

Report 0102. Price and Ownership Status of New Jersey Water Systems

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Executive Summary. Government control over the provision of drinkable water, and of any other service, remains a source of controversy. Supporters of markets contend that private firms and competition will increase efficiency, lower costs, and raise quality. Critics, on the other hand, claim that water is a natural right and therefore should not be treated as a marketable good. Furthermore, they argue that water provision is a natural monopoly. Because water can be a natural monopoly achieving competition is difficult and private firms will exploit the weak competition by raising costs. This paper compares rates across ownership types for the 40 largest water systems in New Jersey. The analysis shows that the rates of public water systems are 60 percent lower than fully privatized systems and public-private partnerships. It is possible that rates are higher for private systems because municipalities defer maintenance and then sell their system when they can no longer defer maintenance. To test for this possibility, I compared publicly owned-and-operated systems to systems owned by private companies for over 15 years, when any deferred maintenance issues should be resolved. The results were virtually unchanged: public systems still had significantly lower rates.

Background

The question of who controls our nation's water supply has important implications especially given our increasing concerns about a dilapidated water infrastructure. According to the American Society of Civil Engineers, there are an estimated 240,000 water main breaks in the United States every year. Out of the "more than one million miles of water mains" in place, only "4,000 to 5,000 miles of drinking water mains are replaced annually" (2013 Report Card). The Environmental Protection Agency estimates the cost of total water infrastructure improvements and repairs over 20 years at \$384.2 billion (Needs Survey and Assessment, 2011).

Given these costs, some have advanced proposals to privatize water systems. Privatization advocates generally argue that private firms can deliver water more efficiently than publicly owned-and-operated systems. The lure of profits and the desire to please stockholders drives these private firms to be more efficient. Moreover, private firms may better maintain their systems and therefore prevent large deferred maintenance expenditures.

However, there are also good reasons to expect that private firms may charge higher prices than publicly owned-and-operated systems. Because individual consumers are generally unable to switch the source of their water supply, the private firms may raise prices well above their costs and reap large profits (i.e., act like a monopoly). As they have no stockholders, public firms have little incentive to raise prices in this way. Therefore, governments should control the water supply to further the public interest. This government control will also ensure access to water – a basic requirement for human life, and a human right.

A middle ground between complete privatization and complete government control of water supplies: public-private partnerships, or PPPs. Typically, PPPs involve government ownership, with varying levels of private involvement. Policy suggestions favoring private involvement generally condition them by further urging strong regulation by local governments. This paper will set out to determine the effect of ownership of water systems on the rates charged to households in New Jersey by comparing rates across ownership types for the 40 largest water systems in New Jersey. The analysis shows that the rates of public water systems are 60 percent lower than fully privatized systems and public-private partnerships. Because it is possible that rates are

higher for private systems because municipalities defer maintenance and then sell their system when they can no longer defer maintenance, the paper also compares publicly owned-and-operated systems to systems owned by private companies for over 15 years, when any deferred maintenance issues should be resolved. The results were virtually unchanged: public systems still had significantly lower rates.

This policy brief organizes as follows: Section II contains a review of the relevant literature on the privatization of water supplies and their effects on costs, including the effects of PPPs. Section III will discuss in detail some of the options available to policymakers. In Section IV, I review my findings of the effects of public and private ownership and management on rates charged to New Jersey residents. Using these finding, I put forth some recommendations in Section V to lower the cost of water.

Literature Review

The literature on water supply generally supports the view that privatization has an adverse impact. García-Valiñas, et. al (2013) studied the effects of 53 municipalities in Spain and found that, all other things being equal, "private or mixed firms set higher average price levels than public ones" once controls were added to control for the possibility that prices cause ownership (rather than the reverse). This contrasts with evidence from poor communities in Thailand, which suggests that although an increase in user charges has resulted from privatization, the increase is statistically insignificant in most cases (Zaki et al., 2009). In the Chilean water system as well, a fully privatized one, there are "high water prices" (Baer, 2014). However, the government has a heavy subsidy program in place. Further, Dore, Kushner, and Zumer (2003) examine privatization of water systems in the United Kingdom and France and show that once again privatization is associated with higher costs.

Relatively less research has been done on the effects of public contracting with private firms (PPPs) on the cost of water usage. However, García-Valiñas, et.al (2013) find that for Spanish municipalities, prices are higher for those municipalities that have chosen to contract the provision of water to an external company. In general, the decision to have services provided outside the municipality is associated with an increase in prices, suggesting that public

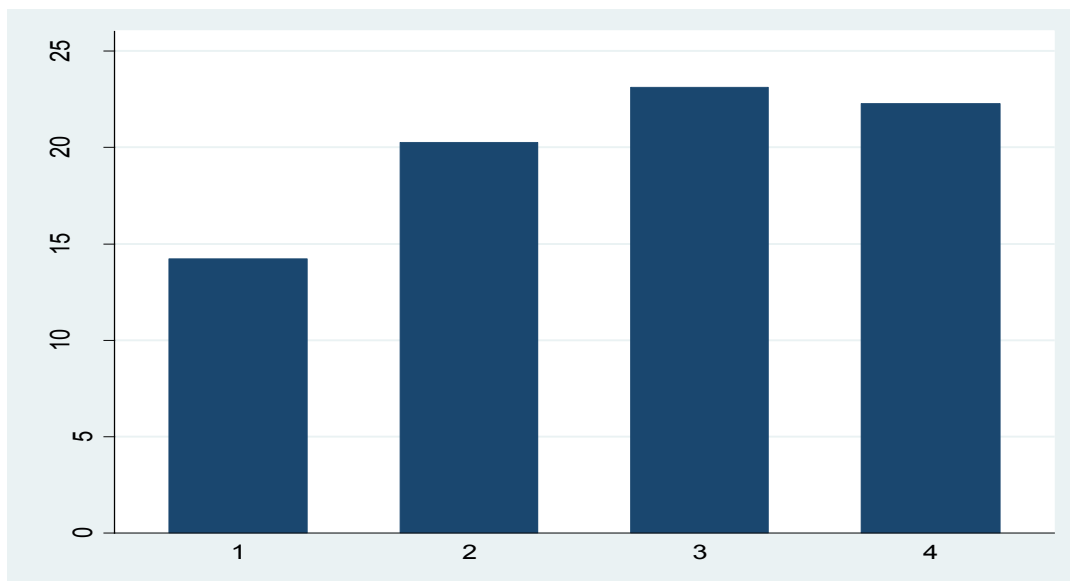


Figure 1. Bar Graph Showing the Average Total Charge for Fully Public (1), Publicly Owned and Privately Operated (2), Fully Private <15 years (3), Fully Private >15 years (4)

companies will charge more than private ones for their services. The authors also find that prices are higher for public-private partnerships than purely private companies.

While these studies offer helpful insights into the effects of privatization on the price of water usage, none particularly focus on the United States or a particular state. Food and Water Watch (2010) reports on the dollar amounts charged for the largest public and private water systems in New Jersey. Using 5,000 gallons as a reference, the authors report that both privately owned and operated, and publicly owned and privately operated water utilities charged 64% more than publicly owned and operated water utilities. The study performed for this policy brief builds upon the Food and Water Watch report, extending the sample size to 40 New Jersey water systems considered to be "very large" or "large" by the Environmental Protection Agency and testing the effects of the ownership and management status on the total amount charged at different level of water usage.

The Food and Water Watch report compares only private and public water systems and as a consequence fails to analyze private public partnerships. More importantly, the analysis fails to consider that private rates may be higher because of deferred maintenance issues. That is,

distressed municipalities may sell off their water systems after they have ignored maintenance for an extended period. When the private firm takes over, the firm must raise rates to address the maintenance issues.

Policy Options

Baer (2014) argues for privatization of the water supply to reduce government involvement and subsidies. Policy support for privatization generally includes the caveat that the government continues to ensure transparency and maintain competition through competitive bidding that includes social and environmental goals (Cotta, 2012). However, use of competitive bidding by municipalities to increase competition may create additional problems. First, contracts for private supply must specify consumer types, consumption levels across time, and quality measures. Second, bidding firms may unintentionally or strategically underestimate costs or overestimate revenues (Chong, et al., 2006). However, governments may control such strategic behavior by comparing competitors based on their performance through the use of benchmarks.

Status	N	Mean	Standard Error
Privately Owned and/or Operated	19	22.39726	0.6358748
Publicly Owned and Operated t = 3.9266**	21	14.21557	1.894447
Privately Owned and Operated	16	22.79857	0.641923
Publicly Owned, Privately Operated t = 1.5080	3	20.25691	1.962603
Privately Owned, Operated < 15 years	10	23.11571	0.2567275
Privately Owned, Operated > 15 years t = 0.6247	6	22.27002	1.734761

Table 2. Two sample t tests comparing Total Charges of:

a) Fully Public Systems with Those of Privately Owned and/or Operated b) Publicly Owned and Privately Operated Systems with Fully Private Systems c) Fully Private Systems for longer than 15 years with those for fewer than 15 years

This policy strategy can offer, among other thing, "strong incentives for the operators," the promotion of efficiency, fair returns, and information sharing to reduce asymmetry (Marques, 2006). An example of this is a benchmarking technique called total cost benchmarking, includes "a measure of total cost on a standardized basis" to be reported by regulators and incentivize private firms to lower costs (Burns, 2005). Regulators create incentive for private firms to deliver improved results on in predetermined areas of efficiency and safety, such as service and water quality and cost.

Finally, Hall, et al. (2013) suggest that "public authorities... should reconsider privatization and liberalization policies" given that "the discipline of competition cannot be effectively introduced, and... regulation, is frequently limited by the bargaining asymmetry". However, a study of water systems in Greece suggest otherwise. PPPs -- including contracted services, lease purchases, temporary privatization, built operate transfer (BOT), and built own operate transfer (BOOT) -- have shown to be economically efficient (Voivontas, et al.,

2002). The author further suggest a strong regulatory structure to ensure that the system provide the improvements that they expect.

Findings

I compared costs across water system types at 1050, 2100, and 4200 gallons used. These levels represent half the average, the average, and twice the average monthly water usage in New Jersey (EPA, 2010). The total cost of water included any fixed monthly charge for water systems that charge a fixed rate to create the total charge for water in each system at the given levels of usage.

Table 1 shows the list of dependent and independent variables. The total charged for water at each usage level will serve as the dependent variables in this study. Also, listed are dummy variables for quarterly fixed rate, quarterly fixed rate with a ceiling, and tiered rate system with no fixed rate. The variables will take the value of 1 if they apply for each water system. This study also controls for population size in each municipality as a percentage of the New Jersey population.

Variables	Coef	S.E.	t
Fully Public	-6.551	3.087	-2.12**
Publicly Owned, Privately Operated	-1.925	4.604	-0.42
Fully Private for Less than 15 years	1.210	3.673	0.33
Tiered System with No Fixed Rate	-7.676	3.607	-2.13**
# Served as % of NJ Population	-23.590	97.135	-0.24
Constant	22.364	2.678	8.35***

Table 3. Regression: Effects of Ownership and Operation Status on Total Amount Charged at the Average Level of Usage. Robust standard errors in parentheses. *p < .1, ** p <.05, *** p .01.

I classify water systems as either publicly owned and operated, publicly owned and privately operated, or privately owned and operated. Publicly owned and privately operated water systems will represent PPPs in this study. Furthermore, I analyze separately water systems that have been privately owned and operated water system for more than 15 years. We use ownership for more than 15 years because distressed municipalities often sell their water systems. These distressed systems typically face a great deal of deferred maintenance. Thus, private providers must raise rates.

Recommendations

To investigate the effects of ownership type on water rates, we compared rates for publicly owned-and-operated water systems to privately owned-and-operated systems and publicly owned/privately operated systems. The results show that privately owned-and-operated systems charge much higher rates (\$22.80) - 60 percent higher - than publicly owned-and-operated systems (\$14.21). It is possible that rates are higher for private systems because municipalities defer maintenance and then sell their system when

they can no longer defer maintenance. To test for this possibility, I compare publicly owned-and-operated systems to systems owned by private companies for over 15 years, when any deferred maintenance issues should be resolved. The results were virtually unchanged: public systems still had significantly lower rates (\$14.21 to \$22.27).

Similarly, publicly owned-and-operated systems show lower rates than systems that are publicly owned and privately operated (\$14.21 versus \$20.25). This suggests that retaining public ownership of the system does not restrain the price increases from privatizing water supply operations. Across all comparisons, these basic results hold whether we calculate the rates at twice the average monthly usage (4,200 gallons) or half the average monthly usage (1,050 gallons). However, more factors may be relevant. The existing literature suggests that privatization delivers quality improvements to water systems once acquired, such as improvements in drinkability, clarity, reliability, and customer service (Zaki, et al., 2009). However, since my results do not test water quality in New Jersey, I refer policymakers to other studies on the link between privatization and water quality.

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