

Local Privatization and Costs: Theoretical Expectations vs Empirical Evidence

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Local Privatization and Costs: Theoretical Expectations vs Empirical Evidence

Abstract

Cost reduction was the key benefit claimed by privatization. We conduct a meta analysis of all published econometric studies of water and waste production since 1965. Little support is found for a link between privatization and cost savings. Cost savings are not found in water delivery and are not systematic in waste. Reviewed studies build from public choice, property rights, transactions costs and industrial organization theories. We conclude public choice theory is too focused on competition which is typically not present in quasi markets. Property rights theory gives attention to ownership and service quality, but absent competition, ownership makes little difference on costs borne by municipalities. Transactions costs argues privatization is best when contracts are complete – a rare situation in public service markets. We find the industrial organization approach most useful in explaining results because it directly addresses incentives, sector structure and regulatory framework.

Local Privatization and Costs:

Theoretical Expectations vs Empirical Evidence

1. Introduction

Reducing costs of city service delivery was the strongest promise made by advocates of local privatization. After more than two decades of experimentation with contracting, and a host of empirical studies of privatization experience, what can we say about privatization and costs? In this paper we review and analyze the empirical evidence on privatization and costs by focusing on the two most economically relevant local services concerning privatization: waste collection and water distribution. From a research perspective, these services have been studied more frequently than any other, and thus provide a critical mass of studies for meta analysis.

Early surveys of the literature (Domberger and Rimmer 1994, Domberger and Jensen 1997) concluded that, according to expectations, privatization of city services was linked to cost savings. However, meta-analyses published later, such as Hirsch (1995), Boyne (1998a, 1998b) and Hodge (2000) found mixed evidence on cost savings and began to raise both methodological and theoretical concerns about such expectations. These review works did not include published articles on waste and water for non Anglo-Saxon countries (the sole exception being a study in 1977 on waste in Switzerland). In recent years, several studies have been published on waste for European Union (E.U.) countries. In addition, several studies have been published on water in E.U and other regions in the world. Hence, our review has a wider geographical scope than the previous reviews.

We focus our analysis on multivariate empirical analyses, as only these studies offer significant conclusions on cost comparisons between public and private production. Based on our review and analysis, we conclude that skepticism of cost savings under privatization is warranted.

The empirical research clearly shows that no direct and systematic relationship can be established between private production and cost savings or productivity.

How might we explain these results? We review four theoretical approaches on the link between local privatization and costs: public choice, transactions costs, property rights and industrial organization. Then we review the empirical evidence in waste and water. We analyze these results in connection with the theoretical insights and show industrial organization and transactions costs offer the most comprehensive framework for explanation. In conclusion, we suggest that if privatization is chosen as a tool for reform, governmental regulation and market structuring is necessary to ensure cost savings occur and are sustained over time.

2. Theoretical Review

We look at four theoretical perspectives that could provide a basis for cost savings under privatization. Public choice and property rights theories look at incentives to managers and the role competition can play in reducing excessive public supply of public services (Niskanen 1971), or providing stronger incentives for cost reduction under private property (Shleifer 1998), and thus reducing costs. Transactions costs and industrial organization theories look more at the nature of the service and structure of the market noting the importance of the costs of contracting and monitoring (Williamson 1999), or the importance of economies of scale (Donahue 1989). We use these theoretical lenses to assess the empirical evidence and conclude that a comprehensive theoretical approach that focuses both on actors and incentives as well as market and regulatory structure is needed in order to understand why privatization has not delivered cost savings.

Public Choice

Public Choice theory gives primary emphasis to incentives and is based upon the view that politicians and bureaucrats behave like the typical neoclassical individual (Niskanen 1971).

Hence, the central actors in the government service delivery process would seek to maximize their personal utility and interests. If public services delivery is a monopoly in the hands of politicians and bureaucrats the result will be an excess of supply of public services and, thus, inefficiency. Politicians and bureaucrats will manage these services with the objective of extracting material rents and political power (Savas 1987).

Public Choice proposes to replace monopoly with competition in the public services market, according to the belief that competition will restrict excessive supply of public services and lower costs. Replacing monopoly with competition can be done by assigning contracts to external producers through competitive procedures, or by promoting competition between governmental units (Tiebout 1956, Osborne and Gaebler 1992). Public choice is a theory of non-market failure (Lowery 1998) and, theoretically, provides a strong rationale to expect cost savings under privatization – if competition is present. But in fact public services are at best quasi-markets with a limited number of alternative private suppliers (Sclar 2000). Competitive markets rarely exist for public services and this undermines the basis for cost savings.

Transaction costs

According to the seminal work by Ronald Coase (1937) transactions will occur inside the firm when market transactions incur higher costs. The transaction costs approach takes the choice to ‘make’ or ‘buy’ within a private firm framework and applies it to government decisions concerning public services delivery. According to Williamson (1999), transactions have three basic dimensions: 1) Uncertainty on how the transaction develops and its results; 2) The frequency with which transactions are repeated; 3) The relative requirement of long-term investments specifically related to the transaction, or sunk costs. Because of these factors, the institutional organization required to establish and to apply the contracts can be very complex.

Theoretical analysis of privatization and contracting out uses the concept of transaction costs in an open sense, which includes administrative costs as well as costs from incomplete contracts. In their theoretical analysis on the choice between public and private production, Sappington and Stiglitz (1987) argue that the main factor explaining the choice of production form is a function of the transaction costs derived from the delegation of authority. Monitoring and control play a central role, and cost minimization does not refer just to production costs, but to the sum of production and transaction costs implied by contracting out. Cost savings are likely to emerge when transactions costs are not huge. Hence, depending on the characteristics of the concrete service (with respect to the three dimensions above) savings will be more or less likely.

Stein (1990) used this approach to classify local government services and assess form of delivery. Transactions costs have been used to explain government choice in the decision to contract out (Nelson 1997, Sclar 2000, Hefetz and Warner 2004). While some authors downplay the contracting costs and argue the costs of bureaucracy are higher (Eggers and O'Leary 1995, Osborne and Plastrick 1997, Savas, 1987), others find the transactions costs to be significant factors in explaining decisions to privatize or reinternalize production (Hefetz and Warner 2004, Brown and Potoski 2003, Kavanagh and Parker 1999, Lowery 1998, Sclar 2000). Cost savings expectations from this view are dependent on nature of service and local market conditions.

Property rights

Grossman and Hart (1986) and Hart and Moore (1990) argue that asset ownership gives the owner control and bargaining power in situations in which the contractor can not perfectly foresee the evolution of the activity. Ownership is an important factor, because it confers the right to obtain the benefits from actions related to the assets, such as profit from the benefits of innovation and efficiency gains.

Hart, Shleifer y Vishny (1997) apply the theory of incomplete contracts and property rights to the choice between public or private production of public services. Their work suggests that with private production incentives exist to reduce costs without regard to quality erosion. Private producers have incentives to innovate in cost reduction. However, cost reduction can be achieved by reducing the quality of the service. To ensure quality under privatization requires increased oversight which can, in turn, blur the line between public and private ownership (Guttman 2000, Bozeman 1987). As the difference between public and private ownership disappears the potential for cost savings from private ownership may disappear as well.

Industrial organization

Similar to the property rights approach, within the industrial organization framework the relationship between incentives and ownership is of core relevance. But the focus here is given to the duality between principal and agents. The problem is how incentives can work so the manager behaves in accordance with ownership's objectives. And, when comparing public and private ownership, differences concerning the ability of aligning managerial actions with ownership objectives are the rationale for differences in efficiency between private and public ownership.

When there is a strong separation between ownership and management, some central factors can work as control mechanisms to improve the alignment between ownership objectives and management (Vickers and Yarrow 1988). According to the industrial organization approach, private ownership will be strongly preferred to public ownership when owners benefit from devoting time and money to get the information needed for supervision, when firms can be taken over, and when firms have a risk of bankruptcy. These factors are more common in markets with some degree of competition and not subject to strong regulation by government (Kay and Thompson 1986, Vickers and Yarrow 1988). Within the industrial organization approach much relevance is given to the fact that the design of contracts and biddings properly specifies conditions that stimulate dynamic

competition and, therefore, reduce the likelihood of future monopolization (Laffont and Tirole 1993, Bolton and Dewatripont 2005).

The following meta analysis of empirical studies draws from these four theoretical bases. Theoretically, we might expect cost savings in both water and waste if competition were present. For waste collection, property rights theory suggests private production could be cheaper due to incentives to invest in new technologies for cost reduction. Public choice theory would emphasize the benefits of competition in reducing costs; but how much competition is really present in waste markets? Industrial organization theory would emphasize economies of scale and industry structure. Although complete contracts are more likely in waste collection, transactions costs may still be high. Although we might expect cost savings under privatization from each of these theoretical perspectives, the empirical evidence is much more mixed and reflects the importance of limited competition, government regulation and market structure.

For water distribution, the theoretical predictions are less optimistic. Property rights would expect cost savings but these might come at the expense of service quality. Competition is harder to realize due to the fixed network infrastructure on which water delivery depends. Industrial organization would emphasize that sunk costs would prevent competitive discipline for private providers. Transactions cost would predict problems due to incomplete contracts. Thus, the theoretical basis for cost savings under private production is even weaker for water distribution.

3. Empirical Review

We review all the published econometric works on relations between costs and form of production for waste collection and water because they are widely provided by local governments, and most of the empirical studies of privatization have been done on these two sectors. This offers the opportunity to look across countries and over time and assess the impacts

of contracting on cost savings. Most studies do not measure costs before and after privatization; instead they compare costs of public production with costs of private production across cities.

Water and waste services can be provided in three ways. Pure private provision occurs when consumers contract with private vendors on an individual basis for water and waste collection services. However, most of the studies in our sample are concerned with publicly provided services that are produced either by municipalities (public production) or private firms (private production). Dubin and Navarro (1988) emphasized this distinction by modeling a two stage process – the decision by a municipality to intervene in the market and publicly provide a service, and the decision of how to deliver the service – either through public or private production. They argued that pure private production would be the most costly due to market failures that prevent taking advantage of economies of density.¹ Competition under pure private production increases overlap and denies the opportunity to realize the advantages of economies of density. A recent study by OECD (2000) confirms that pure private production is more expensive than municipal provision. Under public provision, these economies can be realized through monopoly production, be it private or public. What we analyze is this second production choice and whether, under municipal provision, public or private production is less costly.

Waste Collection

The first econometric study of waste collection was conducted by Werner Hirsch in 1965. Using data from 24 municipalities in St Louis Co, Missouri, he found no difference in cost due to public or private contract arrangement. His production cost model provided an example that has been followed by many studies since. His cost model controlled for amount, quality, service conditions which affect input requirements, factor prices, technology, density, and form of finance (user fee or general budget). These variables took into account important features of property rights, transactions costs and industrial organization theories. Hirsch found no

significant difference in costs by municipal or private production. Similar results have been found in other studies of U.S. municipalities. Statewide samples in Montana (Pier, Vernon and Weicks, 1974) and Missouri (Collins and Downes 1977) found no difference between public and private production under municipal provision. A Connecticut study, (Kempler and Quigley 1976) found private production had lower costs, but they did not control for heavier public provision in cities. In a national sample (Stevens 1978) found no difference in costs in municipalities under 50,000 population, but private monopolies were less costly in cities over 50,000. She attributed this to better technology among private providers in large municipalities. Dubin and Navarro (1988) found economies of density in waste collection but not economies of scale.

Competition is a key feature underlying public choice and property rights theory, but turns out to be problematic even in waste collection. Great Britain provides an interesting case. Compulsory competitive tendering (CCT) was introduced in 1988 requiring municipalities to allow private competition for waste collection. Domberger, Meadowcroft and Thompson (1986) looked at 305 municipalities in England and Wales prior to CCT (from 1983-85) and found that under competitive contracting there was no difference in public and private costs. But in places where there was no competitive contracting, public costs were higher. Competition encouraged public managers to keep costs down. Similar results were found by Szymanski and Wilkins (1993) in the 1984-88 period. Although they found a 20 percent savings in the first year after CCT however, these savings disappeared in four years suggesting underbidding by contractors. Although 71 percent of municipalities won their competitions and retained public service provision, their costs were no different from the private providers. A follow up study by Szymanski (1996) on 365 English municipalities from 1983-94 found that although savings eroded over time, private production costs were lower than public production. The challenge with

waste is that there is competition *for* the market but not competition *in* the market. Thus benefits would be expected to erode over time if market failures related to competition are present.

Only three other studies have found lower costs with private production. These include two works from Canada in the 1970s (Kitchen 1976) and 1980s (Tickner and McDavid 1986) and one more recent study in Ireland in the mid-1990s (Reeves and Barrow 2000). The sources of cost savings under private production tend to be due to technology and productivity arising from more flexible work practices – which speaks to an industrial organization perspective.

The most recent studies on waste collection have found no differences in costs. In the US, Callan and Thomas (2001) using a multi-product framework found that the form of production does not influence costs in a study of municipalities in Massachusetts. Ohlsson's (2003) study of 115 Swedish cities found private production was more costly than public. Dijkgraaf and Gradus (2003) show no difference between public and private production under competitive contracting among cities in Holland. Bel and Costas (2006) study the Spanish case and found that the form of production does not influence costs, and market concentration creates problems for competition.

Regulatory structure matters. In a recent paper, Dijkgraaf and Gradus (2006b) find that private production is initially associated with cost savings, but this effect disappears over time, even with government regulatory interventions. These results suggest the importance of regulatory environment from an industrial organization approach.

In most countries there is a strong association between private production and competition for the market through competitive calls, and public production without competition for the market. Typically public production is outside a competitive framework. The benefits of competitive contracting (increased efficiency) would come primarily with competition *for* the market as monopoly provision would continue to be necessary due to economies of scale. Thus benefits from privatization would be expected to erode over time. Indeed only six of the 17

studies found cost savings with privatization and most of these were using data from the 1970s. Of the works using data in the 1990s, only the English and Irish studies found any cost savings.

Theoretically we expected more competition in waste markets and more benefits from technological innovation than these empirical studies show. Economies of scale seem to be exhausted at a relatively low population level. Failure of cost savings, especially in the more recent studies, derives from incentives, regulatory structure and industrial organization of the sector itself. These features are better understood through an industrial organization perspective.

Table 1 presents information on the empirical studies on waste collection.

Water Distribution

Empirical literature on the relationship between urban water distribution and costs goes back to the mid 1970s. Between the mid 1970s and the mid 1990s the econometric works on the issue are limited to the USA. Since the mid 1990s interest in this kind of analysis decreases in the USA, but the first econometric works appear for the UK, right after the privatization of water systems in England and Wales began in the late 1980s. Finally, in recent years empirical works appear for regions and countries beyond the USA and the UK.

The first econometric study (Mann and Mikesell 1976) used a sample of 188 government-owned and 26 privately-owned water firms and addressed both ownership and regulatory aspects. They found private investor-owned utilities had higher costs than government-owned utilities. The model included operating environmental variables (water supply sources, per capita income and population density of market area) as well as institutional variables (ownership, regulation jurisdiction (state or local) and rate base valuation method. The next study by Morgan (1977) found costs with private production were lower than with public production. Morgan used a sample of 143 firms of water distribution in six USA states. His model gave more attention to operational costs (total output, length of the water network, number of connections served,

percentage of surface water, percentage of water bought from other agencies, and storage capacity) but less attention to institutional and regulatory variables (only a dummy variable reflecting public or private ownership of the firm). The next empirical analysis, by Crain and Zardkoohi (1978), used data from firms in 38 USA states, and like Morgan, found that private firms have lower costs. Using a similar approach, Bruggink (1982) studied a sample of 86 firms and found private firms have higher costs than public production, like the first study by Mann and Mikesell.

Feigenbaum and Teeple (1983) used a hedonic costs model and did not find significant cost differences between private firms and public production. Fox and Hofler (1986) introduced the multi-product characteristic of water firms: they produce potable water and they distribute it. They did not find significant differences for technical efficiency or aggregate costs.

Given the different results obtained in the empirical works already reviewed, Teeple and Glycer (1987) analyzed reasons that could explain these differences. They found models with more restrictions and more omitted variables were more prone to find larger differences between private and public production. However, these results disappeared when the models had fewer restrictions and more relevant variables included. Teeple and Glycer's (1987) own findings showed no significant difference between private and public production. Subsequent works for water service in the USA, using models similar to those already reviewed, show no differences between private and public production (Byrne, 1991), lower costs with private production (Raffie, Narayanan, Harris, Lambert and Collins, 1993), and lower costs with public production (Bhattacharyya, Parker and Raffie, 1994). Finally, Bhattacharyya, Harris, Narayanan and Raffie (1995) used a different methodology, a stochastic frontier costs function, and concluded there are not significant differences between private and public production. Nonetheless, when analyzing according to firm size, Bhattacharyya, Harris, Narayanan and Raffie (1995) obtained that private

production is more efficient when small scales of production and small firms are involved, whereas public production is more efficient when analyzing large scale operations.²

In the UK the first analysis of privatization, efficiency and costs (Lynk 1993) studied all ten regional agencies in England and Wales in the periods 1979-80 (after 1973 reorganization) and 1987-88 (prior to privatization), and 22 out of the 28 private firms in the periods 1984-85 and 1987-88. Lynk used the cost frontier methodology and econometric estimations of total operational cost. The study does not permit a direct comparison of efficiency between public and private units, but offers information on the average levels of efficiency in each type of ownership in the years before privatization. He found inefficiency was higher in private firms, and public agencies had improved their efficiency throughout the 1980s.³

The next econometric work for water privatization in the UK is Ashton (2000a, 2000b), who analyzed potential improvement in efficiency in the former public agencies that were privatized in 1989. His findings show that technical change and total factor productivity improvement after privatization are very small, and the unique relevant change seems to be improvement in the quality of the inputs used in the industry. Finally, Saal and Parker (2000) analyze whether privatization caused a reduction in production costs. They find that the trend toward increasing costs did not change after privatization. Moreover, they find that it is regulation (price caps) that induced efficiency improvements in the mid 1990s.

In recent years several studies of countries in different regions of the world have been published. Jones and Mygind (2000) study on the Baltic countries is the first work that makes efficiency comparisons between private and public delivery of water services.⁴ In Estonia and Latvia they find a private efficiency advantage in some periods, and no significant difference between private and public delivery and efficiency in other periods. In Lithuania no significant relationship between efficiency and production form is found. This is the same result found by

Estache and Rossi (2002) in their analysis comparing the efficiency of 50 public and private firms in 29 countries in Asia and the Pacific region. Estache and Rossi adopt a cost frontier function approach and find that franchising and private sector participation have no significant link with production costs (Estache and Rossi 2002, 145). Finally, Kirkpatrick, Parker and Zhang (2006) study the relationship between form of production and costs in a sample of 76 firms in African countries. They, too, find no significant influence of production form on costs.

Water distribution is characterized by asset specificity and long term contracts (except for England and Wales where ownership was transferred to the private sector). Monopolistic characteristics make competition for the contract unlikely. Government quality regulations are strict. These factors reduce the likelihood of cost savings (Wallsten and Kosec 2005). Indeed, only three of the sixteen studies found private production less costly than public production. All three were done for the USA, two in the early 1970s. While some studies found public production more efficient, most found no significant differences in costs or efficiency between public and private production. The importance of economies of scale and government regulation demonstrates the salience of a broader industrial organization approach.

Table 2 presents information on the empirical studies on water distribution.

4. Discussion

Comparing across water and waste provides the opportunity to assess not only the empirical results but also the relative value of alternative theoretical frameworks. Empirical results for waste show the majority of studies find no difference between public production and private production. While a few studies from the 1970s find cost savings with privatization, these results do not persist over time. For water, only three studies found cost savings with privatization (Morgan 1977, Crain and Zardkoohi 1978, Raffie *et al* 1993). The more dynamic results in waste

collection are best explained by the industrial organization approach which allows us to look at changes in public management, changes in competition, and the way in which incentives affect governments and private managers. We find public choice and property rights theories too static to capture the dynamics of changing incentives due to changes in market and industrial structure.

Public choice theory emphasizes the importance of competition but we see that even in markets for waste collection the only potential competition is *for* the market – for the initial contract. Empirical results suggest that competition for the market is not sufficient to ensure cost savings. We see economies of scale tend toward monopoly production, at least at the neighborhood or municipal scale. Besides, most municipalities do not face a competitive market of alternative suppliers.

Private production is not cheaper. Early reviews suggested the costs of taxes, billing and a non-exclusive market help explain these differences (Fisher 1962, Stevens 1978). But more recent evidence addresses changes in the structure of the solid waste management sector with significant consolidation during the 1990s and this has led to erosion in cost savings over time (Bel and Costas 2006, Dijkgraaf and Gradus 2006a, 2006b). Several cities in the U.S. have split their service markets and maintained a level of public provision even in the face of contracting so that they can sustain competition at least between public and private crews (Ballard and Warner 2000). But this denies the benefits of economies of scale. Competition *for* the market also eroded due to incumbency – contracts are typically renewed as other providers exit the market. In the U.S., Hefetz and Warner (2004) have shown the importance of reverse privatization as a means to maintain competition over time. Reductions in quality and lack of cost savings were the primary reasons for this reverse privatization (Warner and Hefetz 2004).

Despite government regulation to ensure competition and price policies to ensure cost efficiencies, recent research has shown private managers collude and price differences erode.

Dijkgraaf and Gradus (2006a) found that private providers increased their prices after the Dutch government implemented the VAT compensation fund to place higher tariffs on public competitors. The need for such a strong market management role, and to understand how managers respond to regulatory incentives, raises transactions costs for local governments.

In the case of water, due to the nature of a fixed infrastructure of sunk costs, long term concessions are the norm. This creates incomplete contracts and raises concerns about the cost effectiveness of privatization according to transactions costs theory. The industrial organization approach encourages us to focus on incentives which critically depend on the structure of the market. Incentives are less powerful in the water sector, because contract terms are longer (Johnson, McCormally and Moore 2002, Bel 2006). And even when a concession is reopened for bidding, the position of the incumbent is extremely strong given the asset specificity of the service. Competition here is not even a metaphor.

Although there have been some anecdotal reports of quality reduction under private production, close public regulation of water quality limits the potential for private firms to reduce quality. Hence private managers no longer have the incentive for cost minimization and this helps explain why no cost savings are found when comparing public and private ownership (Hart, Shleifer and Vishny 1997). In addition, monopoly production is the norm in water, so ownership does not affect costs.

Generally, industrial organization is a more powerful approach to explain the complex relationship between private production, public production and costs. This is because it puts the emphasis on how incentives work rather than why objectives are established. Because the function of incentives is related to the competitive conditions of the market, different outcomes can be expected from different sectors. This helps us explain the different empirical experience from water and waste collection.

From an industrial organization perspective, privatization is a tool that might or might not permit a better alignment of objective functions to ensure the manager chooses in favor of public objectives. Industrial organization theory allows us to see how incentives and market structure interact to affect the alignment of principal-agent (or public-private) objectives in the public service delivery. This does not mean that competition exogenously imposed on local government will yield efficient results. Indeed under CCT in the UK, the central government took the role of principal in defining objectives for local governments and was forcing local principals to use a tool many did not want to use. In fact, most of the contracts were won by public teams (Stocker 1997, Reimer 1999). Thus we should not expect the same results as when conditions of potential competition and alignment of principal agent objectives are fulfilled.

We find industrial organization and transactions costs economics more useful in explaining what is going on in the contracting market for public services. These theories point us to the importance of a sector's market structure and incentives that arise therefrom as the key factors to explain differences between sectors and dynamics within a sector. By focusing on incentives we see how contracting creates pressure on managers to benchmark costs and production practices with private actors. It also encourages managers to consider other innovations that could increase efficiency. These include mixed public and private production (which is growing in the U.S.) that benchmarks public versus private production in the same jurisdiction (Miranda and Lerner 1995, Warner and Hefetz 2007). We also see inter-municipal cooperation to gain economies of scale (Bel and Costas 2006). These public sector innovations also may explain the failure to find cost savings under privatization. New forms of performance based public management have achieved important efficiency gains within the public sector itself (Osborne and Gaebler 1992, Osborne and Plastrick 1997, Boyne 2002).

One challenge to the theoretical frameworks presented above is the focus on a dichotomous principal agent relationship. Network governance theory requires moving from a simple principal–agent relationship to managing a network of diverse actors where there is dispersed control (Salamon 2002, Rhodes 1996, Goldsmith and Eggers 2004). This network governance is part of a new industrial organization approach that gives attention both to market structure, regulatory frameworks and the motivations of agents (Sclar 2000, Hickey 2006, Miralles 2006).

Conclusion

Differences in costs under public and private production have been attributed to motivations, ownership, transactions costs and industrial organization. By reviewing empirical studies on costs in water distribution and waste collection where the most extensive experience with privatization is found, we can move beyond the inconsistent results of case studies and identify theoretical reasons why cost savings are not systematically found. Waste collection is characterized by weak competition or collusion, because of the trend to concentration in the market. Water distribution is characterized by asset specificity which leads to monopolistic production and incumbent dominance in the event of a concession re-bidding.

While Public Choice theory emphasizes the importance of competition, our analysis shows that competition *in* the market is not expected for water or waste, and competition *for* the market is expected but not typically found. Property rights theory provides useful insights on the trade off between cost reductions and quality, but the emphasis on ownership fails to provide an adequate incentive for efficiency gains absent a competitive structure. Industrial organization gives more attention to market structure, regulations and incentives; and transactions costs puts emphasis on contract completeness. For water distribution we see a natural monopoly where efficiency gains are best achieved with monopoly regulation – not competition. For waste

collection, weak competition between firms erodes potential cost savings. This analysis suggests regulation may be more effective than simple privatization. Regulation is central to ensure quality and efficiency gains, either with regulation of monopoly or with antitrust policy.

The debate on privatization needs to move beyond a debate on competition and ownership and instead look more closely at the costs of contracting and the organization of the sector itself. These are the primary features which will determine cost savings under public or private production. That private production has failed to deliver consistent and sustained cost savings shows the inadequacy of theoretical approaches based mainly on assumptions about competition and ownership. A more elaborate understanding of the nature of public service markets, by service, location and industrial organization, will help to determine when cost savings should be expected from privatization.

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Table 1: Basic characteristics of the relevant works on privatization and costs in waste collection.

Work	Area	Year	Sample	Costs and form of production.
Hirsch (1965)	USA-MO	1960	24	No difference
Pier <i>et al</i> (1974)	USA-MT	Early 70s	22	No difference
Kitchen (1976)	Canada	Early 70s	48	Costs are higher with public production
Kemper & Quigley (1976)	USA-CT	1972-74	128	Private provision more expensive. Within municipal provision private production is less costly than public production
Collins & Downes (1977)	USA-MO	Early 70s	53	Private provision more expensive. Within municipal provision, no differences between public and private production
Pommerehne & Frey (1977)	Switzerl.	1970	103	Costs are higher with public production
Stevens (1978)	USA	1974	340	Private provision more expensive. Within municipal provision, private monopoly is less costly than public in cities > 50,000. No difference in cities < 50,000
Tickner & McDavid (1986)	Canada	1981	132	Costs are higher with public production
Domberger <i>et al</i> (1986)	England & Wales	1983-85	305	Competitive tendering is less costly than public production without tendering. Public and private costs do not differ with competitive tendering
Dubin & Navarro (1988)	USA	1974	261	Private provision more expensive. With municipal provision, private monopoly is more costly than contracting out and public production
Szymanski & Wilkins (1993)	England & Wales	1984-88	185- 335	Public production more costly without tendering. Public and private costs do not differ with competitive tendering
Szymanski (1996)	England & Wales	1984-94	>300	Public production without tendering is more costly. Private costs are lower than public with competitive tendering
Reeves & Barrow (2000)	Ireland	1993-95	48	Costs are higher with public production
Callan & Thomas (2001)	USA-MA	1997	110	Production form does not influence costs
Dijkgraaf & Gradus (2003)	Holland	1996-97	85	Public production more costly without tendering. Public and private costs do not differ with competitive tendering
Ohlsson (2003)	Sweden	1989	115	Costs are higher with private production
Bel & Costas (2006)	Spain	2000	186	Production form does not influence costs
Dijgraaf & Gradus (2006a)	Holland	1998-2005	491	Initially privatization reduces costs. This effect disappears over time

Note: All works in the table are multivariate econometric studies. Only Pier *et al.* is bi-variate.

Source: Author's.

Table 2: Basic characteristics of relevant works on privatization and costs in water distribution.

Work	Area	Year	Sample	Costs, efficiency & production form.
Mann and Mikesell (1976)	USA	1976	214	Public Production is less costly
Morgan (1977)	USA-6 states	1970	143	Private production is less costly
Crain & Zardkoochi (1978)	USA-38 state	1970	112	Private production is less costly
Bruggink (1982)	USA	1960	86	Public production is less costly
Feigenbaum & Teeples (1983)	USA	1970	319	No significant differences between public & private production
Fox & Hofler (1986)	USA-rural areas	1981	176	No significant differences between public and private production
Teeples & Glycer (1987)	USA-Southern CA	1980	119	No significant differences between public and private production
Byrnes (1991)	USA	1976	154	No significant differences between public and private production
Raffie, <i>et al</i> (1993)	USA	1989	238	Private production is less costly
Bhattacharyya, <i>et al</i> (1994)	USA	1992	257	Public production is less costly
Bhattacharyya, <i>et al</i> (1995)	USA	1992	221	No significant differences between public and private production. Private more efficient at small scales of operation, whereas public is more efficient at large scales.
Lynk (1993)	England & Wales	1979-1988	32	Average levels of inefficiency higher in private firms than in public firms
Ashton (2000a,2000b)	England & Wales	1987-1997	10	Neither technical change nor productivity growth with privatization
Saal & Parker (2000)	England & Wales	1985-1999	10	Privatization does not induce costs reduction. Strict regulation does
Jones & Mygind (2000)	Estonia, Latvia & Lithuania	1993-1996	566-655 138-144 325-452	Mixed results in Estonia & Latvia No relation between costs and production form in Lithuania
Estache & Rossi (2002)	Asia & Pacific	1995	50	No systematic relation between costs and production form
Kirkpatrick <i>et al</i> (2006)	Africa	2000	76	Production form does not impact costs

Note: All works in the table are multivariate econometric studies. Studies for the UK have a small number of producing units. Nonetheless, by using panel data the total number of observations is much larger.

Source: Author's.

Endnotes

1 Economies of density can be defined as a reduction in costs because of increasing concentration of the output (whereas economies of scale is concerned with the quantity of output). This is a concept widely used in transport economics, and has been used in studies of waste collection because of the large influence of transportation costs in overall collection costs. Economies of density is a more recent concept than economies of scale. A seminal paper on the differences between these two concepts is Savas, Christensen and Tretheway (1984).

2. There are other evaluations for the USA using Data Envelope Analysis (DEA). DEA is a standard tool used in economics to estimate production frontiers. This approach constructs a 'best practice frontier' (the maximum possible outputs for given quantities of inputs) and this frontier is used to assess firms' technical efficiency. Byrnes, Grosskopf and Hayes (1986) do not find differences in efficiency between public and private production. Lambert, Dichev and Raffie (1993) find that public firms have greater efficiency than private firms.

3. In a later study, Hunt and Lynk (1995) found privatization suppressed the possibility of realizing economies of scope. Economies of scope refer to the potential cost savings from joint production. (Changes in average costs occur because of changes in the combination of output between two or more products. The products do not need to be directly related to each other.) To compensate for loss of economies of scope, privatization would have to yield big improvements in dynamic efficiency. However, their work does not compare public and private production.

4. The Ménard and Saussier (2000) study for France is the first econometric work on water distribution outside the Anglo Saxon countries. However, they do not study the relationship between production form and costs, productivity or efficiency.