 623 and 635.
for the development and modernization of the national system of navigation and traffic control facilities to serve present and future needs of civil and military aviation" by the Airways Modernization Act (PL 85-133) of August 14, 1957. These functions appear so similar that it is quite reasonable to assume that the CAA and the AMB competed for budgetary resources. Consequently, their consolidation probably reduced this competition.

President Eisenhower became rather concerned about an impending crisis in the nation's airways around 1955. Consequently, in February, 1956 he appointed Edward P. Curtis to study the nation's long-range aviation needs. Curtis reported in 1957 that a serious impending crisis in aviation threatened the nation. This Curtis Report led to the quick passage of the Airways Modernization Act in 1957. However, a continuing crisis of confusion about what institutions controlled or should control the airways finally culminated in the Federal Aviation Act of August 23, 1958.

One can observe in Table 6.1 that over the test period from 1953 through 1963 the predecessor agency and the FAA exhibited gigantic real percentage increases in actual outlays for the fiscal years immediately prior and after consolidation, respectively. The mean growth before consolidation was 11 percent and after consolidation it was 21 percent. However, when one performs the designed

\[\text{\footnotesize 22}\text{Ibid., p. 20.}\]

\[\text{\footnotesize 23}\text{Ibid., p. 21.}\]
statistical test, one must accept the null hypothesis. That is, the FAA did not grow significantly more after consolidation than the predecessor agency did before consolidation. Because of the impending aviation crisis and President Eisenhower's personal interest in coordinating the Airways, demand for aviation regulation seemed to germinate early in the Eisenhower Administration, blossom, and then wilt in the early 1960s. Consequently, one finds it very difficult to separate or identify the effect of consolidation alone on the FAA budget.

Competition Hypotheses

The Incrementalist Viewpoint

Until recently, the literature on the budgetary process has been dominated by the theory of incrementalism. Aaron Wildavsky's *The Politics of the Budgetary Process* succinctly states the essence of budgetary incrementalism as follows: "The largest determining factor of the size and content of this year's budget is last year's budget." Wildavsky supports this point by using appropriations data for 37 agencies over a 12-year period. These data showed that about one-third of the cases fell within a percentage change range of zero through plus or minus five percent. Moreover, one-half were within the ten percent range and less than one-tenth changed by more than fifty percent.

24 The large difference in the growth rates (10%) might suggest that this evidence would reject the null hypothesis. However, the fact that the variance in the statistical test was so large implied that the estimated t value would be smaller than, say, in the case of the SRS.

Richard Fenno's analysis in The Power of the Purse arrives at conclusions very similar to Wildavsky's.²⁶ Fenno observed that the House Appropriations Committee satisfies two basic expectations of the entire House. First, it funds programs authorized by Congress. Second, it funds them at an economical level. As a result of meeting these overall expectations, the House Appropriations Committee generally cuts the agency's request, but increases its appropriations over the previous year. This results in a moderate change in the agency's budget over the previous year. Hence, in terms of appropriations its budgetary decisions appear incremental.

Both of the above incremental analyses rely on the concept of a budget base. Wildavsky compares the budget to an iceberg with the largest portion (the base) below the surface and beyond the control of anyone in the budgetary process. The existence of mandatory spending, prior long-term commitments, and permanent appropriations contribute substantially to this base. However, neither analysis rigorously tests the hypothesis that the most important determinant of this year's appropriations is last year's appropriations. The data seem to support the argument, but there were a few aberrant cases that could not be explained by incrementalism. Wildavsky dismissed these cases as representing only a few agencies with predictable cyclical fluctuations, such as the Census Bureau. Certainly, the unusual cases should be explored more fully.

Two lingering questions remained unanswered from the above analyses: (1) What was an increment?, and (2) Which changes were

²⁶Richard Fenno, op. cit., p. 410.
non-incremental? If one defines an increment as any change of ten percent or less, then about one-half of the changes in Wildavsky's data were non-incremental. Are these merely unusual cases? As William Moreland has recently argued, the facts as presented by both Wildavsky and Fenno neither confirm nor deny the incremental hypothesis. 

Surely, the evidence they presented is mixed.

Davis, Dempster, and Wildavsky presented a more rigorous test of the incremental hypothesis in "A Theory of the Budgetary Process." They postulated eight simple, linear decision rules for both the agency and Congress and then tested them using data from fifty-six non-defense agencies over the period from 1947 through 1963. For example, their first equation stated that the agency's budget request is a fixed mean percentage of its previous year's appropriations plus an error term. After extensive analysis, the authors concluded that "The empirical results support the hypothesis that, up to a random error term of reasonable magnitude, the budgetary process of the United States government is equivalent to a set of temporally stable linear decision rules." The two "most popular decision equations" for agencies and Congress (selected 44 times out of 66 cases) directly supported the incrementalist hypothesis.

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29 Ibid., p. 537.

30 Ibid.
One can readily discern this through a process of substitution by using these two "most popular equations" as follows:

(1) \[ X_t = \beta y_{t-1} + \xi_t \]
(2) \[ y_t = a_0 x_t + \eta_t \]

Substituting \( X_t \) into \( y_t \), we get

(3) \[ y_t = a_0 (\beta y_{t-1} + \xi_t) + \eta_t \]

where:
- \( X_t \) is the appropriation requested by the Bureau of the Budget for any given agency for the year \( t \).
- \( y_t \) is the appropriation passed by Congress for any given agency in the year \( t \) (Excluding supplementals).

Thus, as one can gather from equation (3), their results substantially supported the incrementalist hypothesis. In most cases examined this year's appropriations \( (y_t) \) were a function of last year's appropriations \( (y_{t-1}) \) plus an error term(s).

The Non-incrementalist Viewpoint

Recently, Randall B. Ripley and Grace A. Franklin have compiled evidence in a forthcoming book entitled, *Policy-Making in the Federal Executive Branch*, which casts doubt upon the singular explanatory power assigned to last year's appropriations by the incrementalists. Ripley and Franklin conceptualized the "bureaucratic policy arena" as containing four basic components: (1) the external environment; (2) the internal environment; (3) policy actions; and (4) policy results. 31 The external environment contains such elements as public

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opinion, party strength, and economic and social conditions. The internal environment contains such characteristics as agency structure, characteristics of agency personnel, and characteristics of decision-making processes. These two environments intersect, since elements of one are often elements of the other. Policy actions are activities in which the agency engages and policy results are the effects on society stemming from policy actions. These elements were analyzed using an extensive data base including as many as thirty-nine agencies in the federal executive branch from 1952 through 1971. The purpose of this analysis was to determine the most important influences on budgetary policy actions.

The Ripley-Franklin empirical analysis does not support the incrementalist viewpoint. Their basic conclusion was two-fold. First, if one defines an increment as a change of at most plus or minus ten percent, then "budgetary policy actions" are significantly non-incremental. Second, "previous budgetary actions were not the most explanatory variables." Moreover, they found that variables related to economic and social conditions, agency maturity, party strength, and coalitions supportive of the agency had more explanatory power than previous budgetary policy actions. Since the findings will surely create some degree of dissonance in the field of budgetary theory, it is important to relate Niskanen's model to both incrementalism and the Ripley-Franklin results. The next section attempts to fit Niskanen's model to the evidence.

Where Does Niskanen's Model Fit?

Incrementalist?

Niskanen's theory of supply by bureaus would be consistent with the incrementalist viewpoint only under very restrictive conditions. *Ceteris paribus*, changes in an agency's budget (expenditures) could result from two types of "demand" changes. First, the "demand" for an agency's services could shift uniformly up or down, which would lead to an increase or decrease in the budget, respectively. Now, if all changes in "demand" for the various agencies in the executive branch implied no more than a plus or minus ten percent change in the budget, then Niskanen's model would yield results consistent with incrementalism (II1.5 and II1.7). However, due to substantially different exogenous influences on agencies and their promotional power, it is doubtful that the budget growth rates would be so uniform. Indeed, the real fiscal year growth rates of the four agencies examined earlier range from -15 percent to +57 percent. Eighteen of these growth rates fall within the ten percent range, but nineteen exceed this arbitrary definition of incremental change. Second, consolidation of certain bureaus could also lead to higher budget growth rates than other agencies. Thus, if the consolidation hypothesis is eventually supported by the data, executive reorganization could be an additional reason why budgeting is not incremental.

Changes in a bureau's cost structure can also affect budget growth rates. First, uniform changes in costs, *ceteris paribus*, could also increase the budgets of budget-constrained bureaus, while not affecting demand-constrained bureaus (II3.4 and II3.5). This would
Imply differentials in growth rates of budgets. For example, if both types of bureaus face uniform "demand" increases that imply budget increases of ten percent, but they have also uniformly reduced their marginal costs, then the budget-constrained bureau’s budget will grow at a faster rate than ten percent. Second, *ceteris paribus*, if the number of alternative suppliers increases and the elasticity of "supply" increases as a result, then the budget-constrained bureau’s budget will grow, but a demand-constrained bureau’s budget will not grow (114.3 and 114.4). Hence, both types of cost changes could lead to differentials in budget growth rates between bureaus.

A relevant example will illustrate this difference. If the Air Force is budget-constrained and creates more competition between contractors bidding for research, development, and production rights to an airplane, then its budget will expand. Thus, according to Niskanen’s model the Air Force would become more inefficient. Since economists have often recommended competitive practices during these stages of the production process, this implication contradicts the conventional wisdom. Moreover, the demand-constrained bureau has no incentive to implement these competitive procedures, because it does not lead to a larger budget. Thus, the prevalence of demand-constrained bureaus would explain why competitive procedures have not been ambitiously adopted in the federal executive branch.

Unless the net "demand" and "supply" effects on the budgets of agencies in the federal executive branch distribute quite uniformly, it is not likely that Niskanen’s model would lead to budgetary effects consistent with incrementalism. However, it is conceivable that these
effects could explain the "shift points" in the otherwise temporally stable decision equations of Davis, Dempster, and Wildavsky. Ceteris paribus, a large and increasing growth rate in a bureau's budget could result from an effective promotional campaign. If this growth rate were substantially different from an earlier period, then a "shift point" could be identified. Indeed, "shift points" could also result from consolidation, but the initial tests yield mixed results. The relative temporal instability of Davis, Dempster, and Wildavsky's decision equations over their entire test period suggests that there are influences exogenous to their simple decision rule equations. Niskanen's model may help to identify these exogenous influences.

Non-Incrementalist?

Since Niskanen's model does not seem generally consistent with the theory of budgetary incrementalism, perhaps it is consistent with the Ripley-Franklin findings. These results are stated in the form of eight clinical messages to bureaucrats. The following discussion states each message separately and then discusses it in the context of Niskanen's model. The extent to which Niskanen's model is consistent with these findings should at least demonstrate its ability to describe or explain budgetary phenomena.

1. If an administrator wants to maximize the responsiveness of his agency to social conditions then he should self-consciously identify the issue areas in which the agency's programs have impact because the constraints in different issue areas are different and the administrators can package

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33 Davis, Dempster, and Wildavsky, op. cit., p. 538.
programs to increase their relevance to different issue areas.34

Why would an administrator want to maximize the responsiveness of his agency to social conditions? According to Niskanen's model, the answer would be to maximize the budget. The earmarking of tax revenue is an effective way in which a bureau could link itself with social or economic conditions. For example, the federal interstate highway system has been financed through the earmarking of gasoline taxes. This arrangement has built in substantial growth in "demand" for the Federal Highway Administration's services. As the population became more mobile through the use of the automobile, it consumed more gasoline. As we consumed more gasoline, more tax revenue flowed into the highway trust fund. As more revenue flowed into the highway trust fund, more interstate highways were built. As more interstate highways were built, the population became more mobile. Consequently, as long as no constraining factor intervened in this growth process (such as an oil crisis), demand for highways continued to increase.

The highway trust fund arrangement was tremendously beneficial not only to the Federal Highway Administration in terms of budget maximization, but also to a constellation of interests surrounding its programs. First, factors of production such as highway contractors and construction workers benefited through the expanded derived demand for their services. Second, tourists and truckers benefited directly from the increased mobility provided by the new highways. Third, the tourist business and the automobile industry also experienced increases

34Randall B. Ripley and Grace A. Franklin, op. cit.
in demand for their services as a result of this highway growth. However, new constraints have recently confronted this system. The oil crisis and the pollution problem in part created by the pervasive use of the automobile have dramatically impacted on the economy. Since we were locked into this trust fund arrangement, the demand for transportation was limited to an expression of the demand for highways. The consequence may have been an over-supply of highways without due consideration for other transportation alternatives. Thus, through this highly effective technique of budget maximization, an ultimate result may have been an inefficient national transportation system.

2. If an administrator wants to maximize the number of dollars available to his agency through congressional appropriations then he should be aggressive in increasing requests for appropriations over previous requests and over previous appropriations figures. 35

This message is certainly consistent with Niskanen's model. The budget-maximizing bureaucrat should aggressively seek to expand his budget, particularly if the bureau is budget-constrained. Once he can stimulate "demand" well enough to move into the demand-constrained region, he can maximize the bureau's budget up to the point that the sponsor receives no additional benefit from an additional unit of output. At this point the bureau has much organizational slack, which it can use in a discretionary manner to promote its services further. Also, organizational slack can serve as a buffer in times of adversity. For example, if costs of production increase dramatically due to inflation, it has a financial buffer against the reduction in output that

35 Ibid.
would face a budget-constrained bureau. Thus, the attractive discretionary uses of organizational slack should encourage the bureaucrat to seek a budget maximum aggressively.

3. If an administrator wants to maximize the number of dollars available to his agency then he should concentrate more heavily on building support within the executive branch (especially the Office of Management and Budget) than on building support within Congress. 36

Niskanen's model does not explicitly treat the Office of Management and Budget (OMB) as separate from the bureau. However, this finding is consistent with Niskanen's assumption that the sponsor is passive. That is, the sponsor will permit the expansion of a bureau far beyond the point at which marginal benefits equal marginal costs to at least the point at which total benefits equal total costs. Indeed, in the demand-constrained case the bureau expands to the point where the marginal benefits equal zero. Thus, support of the OMB could be more important, since Niskanen assumes the full support of Congress. Indeed, OMB may act as one of the few restraining influences in the budgetary process.

4. If an administrator wants to maximize the number of dollars available to his agency then he should actively seek public attention and support for the agency from the President. 37

This finding is very consistent with Niskanen's model. An increase in favorable public opinion or presidential support should stimulate the "demand" for a bureau's services and thus increase its budget. This finding is particularly important in the AID case, where the

36 Ibid.
37 Ibid.
presidential indorsement was described as a positive exogenous influence on AID's "demand." However, one could argue that a presidential indorsement is a sign that an agency is in trouble. This point is refuted by the above Ripley-Franklin finding, which further supports the discussion of the AID case.

5. If an administrator wants to maximize the number of dollars available to his agency he should attempt to increase the size of his agency simply in terms of total number of employees.38

Niskanen's model does not explicitly treat the number of employees as a variable. Implicitly, the number of employees may simply be a function of the budget, rather than vice versa. For example, a demand-constrained bureau could use its organizational slack to hire new employees, who could help to stimulate further demand for the bureau's services. Also, to the extent that consolidation means incorporating another agency into an already existing agency, the agency's number of employees would rise in addition to its budget. Thus, if consolidation is a tool through which the agency can increase its employee size in addition to its budget, this finding is consistent with Niskanen's model.

6. If an administrator wants to maximize the number of dollars available to his agency then he should attempt to minimize congressional controversy over the agency's programs.39

Again, Niskanen's model assumes that the sponsor is passive. If controversy develops, then congressmen may examine the benefits and

38 Ibid.
39 Ibid.
costs more closely. As a result, analysts may discover substantial organizational slack within the agency. Then, the Congress could conclude that a cut in the bureau's budget would not reduce the amount of services supplied by the bureau in a given fiscal year. Hence, controversy could lead to a cut in an agency's budget. Certainly, this finding is consistent with Niskanen's model.

7. If an administrator in a relatively poor agency wants to improve the budget of his agency then he should work particularly hard to get authorization to hire additional supergrades and he should make sure that all such slots are filled.

Niskanen's model does not deal directly with the personnel structure of organizations. However, if additional supergrades enhance the technical efficiency with which the bureau organizes its inputs, then this would shift the minimum marginal cost function downward. This downward shift would increase the budget of a budget-constrained bureau, but have no effect on a demand-constrained bureau. Since budget-constrained bureaus are likely to be relatively poor, this explanation using Niskanen's model seems entirely plausible.

8. If an administrator wants to maximize the number of dollars available to his agency through congressional appropriations then he should spend all of the money available to his agency for a fiscal year before the end of that fiscal year.

This message relates directly to Niskanen's concept of organizational slack. The demand-constrained bureau must conceal this "fat"
in the organization by making certain that it is spent each year. Otherwise, the sponsor would quickly realize that it had granted a budget too large for the output produced by the bureau. Certainly, in the short-run leaving unspent funds at the end of the fiscal year would be inconsistent with budget maximization.

The above discussion demonstrates that one can construct an analytical argument using Niskanen's model consistent with the recent Ripley-Franklin findings. This discussion is in no way a scientific test of Niskanen's theory, but does illustrate its potential as both an analytical and explanatory tool. Indeed, the methodological difficulties of constructing a rigorous scientific test of Niskanen's theory suggest that its use as an analytical tool may currently be more fruitful. Further attempts to use it as an analytical tool could illuminate its value in practice far beyond any sterile statistical tests of a limited number of hypotheses. The discussion of the Ripley-Franklin clinical messages is but one example of how one could pursue this process.

**Conclusion**

The limited evidence presented in this chapter on a rudimentary test of the consolidation hypothesis leads to a three-fold conclusion. First, even this simple statistical test presents problems, which often one can only solve with an arbitrary decision. For example, how long should the test period extend through time? Is five years before and after consolidation too many or too few years? Perhaps one should examine only the year before and the year after, but then
one could not test for statistical significance. Second, the ceteris paribus assumption simply does not hold very well. Even in these limited cases, the exogenous influences may have swamped the effect of consolidation. Third, it simply is not clear from the evidence that consolidation is an important factor in the growth of budgets. Only one case in four supported the consolidation hypothesis. Consequently, the evidence presented is inconclusive.

The comparison with other theories on budgeting leads to two basic conclusions. First, Niskanen's model is consistent with the theory of budgetary incrementalism only under highly restrictive and unlikely conditions. Second, one can incorporate the recent Ripley-Franklin findings into Niskanen's model. Given this descriptive or explanatory power, Niskanen's theory could be used as an analytical model to explore further case studies of bureaus. For example, since Niskanen's model implies that demand-constrained bureaus have no incentive to adopt economists' recommendations to implement competition among suppliers of factors of production, such an approach may be a fruitless policy to recommend. Perhaps other alternatives should be explored. The final chapter considers some of these alternatives.
CHAPTER VII

SUMMARY AND CONCLUSIONS

William A. Niskanen's theory of supply by bureaus is an ingenious application and extension of the economics paradigm to the study of bureaucracy. It challenges the well-accepted public administration principle of consolidation. If the evidence supports this theory, the public administrators may have been prescribing a self-defeating policy to achieve the goal of efficiency. Hence, this theory could potentially revolutionize executive reorganization policy in American public administration.

The contribution of this study is basically five-fold. First, it demonstrates the policy relevance of Niskanen's theory to modern public administration. Second, it uses a unique graphical presentation to examine the deductive validity of Niskanen's basic argument. Third, it formally and informally evaluates Niskanen's theory. Fourth, it performs a rudimentary test of the consolidation hypothesis. Fifth, it discusses the theory's explanatory power and potential as an analytical tool. Each of these analyses leads to some basic conclusions about the theory, which one can briefly summarize.

First, the discussion developing the policy relevance of Niskanen's theory demonstrates how well entrenched the principle of consolidation is in public administration thought. Even the devastating attacks upon
this principle by both Dwight Waldo and Herbert Simon have not stimulated a revision in reorganization policy. This policy represents a classic case of goal displacement in which the alleged means to achieve efficiency has supplanted the goal of efficiency. Thus, the goal of executive reorganization policy has become consolidation, which according to Niskanen's theory paradoxically decreases efficiency. Certainly, the challenges to this principle mounted by Waldo, Simon, and Niskanen suggest that modern public administration should reevaluate its acceptance of this principle.

Second, the intersubjective examination of Niskanen's theory is a major contribution of this study. Using a common technique of graphing functions along with their derivatives, it replicates Niskanen's deductions. Thus, Niskanen's theory of supply by bureaus is deductively valid. Moreover, this unique graphical technique provides an analytical framework in which one can evaluate policy proposals. For example, it is normally assumed that competition among suppliers of factors of production leads to efficiency. However, this model demonstrates that the promotion of competition among suppliers of factors of production surprisingly leads to more inefficiency. Clearly, the application of this analytical framework could help to enhance the rationality of executive organization policy.

Third, the formal and informal evaluation of Niskanen's theory leads to one very important conclusion. The theory lacks generality, because of the highly restrictive conditions required by the competitive norm. However, despite this lack of generality, the theory scores
extremely well under the criteria of falsifiability and testability. One must reserve judgment until its degree of confirmation has been well established. In contrast, Herbert Simon has demonstrated that the four principles of administrative management (specialization, span of control, unity of command, and consolidation) do not constitute a logically consistent system. Hence, modern public administration continues to follow contradictory administrative management principles. Although Niskanen's theory of supply by bureaus is not methodologically perfect, it is certainly more logically consistent than the conventional public administration practice.

Fourth, due to severe measurement difficulties, Niskanen's theory currently is not readily testable with available data. Moreover, even when one formulates a simple statistical test of the consolidation hypothesis, one confronts difficult methodological decisions for which only arbitrary answers exist. The evidence presented suggests that potential exogenous influences on the budget render an empirical test of the consolidation hypothesis extremely difficult. Consequently, this study only presents a beginning attempt at scientific verification and the results are quite ambiguous.

Fifth, the theory has explanatory and analytical potential. It yields implications which are both nontrivial and provocative. The extent to which it can create controversy surrounding previously well-accepted organization policies may help to perfect those policies. Ultimately, the production of public services may become more efficient. In addition to continuing the scientific verification process, its use
as both an explanatory and analytical tool presents fruitful avenues for further research.

Finally, Niskanen's theory implies that a competitive bureaucracy would be more efficient than a monopolized bureaucracy. Although Niskanen's theory lacks generality, it certainly is more logically consistent than the administrative management principles that have encouraged a monopolized bureaucracy. Because both theoretical approaches have weaknesses, it is difficult to definitely choose between them. Perhaps some experimentation with both arrangements is justified. Despite the weaknesses in Niskanen's model, under certain conditions the argument supports limited experimentation with competitive bureaus.
APPENDIX A

HYPOTHESES DERIVED FROM NISKANEN'S MODEL
APPENDIX A

HYPOTHESES DERIVED FROM NISKANEN'S MODEL

H1. Given the demand for services represented by the collective organization, all bureaus are too large, that is, the budget and output of all bureaus will be larger than that which maximizes the net value to the sponsor. (p. 49)

H2. As a consequence of the overly large equilibrium output, all bureaus which purchase factors on a competitive market with rising supply prices generate a larger net value to the owners of specific factors used in the production of the bureau's services than would be the case at a lower, optimal output level. (p. 50)

H3. Some bureaus, particularly new ones (for which the demand has only recently become higher than the minimum cost) and bureaus that are faced by a substantial exogenous increase in costs, supply the equilibrium level of services at the minimum possible budget. In contrast, other bureaus, particularly older ones (for which demand has continuously increased relative to costs) and bureaus that are faced by a substantial exogenous reduction in costs, supply the equilibrium level of services at a budget higher than the minimum necessary costs. (p. 50)

H4. Some bureaus, specifically those that operate in the budget-constrained region and face increasing prices for specific factors, may exercise factor price discrimination. They have a larger budget and output of services (and a lower average budget per unit of output) than other bureaus with similar demand and cost conditions that pay competitive factor prices. Such factor price discrimination is most likely to be used on those specific factors which are weakly represented by the officers of the sponsor organization. (p. 52)

H5. Some bureaus, specifically those in the budget-constrained output region, seek out and use the minimum cost combination of the available factors and processes to supply the equilibrium output. Factors or processes will be used in a combination such that the marginal cost per unit of output for all factors used will be the same. Improvements in efficiency lead to both a higher budget and output, but to a lower average budget per unit of output. At the efficient combination of factors or processes
relatively more of those processes for which the marginal costs increase less rapidly are used, compared to the use of only one process. Improvements in efficiency may generate either more or less factor surplus. (pp. 57-58)

H6. Some bureaus, specifically those in the demand-constrained output region, are characterized by indeterminate production behavior. These bureaus may or may not use efficient combinations of factors or processes, but there is no incentive inherent in the bureaucratic form that leads them to seek out and use efficient combinations. For these bureaus, more efficient factor combinations will not lead to any change in their budget, output, or factor surplus. (p. 58)

H7. A bureau will supply an output up to twice that of a competitive industry faced by the same demand and cost conditions. (p. 64)

H8. At the equilibrium level of output, a bureau will generate smaller net benefits than a competitive industry but, in the absence of factor price discrimination, a larger factor surplus. This suggests that the owners of specific factors will be stronger advocates of the bureaucratic supply of a service than will most beneficiaries of the service. (p. 64)

H9. At the equilibrium level of output, a bureau may appear to be nearly as efficient as a competitive industry (in terms of average costs per unit of output), but this average cost is realized only at the higher output level, where the marginal value of the service is less than the marginal cost. (p. 64)

H10. The minimum marginal cost function of a bureau, like that of a profit-seeking monopoly, will not be revealed by its budget and output proposals. The budget and output combinations proposed by a bureau will suggest that the marginal costs decline with output, regardless of the shape of the minimum marginal costs. (p. 65)

H11. The output and the budget of the bureau operating in the budget-constrained region will grow faster than those of a competitive industry faced by the same increase in demand. For constant costs, the rate of increase of both output and budget will be twice that of a competitive industry. The output of a bureau operating in the demand-constrained region will generally grow faster than a competitive industry; when marginal costs are constant, however, the rate will be the same. In this region the budget of a bureau will grow proportionately with the square of the demand increase. (p. 77)

H12. The output and budget of a bureau operating in the budget-constrained region will increase in response to a reduced
elasticity of demand for its service. In the demand-constrained region the output will decrease, but the budget will increase in response to a reduced elasticity of demand. Bureaus in either region should be expected to engage in promotional activities to reduce the elasticity of demand for their service. (p. 77)

H13. The output and budget of a bureau operating in the budget-constrained region will always increase at a faster rate than for a competitive industry faced by the same uniform reduction in marginal costs. For constant marginal costs, the rate of increase of output will be twice that of a competitive industry. The budget of a bureau will increase quite rapidly in response to an initial reduction in marginal costs and then less rapidly to equal successive reductions. Bureaus operating in this region have an incentive to identify and implement cost-reduction practices. In the demand-constrained region, the output and budget of a bureau are invariant to the level of marginal costs. (p. 77)

H14. The output and budget of a bureau operating in the budget-constrained region will increase in response to an increased elasticity of minimum marginal cost function. Bureaus in this region should be expected to choose production processes with a lower marginal cost at higher output levels. In the demand-constrained region, both the output and budget of a bureau are invariant to the slope of the minimum marginal cost function. (p. 77)

APPENDIX B

PROOF OF H11.5
APPENDIX B

PROOF OF H11.5

Budget-Constrained Bureau

1. \( \frac{\delta B_B}{\delta a} > \frac{\delta B_C}{\delta a} \)

2. \( \frac{(2a-c) - (2ab-2bc)}{(b+d)} > \frac{(2a-c) - (4ab-4bc)}{(2b+d)} \)

3. \( \frac{(2a-c) (b+d)^2 - (2ab-2bc) (b+d)}{(b+d)^3} > \frac{(2a-c) (2b+d)^2 - (4ab-4bc) (2b+d)}{(2b+d)^3} \)

4. \( \frac{(2a-c) (b+d) - (2ab-2bc)}{(b+d)^2} > \frac{(2a-c) (2b+d) - (4ab-4bc)}{(2b+d)^2} \)

5. \( \frac{2ab+2ad-cb-cd-2ab+2bc}{(b+d)^2} > \frac{4ab+2ad-2bc-cd-4ab+4bc}{(2b+d)^2} \)

6. \( \frac{2ad-cd+bc}{(b+d)^2} > \frac{2ad-cd+2bc}{(2b+d)^2} \)

7. \( \frac{d(2a-c)}{(b+d)^2} + \frac{bc}{b^2+2bd+d^2} > \frac{d(2a-c)}{(2b+d)^2} + \frac{2bc}{4b^2+4bd+d^2} \)

8. \( \frac{d(2a-c)}{2bc(b+d)^2} + \frac{1}{1/2 (b^2+2bd+d^2)} > \frac{d(2a-c)}{2bc(2b+d)^2} + \frac{1}{4b^2+4bd+d^2} \)

9. \( \frac{d(2a-c)}{2bc(b+d)^2} + \frac{1}{b^2/2+bd+d^2/2} > \frac{d(2a-c)}{2bc(2b+d)^2} + \frac{1}{4b^2+4bd+d^2} \)

Competitive Industry

Consider the first expression on both sides of the inequality.

Since the numerators are equal and the denominator on the right side exceeds the denominator on the left side, the expression on the left side exceeds that on the right. Now, consider the second expressions on both sides of the inequality. Again, the numerators are equal, but the denominator on the right side exceeds the denominator on the left. Thus, the left side again exceeds the right side. Therefore, since
both expressions added on the left side exceed the expressions added on the right side, the entire left side exceeds the right side. This proves the validity of H11.5.
APPENDIX C

PROOF OF H11.6
APPENDIX C

PROOF OF H11.6

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<tr>
<th>Budget-Constrained Bureau</th>
<th>Competitive Industry</th>
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<tbody>
<tr>
<td>1. $\delta B_b/\delta a$</td>
<td>$\delta B_c/\delta a$</td>
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<tr>
<td>2. $\frac{(2a-c) - (2ab-2bc)}{b}$</td>
<td>$\frac{(2a-c) - (4ab-4bc)}{2b}$</td>
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<tr>
<td>3. $\frac{b^2(2a-c) - (2ab-2bc)}{b^2}$</td>
<td>$\frac{4b^2(2a-c) - (4ab-4bc)}{8b^3}$</td>
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<td>4. $\frac{b(2a-c) - (2ab-2bc)}{b^2}$</td>
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<tr>
<td>5. $\frac{2ab-bc+2bc}{b^2}$</td>
<td>$\frac{4ab-2bc+4ab+4bc}{4b^2}$</td>
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<tr>
<td>6. $\frac{bc}{b^2}$</td>
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<tr>
<td>7. $\frac{c/b}{c/(2b)}$</td>
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APPENDIX D

PROOF OF H13.3
APPENDIX D

PROOF OF H13.3

<table>
<thead>
<tr>
<th>Budget Constrained Bureau</th>
<th>Competitive Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. $\delta B_b/\delta c$</td>
<td>$\delta B_c/\delta c$</td>
</tr>
<tr>
<td>2. $\frac{-a + 2ab - 2bc}{b+d}$</td>
<td>$\frac{-a}{2b+d} + \frac{4ab - 4bc}{(2b+d)^2}$</td>
</tr>
<tr>
<td>3. $\frac{(-a)(b+d) + (2ab - 2bc)(b+d)}{(b+d)^3}$</td>
<td>$\frac{(-a)(2b+d) + (4ab - 4bc)(2b+d)}{(2b+d)^3}$</td>
</tr>
<tr>
<td>4. $\frac{(-a)(b+d) + (2ab - 2bc)}{(b+d)^2}$</td>
<td>$\frac{(-a)(2b+d) + (4ab - 4bc)}{(2b+d)^2}$</td>
</tr>
<tr>
<td>5. $\frac{-ab - ad + 2ab - 2bc}{(b+d)^2}$</td>
<td>$\frac{-2ab - ad + 4ab - 4bc}{(2b+d)^2}$</td>
</tr>
<tr>
<td>6. $\frac{ab - 2bc - ad}{(b+d)^2}$</td>
<td>$\frac{2ab - 4bc - ad}{(2b+d)^2}$</td>
</tr>
<tr>
<td>7. $\frac{b(a - 2c) - ad}{(b+d)^2}$</td>
<td>$\frac{2b(a - 2c) - ad}{(2b+d)^2}$</td>
</tr>
<tr>
<td>8. $\frac{1}{b^2 + 2bd + d^2}$</td>
<td>$\frac{2}{b(a - 2c) - ad}$</td>
</tr>
<tr>
<td>9. $\frac{1}{b^2 + 2bd + d^2}$</td>
<td>$\frac{2b^2 + 2bd + d^2/2}{b(a - 2c) - ad}$</td>
</tr>
</tbody>
</table>

Now, since the numerators on each side are equal one can consider the denominators. First, for $d > 0$, the first expression in the numerator of the entire denominator on the right exceeds the first expression on the left ($2b^2 > b^2$). Likewise, the second expressions are equal ($2bd = 2bd$). Finally, the third expression on the left exceeds that on the right ($d^2 > d^2/2$). Initially, this appears ambiguous. However,
APPENDIX D cont'd

given the Marshallian stability condition \((b > |d|)\), it follows that
\((b^2 + d^2) < (2b^2 + d^2/2)\). Thus, since the denominators of the entire
denominator are equal, the entire denominator on the right exceeds
that on the left. Therefore, the entire expression on the left
exceeds that on the right. H13.3 is valid.
BIBLIOGRAPHY


Key, V.O. "The Lack of a Budgetary Theory." The American Political Science Review, XXIV (December, 1940), 1137-1144.


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