
INSTITUTIONAL ANALYSIS

Editors, Michael D. McGinnis and Elinor Ostrom

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POLYCENTRICITY AND LOCAL PUBLIC ECONOMIES

*Readings from the
Workshop in Political Theory
and Policy Analysis*

Michael D. McGinnis, Editor

Ann Arbor

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Contents

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List of Figures	viii
List of Tables	x
Series Foreword	xiii
Acknowledgments	xviii

Introduction *by Michael D. McGinnis*

1

Part I. Conceptual Foundations of Institutional Analysis

Chapter 1.	The Organization of Government in Metropolitan Areas: A Theoretical Inquiry <i>by Vincent Ostrom, Charles M. Tiebout, and Robert Warren</i>	31
Chapter 2.	Polycentricity (Part 1) <i>by Vincent Ostrom</i>	52
Chapter 3.	Public Goods and Public Choices <i>by Vincent Ostrom and Elinor Ostrom</i>	75

Part II. Frameworks for the Study of Public Economies

Chapter 4.	A Behavioral Approach to the Study of Intergovernmental Relations <i>by Vincent Ostrom and Elinor Ostrom</i>	107
Chapter 5.	Polycentricity (Part 2) <i>by Vincent Ostrom</i>	119
Chapter 6.	Metropolitan Reform: Propositions Derived from Two Traditions <i>by Elinor Ostrom</i>	139

Part III. Empirical Research on Police Services

Chapter 7.	Why Do We Need Multiple Indicators of Public Service Outputs? <i>by Elinor Ostrom</i>	163
Chapter 8.	Does Local Community Control of Police Make a Difference? Some Preliminary Findings <i>by Elinor Ostrom and Gordon P. Whitaker</i>	176

Chapter 9.	Community Control and Governmental Responsiveness: The Case of Police in Black Neighborhoods <i>by Elinor Ostrom and Gordon P. Whitaker</i>	203
Chapter 10.	Size and Performance in a Federal System <i>by Elinor Ostrom</i>	232
Part IV. Implications for Metropolitan Governance		
Chapter 11.	Defining and Measuring Structural Variations in Interorganizational Arrangements <i>by Elinor Ostrom, Roger B. Parks, and Gordon P. Whitaker</i>	265
Chapter 12.	Neither Gargantua nor the Land of Lilliputs: Conjectures on Mixed Systems of Metropolitan Organization <i>by Elinor Ostrom and Roger B. Parks</i>	284
Chapter 13.	Citizen Voice and Public Entrepreneurship: The Organizational Dynamic of a Complex Metropolitan County <i>by Ronald J. Oakerson and Roger B. Parks</i>	306
Chapter 14.	Fiscal, Service, and Political Impacts of Indianapolis-Marion County's Unigov <i>by William Blomquist and Roger B. Parks</i>	329
Chapter 15.	Do We Really Want to Consolidate Urban Areas? [It's Like Deja Vu All Over Again] <i>by Roger B. Parks</i>	349
Part V. Continuing Challenges for Research and Policy		
Chapter 16.	Complex Models of Urban Service Systems <i>by Roger B. Parks and Elinor Ostrom</i>	355
Chapter 17.	Consumers as Coproducers of Public Services: Some Economic and Institutional Considerations <i>by Roger B. Parks, Paula C. Baker, Larry L. Kiser, Ronald J. Oakerson, Elinor Ostrom, Vincent Ostrom, Stephen L. Percy, Martha Vandivort, Gordon P. Whitaker, and Rick K. Wilson</i>	381
Suggested Further Readings		393
Contributors		397
Index		401

Figures

3.1	Types of Goods	78
6.1	Posited Relations Among Variables in the Metropolitan Reform Tradition	144
6.2	Posited Relations Among Variables in the Political Economy Tradition	150
8.1	Posited Relations of Small Size and Community Control with Intervening and Dependent Variables	179
10.1	The Theoretical Consolidation Model (Simplified Form)	232
10.2	The Operational Consolidation Model (Simplified Form)	233
10.3	The Alternative Operational Model (Simplified Form)	234
10.4	A Rival Methodological Model	235
10.5	The Independent Effects of Training Levels on Citizen Evaluations Controlling for Size of Police Department and Socioeconomic Status of Neighborhood	247
11.1	Fayetteville, North Carolina, SMSA	270
12.1	Frontier Production Possibility Curves	287
12.2	Graphical Representation of Relative Technical Efficiency	288
14.1	Marion County Townships and Pre-Unigov City of Indianapolis	333
16.1	Iso-Benefits Residuum Contours	368
16.2	Possibility and Utility Curves	369
16.3	Relationship Between Risk of Exposure to Citizen Monitoring Efforts and Multiplicity of Industry Structure	372
16.4	Bureau Chiefs' Indifference Curves in High and Low Multiplicity SMSAs	373
16.5	Frontier and Average Production Functions—Number of On-Street Cars	376
16.6	Frontier Production Possibility Curves	376
17.1	Production Relationships and Budget Functions	385

Having explored the relationship of polycentricity to different aspects of political decision making, I shall turn [in part 2] to some implications that polycentricity has for organizing research in the governance of metropolitan areas. Polycentricity implies quite different configurations of political relationships in metropolitan areas than would exist in a monocentric order. We can expect scholars from the two traditions to use different approaches, different concepts and languages and different methods. However, if these differences can be focused upon contradictory conclusions that derive from different theoretical analyses, then empirical research can be used to sort out the competing contentions.

CHAPTER 3

Public Goods and Public Choices

Vincent Ostrom and Elinor Ostrom

Until recently, the private sector and the public sector have been viewed as two mutually exclusive parts of the economy. The private sector is generally viewed as organized through market transactions. The public sector is generally viewed as being organized only through governmental institutions where services are delivered through a system of public administration. Principles of public administration traditionally called for the organization of services through an integrated command structure where all personnel are accountable to a single chief executive. Coordination in the private sector is attained by the market system that governs economic relationships through competitive buying and selling. Coordination in the public sector presumably is attained, by contrast, through a bureaucratic system in which superiors control subordinates in an integrated command structure that holds each public employee accountable to a chief executive as an elective public official.

During the last two decades, traditional presumptions about public sector organization have been subject to serious challenge. Economists studying public sector investment and expenditure decisions have observed that institutions designed to overcome problems of market failure often manifest serious deficiencies of their own. Market failures are not necessarily corrected by recourse to public sector solutions.

This section analyzes the basic characteristics of public services and the important role for diverse organizations, including private enterprises, in the delivery of such services. The public economy need not be an exclusive government monopoly. It can be a mixed economy with substantial private participation in the delivery of public services. Such a possibility offers impor-

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tant prospects for overcoming some public sector inefficiencies and providing taxpayers with an increased return for their tax dollars.

Public economies, however, are quite different from market economies. A private entrepreneur who decides to engage in the delivery of a public service by relying upon traditional market mechanisms is destined to failure. He must instead understand the logic of a public economy and learn to pursue his opportunities within those constraints. The *private delivery of public services* is a different ball game from the *private delivery of private goods and services*.

In clarifying the logic of a public economy, we shall first consider the nature of public goods as distinguished from private goods. We shall then explore the organizational possibilities for the public sector, including the development of marketlike arrangements. Such arrangements suggest an industry approach to public services with quite different implications for public administration.

The Nature of Public Goods

People have long been aware that the nature of goods has a bearing upon human welfare. Aristotle, for example, observed: "That which is common to the greatest number has the least care bestowed upon it." Within the last two decades an extensive literature has developed on the characteristics that distinguish public or collective goods from private or individual goods. In this discussion we shall consider exclusion and jointness of use or consumption as two essential defining characteristics in distinguishing between private and public goods. We shall also examine basic differences in measurement and degree of choice that have a significant bearing upon the organization of public services. Implications will then be drawn about some inherent problems of organizing economic relationships that involve public goods.

Exclusion

Exclusion has long been identified as a necessary characteristic for goods and services to be supplied under market conditions. Exclusion occurs when potential users can be denied goods or services unless they meet the terms and conditions of the vendor. If both agree, goods or services are supplied at a price. A quid pro quo exchange occurs. The buyer acquires the good, and the seller acquires the value specified.

Where exclusion is infeasible, anyone can derive benefits from the good so long as nature or the efforts of others supply it. The air we breathe can be viewed as a good supplied by nature, so exclusion is difficult to attain. A view of a building—whether seen as a "good" or a "bad"—is supplied by the efforts of others and is not subject to exclusion in normal circumstances. Air, noise, and water pollution are "bads" that an individual cannot exclude or

avoid except at a cost; conversely, an individual cannot be excluded from receiving a good when the pollution level is reduced.

Jointness of Use or Consumption

Another attribute of goods or services pertains to jointness of use or consumption. No jointness of consumption exists when consumption by one person precludes use or consumption by another person. In that case consumption is completely subtractible. A loaf of bread consumed by one person is not available for consumption by another: it is subtracted from the total that was originally available. A good *having no jointness* of consumption and with which exclusion is feasible is defined as a purely private good. Jointness of consumption, on the other hand, implies that the use or enjoyment of a good by one person does not foreclose its use or enjoyment by others; despite its use by one person, it remains available for use by others in undiminished quantity and quality. A weather forecast is an example of a joint consumption good.

Few, if any, joint consumption goods are perfectly nonsubtractable. The use and enjoyment of gravity as a force that firmly keeps our feet on the ground may illustrate the case of perfect *nonsubtractability*, but most joint consumption goods are instead subject to *partial subtractability*. At certain thresholds of supply, one person's use of a good subtracts *in part* from its use and enjoyment by others. Congestion begins to occur. Each further increase in use impairs the use of the good for each other person in the community of users. Highways, for example, become subject to congestion when the addition of more users causes delays and inconveniences for others. Fire protection, another joint consumption good, may deteriorate when a finite force experiences a high rate of demand. Such goods are then subject to degradation or erosion in their quality unless supply is modified to meet the new demand.

Both exclusion and jointness of consumption are characteristics that vary in degree rather than being all-or-none characteristics. The two extreme cases of jointness of consumption—complete subtractibility and complete nonsubtractability—give logical clarity in distinguishing *purely private* from *purely public* goods. Whenever use by one user subtracts *in part* from the use and enjoyment of a good by other users we have partial subtractability. In the same way we can think of exclusion as applying in degrees. A walled city can attain a high degree of exclusion by controlling admission to those who wish to reside, enter, and do business with the city. Even in the unwalled city, jurisdictional boundaries may be a way for distinguishing between residents and nonresidents where some public goods and services are primarily for the joint benefit of persons living within those boundaries. A weak form of partial exclusion may exist in such circumstances.

Exclusion and jointness of consumption are independent attributes. Both

characteristics can be arrayed in relation to one another. The jointness characteristic can be arrayed into two classes: *alternative uses*, which are highly subtractible and *joint uses*, which are nonsubtractable. Exclusion can also be arrayed into two classes, in which exclusion is either *feasible* or *infeasible*. Exclusion is technically infeasible where no practical technique exists for either packaging a good or controlling access by a potential user. Exclusion may also be economically infeasible where the costs of exclusion are too high. If these defining characteristics are then arrayed in a simple matrix, four logical types of goods are revealed as indicated in figure 3.1.

		Jointness of Use or Consumption	
		Alternative Use	Joint Use
E X C L U S I O N	Feasible	<u>Private Goods:</u> Bread, shoes, automobiles, haircuts, books, etc.	<u>Toll Goods:</u> Theaters, night clubs, telephone service, toll roads, cable TV, electric power, library, etc.
	Infeasible	<u>Common-Pool Resources:</u> Water pumped from a groundwater basin, fish taken from an ocean, crude oil extracted from an oil pool	<u>Public Goods:</u> Peace and security of a community, national defense, mosquito abatement, air pollution control, fire protection, streets, weather forecasts, public TV, etc.

Fig. 3.1. Types of goods

Market arrangements can be used to deliver either private goods or toll goods, that is, where exclusion is feasible. In the case of toll goods a price is charged for access or use, but the good is enjoyed in common. Special problems arise, as in a theater, where the conduct of one user may detract from the enjoyment of other users. The value of the good depends both upon the quality of the good produced and upon the way it is used by others.

In the case of a common-pool resource, exclusion may be infeasible in the sense that many users cannot be denied access. But, use by any one user precludes use of some fixed quantity of a good by other users. Each pumper in a groundwater basin, for example, makes a use of water that is alternative to its use by each other pumper. Each fish or ton of fish taken by any one fisherman prevents any other fisherman from taking those same fish. Yet no basis exists for excluding fishermen from access to fish in the ocean. Once appropriated from a natural supply, water can be dealt with as a toll good to be supplied to those who have access to a distribution system; similarly, once taken from the ocean, fish can be dealt with as a private good. Water management problems, typifying common-pool resources, are likely to be subject to market failure while water distribution problems typifying toll goods are

likely to manifest market weaknesses associated with monopoly supply.

The broad range of services rendered by governmental agencies may cover all different types of goods and services. The food supplied to schoolchildren under surplus commodity programs is an example of purely private goods. Most governmental services, however, are of the public good, toll good, or common-pool resource types. These variations may, for example, have significant implications for the development of user charges as substitutes for taxes and other marketlike mechanisms in the operation of governmental service activities. In this discussion we shall focus more upon the type characterized as public goods because they pose the more difficult problems in the operation of a public economy.

Before pursuing some of the implications that follow from joint consumption in the absence of exclusion, we shall consider two other characteristics of public goods and services. These relate to measurement and degree of choice. These characteristics also have important implications for the organization and delivery of public services.

Measurement

Since public goods are difficult to package or unitize they are also difficult to measure. Quantitative measures cannot be calculated like bushels of wheat or tons of steel. Qualitative measures such as the amount of dissolved oxygen in water, victimization rates, and traffic delay can be used to measure important characteristics of goods subject to joint consumption, but such measures cannot be aggregated in the same way that gross production can be calculated for a steel factory or for the steel industry as a whole.

The task of measuring performance in the production of public goods will not yield to simple calculations. Performance measurement depends instead upon estimates in which indicators or proxy measures are used as estimates of performance. By utilizing multiple indicators, weak measures of performance can be developed even though direct measures of output are not feasible. Private goods are easier to measure, account for, and relate to cost-accounting procedures and management controls.

Degree of Choice

Where a good is characterized by jointness of consumption and nonexclusion, a user is generally unable to exercise an option and has little choice whether or not to consume. The quality of a good or service is available under existing terms and conditions, and one's preference will not materially affect the quality of such a good. Furthermore, individuals may be forced to consume public goods that have a negative value for them. Streets, for exam-

ple, may become congested thoroughfares restricting the convenience of local residents and shoppers who are required to cope with the traffic whether they like it or not.

Yet, the structure of institutional arrangements may have some effect on the degree of choice that individuals have. Councilmen representing local wards would, for example, be more sensitive to protests by local residents about how streets are used in those wards than councilmen elected at large. Voucher systems, where individual use of a pro rata share of tax funds to procure services from alternative vendors of educational services, for example, may allow for a much greater degree of choice on the part of individual users. Educational services, however, have less the characteristics of a public good and more the characteristics of a toll good. Other forms of local option might exist in organizing public services. Table 3.1 summarizes several of the key characteristics associated with public and private goods.

TABLE 3.1. Public and Private Goods

Private Goods	Public Goods
Relatively easy to measure quantity and quality	Relatively difficult to measure quantity and quality
Can be consumed by only a single person	Consumed jointly and simultaneously by many people
Easy to exclude someone who doesn't pay	Difficult to exclude someone who doesn't pay
Individual generally has a choice of consuming or not	Individual generally has no choice as to consuming or not
Individual generally has a choice as to kind and quality of goods	Individual generally has little or no choice as to kind and quality of goods
Payment for goods is closely related to demand and consumption	Payment for goods is not closely related to demand or consumption
Allocation decisions are made primarily by market mechanism	Allocation decisions are made primarily by political process

Source: Authors and E. S. Savas. The tables in this chapter were worked out jointly with Savas, editor of the volume in which the essay was originally published.

Some Implications for Organization

Public goods—defined as goods subject to joint consumption where exclusion is difficult to attain—present serious problems in human organization. If a public good is supplied by nature or the efforts of other individuals, each individual will be free to take advantage of the good since he cannot be excluded from its use or enjoyment. A cost-minimizing individual has an incentive to take advantage of whatever is freely available without paying a price

or contributing a proportionate share of the effort to supply a public good. So long as rules of voluntary choice apply, some individuals will have an incentive to “hold out” or act as “free riders,” taking advantage of whatever is freely available. If some are successful in pursuing a holdout strategy, others will have an incentive to follow suit. The likely short-run consequence is that voluntary efforts will fail to supply a satisfactory level of public goods. Individuals furthering their own interests will fail to take sufficient account of the interests of others, and the joint good will inexorably deteriorate.

Market institutions will fail to supply satisfactory levels of public goods and services. Exclusion is infeasible. Therefore, to supply many public goods and services, it is necessary to have recourse to some form of collective action in which sanctions can be used to foreclose the holdout problem and to compel each individual to pay his share of the burden. In small groups, individuals may be successful in keeping account of each other's efforts and applying social coercion so that each person assumes a share of the burden to procure jointly used goods. But large groups are less successful in coping with the provision of public goods shared by a whole community of people. Each individual is more anonymous. Each person's share of the total good may seem insignificantly small. Each can function as a holdout with greater impunity. Potential recourse to coercion in levying taxes and preventing holdouts will be more important. This is the reasoning behind Aristotle's contention that the good or property shared in common by “the greatest number has the least care bestowed upon it.”

Patterns of organization that can mobilize coercive sanctions are necessary for the operation of a public economy. This is why people seek recourse to governmental institutions. The provision of law and order is simply one of many public goods that are important to the welfare of human societies. Market institutions will fail to supply such goods and services because markets require exclusion, exchange, and voluntary transactions.

But recourse to coercive sanctions and governmental organization does not provide both the necessary and sufficient conditions for the delivery of public goods and services under relatively optimal conditions. Instruments of coercion can be used to deprive others and make them worse off rather than better off. Governmental institutions permit those who mobilize majority support to impose deprivations upon those in the minority. Governmental institutions can become instruments of tyranny when some dominate the allocation of goods in a society to the detriment of others.

Furthermore, difficulties in measuring the output of public goods and services imply that governmental officials also will have difficulties in monitoring the performance of public employees. Management of public enterprises will be subject to even less effective control than the management of private enterprises where outputs can be measured in quantifiable units.

Where citizens have little choice about the quality of public services supplied to them they will also have little incentive to do anything about it. The costs of attempting to do anything about the services they receive are likely to exceed any tangible benefit that they themselves will receive. As a result, individuals face situations in which anticipated costs exceed anticipated benefits. The rational rule of action in such cases is to forgo the "opportunity" to accrue net losses.

The Organization of a Public Economy

The characteristics of nonexclusion, joint consumption, lack of unitization and direct measurability, and the small degree of individual choice pose substantial problems for the organization of a public economy. Recognizing that the world is composed of many different goods and services that have these characteristics, and that such goods come in many different forms, we are confronted with the task of thinking through what patterns of organization might be used to accommodate these difficulties and yield reasonably satisfactory results. Just as we can expect market weakness and failure to occur as a consequence of certain characteristics inherent in a good or service, we can also expect problems of institutional weakness and failure in governmental operations as a consequence of the characteristics of certain goods and services.

Furthermore, no solution will work by itself. Markets have important self-regulating or self-governing characteristics; but all market systems depend on nonmarket decision-making arrangements to establish and maintain property rights, to authorize and enforce contracts, and to provide other joint facilities including a common medium of exchange, common weights and measures, roads, and so forth, that are used by all market participants.

In considering the organization of a public economy, we shall reason through a number of the problems involved. First, we shall consider some basic elements in a public economy. There we indicate some basic assumptions and terms and characterize the function of collective consumption units and production units. The organization of both consumption and production requires explicit attention in a public economy. Multiple collective consumption units and multiple production units acting jointly to procure and supply particular types of goods or services that are jointly consumed by a community of people can, in turn, be viewed as elements in public service industries.

Second, we shall then examine some difficulties in the nature of public goods that pose special problems in the relationship of collective consumption units to production units in any particular public service industry. These problems include (1) financing; (2) regulating patterns of use; and (3) coproduction where service users are essential to producers.

Third, we shall then examine some opportunities for enhancing effi-

ciency and creating self-regulating tendencies in public service industries. Economies of scale can be realized among multiple units. Relationships among collective consumption units and production units can assume marketlike characteristics where competitive pressures enhance efficiency. Mechanisms for conflict resolution, however, must be available if conflicts, which are not amenable to voluntary agreement, are to be resolved effectively.

Some Basic Assumptions and Terms

It is useful to consider individuals as the basic unit of analysis, and to assume that goods are scarce and that individuals attach values to goods and services. We can stipulate a decision-making framework that structures opportunities and constraints for individuals to act in relation to one another. Then we can analyze the consequences when people choose strategies to enhance their well-being.

A public good, as defined in the preceding, is a good or service subject to joint use or consumption where exclusion is difficult or costly to attain. The essential difficulty in organizing public economies, thus, is on the consumption side of economic relationships. Governments, like households, might be viewed first as *collective consumption units*. Once the collective consumption aspects of governmental organization have been identified, we can then turn to the production side. Governmental agencies and private enterprises can be viewed as potential production units concerned with the supply and delivery of public goods and services. We shall distinguish between these two aspects by referring to "collective consumption units" and "production units." A single unit of government may include both types of organizations within its internal structure. Or, a governmental unit operating as a collective consumption unit may contract with another governmental agency or a private enterprise to produce public services for its constituents.

Collective Consumption Units

In the organization of collective consumption units the holdout problem must be avoided. Arrangements must be made for levying assessments, taxes, or user charges on beneficiaries. Strictly voluntary efforts to supply public goods and services will fail to yield satisfactory results. Authority to levy taxes or assessments or to coerce user charges is necessary to avert holdouts and to supply funds for jointly used goods or services.

Some forms of private organization have the authority to levy compulsory assessments upon members. Homeowners' improvement associations and condominiums may be organized under terms of deed restrictions so that all individuals buying a house in a subdivision or a unit in an apartment com-

plex are required to become and remain members so long as they continue to own the house or apartment. Bylaws of homeowners' improvement associations or condominiums provide for the election of officers to act on behalf of members and authorize the levy of assessments as the equivalent of a tax for the provision of joint services and facilities to be used in common by the residents of the subdivision or the apartment complex.

Each person acquiring property in such a subdivision or condominium voluntarily agrees to pay assessments and be bound by the terms of the bylaws as a part of the purchase contract. All other purchasers are required to do so as well. With unanimity about the appropriateness of the bylaws and their taxing authority assured, no single resident can function as a holdout and derive benefits from joint endeavors without paying a proportionate share of the costs. When effectively organized, homeowners' improvement associations and condominiums can undertake the provision of police protection services, recreation services, public works, and other efforts for the joint benefit of members.

Where property rights have already been vested and people want to procure services for their joint benefit, the problem of dealing with potential holdouts usually requires some form of governmental organization established through majority vote as a substitute for the unanimous consent of all property owners or residents. Various forms of municipal corporations and public service districts can be organized under such arrangements. An alternative option sometimes available is to create a special assessment or improvement district within an established unit of government to finance a special service for a particular neighborhood. Each of these public instrumentalities has authority, under the terms of its charter, to exercise governmental prerogatives to tax and to use criminal sanctions to enforce its rules and regulations.

Whereas the income received for providing a private good conveys information about the demand for that good, taxes collected under the threat of coercion say little about the demand for a public good or service. Payment of taxes indicates only that taxpayers prefer paying taxes to going to jail. Little or no information is revealed about user preferences for goods procured with tax-supported expenditures. As a consequence, the organization of collective consumption units will need to create alternative mechanisms to prices for articulating and aggregating demands into collective choices reflecting individuals' preferences for a quantity and/or quality of public goods or services.

An appropriately constituted collective consumption unit would include within its jurisdictional boundary the relevant beneficiaries who share a common interest in the joint good or service and would exclude those who do not benefit. The collective consumption unit would be empowered to make operational decisions without requiring unanimity: this is necessary to foreclose holdouts. It would hold a limited monopoly position on the consumption

side. It would have authority to exercise coercive sanctions, but it need not meet the criterion sometimes used to define a government as exercising a monopoly over the legitimate use of force for a society as a whole.

The choice of particular voting rules, modes of representation and rules applicable to making operational decisions about taxes, expenditures and levels of service needs to be viewed from a constitutional perspective where the consequences of such rules are estimated in choosing a particular structure of organization. The set of rules most likely to produce decisions that take account of citizen-consumer interests is preferred. Citizens are presumed to be the best judges of their own interests. Such rules provide mechanisms for articulating and aggregating demand in the absence of market prices and for translating demand into decisions about the level of service to be procured.

If action can be taken under a set of decision rules where the benefits for each individual can be expected to exceed costs, and costs can be fairly proportioned among beneficiaries, each individual would have an incentive to agree to such a form of collective organization, forgo holdout strategies and procure the joint consumption good. Substantial unanimity would exist among such a community to undertake collective action to procure a public good or service.

Production Units

A production unit, by contrast, would be one that can aggregate technical factors of production to yield goods and services meeting the requirements of a collective consumption unit. The organization of an appropriate production unit will require a manager who can assume entrepreneurial responsibility for aggregating factors of production and organizing and monitoring performance of a production team that would supply the appropriate level of a good or service.

A collective consumption unit may supply a public good or service through its own production unit. In that case, the collective consumption unit and the production unit would serve the same population. Yet, the constitution of the two units may be essentially separable. The chief executive or city council representing the collective consumption unit, for example, may bargain with managers of production units to secure an appropriate supply and delivery of public goods and services. The headlines in many local newspapers are filled with accounts of such negotiations. They frequently stress the conflict of interest between production units and those who represent the interests of citizens as consumers. Nevertheless, this is a very common organization pattern, typified by a municipality with its own police, fire, or street maintenance department.

As an alternative to organizing its own production unit, a collective consumption unit might decide to contract with a private vendor to supply a pub-

lic good or service. In that case, public officials would translate decisions about the quantity or quality of public goods or services into specifications used to secure bids from potential vendors, state the terms and conditions for contractual arrangements, and establish standards for assessing performance. The collective consumption unit would also need to employ its own manager who would function as a purchasing agent to receive information about costs and production possibilities from potential vendors, negotiate and contract with vendors, receive service complaints from users, and monitor vendors' performance in delivering services. The collective consumption unit would operate as a "provider" or "arranger" of the service and the private vendor as the "producer" or "supplier." Organizing the consumption functions in a public economy can be distinguished from organizing the production functions. We refer to the one as *provision*, the other as *production*. Some general characteristics of collective consumption units and production units are summarized in table 3.2. A variety of municipal services in the United States, including street sweeping, snow removal, solid waste collection and disposal, fire and police protection, engineering services, planning services, and construction of public works, among many others, is supplied by private vendors.

TABLE 3.2. Collective Consumption Units and Producer Units

Collective-Consumption Unit	Producer Unit
Generally, a government that aggregates and articulates the demands of its constituents	May be a unit of government, a private, profit-making firm, a not-for-profit institution, or a voluntary association
Has coercive power to obtain funds to pay for public services and to regulate consumption patterns	Aggregates factors of production and produces goods to the specification of a collective consumption unit
Pays producer units for delivering public goods	Receives payment from collective consumption unit for delivering public goods
Receives complaints and monitors performance of production unit	Supplies information to collective consumption unit about costs and production possibilities

Source: See table 3.1.

A third option is to establish standards of service that apply to all residents of a community and leave to each household the decision concerning what private vendor should supply service to that household. Multiple vendors may be franchised, or anyone wishing to do business under the terms and conditions specified by the collective consumption unit for such a service may do so. Solid waste collection is a service often supplied under such conditions. Such services are highly individualized with only a limited degree of joint use or consumption. The limited degree of jointness can be taken care of by applying common standards to all households and vendors.

A fourth option is to collect taxes, assuring that each contributes his proportionate share of the burden, and then make available a voucher to each household so that it can decide among alternative producers and service packages. If applied to educational services for example, a voucher would be issued for each child or person eligible for educational services. The decision of the type of school and curriculum to be selected would be left to the family rather than to school authorities. Services amenable to voucher arrangements have characteristics associated with toll goods where consumption benefits others as well. The community at large benefits from an individual's education apart from the separable benefit derived by each individual. Community contributions to each individual's education are then justified. If those benefits were as great or greater when expenditure decisions are made by the family unit rather than by educational authorities, then a voucher system would be justified. Vouchers have been used for housing (rent supplement vouchers), health services (Medicaid can be considered a form of health voucher), and even for food (food stamps). The last, while usually considered a private good, is like education in that everyone benefits by having no one starve.

A fifth possibility is for a collective consumption unit to contract with a production unit that is organized by a different unit of government. Many municipalities acting as collective consumption units contract with other municipalities, or some other unit of government, to supply police services, fire services, water storage and transmission services, educational services, library services, and a wide range of other public services.

A sixth way of organizing production occurs when a collective consumption unit decides to rely upon its own production unit to supply some components of a service but to rely upon other consumption and production units to arrange for other components of a service. Its own production unit may draw upon other producers to supply it with factors of production, serve as a purchasing agent to procure and monitor the delivery of supplemental services, or function as a joint producer supplying a mix of services rendered by the joint effort of multiple production teams. Any given collective consumption unit may rely upon the joint production efforts of several different producers in supplying and delivering a particular bundle of goods and services that is subject to joint consumption. It may also act in cooperation with other joint consumption units that are willing to contribute supplemental funds to procure a particular level of services. Options for obtaining public services are summarized in table 3.3.

Public Service Industries

As soon as we begin to array some of these options for organizing collective consumption units and production units, a wide variety of possibilities be-

TABLE 3.3. Options for Obtaining Public Services

A government that serves as a collective consumption unit may obtain the desired public goods by
1. Operating its own production unit <i>Example:</i> A city with its own fire or police department
2. Contracting with a private firm <i>Example:</i> A city that contracts with a private firm for snow removal, street repair, or traffic-light maintenance
3. Establishing standards of service and leaving it up to each consumer to select a private vendor and to purchase service <i>Example:</i> A city that licenses taxis to provide service, refuse collection firms to remove trash
4. Issuing vouchers to families and permitting them to purchase service from any authorized supplier <i>Example:</i> A jurisdiction that issues food stamps, rent vouchers, or education vouchers, or operates a Medicaid program
5. Contracting with another government unit <i>Example:</i> A city which purchases tax assessment and collection services from a county government unit, sewage treatment from a special sanitary district, and special vocational education services from a school board in an adjacent city
6. Producing some services with its own unit, and purchasing other services from other jurisdictions and from private firms <i>Example:</i> A city with its own police patrol force that purchases laboratory services from the county sheriff, joins with several adjacent communities to pay for a joint dispatching service, and pays a private ambulance firm to provide emergency medical transportation

Source: See table 3.1.

comes apparent. Such a system may have large numbers of autonomous units of government with substantial degrees of overlap among multiple levels of government. Many private enterprises and voluntary associations may function as integral parts of such a public service economy. Substantial separation of powers within each unit of government may exist where all decision makers are constrained by enforceable legal or constitutional limits upon their authority. Each citizen participates in multiple consumption units organized around diverse communities of interest through overlapping levels of government and is served by an array of different public and private producing units supplying any particular bundle of public goods or services.

Each citizen, in such circumstances, is served not by "the" government, but by a variety of different *public service industries*. Each public service industry is composed of the collective consumption units serving as providers and production units serving as suppliers of some types of closely related public goods or services that are jointly consumed by discrete communities of individuals.

We can then think of the public sector as being composed of many public service industries including the police industry, the education industry, the water industry, the fire protection industry, the welfare industry, the health services industry, the transportation industry, and so on. The governmental component in some industries, such as the police industry, will be proportionately larger than other industries, such as the health services or the transportation industry. But most public service industries will have important private components.

Each industry will be characterized by distinctive production technologies and types of services rendered. These facilitate coordination of operational arrangements within an industry and allow for substantial independence between industries. The water industry, for example, is based upon technologies that facilitate collaboration among many agencies operating at different levels of government and among both public and private interests. These technologies in the water industry are easily distinguishable from the police industry or the education industry. The water industry serving any particular area will normally include large-scale water production agencies like the U.S. Corps of Engineers, which operates dams and large water storage facilities, intermediate producers like metropolitan water districts and county water authorities that operate large aqueducts and intermediate storage facilities, and municipal water departments, water service districts, mutual water companies, or private water utility companies that operate terminal storage facilities and retail distribution systems. The quality and cost of water delivered at the tap and the facilities available for recreation, navigation, flood control, and related uses will depend upon the joint operation of many different governments, agencies, and firms functioning in a water industry.

Some Problems Affecting Relationships among Collective Consumption Units and Production Units in Public Service Industries

The special characteristics of public goods generate a number of difficulties that affect relationships within public service industries. These difficulties create problems especially in the relationship of collective consumption units with production units. Marketing arrangements in the private sector usually involve financial arrangements as an incidental feature of each transaction. The public sector, by contrast, usually disassociates financial arrangements from service delivery. This disassociation of financing from service delivery further implies that service delivery may occur without satisfactory information about demand or user preference. Where jointness of consumption is accompanied by partial subtractability, special problems may also arise in regulating patterns of use among diverse users. One use or pattern of use may, in

the absence of regulation, seriously impair the value of the good or service for other users. Many public services—like some private services—depend critically upon service users to function as essential coproducers. Each of these problems—(1) financing; (2) regulating patterns of use; and (3) coproduction—poses difficulties in the relationship between collective consumption units and production units. Satisfactory performance in public service industries will depend upon finding constructive resolution to these problems.

Finance

In market relationships, the decision to buy any particular good or service automatically entails a consideration of forgone opportunities. The price expressed in money terms is the equivalent of all other goods and services that could be purchased with the same amount of money. A decision to buy a particular good or service reflects a willingness to forgo all other opportunities for which that money could have been used. An expression of demand in a market system always includes reference to what is forgone as well as what is purchased.

The articulation of preferences in the public sector often fails to take account of forgone opportunities. The service is available for the taking. Unless collective consumption units are properly constituted to give voice to user preferences, much essential information may be lost in the system. The mode of taxation may have little or no relationship to the service being supplied. Furthermore, individuals may function in many different communities of users. Residents of local neighborhoods may, for example, have different demands for police services involving different communities of interest when they commute from an area of residence to work in a different location.

Because most public goods and services are financed through a process of taxation involving no choice, optimal levels of expenditure are difficult to establish. The provision of public goods can be easily overfinanced or underfinanced. Public officials and professionals may have higher preferences for some public goods than the citizens they serve. Thus they may allocate more tax monies to these services than the citizens being served would allocate if they had an effective voice in the process. Underfinancing can occur where many of the beneficiaries of a public good are not included in the collective consumption units financing the good. Thus they do not help to finance the provision of that good even though they would be willing to help pay their fair share.

Financial arrangements are also the means by which redistribution is accomplished. Many of the proposals for large-scale consolidation of governmental units serving metropolitan areas are based on an assumption that increased equity will result by expanding the tax base. A broader tax base, it is

thought, will ensure that wealthy suburbanites pay for essential services needed by the poor. No evidence is available to indicate that this actually happens in large cities. Poor neighborhoods receiving "services" that are not tailored to their needs may not be better off when increased resources are allocated to their neighborhood. In large collective consumption units, residents of poor neighborhoods may have even less voice about levels and types of services desired than they do in smaller-sized collective consumption units. Increasing the size of the smallest collective consumption unit to which citizens belong may not help solve problems of redistribution.

The financing of any particular public good or service may require contributions from more than a single collective consumption unit because beneficiaries from the production of that good may not be isolated in a single unit. Public education, for example, is of primary benefit to the family units whose children are being educated. However, substantial external benefits to others located within the same state and within the nation may accrue as a result of having a good educational system in each locality. Thus, the financing of education may best be achieved through a combination of resources coming from local, state, and national sources. However, the funding of a school system directly from several tax sources may make the school system less sensitive to the diverse interests of the different family units that directly receive educational services. The use of a voucher system for at least a major portion of the financing of public education would increase the relative voice of the family units that would choose the school or schools to supply educational services for their children.

The working out of financial arrangements between collective consumption units and production units is one of the most difficult problems faced by entrepreneurs in the public economy. Without market prices and market transactions, the act of paying for a good generally occurs at a time and place far from the act of consuming the good; individual costs are widely separated from individual benefits. Yet a principle of fiscal equivalence—that those receiving the benefits from a service pay the costs for that service—must apply in the public economy just as it applies in a market economy. Costs must be proportioned to benefits if people are to have any sense of economic reality. Otherwise beneficiaries may assume that public goods are free goods, that money in the public treasury is "the government's money," and that no opportunities are forgone in spending that money. When this happens the foundations of a democratic society are threatened. The alternative is to adhere as closely as possible to the principle of fiscal equivalence and to proportion taxes as closely as possible to benefits received.

Where charges can be appropriately levied on individual beneficiaries, user charges or use taxes can substantially alleviate the problems associated with rationing the use of a joint good when partial subtractability results in

potential congestion costs. Highway construction and maintenance services, highway police patrols and other services for motorists could, for example, be charged against gasoline taxes rather than other forms of general taxation. User charges or use taxes lead beneficiaries to calculate the cost of a service as against the value of a marginal use. Criminal sanctions need not be the principal means to regulate the use of a public good or service that is freely available to all users, if user charges can more appropriately proportion use to supply.

Regulating Patterns of Use

The characteristics of partial subtractability of consumption imply that increased use at any given threshold of supply may impair the value of a good or service for other users. As congestion occurs, parks or streets decline in value to each individual user as more users take advantage of available facilities. Where multiple uses occur, one pattern of use may drive out other patterns of use. The use of a waterway to discharge wastes, for example, may exclude its use for recreational purposes. As some uses drive out other uses a serious erosion in the qualities of public life can occur. Jointness of use under conditions of partial subtractability may require rules for ordering patterns of use so as to reduce potential conflict among the different uses made by any community of users. If rules are to be effective, mechanisms for their enforcement must be available. The delivery of public goods and services under these conditions depends upon the proportioning of supply to demand by way of a system of rules that takes account both of the conditions of supply and the patterns of use. Unless those rules take account of varying patterns of use and supply conditions in discrete circumstances, they are likely to become serious impediments to joint well-being. Heavy use of city streets for through traffic may, for example, impair their use by local residents in patronizing local businesses and tending to local problems.

These conditions may require an especially close coordination between production and consumption units. The delivery of service by a producer needs to occur where patterns of use are regulated to gain optimal advantage of the services and facilities made available. The construction and maintenance of rural farm-to-market roads is not compatible, for example, with their use to transport coal from mines to major transport terminals. Heavy coal hauls will destroy roads that are not constructed and maintained for those loads. Vendors, in such circumstances, are not producing for anonymous buyers. Vendors, instead, are supplying a tailor-made service subject to particular terms and conditions of use by discrete communities of users.

The regulation of patterns of use becomes one of the critical consumption functions performed by collective consumption units. This is why

authority to enforce rules and regulations by recourse to criminal sanctions is usually assigned to governmental instrumentalities responsible for procuring a public good or service. Collective consumption units must assume primary responsibility for regulating and enforcing patterns of use. Yet, those regulations are meaningful only in light of discrete demand and supply conditions. Modifying supply conditions may alter the regulation and enforcement problems.

Even among governmental agencies, production of a service is frequently separated from regulating and enforcing patterns of use. Agencies responsible for policing the use of streets and highways, for example, are separate from those responsible for constructing and maintaining those streets and roads. Nevertheless, producers in a public service industry need to be aware that services subject to joint use involve sensitive problems in proportioning supply to use and in regulating patterns of use. Otherwise, problems of congestion and conflicts among users can lead to the erosion of public services and a degradation of community life.

Coproduction

Another problem in proportioning supply to patterns of use arises when users of services also function as essential coproducers. Without the intelligent and motivated efforts of service users, the service may deteriorate into an indifferent product with insignificant value. The quality of an educational product, for example, is critically affected by the productive efforts of students as users of educational services. Unless educational services are delivered under conditions that treat students as essential coproducers, the quality of the product is likely to be of little value. The health of a community depends as much on the informed efforts of individual citizens to maintain good health as it does upon professional personnel in health care institutions. The efforts of citizens to prevent fires and to provide early warning services when fires do break out are essential factors in the supply of fire protection services. The peace and security of a community are produced by the efforts of citizens as well as its professional policemen. Collaboration between those who supply a service and those who use a service is essential if most public services are to yield the desired results.

These problems arise in all service industries in both the private and public sectors. The private doctor is confronted with the same problem as the public school teacher. When professional personnel presume to know what is good for people rather than providing people with opportunities to express their own preferences, we should not be surprised to find that increasing professionalization of public services is accompanied by a serious erosion in the quality of those services. High expenditures for public services supplied ex-

clusively by highly trained cadres of professional personnel may be a factor contributing to a service paradox. The better services are, as defined by professional criteria, the less satisfied citizens are with those services. An efficient public service delivery system will depend upon service personnel working under conditions where they have incentives to assist citizens in functioning as essential coproducers.

Intelligent and efficient strategies of consumption are as essential to the welfare of human communities as intelligent and efficient strategies of production. Coproduction requires that both go hand in hand to yield optimal results. The organization of a public economy that gives consideration to economies of consumption as well as of production and provides for the coordination of the two is most likely to attain the best results.

Opportunities in Public Service Industries

Where multiple consumption and production units have served communities of people in both procuring and supplying public goods and services, conventional wisdom has alleged that duplication of functions occurs as a consequence of overlapping jurisdictions. Duplication of functions is assumed to be wasteful and inefficient. Presumably efficiency can be increased by eliminating "duplication of services" and "overlapping jurisdictions." Yet we know that efficiency can be realized in a market economy only if multiple firms serve the same market. Overlapping service areas and duplicate facilities are necessary conditions for the maintenance of competition in a market economy.

Can we expect similar forces to operate in a public economy? If we can, relationships among the governmental units, public agencies, and private businesses functioning in a public economy can be coordinated through patterns of interorganizational arrangements. Interorganizational arrangements, in that case, would manifest marketlike characteristics and display both efficiency-inducing and error-correcting behavior. Coordination in the public sector need not, in those circumstances, rely exclusively upon bureaucratic command structures controlled by chief executives. Instead, the structure of interorganizational arrangements may create important economic opportunities and evoke self-regulating tendencies. Some of these opportunities are examined.

Proportioning Consumption and Production Possibilities

In a world where goods subject to joint consumption vary from household size to global proportions, the availability of an array of differently sized collective consumption and production units will provide opportunities to realize diverse economies of scale. Where heterogeneous preferences for public services exist, advantage can be gained by having relatively small collective consumption

units. As long as a collective consumption unit can articulate preferences for its own constituency and has access to a reasonably equitable distribution of income, the collective consumption unit can specify the mix of services preferred, procure an appropriate supply of those services, and pay for them. In this case a small collective consumption unit might contract with a large production unit, and each might take advantage of diverse scale considerations in both the consumption and production of a public good or service.

Another circumstance may exist where the collective consumption unit is large but efficient production is realized on a smaller scale. The appropriate consumption unit for users of interstate highways in the United States, for example, is probably a national unit. This national unit functions as a "provisioner" by developing appropriate specifications and financial arrangements for procuring interstate highway services. However, variability in climatic and geographic conditions over a large continental area is such that the production and maintenance services can be more efficiently supplied by smaller organizations. Thus, the U.S. Department of Transportation acts as a buyer of interstate highway services from state highway departments and private contractors that act as the principal production units.

The proportioning of diverse consumption and production possibilities in a complex public economy will not occur automatically but requires a conscious pursuit of relative advantages. An awareness that bigger is not necessarily better must precede a search for the combinations that generate the highest level of user satisfaction for given expenditures of efforts. Substantial improvements might be made.

Competition, Bargaining, and Cooperative Efforts

If each collective consumption unit has potential access to several production units and is prepared to consider alternative options in arranging for the supply of a good or service, the relationships between collective consumption units and production units will take on the characteristics of a quasi-market relationship. The market in this case is *not* between producers and *individual consumers*. We would expect such market structures to fail. The quasi market, instead, arises in the relationships among collective consumption units and production units.

If the potential producers include an array of private vendors and public agencies, an opportunity exists for bargaining to procure public goods or services at least cost. The opportunity for bargaining among collective consumption units and production units also creates incentives on the part of the bargaining parties to increase levels of information and to develop indicators of performance.

Bargaining may also occur in a noncompetitive situation in which multi-

ple production units may be able to gain a joint benefit by coordinating their actions with one another. Various police agencies may, for example, have mutual aid or joint operating agreements to provide backup service whenever emergencies arise and all personnel are otherwise committed. Peak-load capabilities may be maintained by drawing upon reserves in other departments rather than requiring all departments to meet their own separate peak-load demands from their own reserves.

These joint efforts may be extended to organizing supplemental public or private enterprises to supply a variety of indirect services such as crime laboratories, police training academies, and joint dispatching services. Where high levels of interdependency have developed through cooperative arrangements, collective consumption and production units can be expected to develop routine organizational arrangements to reduce bargaining costs. These arrangements often take the form of a voluntary association with regularly scheduled meetings, with officials to set meeting agendas and to arrange for the organization and presentation of pertinent information. Many of these voluntary associations of collective consumption and production units may be formally organized with bylaws and membership fees or assessments to cover the cost of a small permanent secretariat that organizes information, implements decisions, and engages in entrepreneurial activities on behalf of the association.

Conflict and Conflict Resolution

Cooperative arrangements maintained under a rule of unanimity can always be threatened by the presence of a holdout where multiple collective consumption and production units are creating significant externalities for one another. If those externalities have the characteristics of a public good in a large domain that impinges upon several collectivities, one collectivity may find it advantageous to hold out and enjoy the benefits it can derive from the joint actions of others without assuming its proportionate share of the costs. If some holdouts are successful in their strategy, others will follow suit. Cooperative arrangements will fail, and there will be an erosion in welfare for everyone concerned. The maintenance of a holdout strategy and the impending threat of tragedy may lead some to respond to holdouts with threats or counterthreats. Unless constrained by the availability of institutions for adjudicating and resolving conflicts, threats and counterthreats can escalate into violence and warfare.

A highly fragmented political system *without* substantial overlap among the many jurisdictions is especially vulnerable to this form of institutional failure. Americans refer to this as "balkanization." With overlapping units of government, conflicts among governments at any one level may be resolved

by recourse to the decision-making arrangements existing at a higher level of government. Such arrangements are inherent in federal systems of government. The critical feature is the availability of legal, political, and constitutional remedies to the parties injured as a consequence of negative externalities that are generated by governmental action.

Courts have played an especially important role in resolving conflicts among independent agencies and firms operating in a public economy. They are competent to decide an issue without dominating all channels of control and allocations of resources. In contrast, when a chief executive in an integrated command structure resolves conflicts among his subordinate public agencies, the impact is rarely confined to discrete issues. It is likely to affect future budgetary allocations, career opportunities for public employees, and the organizational status of operating agencies.

In California, where contracting for public services has the greatest competitive pressure, county grand juries have assumed a continuing responsibility for monitoring the operation of intergovernmental contracts. Inappropriate use of tax funds by public agencies functioning as contract producers would transfer service costs to the public treasury of the producing agency rather than paying for them from the treasury of the benefiting community. Inappropriate use of tax funds might also constitute subsidies to public producers. Such subsidies would drive private enterprises out of the business of producing public services even though private enterprises might be more efficient in rendering a comparable quality of service. Grand juries with jurisdiction to inquire into the discharge of public trust by state and local agencies can perform an important function in maintaining the integrity of marketlike relationships and encouraging competitive pressure in a public economy.

Without appropriate mechanisms for processing conflicts and monitoring the operation of a public service economy, contracting can be used as an instrument for the grossest forms of political corruption. Contracts with firms that are the chosen instruments of political bosses have long been used as a means of milking public treasuries, supplying the coffers of political machines, and creating private fortunes. (The Indiana Department of Motor Vehicles, for example, contracts out its licensing operation to the county chairmen or other party officials of the political party that is successful in controlling the office of governor. The party official derives fees from this contract service to finance political operations. In the absence of competitive pressure from other vendors, it is most doubtful that this form of contracting enhances efficiency.) No system of economic relationships will perform well without appropriate public policies and institutions to enforce these policies.

Conflict arises when someone believes he is being harmed by another's action. If the situation is remedied so that no one is harmed, a net improvement in welfare will occur. Thus, conflict is as important an indicator of po-

tential economic losses as the red ink on a balance sheet. Mechanisms for conflict resolution contribute to economic welfare when they formulate solutions that right wrongs and restructure arrangements so that everyone is either left better off or no one is harmed or left worse off.

But to maintain a system that is open to conflict and conflict resolution, the participating parties in the system must have autonomous legal status with authority to sue and be sued and to take independent decisions in advancing a set of interests. If public economies are to gain the advantage of quasi-market competition and voluntary cooperation in producing and consuming public goods, they must be able to maintain arms-length relationships and they must have available to them institutions that can adjudicate conflicts among parties with equal standing in law. Adjudication does not occur in the absence of equal legal standing. Subordinates obey rather than cooperate.

Alternatives and Choices

Alternative possibilities can be conceptualized for the organization of public sector activities. One possibility is a bureaucratic system of public administration in which all relationships are coordinated through a command structure culminating in a single center of authority. This possibility treats the public and private sectors as mutually exclusive. No place exists for private enterprise in the organization of such a system of public administration.

Another possibility is to conceive of units of government as being collective consumption units whose first order of business is to articulate and aggregate demands for those goods that are subject to joint consumption where exclusion is difficult to attain. Demands are effectively articulated when decisions reflecting user preferences about services are reached and funds are committed. Several options are available for organizing production including that of contracting with private vendors to produce specified goods or services. Relationships are coordinated among collective consumption and production units by contractual agreements, cooperative arrangements, competitive rivalry, and mechanisms of conflict resolution. No single center of authority is responsible for coordinating all relationships in a public economy. Marketlike mechanisms can develop competitive pressures that tend to generate higher efficiency than can be gained by enterprises organized as exclusive monopolies and managed by elaborate hierarchies of officials.

This new mode of analysis that applies economic reasoning to nonmarket decision making should be used to reconsider the basic structure of a public economy. Changes that offer the prospect of advancing the net well-being of everyone concerned should be experimented with as being economically justified. The exercise of political power is economically justified only when benefits exceed costs; it is not justified as a means for the powerful to

benefit themselves at the cost of the powerless.

The critical factor in this approach is to begin with the nature of the goods involved, in terms of exclusion, partial subtractability, and measurability. To the extent that such characteristics exist, elements of public choice, in increasing degrees, can be introduced.

If the community of beneficiaries can be identified, then a principle of fiscal equivalence can be relied upon to design a collective consumption unit so that beneficiaries bear the cost and exercise the dominant voice in determining the quantity and/or quality of service to be made available. Wherever user charges or use taxes can be established, they can be used to advantage in giving users a sense of reality about the costs inherent in alternative choices.

The particular forms of organization used in establishing collective consumption units—consumer cooperatives, municipal corporations, public service districts, or other forms of governmental organization—are choices that can be taken by the relevant community of people so long as they bear the costs of the enterprise. The community of beneficiaries can, so long as they bear the costs, also be assigned substantial constitutional authority to establish and modify the terms and conditions that apply to the future governance of the collective consumption unit.

The selection of appropriate arrangements for the supply and delivery of a public service is open to several potential options. The wider the range of these options, the greater the degree of competitive pressure that will exist in any particular public service industry. It is precisely this competitive pressure that offers prospects for the best performance both in the sense of being responsive to user demands and in the sense of minimizing costs in doing so. In a well-developed public economy, many collective consumption units may find a mixed strategy advisable in which they rely, in part, upon their own production agencies but maintain extensive contractual arrangements with private enterprises and other public agencies to produce the mix of services preferred by their constituents.

Competitive pressures are the key factors in maintaining the viability of a democratic system of public administration. Substantial incentives will exist among established businesses and governmental agencies to protect their own interests by restricting the entry of competitive alternatives. If such efforts are successful, competitive rivalry loses its capacity to enhance efficiency and deteriorates into collusive efforts by some to gain dominance over others. This risk is carried to the greatest extreme in the case of a fully integrated monopoly solution. The traditional principles of public administration imply monopoly organization applied to the entire public sector. Private enterprises as producers of public goods and services can significantly improve the efficiency of the public sector so long as competitive pressures can be openly and publicly maintained.

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