

**PRIVATIZATION: A Review of Its Potential in the Water Industry, Dominated by Natural Monopoly, Political Intervention and Social Concerns.**

by  
Todd M. Scrima

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First Reader

Franklin J. Weber

Second Reader

Robert P. Rice

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## ABSTRACT

Today there exists a variety of views on the potential for privatization in reducing the costs of services historically provided by government. The water industry is one such area that is dominated by government provision. Privatizing public water utilities has a large potential for ultimately reducing government involvement in the services provided to society. Its potential success depends on a variety of economic, political and social factors.

## I.

### INTRODUCTION

Water utilities in the United States have been historically owned and operated in the public domain. Presently there are in excess of 19,236 centralized water systems in the U.S. of which 71% are publicly owned. (Mushkin, 1972) If these systems could be privatized there would be a significant reduction in government involvement in our country. Further, if the economic efficiency of the industry were increased, as suggested by advocates of privatization, a significant cost savings would be realized by its customers.

The question posed in this paper is, can water utilities be effectively privatized? Or will their inherent nature towards monopoly simply transform them into a private monopoly. If privatizing a water utility merely creates another form of monopoly, then its potential for successfully reducing the size of government and cost for services may be ineffective.

In an effort not to rule out the potential for privatizing the water industry, it should be noted that other countries have successfully done so. France has

historically had its water needs provided by private companies. Today approximately 55% of France's drinking water is provided by private enterprise. Even though comparative studies are not available on the cost of private and public water systems in France, the trend towards greater privatization suggests enhanced cost effectiveness of the privatized systems. (Hanke and Walters, 1987)

With the apparent success France has had in the private provision of drinking water supplies and the perceived need to reduce the size of our government, the potential for privatizing water utilities in our country could prove very important with respect to the size of government and the potential for greater efficiency within the industry. The necessity for water to sustain life, makes any program for altering its provision of enormous importance economically, politically and socially.

The focus of this paper is on the key economic, political and social implications involved with the water industry. Factors such as the structure of public utilities (natural monopolies), nature of goods and services (quasi public goods), political intervention and many other important economic factors will be viewed in

light of privatization. The development of the water industry will be outlined to pin-point the factors that pushed the water industry towards predominantly public ownership. And finally this research examines the major economic conditions within the industry to see if they will facilitate the current privatization models that are being offered as a means to enhance the industry's overall cost efficiency. Further, privatization in the water industry may prove to be economically correct, but socially unacceptable.

## II.

### PRIVATIZATION AND HOW IT SHOULD WORK

Privatization is an attempt at reducing the size of government by (1) reducing public expenditures, (2) reforming public expenditures and, (3) turning more public services over to private enterprise. Privatization can be further defined at the local level to mean public asset divestiture, private financing of infrastructures, and private provision of services.

Privatization programs consist in three major areas: "(1) privatization of competitive firms - or, more generally, transfer to the private sector of state-owned enterprises operating in competitive product markets free from substantial market failure; (2) privatization of monopolies - transfer to private sector of state-owned enterprises with substantial market power, like network utilities...; and (3) contracting out of publicly financed services, previously performed by public sector organizations, to the private sector." (Vickers and Yarrow, 1991)

Even though widely accepted as a privatization function some experts with a more purist view point see

contracting out as not true privatization because government still controls the services being delivered. In the subsequent review contracting services to private firms will be considered as an important aspect of privatization.<sup>1</sup>

Along with the expectations that privatization can reduce the cost of publicly provided services, comes a somewhat more liberal ideology that sees privatization as a means to reassign the decision process of providing services from public employees to private individuals. This process is felt to create a more democratic society.

An important element in privatization is the difference in the objectives of a firm between public and private ownership. Public owners are not profit seeking in their approach to running the firm. Their personal agendas may reflect favors to interest groups, patronage and maximizing their own social welfare. By contrast private ownership attempts to maximize profits. By doing so, private profit motives and social welfare should closely align. (Vickers and Yarrow, 1991) This assumption is based on a competitive market with the

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<sup>1</sup> A 1985 survey by the International City Management Association (ICMA) showed a wide variety of programs contracted out including Library operations (12%), tree trimming (30%), utility billing (13%), crime prevention and control (10%), data processing (24%), and vehicle towing(78%).



absence of market power.

Where monopoly power or externalities are present government involvement through regulations may be necessary. These regulations may actually drive the private operation of the firm back to the inefficiencies encountered under public ownership. The difference between public and private ownership may become indistinguishable.<sup>2</sup>

Another important aspect of privatization is that of managerial monitoring. Normally in a publicly run enterprise there is very little review of managerial performance. In such an environment public managers are able to pursue their own agendas which as previously mentioned can lead to inefficiency. Only when political sensitivity is spawned through lack of operating revenues and possible reduction of services, does managerial performance become an issue for political review.

Unlike public managers, private managers are faced

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<sup>2</sup> That is not, of course, to say that public ownership and regulated private ownership have identical consequences. One possible difference lies in the information available to government decision makers. (Schapiro and Willig, 1990)

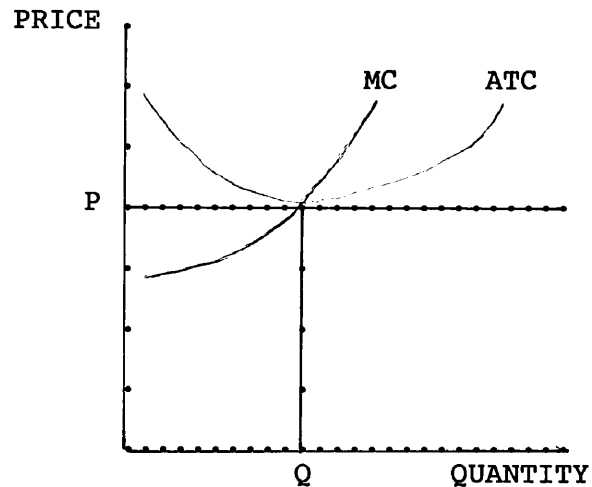
daily with capital market pressures.<sup>3</sup> Their performance can be positively influenced through profit sharing and stock options. The better their performance the greater their financial rewards. Poor performance by managers and their company can lead to bankruptcy or possible take overs. The positive and negative rewards faced by private managers gives them the incentive to maximize their performance.

A key element to the success of privatization is maintaining market equilibrium through competition. "Pure competition involves - many sellers and buyers of a standardized product; free entrance, no collusion." (Reynolds, 1985) Economic efficiency is achieved in a market economy through allocative and production efficiency. This means that the correct amount of each good is produced at the lowest price possible. This concept can be seen in figure 2-1. (Next Page)

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<sup>3</sup> In economies where capital markets are underdeveloped, privatization may be used as an element of policy to promote their developments. (Vickers and Yarrow, 1991)

FIGURE 2-1.  
An individual producer in long-run equilibrium



$$\text{PRICE} = \text{MARGINAL COST (P=MC)}$$

SOURCE: Reynolds, Loyd G. *Micro Economics: Analysis and Policy*. Illinois: Richard D. Irwin, Inc., 1985 Fig. 5-8, p.135

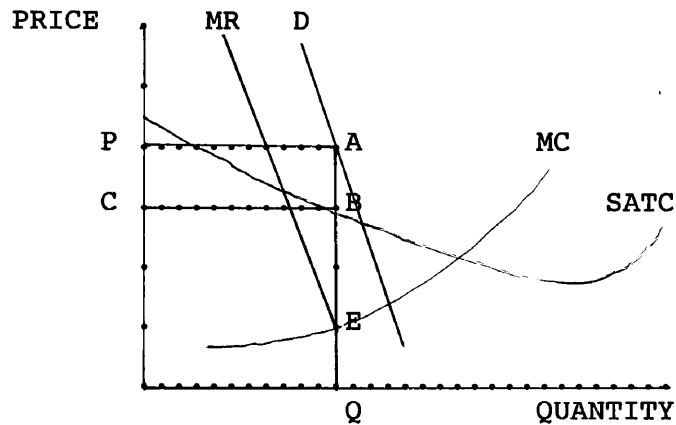
The satisfaction of a consumer purchasing the last unit produced in figure 2-1 equals the satisfaction derived from using their resources in the production of other goods. In this model  $P=MC$ , competition forces producers to maintain minimum returns. Only through increased operational efficiency can a producer hope to increase their profit. This is an important aspect of privatization and competition.

Privatization in a non-competitive market environment is subject to different economic conditions. In a monopolistic market there may be just one supplier of a good. If there are no substitutes for the product the

producer is free to set pricing for the product. Based on the price set, the producer will be able to sell as many units possible, subject to the consumer demand curve for that product.

The economic model for a producer with market power can be seen in figure 2-2.

FIGURE 2-2  
Oligopolists can maximize profit by agreeing to charge the monopoly price



SOURCE: Reynolds, Loyd G. *Micro Economics: Analysis and Policy*. Illinois: Richard D. Irwin, Inc., 1985 Fig. 6-4, p. 152

It is important to note that the marginal revenue (MR) is not equal to price as it was under the pure competition model in figure 2-1. In figure 2-2 the producer will maximize profits where marginal costs equals marginal revenue ( $MC=MR$ ) at point E. Any quantity sold to the left of Q will cause marginal revenue to be

greater than marginal cost so that the company will produce more. Any quantity sold to the right of  $Q$  will cause marginal cost to be greater than marginal revenue so that the company will produce less.

At the quantity  $Q$  the company will charge price  $P$ . At quantity  $Q$  the average total cost is  $QB$  which includes the normal return on capital under pure competition. Unlike under pure competition the monopolist firm makes an economic profit of  $AB$  per unit or a total profit of  $ABCP$ . In a purely competitive market, when economic profits are made by one firm, additional firms will move into the industry. In a market power setting additional firms are restricted from the market due to technological or natural monopoly conditions. The more inelastic the demand for the product the stronger the monopoly is considered.

Firms whether in a competitive setting or in a monopoly, maximize their profits where marginal revenue equals marginal cost. In a monopoly setting a firm normally will maximize its economic profits unless pressured by regulatory activity. In a competitive market economic profits are short term. The analogy between competitive and non-competitive markets will be useful in our review of privatizing public water utilities.

### III.

#### **PUBLIC WORKS (WATER UTILITIES)**

A better understanding of public works function is important if we are going to be able to discern privatization effects on public water utilities. A public water utility is just one of many different types of public works facilities that make up the infrastructure of our urban areas. These facilities range in activities from waste water and solid waste collection systems to highways and airports. For the benefit of our discussion public works can be defined as follows:

the physical structures and facilities that are developed and acquired by public agencies to house governmental functions and provide water, power, waste disposal, transportation, and similar services to facilitate the achievement of common social and economic objectives. (Stone, 1974)

The definition of public works above can be broadened as follows:

they provide the physical infrastructure (facilities and services) essential to urban society and economic and social development. They constitute the main fabric of what may be called urban physical systems linked to national and regional systems. Public works make human settlements and nations possible. (Stone, 1974)

From these definitions it becomes apparent that public works facilities, which includes public water utilities are of immense importance to contemporary society. This fact is highlighted in that 1/3 to 1/2 of local government budgets are allocated to public works functions. (Cohn and Manning, 1974) The large percentage of local funds allocated to public works makes their potential privatization important. If privatization does increase the efficient allocation of their services, substantial cost savings could be realized.

Public water utilities like other public works activities function in a very interactive urban environment. "Fiscal crisis, labor relations, the working of the political process, the demands of new technology, ... increased ecological and environmental concerns." (Korbitz, 1976) All these factors greatly influence how public utilities function both economically and socially. The dynamics of their environment complicate attempts at increasing their operational efficiency, whether it be through public or private provision.

#### IV.

#### WATER UTILITIES AS NATURAL MONOPOLIES

Further review and definition of public water utilities leads us to the term "natural monopoly."<sup>1</sup> An industry is usually said to be a natural monopoly if production can be conducted most efficiently by a single entity. According to Steve H. Hanke and Stephen J.K. Walters (1987), "the water supply industry is a straight forward illustration." They use the following example to illustrate their point:

The capacity of the pipes used to supply water is roughly proportional to its cross-sectional area. The associated cost is proportional to its circumference. If the cross section of the pipe is doubled, the circumference is less than doubled. This illustrates that while the value of water is doubled, the cost does not. Ultimately the average transmission costs decline. This idea is supported by the fact that adding more customers to a water system reduces the unit cost to everyone.

Field data collected by Hanke and Roland W. Wentworth strongly support this theory. (Hanke & Walters, 1987)

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<sup>1</sup> "Natural monopoly" and "public utility" are often used interchangeably. Kahn (1971) regarded the essence of natural monopolies as: "...their costs will be lower if they consist in a single supplier." and "...a natural monopoly is an industry in which the economies of scale - that is, the tendency for average costs to decrease the larger the producing firm - are continuous up to the point that one company supplies the entire demand."



Further evidence of water utilities inherent nature to be a monopoly can be seen in a list of characteristics of monopolies as provided by Farner (1902) which still have significance today: (Berg & Tschirhart, 1988)

1. capital intensive (significant fixed costs)
2. viewed as necessity (essential to community)
3. non-storable (fluctuating demands)
4. produced in favored location
5. involves direct connection to customers

The characteristics outlined by Farner exemplify the water utility industry. Water utilities fixed costs are large due to the expansive infrastructure needed to (1) produce, (2) deliver and (3) store water for its customer base. Without question water is a necessity not only to individuals, but for communities. Water production has minimal storage capability and is burdened by seasonal high demands. The production of water is restricted to those areas where it can be pumped from the ground or from some type of surface water source. And lastly, providing water to customers on a large scale usually requires a direct connection to them.

Natural monopolies such as water utilities are

subject to market price distortion, due to their inherent market power. These irregularities in the market pricing structure can take on a number of forms as outlined by Berg and Tschirhart (1988) in their book Natural Monopoly Regulation:

1. prices too "high" (reflecting monopoly power)
2. prices too "low" (predatory pricing)
3. prices high for some low for others  
(discrimination or subsidies)
4. prices unstable (difficult to maintain competitive pricing)

The potential for market price distortion due to the presence of a monopoly creates the need for some type of oversight to protect the product's market price. Water utilities are usually governed by direct government control or through government regulation. Regulatory boards or commissions attempt to control cost, price, profits and quality of services. "The board or commission through regulatory action attempts to produce economic results which would occur automatically under market competition: production at minimum cost, output determined by equality of price and marginal cost, and also a normal rate of return on capital." (Reynolds, 1985) Unfortunately government control and/or regulation

sometimes can cause their own market pricing problems.  
The need for government regulations will be discussed in  
more detail later.

V.

**WATER UTILITIES  
NATURE OF GOODS AND SERVICES**

Public works facilities, specifically public water utilities can be categorized by the type of good or service they provide. Water utilities provide a form of quasi public goods and services. Unlike pure public goods the services of a public water utility are able to be excluded from individuals not wishing to receive them.<sup>1</sup> Quasi public goods differ from private goods in that they can cause spill over effects or externalities. Reynolds (1985) indicates that, "...like a public good, quasi public goods have important elements of publicness in its consumption...." From Reynolds definition it seems that quasi public goods are closer in character to public goods than to private goods.

It is important to note that the nature of a good, that being, private, quasi public or public goods have an important influence on their potential provision through privatization. Pure public goods which are non-rival in consumption and non-excludeable to potential consumers are usually provided by our government.

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<sup>1</sup> Pure public goods are: 1. nonrivalness in consumption and 2. nonexcludability from consumption.

Examples of these types of services are national defense, police protection and for the most part fire protection. Pure private goods on the other hand are goods demanded by customers, produced by private enterprise based on the demand, and sold at the market equilibrium price. The market equilibrium price is based on the supply and demand of the product being sold.

Quasi public goods due to their nature may be provided by either government or by the private sector or some combination of both. This leads to an interesting choice when considering which provider, government or the private sector can do so most efficiently.

TABLE 5-1.  
Percentage of public versus private water utilities

YEAR	PUBLIC WORKS	PRIVATE WORKS	TOTAL	% PUBLIC
1800	1	14	15	6.7
1810	5	21	26	19.2
1820	5	25	30	16.6
1830	9	35	44	20.5
1840	23	41	64	35.9
1850	31	50	81	39.7
1860	57	79	136	41.9

SOURCE: Glaser, Martin C. Public Utilities in American Capitalism. New York: The Macmillan Co., 1957, Table 1 p. 47

## VI.

### THE DEVELOPMENT OF WATER UTILITIES

The early development of the water utility industry was predominantly undertaken by private enterprise. Centralized water systems were developed to provide fire protection and domestic water needs to its customers. The earliest system was constructed in Boston around 1654. Similar systems were developed in Bethlehem, Pennsylvania, New York, and Philadelphia between 1762 and 1830. The system in Philadelphia was the first successful municipal water supply constructed. Since 1800 the tendency in development of water utilities has been towards public ownership. (See Table 6-1.)

**TABLE 6-1.**  
Percentage of public versus private water utilities

YEAR	PUBLIC WORKS	PRIVATE WORKS	TOTAL	% PUBLIC
1800	1	15	16	6.3
1810	5	21	26	19.2
1820	5	25	30	16.6
1830	9	35	44	20.5
1840	23	41	64	35.9
1850	33	50	83	39.7
1860	57	79	136	41.9

SOURCE: Glaeser, Martin G. Public Utilities in American Capitalism. New York: The Macmillan Co., 1957, Table 1 p.27

As can be seen in Table 6-1. public ownership in water utilities increased from 6.3 percent in 1800 to 41.9 percent in 1860. It seems that this swing in ownership was dictated by economic necessity. Increased water supply for fire protection and hygienic conditions necessitated using the power of eminent domain to obtain the necessary water rights. (Glaeser, 1957) Private enterprise was unwilling at this time to take on these social and economic commitments.

Obtaining and providing ample water supply was essential to the growth of cities and ultimately increased property values within the community. This type of spirited competition for providing adequate utilities between competing communities lent itself to the advent of various financing and service provision alternatives. One such alternative was that of franchise grants and contracts which came to the forefront during the early part of the nineteenth century. Due to their importance in the development and provision of water utility services they will be reviewed in more detail later.

Between 1860 and 1896 centralized water systems increased from 136 systems to 3,179 systems. Public

ownership also grew to 53 percent or 1,690 public water systems. Technological advances during the late 1800,s and early 1900,s were fueled by the development of electrical power and improved pumping equipment.

With more extensive water systems and associated population growth came increased environmental pollution. The pollution was generated by a combination of inadequate facilities for handling sewage and the environmental impact of industrial wastes. Increasing death rates from typhoid fever were first noticed by health officials in the 1890's. (Glaeser, 1957) This growing problem was traced to water pollution.

With the discovery of water pollution and its negative health effects came government intervention in the form of regulations governing the production of water. These regulations were an attempt to minimize or control the negative technological externalities incurred by improper water resource management.<sup>1</sup> Technological externalities arose from the use of scarce resources of which no particular individual or group had property rights over. The property rights issue forced the government to initiate some type of intervention process.

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<sup>1</sup> Technological externalities - are external effects not transmitted through the price system. (Reynolds, 1985)



In this case the government regulations and subsequent impact on the economic provisions of the water utility industry will be reviewed in detail later. It is important to note that early on in the development of the water utility industry government intervention was necessitated by the large social problem created by water pollution. This would set the stage for the future development of the industry.

The twentieth century was dominated by two main problems for the water industry. Both issues, scarcity of water and the quality of water would be open to intense scrutiny from the Federal government all the way down to local government. By 1945 the number of centralized water systems had grown to 15,400 of which approximately 80 percent were public systems. The only large system at this time that was exclusively supplied by private enterprise was in Indianapolis. Due to the ever increasing water demands of cities larger and larger quantities of water were needed and surface water supplies became the major water source. Because of surface waters susceptibility to contamination came increased pressure to assure high quality water free of pollution.

To facilitate the needs of the growing communities

for water in the twentieth century, new governmental involvement developed. One such development was Metropolitan Water districts. In 1928 the Metropolitan Water District of Southern California was founded. Its function was to secure water rights for its members and provide to them at wholesale cost the water demands they needed. The members who purchased water at whole sale rates would in turn sell the water to their customers at retail prices. Metropolitan Water Districts allowed smaller communities without the resources to negotiate or obtain needed water rights to be part of a bigger group which had the resources to do so. Subsequently hundreds of metropolitan water districts have developed across the country.

The water industry throughout its development has been faced with problems revolving around the issues of common resources and externalities. Because of these social problems the water industry has been pushed more into the web of government involvement either through actual ownership or by government regulation. This fact will greatly influence our findings with respect to the impact ownership and competition have on the efficient allocation of water to its customers by the water utility industry.

## VII.

### DRINKING WATER REGULATIONS

The water industry has been subject to government laws and regulations for nearly 100 years. Its roots date back to the early 1890's when the Interstate Quarantine Act was enacted. The law empowered the US Public Health Service (USPHS) to help stop the spread of communicable diseases across state lines.

The first federal drinking water standards were adopted in 1914. The USPHS through the US Treasury was responsible for assuring specific bacteriological quality of interstate water haulers. Soon afterwards many state and local governments adopted these standards for the water suppliers under their jurisdiction.

In 1962 the standards were revised to cover 28 constituents. (Pontius, 1993) The standards set limits on health related chemical and biological impurities. There were also standards set for aesthetic qualities such as appearance, taste and odor. All 50 states accepted these standards either as regulations or guidelines. (Oleckno, 1982)

In 1969 the USPHS undertook a study called the

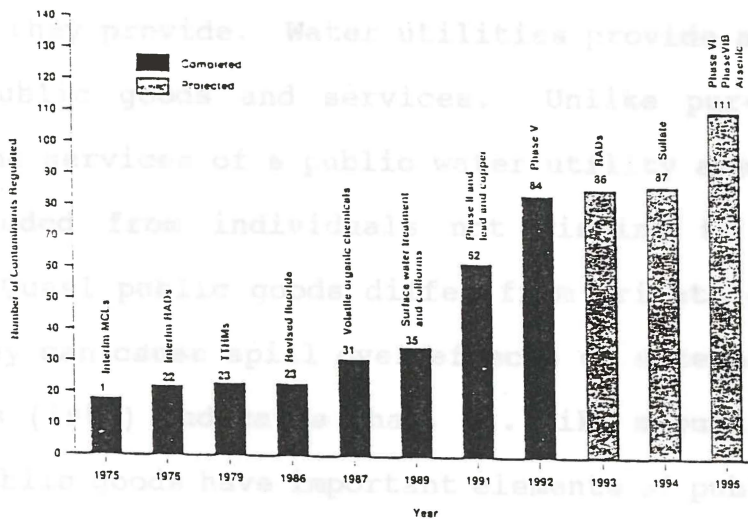
Community Water Supply Study (CWSS). The object of the study was to see if the US drinking water industry met the 1962 standards. It was found that 41 percent of the systems surveyed did not meet the guidelines. (Pontius, 1993) Several million people were being provided with water of inadequate quality while 360,000 people were being supplied with potentially dangerous water. (Pontius, 1993)

In 1974 the US Environmental Protection Agency (USEPA) was created as an independent office under the Executive Office of the President. They took over the review of the 1962 standards from the USPHS. Further studies conducted by the USEPA, the General Accounting Office (GAO) and others supported the findings of the CWSS. (Hawkins, 1975) Congressional interest in new federal safe drinking water legislation increased. In 1974 the discovery of trihalomethanes in public water systems drew further attention to the need for additional federal legislation. (Bellar, 1974)

In 1974 the Safe Drinking Water Act (SDWA PL 93-523) was signed into law. The SDWA set national primary drinking water regulations which applied to all public water systems. Interim regulations were adopted in 1975 based on the 1962 USPHS standards. In 1977 revised

regulations were proposed based on a study of the health effects of contaminants done by the National Academy of Sciences (NAS). As can be seen in figure 7-1 only 23 contaminants were regulated between 1974 and 1986.

FIGURE 7-1. Promulgation of drinking water reg's. by year.



SOURCE: USEPA, Office of Ground Water and Drinking Water

In 1986 further findings on organic contaminants and pathogens such as *Giardia lamblia* focused Congressional attention on the adequacy of the SDWA. Congress was particularly critical of the USEPA's rate of progress in regulating contaminants. In June of 1986 Amendment (PL 99-339) was enacted. The amendment required the EPA to set standards on 83 contaminants according to specific deadlines. Even though most of the deadlines have not been met, increased regulations on the water industry have occurred.

## VIII.

### OBSTACLES TO PRIVATIZING WATER UTILITIES

The subsequent review of the water utility industry touched on specific areas of its development and structure which contributed to its present form, dominated by public ownership. According to Savas (1982), "the principle function of government is to provide services that by nature are monopolies," No one particular issue is more important than the fact that water utilities are considered "natural monopolies." Economies of scale as pointed out by Hanke and Walters (1987) dictate economical efficiency by only having one water supplier in a given area. Duplication of this service by other potential suppliers would be very inefficient due to the large capital costs needed for the infrastructure requirements.

Urban growth spawned the need for greater quantities of water. The large capital costs needed to expand the infrastructures to produce, distribute and store water were cost prohibitive to potential private investors. Realizing the importance of providing adequate public services caused governments to increase their involvement.

The fact that most public water utilities are natural monopolies limits the prospects for privatization. "Due to incumbent firms large sunk costs, entry into the market is not possible. (Berg and Tschirhart, 1988) The chance for pure competition with many sellers of a standardized product is not possible. Privatization within the framework of monopolies would best be accomplished through some form of franchise bidding or contracting out of services. To maximize or increase operational efficiency the existing economies of scale within the monopoly would need to be utilized.

#### COMMON RESOURCES

Another potential problem area in attempting to privatize water utilities is the fact that water is a common resource. It is not privately owned but can be shared by many potential users. One groups use of water may have harmful effects on the use by others creating negative externalities. For example, surface water may be viewed by one group as a recreational source, by another group as a necessity for their industrial processes and by another as their source of domestic water. Potential industrial pollution to the water could reduce the recreational and domestic uses of the water, creating a need for some type of intervention. More

times then not, problems stemming from common resources lead to legal action and/or government intervention.

The competition for common resources is an everyday occurrence. Many issues over water rights end up in litigation and further government regulation. The potential for extended legal action limits potential private investors who do not wish the financial risk of such legal endeavors.

Recently the US Forest Service lost a court case in Colorado over water rights. In this case the US Forest Service wanted to reserve water right in Colorado to preserve natural stream beds. "Colorado water users - agricultural and municipal testified against the USFS claim, fearing a victory would threaten existing and future water supplies." (Water Works News, Mar-93) The US Forest Service spent upwards of \$10 million in legal fees trying to prove their case, only to lose. The financial extent of the legal action taken in this example indicates the potential costs with which water purveyors could be faced.

As sources of water become more scarce the legal posturing for water rights will become increasingly critical. A further example of this can be seen in the



sparing going on between Arizona and Nevada over the Law of the River - 1922 Colorado River Compact. Arizona's fear of future water shortages have them revisiting a compact signed by seven states 71 years ago. The potential for lengthy legal action and possible government intervention looms.

To achieve greater lobbying power states and local units seek to become part of a larger entity. States form compacts with other states jointly affected by common resource issues, while local units consolidate into Metropolitan districts to assure their long term interests in common resources such as water are protected. Meanwhile government involvement is on the increase. The joint use of common resources seems to be an issue that will undoubtedly continue to fall into the hands of government both through legal action and regulations.

#### **EXTERNALITIES**

As previously indicated joint consumption of common resources can cause externalities.<sup>1</sup> Externalities can "...influence the well-being of nonconsenting parties; the nonconsenting parties may be either helped (by external benefits) or harmed by (external costs).

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<sup>1</sup> Externalities are effects of action by one producer or consumer on the costs or rewards of other producers or consumers. (Reynolds, 1987)

(Gwartney and Stroup, 1983) An example of this in the water industry would be, "...monopoly rents which are partly used (implicitly or explicitly) to cross-subsidize high-cost consumers." (Vickers and Yarrow, 1991) In this example certain customers are actually paying higher water rates to the benefit of others who are receiving lower rates. Those subsidizing the cost of water are harmed by external costs, while those subsidized are receiving external benefits. Pletzman (1989) feels that privatization will undermine this cross-subsidization, requiring taxing and/or subsidies to be established. Again more government involvement, when the attempt through privatization is to reduce the size of government.

#### **GOVERNMENT REGULATION**

As long as monopolies are present, common resource questions arise and externalities exist, some form of government intervention to regulate will be necessary. Since the water industry is faced with all three of these concerns it seems safe to assume that government involvement with the industry will be necessary regardless of the form of ownership (public or private).

Government regulation with respect to natural monopolies or public utility regulation dates back into

the late 1800's. Growing concerns over the economic power of public utilities spurred review of, "this capital-intensive technology." (Berg and Tschirhart, 1988) The goal of these early regulatory activities are summarized by Banbright (1961) as follows:

1. Simplicity and public acceptability
2. Freedom from controversy
3. Revenue sufficiency
4. Revenue stability
5. Stability of rates
6. Fairness in apportionment of total costs
7. Avoidance of undue rate discrimination
8. Encouragement of efficiency

It should be noted that most of these goals have components of efficiency. It should also be mentioned that balancing economic efficiency with political priorities adds considerable difficulty for natural monopoly control mechanisms: (Schmalensee, 1979)

In short, the political view of appropriate regulatory performance is an inherently unattainable ideal; effected interest group competition on all decisions and effective decision making are incompatible, In order to permit regulators to consider the whole spectrum of collective goals and to respond directly or indirectly to all interest group pressure, they must be given considerable freedom of action. But the relative lack of control that must accompany the delegation of broad

authority increases the difficulty of ensuring that desirable trade-offs are made and make special interest action or inaction more likely. It is simply not possible, desirable though seems in principle, to use the control of natural monopoly effectively to pursue a number of potentially conflicting social goals.

If the true goal of natural monopoly regulation is lost in the conflicting political and social concerns, the end product which should be the efficient allocation of services is not met. Privatization introduced into a natural monopoly setting will be faced with these same political and social conflicts. Because of this it may not improve long term efficiency as originally thought.

#### **PUBLIC EMPLOYEE DISPLACEMENT**

Another area of concern and potential problems in privatization is the dislocation of public employees. Public employees maintain considerable political power. Because they are employed by government they normally support political candidates who will increase governmental programs. According to Savas (1982), "...public employees represent a sixth of the work force, cast more than a quarter of the votes." These numbers obviously represent a group of voters who can generate considerable influence in an election.

Public employee unions have strongly resisted local

contracting out initiatives. Lobbying activities and lawsuits have blocked many attempts to implement privatization. Areas with strong employee unions have been quite successful in keeping privatization out.

A study conducted by Dudek and Company for the National Commission for Employment Policy (May, 1988) highlighted some other major areas of concern over public employee displacement:

1. Percentage of public employees losing their jobs due to privatization - (5 to 10 percent of those displaced lost their jobs)
2. Amount of public assistance needed for those workers displaced. - (1.5 percent of the savings generated by contracting out)
3. Do private contractors pay lower wages? - (private contractors generally pay lower wages compared to those paid by government)
4. How do fringe benefits compare between private firms and government. - (generally government is more generous in their benefit packages, especially in retirement)

5. Do private contractors use labor more efficiently? - (increased labor productivity is a key element of privatization for it to work effectively)
  
6. Privatization effect on minorities and women. - (no major harmful effects for either)
  
7. Overall employment effect - (nearly as many jobs are created in the private sector as lost in government)

Based on this study it seems that the net effect of privatization on employment are reduced wages, somewhat reduced benefits and increased productivity. Good for government but not quite so good for the public employee. It was also noted in the study that privatization would be more readily accepted by public employees if it were done to provide new services, and only replace employees through attrition, minimizing layoffs to current employees.

A 1987 study done by Touche Ross indicated that 47 percent of local administrators stated that attempts to privatize were impeded due to local employee resistance.

(Dudeck and Company, 1988) This clearly indicates that employee resistance to privatization can be a major factor as to its success or failure.

## IX.

### ALTERNATIVE FORMS OF PRIVATIZATION FOR PUBLIC WATER UTILITIES

#### Franchise Contracts

Due to the economic environment of public water utilities the alternatives for privatizing are somewhat limited. One form of privatization that has historically been used in public utilities is franchising.<sup>1</sup> Franchises are most frequently employed by municipal governments for the provision and production of toll goods. (Stein, 1992) E.S. Savas (1982) in his book *Privatizing the Public Sector* indicates that, "many toll goods are natural monopolies, which is to say that as the number of users increases, the cost per user decreases." He further stated that, "Collective - action may be required to assure that these monopolies are created and granted in the first place and then regulated so that the owners do not exploit their monopoly privileges unfairly." Stein's and Savas's use of toll goods equates to what other writers such as Reynolds (1985) calls quasi public goods. They can be supplied in a market place but need collective action to control or regulate.

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<sup>1</sup> Franchising refers to the strategy of auctioning the right to provide a (natural) monopoly service. Franchising creates competition for the market when competition in the market is infeasible or undesirable. (Ramamurt and Vernon, 1991)



Provision of toll goods such as water, gas and urban transit through franchise grants dates back to the early part of the nineteenth century. During this time non-exclusive franchise rights for public services were granted through state legislation. Local units of government were not satisfied with the states' decisions on providers granted franchises in their areas. They felt they could make better decisions on granting franchises under state delegated authority. Authority was eventually conferred upon cities to establish franchise grants for public services.

Early franchises were expressly perpetual or lacking a definite time limit. (Glaeser, 1957) Due to this fact there was very little regulatory effect on the utilities by local units of government. In this type of setting competition failed to function because utilities would eventually consolidate into a single company. Because of the problem with perpetual franchises, new laws were passed to limit the lengths of franchises. The new short term franchises (10 to 60 years) were designed to prevent monopoly profits for public utilities.

As it turns out short term franchises were also a failure. Companies under existing franchise contracts held an advantage in negotiating contract renewals.

Because of the uncertainty of short-term franchises companies were unwilling to extend infrastructures to new areas unless it was tied into a contract extension.

From the experience gained by cities with non-exclusive perpetual and short-term franchise grants came a reorganization of thought. "Public utilities, whether in public or in private hands, are best conducted under a system of legalized and regulated natural monopoly." (Glasser, 1957) This new concept of exclusive franchise rights was still bothered by term limitations. Franchise contracts without provisions for municipal buy backs of property hindered expansion of utilities into needed areas. Investors tended to manipulate earnings to recapture their investments, meanwhile allowing the services to deteriorate.

Control of rates under franchise contracts was another problem between the local units of government and the contractors providing the services. Potential investors were reluctant to enter into agreements where there were considerable control over rates by cities. They preferred contracts where local units did not have the power to alter or repeal existing rates covered under the franchise agreement.

The problems encountered with attempts to provide public utility services by franchise grants and the subsequent sentiment towards monopolies made public ownership and operation an alternative for delivery of public services. This move towards public ownership of utilities belies E.S. Savas's thoughts on, "the principle function of government is to provide services that by nature are monopolies." (Savas, 1982)

#### Contracting Out

Contracting out is a competitive bidding process, which allows government to obtain services at the lowest possible cost. When government contracts out a service it retains funding responsibilities but hires a private firm to perform or deliver the services. This idea as a means of increasing efficiency is echoed in comments made by the Committee for Economic Development, "the public sector seems likely to function best as a market creator, systems manager, and contractor of social tasks rather than as an actual operator of every kind of public service." (Donahue, 1989) In more general terms, government should not be obligated to provide services, but see that they are provided. This type of thinking representative of the ideas behind contracting out public services.

A 1985 study by the National Center for Policy Analysis bluntly declared, "city government can cut half the cost of city services by contracting with private firms." (Donahue, 1989) Further rationale was listed as follows:

Private ownership allows the concentration of interest in efficiency; public ownership does not. Public management is constrained by layered authority, mandatory reviews, civil service rules, formal bid procedures, and so on; private management is not. Public organizations usually are secure against competition, provide organizations frequently are not. Private firms that fail to deliver face bankruptcy; public agencies that fail to deliver do not.

As good as privatization (contracting out) sounds, it is not without its potential problems. Problems that could undermine the increase efficiency that contracting out is propertied to achieve.

#### POTENTIAL PROBLEMS WITH CONTRACTING OUT:

1. Low balling contracts only to have contractor come back at later date to raise prices.
2. Reduction in the quality of services provided.
3. Corruption caused by payoffs, bid rigging, price fixing and kick backs.

#### 4. Ensuring services to the poor.

Various activities in the water industry could be provided by contracting out. By doing so government would be assuring the service is provided without having to provide it. In conjunction with contracting out, the industry would have to maintain its overall goals and objectives:

To provide an adequate supply of water that is free of health hazards, aesthetically acceptable, and a adequate quality for household, commercial, and industrial use. To provide prompt, courteous, reliable service and to minimize injuries and damage associated with the system. (Hatry, Blair. Fisk, Greiner, Hall Jr., and Schaenman, 1977)

Through the process of supplying water, (1) water intake, (2) water purification, (3) water storage and (4) water distribution, water utilities engage in a wide range of activities on a routine basis. The activities range from capital-intensive activities such as pumping operations to more labor-intensive areas such as meter reading and customer service. (Hatry, Clarren, Houten, Woodward, and DonVito, 1979) It is the labor-intensive activities that are best suited to be enhanced by contracting out. This is obviously a factor of lower labor costs and greater productivity in the private

sector.

Since water utilities can be a mix of capital-intensive and labor intensive activities at the operational level, such as, water intake operations, it would be easier to implement contracting out at the individual service level. For example contracting out the entire water intake operation (pumping of water to or from wells, rivers reservoirs, water towers and treatment plants) would prove difficult because of the capital intensive nature of the equipment involved, while individual services such as electrical repair and maintenance would be much easier to implement and more efficient.

Any moves towards enhancing efficiency through contracting out should also consider the quality of the service. Increased efficiency accompanied by decreases in the quality of the service makes contracting out less attractive as an alternative to the public provision of the service.

X.

PRIVATIZATION IN THE WATER INDUSTRY

In an article written by Steve K. Hanke and Stephen J.K. Walters, *Privatizing Waterworks* (1987), they discuss franchise contracts within the realm of Chadwickian theory. The basic premise of Chadwick's theory is that franchise contracts should be bid on the charges for services to be offered and not a lump sum bid for the franchise rights. Chadwick concluded the later would cause water monopolies to continue to produce and overcharge for its services.

Franchise contracts for the provision of exclusive water rights have been used in France since 1782. The franchise contracts have taken on two basic forms. "Concession contracts", in which the private firm is responsible for construction and operation of the facilities. The other form is "affermage contracts" in which the facilities are constructed publicly and are operated by private firms.

Hanke and Walter (1987) conclude from their review that both theory and evidence strongly support the notion that private provision of water services is more efficient than governmental supply. A study conducted

by W. Mark Crain and Asghar Zarkoohi (1978) supports Hanke's and Walters position. Crain and Zarkoohi found operating costs to be 25 percent higher in public water utilities than in private water utilities. Crain and Zardkoohi attribute their findings to lower production and under-utilization of capital by government.

In the U.S., the American Water Works Association periodically publishes comparative data on cost, returns and other financial information relevant to public and private water utility operations. One of the problems with analyzing the data are the organizational ambiguities between different water suppliers. Organizations may vary in, "size and dispersion of population served; in the scale and age of their capital equipment; in the costs paid for labor, machinery, water, energy, and finance; in the quality of available water supplies; and in how much they treat the water before pumping to its customers." (Donahue, 1989) Systematic differences between public and private water suppliers might lead to misleading results if compared.

In light of these potential problem areas in comparing public and private water utilities, seven studies have been conducted to review comparative cost effectiveness. To compensate for the systematic



differences, models have been developed to compensate for the factors mentioned previously. The results of the comparisons can be seen in Table 10-1.

Table 10-1

Water Utility Cost Studies: A Summary

Study	Conclusion
Man and Mikesell, 1976	Public more efficient
Crain and Zardkoohi, 1978	Private more efficient
Bruggink, 1982	Public more efficient
Feigenbaum and Teeples, 1983	No significant difference
Feigenbaum, Teeples and Glycer, 1986	No significant difference
Byrners, Grosskopf and Hayes, 1986	No significant difference
Teeples and Glycer, 1987	No Significant difference

SOURCE: Donahue John D. The Privatization Decision. New York: Basic Book, Inc., 1989, Table 4.3 p.75

It is important to note that each subsequent study attempted to further refine problem areas that were encountered in the studies done previously. As can be seen in table 10-1, the evidence indicates that there is no tendency for private water utilities to be more productive. The results are quite persuasive, "despite

presumptively superior incentives of the profit-seeking form of organization, private water utilities, on average, are no cheaper than public ones." (Donahue, 1989)

Even though private firms are potentially superior for efficient production, their potential may not work under certain circumstances.<sup>1</sup> In this case, "public versus private matters, but competitive versus non-competitive usually matters more. (Primeaux, 1977) It is important to note that the varied findings on the seven studies conducted are indicative of the difficulties encountered when analyzing economic data retrieved from a natural monopoly setting. Due to this fact very few studies have been done on water utilities with respect to operational efficiency.

Even though comparative data are not available for contracting out individual service levels in the water industry, the potential should be comparable to the findings in other privatized public service areas. Individual service levels that are labor intensive should be a prime area for comparison.

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<sup>1</sup> Walter Primeaux (1977) concludes, "private monopolies develop the same kind of organizational slack that plaques public agencies, and regulation cannot really substitute for competition.

A study conducted by Barbara J. Stevens for the Department of Housing and Urban Development found that municipal agencies are 50 percent less efficient than private contractors. (Donahue, 1989) A summary of Stevens findings can be found in Table 10-2.

TABLE 10-2  
ESTIMATED GAINS FROM PRIVATIZATION

Function	Extra cost of municipal services over the cost of contractor services (by %)
Asphalt overlay construction	96
Janitorial services	93
Traffic Signal Services	56
Street cleaning	43
Trash collection	42
Turf maintenance	40
Tree maintenance	37
Payroll preparation	0

SOURCE: Donahue, John D. The Privatization Decision. New York: Basic Book, Inc., 1989, Table 7.2 p.139

As can be seen in Table 10-2 each activity other than payroll preparation cost more to be provided by public means. The water utility industry has many individual serves that could be potentially contracted out. Some of these activities are listed below:

#### WATER SUPPLY ACTIVITIES

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- |                          |  |
|--------------------------|--|
| 1. Water Quality Testing | Testing of water samples to ensure the meeting of water quality standards.   |
| 2. Main Services         | Activities associated with constructing, inspecting and maintaining water mains.   |
| 3. Repair Operations     | Activities involved in repairing breaks or leaks in water mains or other aspects of the storage and distribution system. |
| 4. Meter Services        | Activities associated with installing adjusting or repairing, or replacing water meter or boxes.                         |
| 5. Fire Hydrant Services | Activities associated with installing, reinspectng and maintaining fire hydrants.  |
| 6. Valve Services        | Activities associated with inspecting and maintaining valves and valve boxes.  |
| 7. Pressure Survey       | Surveys of distribution system operations to check for leaks, breaks, obstructions, etc.                                 |

8. Billing and Collection      Billing of customers for water use and collection of unpaid accounts.

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Hatry, Hary P., Clarren, Sumner M., Houten, Therese von, Woodward, June D. and DonVito, Pasqual A. Efficiency Measurement for Local Government Services. Washington D.C.: The Urban Institute, 1979

Many water industry activities are presently being contracted out: engineering services, meter installations, servicing and reading, distribution system installation and repairs, and utility billing and collections, just to name a few. Private contractors are providing to public water utilities the necessary labor and technical expertise needed to perform these activities. Even though comparative data are unavailable, one could surmise based on the success of contracting out in other public service areas as indicated by Steven's study, cost savings are being realized by the water utilities.

## XI.

### CONCLUSION

Research on privatization in the water utility industry has been very limited. There are a number of reasons for this, "including the expense and trouble involved in large-scale field studies, the methodological difficulty of isolating the effect of organizational form from a host of other determinants of cost or quality, demonstrated readiness of both advocates and opponents of privatization to make claims and make policy without waiting for empirical validation, and, perhaps, the issue's general lack of glamour...." (Donahue, 1989) Even so, there is enough information to make some specific conclusions on privatization with respect to public water utilities.

Rather than ask if the water industry can be privatized, the more important question is, how can it be made more competitive? Competition is not an automatic result of privatization, especially in an industry that is considered to be a "natural monopoly." By economic necessity the economies of scale that exist in public utilities need to be maintained to keep pricing at an optimal level. As in the water industry, this usually means a single supplier will be utilized to

provide services.

Earlier, two forms of privatization were discussed, one being franchise agreements. Franchise contracts arguably are structured to promote competition in the water industry which is considered a natural monopoly. According to Steve H. Hanke and Stephen J.K. Walters (1987) franchising should generate substantial benefits for water customers:

Both theory and evidence strongly support the notion that private supply is more efficient than governmental supply. Waterworks, however, are true national monopolies; consequently, many argue against privatizing them. As they see it, privatization would simple transform a public monopoly into a private monopoly. But that need not be the case. The benefits of large-scale, single firm operations can be secured at competitive prices. This can be accomplished by employing Chadwick's system of franchise bidding in which the rights to a franchise are awarded to the firm that offers the best terms to the public.

Unfortunately, the preponderance of historical information on franchising and public utilities does not bear this out. Glaeser (1957) points out the following problems encountered with franchise contracts:

1. ...competition failed to function because consolidation were the ultimate outcome.
2. ...substantial earnings began early and developed into monopoly profits.

3. ... existing companies had an advantage in negotiating for renewals.
4. ...uncertain tenure often created a situation which made refinancing difficult if not impossible.
5. ...companies were unwilling to build needed extensions unless suitable arrangements could be made to insure a continuance of their right to operate and thus enable them to secure the necessary capital.
6. An ever greater evil that crept into the administration of these enterprises as a result of the effectiveness of control under the special franchise was that of discrimination in both the service and rate.

Glaeser's findings on franchise contracts hardly supports Hanke's and Walters theory on private supply efficiency. Under franchise agreements he found sustaining competition to be very difficult, rates long term developed into monopoly profits and services were negatively impacted. Donahue (1989) echoes similar concerns as follows: "In the complex relationships among utility managers, investors, regulators, and consumers, contractual structures that give the right signals and incentives are difficult, and sometimes impossible, to fashion." The economic, political and social complexity of public water utilities makes efficiency enhancement through private franchise contracts questionable at best. The limited number of studies done on public water utilities show neither the public nor private provision of services to be superior. Social acceptance of public



employee displacement due to franchise agreements further add to the difficulty of its successful implementation.

Selective privatization as earlier indicated in Steven's study could reduce the cost of government services by as much as 50 percent. This would allow public officials to concentrate their energies on tasks that could not be delegated. Private contracting not only provides cheaper labor and more productivity, but can provide the specialized needs that are impossible for most utilities to staff. Many utilities contract out specialized engineering functions (architectural, civil design and environmental), large project administration and construction, laboratory testing and many other functions. These contractual services are not practical for most utilities to maintain because of their technical requirements and cyclical demand.

Contracting out is not without its potential problems. Public employee displacement is an important aspect of selective privatization in public water utilities. "Even if taxpayers' stake in efficiency take precedence over workers, claims to their jobs, taking steps to cushion privatization shock to municipal workers - while it will likely cut savings considerably - is both politically prudent and commendably humane. (Donahue,

1989)

Corruption is another area of concern when considering contracting out. If present, corruption and/or collusion can dramatically reduce or negate the effectiveness of contract services. Carefully structured competition for private firms through concise contract specifications will help reduce this potential problem.

When considering selective contracting out it is important to privatize the right services. This can only be done if the municipal officials overseeing the water utility have the necessary information to make correct decisions. In Section X of this paper, Table 10-2, it can be seen that payroll preparation has no costs advantages under private provision. Yet, Steven's reports that more cities contract out payroll services than street cleaning which affords a 43 percent savings through private provision. Obviously selecting the correct service to contract out is key for privatization to work most efficiently.

Public water utilities operate in a very complex economic, political and social environment. Continuing pressure is placed on the industry by government regulations. These regulations attempt to safeguard

consumers by controlling natural monopoly pricing, assuring adequate water quality, rationing common resources and addressing problems created by externalities. Customers demand the highest quality water at the lowest possible price. Couple these issues with the fact that in theory, the water industry being a natural monopoly functions most efficiently in a single supplier environment, will preclude a large divestiture of government involvement with the water industry.

Increase cost efficiency in the water industry seems to be most obtainable through selective contracting out of service level activities. To achieve this public employee unions must become active partners in the privatization process. Joint cooperation between the public and private sector will be key for successfully contracting out services.

Those advocating privatization should not say that the public sector is bad and the private sector is good, or that we need to dismantle the state or do away with the public sector. In fact, if privatization is to succeed, we need a very strong, healthy and well managed public sector." (Sevelin, 1986)

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