Network information and performances in franchise bidding agreements: evidence from the French water industry[♣]

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Preliminary version, please do not quote

Abstract : the literature focusing on franchise bidding agreements points out the existence of information asymmetries that may affect the performance of these contracts. Indeed the private firm operating the service generally detain better information about the costs of the service than the public authority and may exploit this advantage to increase its profits unduly. However empirical works trying to put into evidence the impact of informational asymmetries on the performance of franchise bidding schemes are still scarce. Focusing on a sample of 5000 French municipalities observed in 2004, we show that the water price increases as information on the network improves when the service is managed directly by the municipality. However such a link is not observed when the service is delegated to privates firms. This result may indicate that the costs incurred by municipalities to discover information on their network are counterbalanced by the gain they obtain from the decrease in the informational advantage of the private firm, leaving the water price unchanged in delegated services.

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INTRODUCTION

Franchise bidding agreements have been viewed by several scholars as an efficient way to introduce competition in natural monopoly industries (Demsetz [1968], Posner [1972]). Examples of industries where these agreements have been extensively used are the television cable sector in the United States (Zupan [1989a, 1989b]), the water sector in France (Chong et. *al* [2006] or the highway sector in Chile (Engel et. *al* [1997]).

Demsetz [1968] emphasizes that when the number of firms attending the bidding process is sufficiently high and if there is no possibility of collusion among them, competition *for* the market will enable the public authority to select the most efficient firm. What's more, as the franchise granted is limited in time, the winning bidder will have incentives to maintain its price at a competitive level all along the contract in order to maximize its chances to be renewed at the subsequent auction[1]. Hence, franchise bidding contracts for natural monopolies aim to avoid the inefficient outcomes associated with monopoly pricing.

However in practice, economists identified several failures that may weaken the performance of franchise bidding schemes (Crocker and Masten [1996]). The existence of information asymmetries between the public authority and the private firm is one of the major problems that may affect these agreements (Laffont and Tirole [1993]). Even if the firm's operating costs are initially revealed to the public authority through a competitive auction process, they may evolve over time because the environment is not static[2]. Then the private firm may develop over time private information about its operating costs[3]. After signing the contract, it may naturally be tempted to ask for price renegotiations by pretending that its costs have unexpectedly increased because of unfavourable external events. The public authority may be reluctant to refuse the renegotiations because it fears for the financial health of the private company that has to ensure the provision of public services that are often strategic[4]. Indeed,

[1] An efficient bidding process ensures that the winning firm will propose a price for the service that is close to its unit average cost. Indeed marginal cost pricing is impossible in these industries precisely because they present natural monopoly features.

[2] For instance, new technologies may appear, demand may vary, the macroeconomic situation may evolve as well as conditions of supply at the local level.

[3] As Armstrong and Sappington [2007] emphasize, *"because of its superior resources, its ongoing management of production, and its frequent direct contact with customers, a regulated firm will often be better informed than the regulator about both its technology and consumer demand"*.

[4] Water provision, garbage collection or urban transports are some examples of public services that are politically strategic.

financial problems of the franchise may lead to risks of decrease in the service quality resulting in disruptions or interruptions in service provision. In the worst case, the firm may go bankrupt, which would be politically unacceptable (Williamson [1976], Guash [2004]).

As a result, exploiting its informational advantage enables the private firm to increase its profits excessively. The "New Economics of Regulation" (Laffont [1994]) developed a lot of theoretical Principal-Agent models that propose potential solutions to deal with these informational asymmetries[5]. One of these solutions could consist in finding some means to oblige the private firm to inform about its operating costs. For instance the public authority may use auditing procedures (Baron & Besanko [1984b]). It may also oblige the firm to produce financial reports or accounting data[6]. Whatever the method used, reducing the informational rent of the firm is costly. Therefore, the decision to control the firm or not requires that the municipality compares the benefits of improved information to the costs incurred to oblige the firm to tell the truth (Armstrong & Sappington [2007]).

Using a database of 5000 French municipalities observed in 2004, we show that when municipalities get more and more information about their water network, the price paid by consumers increases when the service is operated directly by the municipality. However the water price is not affected by the improvement in the municipalities' network information when the service is managed by a private firm through a franchise bidding contract. To the extent that water prices appear to be higher on average when the service is operated by a private firm, our results suggest that the price difference between the two organizational modes decreases as network information increases. Our empirical evidence may be consistent with the idea that the costs incurred to get more information on the network are offset by the efficiency gains resulting from the decrease in the informational advantage of the private firm, leaving the price unchanged in franchise bidding contracts.

The interest of this paper is twofold. First, as far as we know, there is no empirical work that tries to evaluate the impact of the acquisition of network information on the short-run performance of franchise bidding contracts. Second, our preliminary results are consistent with the fact that gathering network information may not necessarily impact on the price

[5] See Armstrong & Sappington [2007] for a survey of these models.
[6] In such a case, the public authority would nevertheless need to have auditing capabilities because it would be obliged to verify that the information transmitted by the firm are not false.

performance of franchise bidding contracts and municipalized services the same way. This point is important because the incentives of municipalities to get more information on the network may depend on the short-run relative cost and benefits associated with improved information, but these relative costs and benefits - that are reflected in the water price paid by consumers - depend in turn on the organizational mode in which municipalities are embedded.

The paper is organized as follows. In the first part, we present the theoretical framework and apply it to the water industry. The second part is more specifically devoted to the description of the French water industry. In the third part, we present our data and proceed to statistical treatments that enable us to emphasize some interesting results with regards to the link between network information, organizational choices and price performances. Conclusion follows.

1. Theoretical background

We consider a municipality (the Principal) that must organize the provision of a public service with natural monopoly features. She can decide either to provide the service herself, or to delegate the operation to a private firm (the Agent). When the municipality chooses a franchise bidding agreement, the firm develops over time private information about its operating costs. As a result, he may be tempted to complain that its costs are too high in order to obtain price increases and then, to boost its profits. A public employee has no incentive to behave this way as its wage does not depend on its operating costs. As a consequence, information asymmetries induce inefficiencies in franchise bidding contracts that must be dealt with.

For instance, if we consider the water industry, a great part of the network is underground and then invisible. When the water service is operated by a private firm through a franchise bidding contract, he may be tempted to declare a bad network's quality and then, high maintenance costs in order to obtain the right to charge higher prices to consumers. Therefore, the municipality may find it important to gather information about the water network so as to reduce the leeway of the private firm for cost manipulations.

In order to obtain more information about the network, a municipality can use auditing procedures by relying to independent experts. She can also ask the private firm to produce and

diffuse explicit information on the network and make some controls so as to verify that information transmitted is correct[7]. These policies are costly but may also induce sizeable advantages.

Let's sum up our framework by a simple model in order to fix the ideas. At date $\mathbf{t_0}$, the private firm (or the public employee) announces its operating costs. At date $\mathbf{t_1}$, the municipality decides to obtain more information about her water network and asks the private firm (or the public employee if the service is municipalized) to produce and transmit explicit information about the water network[8]. The municipality may agree on a price increase in order to finance the production of information. At date $\mathbf{t_2}$, information is transmitted to the municipality. Then, a price revision may occur or sanctions may be taken if the data transmitted are not compatible with the announcement of the firm at date $\mathbf{t_0}$. In a Principal-Agent framework, what would be the incidence of this policy on the water price paid by consumers in the short-run?

Two different factors may impact on the water price at the end of period $\mathbf{t_2}$: the cost of information *production* and *control* on the one hand, and the benefits of improved information on the other hand. As it will be shown below, the overall effect is unclear in the short-run but it may not be the same whether the municipality chose in-house provision or a franchise bidding contract.

One can think that a private firm may spontaneously be willing to produce a certain level of network information because a too bad network knowledge may deprive his profits[9]. Conversely, getting information on the network does not affect the public employee's profits. He then has no spontaneous incentives to realize efforts in this sense. That's why, when the municipality asks for new network information, *production costs* may be higher in municipalized services than in delegated services. Arguably, some information wanted by the municipality at date $\mathbf{t_1}$ may already be available on request to the private firm without further investigations on the network, which is less likely if this information is asked to a public

[7] We will call "explicit information" the part of the network's information that is shared with the municipality by the private firm (or public employee). The nature of information can be diverse (age of each portion of the network, material used for the pipes, etc.) as we will see in the empirical part.
[8] Indeed, we can naturally expect that the one who operates the network day-by-day is the one who will be able to produce and transmit network's information at the least cost.
[9] For instance, insufficient network information induces inefficient investment programs and excess water leakages, as it will be discussed below.

employee. If we note $\mathbf{I_D}$ the quantity of information detained by the private firm and $\mathbf{I_P}$ the quantity of information detained by the public employee at date $\mathbf{t_1}$, we have $\mathbf{I_D} > \mathbf{I_P}$. However, private firms' network information, albeit greater than municipalities, is not necessarily optimal. Indeed, collecting new information about the underground pipes is costly so that the private firm may not necessarily have the appropriate incentives to optimise his network's knowledge. This is especially true when private firms do not own the network and when their contract is of limited duration[10]. Therefore, by being obliged to produce and transmit explicit information to the municipality, the private firm may improve its own network knowledge at the same time. To sum up, at date $\mathbf{t_1}$, we have $\mathbf{I^*} > \mathbf{I_D} > \mathbf{I_P}$, where $\mathbf{I^*}$ is the optimal level of explicit information. This level ensures appropriate incentives for infrastructure maintenance and renewal[11]. Of course, $\mathbf{I^*}$ is assumed to be known by the municipality[12].

If *production costs* are higher for municipalized services, what we will call *control costs* may be an important concern for both organizational modes. We will divide these *control costs* into two categories. Transmission costs refer to the situation when the private firm hides some existing information to the municipality whereas verification costs refer to the situation when the municipality has to ensure that information transmitted is reliable.

At date $\mathbf{t_1}$, the private firm may underestimate the quantity of information he detains. More precisely, he may be tempted to hide information and pretend that the *production costs* are high in order to obtain a price increase and perceive undue profits. What's more, the firm may also be tempted to transmit false information to the municipality at date $\mathbf{t_2}$ by signalling a bad network quality so as to preserve his informational rent. Indeed, if at date $\mathbf{t_0}$, the firm announces high operating costs and if information transmitted at date $\mathbf{t_2}$ reveals that the network's quality is good and then, that his operating costs are low, the municipality will decide to shut down the water price, which would mean a loss of informational rent for the private operator. The municipality may then have to incur additional *control costs* in order

[10] This is the case in the French water industry. Arguably, if the private firm does not own the network, the shorter her contract, the less she is concerned about the network's performance, as increasing her efforts on the network (maintenance and investments) induces benefits that may be recouped by the subsequent operator (Laffont & Tirole [1993]).

[11] Our model then assumes that none of the organizational mode ensures an optimal level of incentives for information collection. Once again, this assumption seems consistent with empirical observations in the French water industry, as it will be discussed below.

[12] In the same way, we will show below that when the municipality chooses in-house production, $\mathbf{I_P}$ is known by the municipality. However, in a franchise bidding contract, we will show that the firm may have incentives to hide available information. As a consequence, $\mathbf{I_D}$ may be private information for the operator if he is not controlled appropriately by the municipality.

both to ensure that the private operator does not hide existing information (transmission costs) and that information transmitted by the firm at date $\mathbf{t_2}$ about the network is correct (verification costs). Obviously, these control costs may be reflected in the consumers' water bills.

Transmission costs can be expected to be lower in municipalized services to the extent that public employees earn no rent by hiding existing information at date $\mathbf{t_1}$. However, public employees may be tempted to transmit false or unreliable data to the municipality at date $\mathbf{t_2}$ instead of increasing their efforts to improve existing information. More precisely, public employees may lie about the data transmitted, not because they earn informational rents, but because they may be more reluctant to produce new network information than private operators[13]. This will be especially the case if creating false network data is less effort consuming than producing new information. As a consequence, municipalized services may also be concerned by verification costs. Arguably, these costs may be all the more important as municipal employees have to produce high level of explicit information.

To summarize, *production costs* may be higher in municipalized services. Concerning *control costs*, transmission costs may be lower in municipalized services, but verification costs may be a concern for both organizational modes and it's not obvious to determine their relative importance. Therefore, at a theoretical point of view, it is not clear whether the overall impact of these costs on water prices will be greater in municipalized services or in franchise bidding agreements.

If acquiring more explicit network information induces several costs, it may also involve sizeable benefits. First, a better network knowledge enables (in the long run) more efficient investments programs in network's renewal and (in the short run) better infrastructure maintenance as water leakages may be detected and fixed more quickly, be the service

[13] Suppose for instance that the municipality asks the (public or private) operator at date $\mathbf{t_1}$ for the production and transmission of explicit information to a level that equals $\mathbf{I^*}$ and negotiate with him a price increase to perform this task. Clearly, the incentives to produce efforts to reach $\mathbf{I^*}$ should be greater in franchise bidding agreements for two reasons. First, at date $\mathbf{t_1}$, $\mathbf{I_P < I_D}$, which means that the public employee has to realize more network investigations than the private firm in order to reach $\mathbf{I^*}$ (for instance, network investigations will be more time-consuming for public employees, and then, more costly in terms of effort). Second, acquiring network information can generate benefits for the private firm but not for the public employee. For instance, network investigations may enable firms to discover and repair water losses, which may decrease their operating costs. Such positive externalities associated with the acquisition of network information do not exist for public employees.

delegated or operated directly by the municipality[14]. Second, when the service is delegated, the informational advantage of the private firm is reduced and then, the performance of the franchise bidding agreement should be enhanced. Arguably, if the firm anticipates that the municipality will ask new information on the network at date $\mathbf{t_1}$ and will exert an effective control, he may relinquish to hide or distort information at date $\mathbf{t_1}$ and he may be tempted to report truthfully about its operating costs at date $\mathbf{t_0}$. Indeed, if information transmitted at date $\mathbf{t_2}$ is not compatible with the firm's *ex ante* report and if shirking is detected, the price will be readjusted downward and the firm may incur additional costs (contractual penalties, loss of reputation etc.).

The following table sums up the short-run and long-run gains induced by the acquisition of explicit information about the network[15]:

Table 1. Short-run and long-run gains from the acquisition of explicit information about the network

Short-run benefits		**Long-run benefits**	
Municipalized services	*Delegated services*	*Municipalized services*	*Delegated services*
More efficient infrastructure maintenance	*More efficient infrastructure maintenance* *Fewer information asymmetries*	*More efficient network's renewal*	*More efficient network's renewal*

One can considerate that if a municipality decides to set up some measures that enable her to get better information about its water network, this is precisely because she anticipates net benefits, at least in the long-run.

All in all, the short-run benefits induced by a better network's knowledge should be greater when the service is delegated than when the service is municipalized to the extent that unlike

[14] In other words, the acquisition of explicit information by the municipality increase $\mathbf{I_P}$ (if the service is municipalized) and $\mathbf{I_D}$ (if the service is delegated), to a level that is closer to $\mathbf{I^*}$.

[15] The gains partly consist in cost reduction that may benefit to the consumers through price decreases. However, better efficiency may also be achieved with regards to other dimensions of performance. For instance, service quality may be improved to the extent that more efficient infrastructures' maintenance and renewals lead to lower risks of service interruptions. As our data do not enable us to undertake a complete welfare analysis, the paper will merely study the consequences of variations in municipalities' network information on the water price paid by consumers (see below).

a public employee, a private firm has a financial interest in exploiting its informational advantage on the network.

The following table summarizes the comparative short-run gains and costs of improved information according to the organizational mode chosen by the municipality with regards to water provision:

Table 2. Comparative short-run gains and costs of improved information according to the organizational mode

Costs and benefits	*Municipalized services*	*Delegated services*
Production costs	-[16]	+
Control costs	?	?
Short-run benefits	-	+

Our analysis raises two empirical questions: do the benefits of improved information outweigh the costs in the short-run? Does improved network information affect the performance of municipalized services and delegated services in a similar way? Before addressing these questions, it seems important to describe briefly the main features of the French water industry as it will be the support of our empirical analysis.

2. The French water industry

In France, the water industry is organized at a local level. Municipalities always own their water network but they have two organizational modes at their disposal. More precisely, municipalities can decide to manage themselves their water service. The organizational mode for water distribution can then be referred to as *direct management*. But they can also choose to call upon a private firm using a franchise bidding contract[17]. In this case, the private firm is chosen after a bidding procedure and is given the right to operate the service for a certain number of years[18]. The average duration of a contract is 12 years.

[16] The sign « minus » in the first row and first column means that municipalized services have a disadvantage with regards to acquisition costs compared to delegated services. Naturally, the signs in the third column are the reverse of those in the second column.

[17] In fact, in this case, municipalities can choose among several organizational modes. See Chong et al. [2006] for more precisions.

[18] The duration of a contract for water provision is limited to 20 years by the French legislation (Barnier law [1995]). For more details about the organization of the bidding procedure in France, see Chong et al. [2006].

Direct management and franchise bidding agreements have different properties with regards to incentives for information production and diffusion. When direct management is the organizational mode, the service is operated by a public employee who is a civil servant paid by a fixed wage[19]. He then has few incentives to gather information about the network as his remuneration does not depend on the network's performance. However, he may not be reluctant to transmit the available information to the municipality. Conversely, the network's performance may affect the private firm's remuneration. For instance, too many water losses may deprive his profits. As a consequence, he may have more incentives to get information about the underground infrastructures as a better network's knowledge enables more efficient pipes' maintenance and renewals[20]. Nevertheless, he may be more reluctant to transmit some information collected to the municipality so as to preserve his informational rents. That's why, as emphasized above, the municipality may have to undergo additional transmission costs in franchise bidding agreements. As our analytical framework suggests, in both organizational modes, the municipality may have to undergo a certain level of verification costs to ensure that the data produced by the agent (municipal employee or private firm) is reliable. The private firm may have an incentive to lie because he wants to preserve his informational rents whereas public employees may lie because distorting data may be less costly (in terms of effort) than producing new network information.

Whatever the organizational mode, it seems that many French municipalities do not dispose of sufficient information about their water network[21]. Concerning delegated services, the informational advantage of private firms operating local water services is not a trivial problem. The French public Court of Auditors (Cour des Comptes) emphasizes that if some municipalities are well informed about the quality of their infrastructures, in particular by requiring private firms to actualise regularly the network maps, many of them are not. The Court indicates that municipalities should ensure that private firms regularly transmit actualised data about the water network and they should control for the reliability of these data. At last, the Court points out that good information about the network is a prerequisite for efficient maintenance and renewal programs[22].

[19] His wage increases with an index reflecting seniority but does not depend on his performances.
[20] However, private firms' incentives are not necessarily optimal to the extent that their contract is limited in time and that the network belongs to the municipality. For instance, incumbent firms may decrease their investigations on the network at the end of the contract because if their contract is not renewed, they would lose the benefits of their efforts.
[21] See Cour des Comptes [2003], p. 55 & 56.
[22] See Cour des Comptes [2003], p. 55, 56 & 57.

However, if it's obvious that a good network's knowledge is socially desirable in the long-run[23], the short-run effects of policies aiming to improve network information are unclear. As emphasized above, short-run benefits as well as short-run costs may be observed and the overall impact on the operating costs and therefore, on the water price, is ambiguous. But more importantly, the impact may not necessarily be the same according to the organizational mode chosen by the municipality, which is not a trivial prediction. That's why, in what follows, we propose to investigate this question empirically using data on the French water industry.

3. Empirical analysis

3.1. Data

Our initial sample is made up of 5000 French municipalities observed in 2004. We created this dataset by combining information obtained with the French Environment Institute (IFEN) and the French Health Ministry (DGS)[24]. All municipalities' size is proportionally represented except for large municipalities that are all present in the sample. Municipalities may not necessarily have the same organizational mode for water production and water distribution. But in order to realize relevant performance comparisons across organizational modes, we restricted our analysis to public authorities for which this is the case. Our final sample then reduces to 4479 observations. The unit of observation is a municipality in 2004.

Price

Our performance indicator is the retail price of water paid by consumers for an annual consumption of 120 cubic meters net of national and local taxes (variable ***PRICE***).

Governance choice

We create a dummy variable equal to 1 if the municipality decided to assign the production and distribution of water to private company and 0 otherwise (variable ***DELEG***).

[23] Efficient network maintenance as well as relevant investment's programs not only reduce the long-run costs of water provision. An improvement of the network's quality also results in a better service quality for consumers by decreasing the likelihood of water shut-off. Environmental gains can also be expected in the sense that fewer leakages contribute to the preservation of water resources.

[24] All data come from IFEN and SCEES (Service Central des Enquêtes et Etudes Statistiques) except the data concerning the kind of treatment used for raw water, which come from the DGS (Direction Générale de la Santé).

Network information quality

One of the indicators used by practitioners to measure network information quality is the percentage of the network's maps actualized every year. We can then infer that municipalities dispose of better short-run information if 100% of the maps are actualized a given year than if they are not. In the database, three variables are available:

INFOTOP indicates the percentage of the network's maps actualized in 2004 with topographic information.

INFODESC indicates the percentage of the network's maps actualized in 2004 with a detailed description of each section.

INFOLOC indicates the percentage of the network's maps actualized in 2004 with localisation and inventory of the interventions.

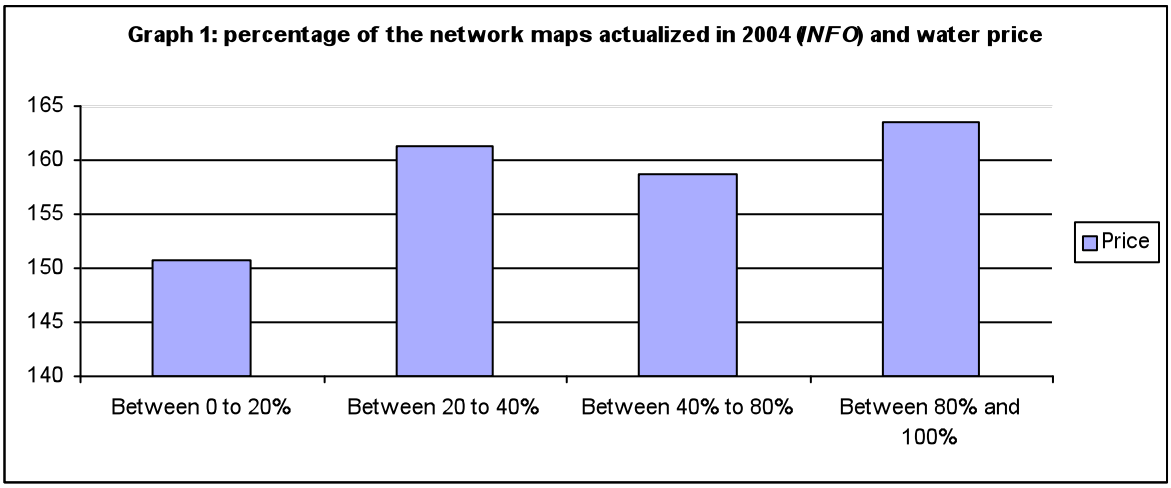
The three variables enable us to construct a measure of short-run network information[25]:

$$\boldsymbol{INFO} = \frac{INFOTOP + INFODESC + INFOLOC}{3}$$

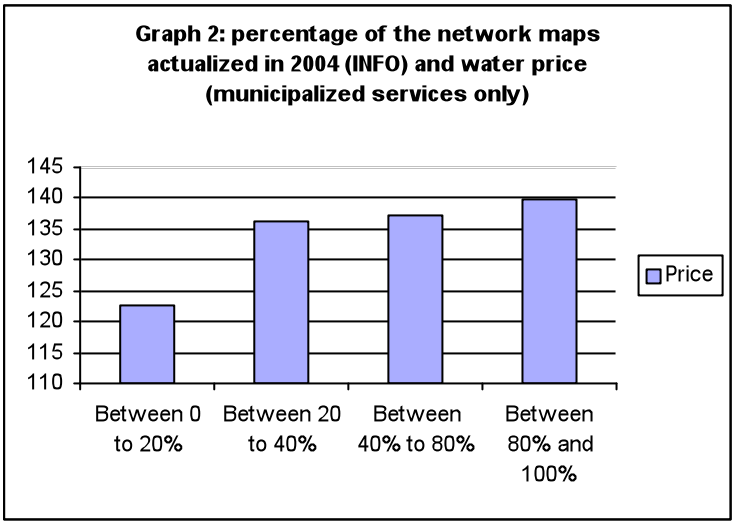
3.2. Some statistical results

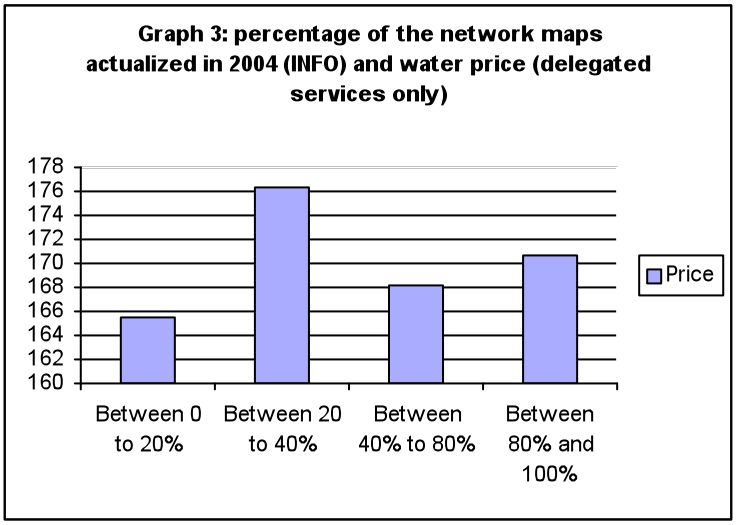
The first graph reveals that an increase in information quality increases the price on the overall sample, especially when the level of the ***INFO*** variable exceeds 20%. This result seems to indicate that the short-run costs of information collection exceed the short-run benefits.

[25] We were told by practitioners that ***INFODESC*** and ***INFOLOC*** provide more network information than ***INFOTOP***. However, as it is difficult to find an appropriate weighting, we constructed ***INFO*** as a mean of the three available variables. We also considered each of the information variables separately in the statistical analysis that is presented below.



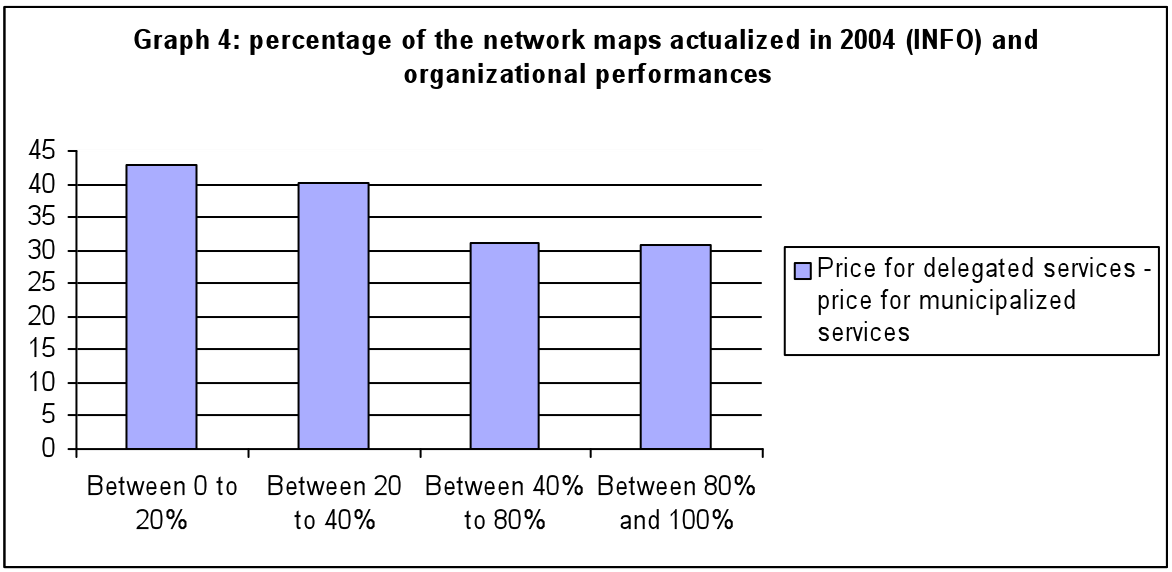
However, graph 2 and 3 suggest that this positive link is especially explained by municipalized services. Indeed, there is no obvious correlation between information quality and price performance for delegated services:





Graph 2 and 3 clearly suggest that water prices are higher on average in delegated services. Whatever the level of the ***INFO*** variable, the water price never exceeds 140 euros (for 120 cubic meters consumed) in municipalized services as it always exceeds 160 euros for delegated ones. As a result, when we directly focus on the price difference between delegated services and municipalized services, we observe that the gap between the two organizational modes decreases as network information increases[26].

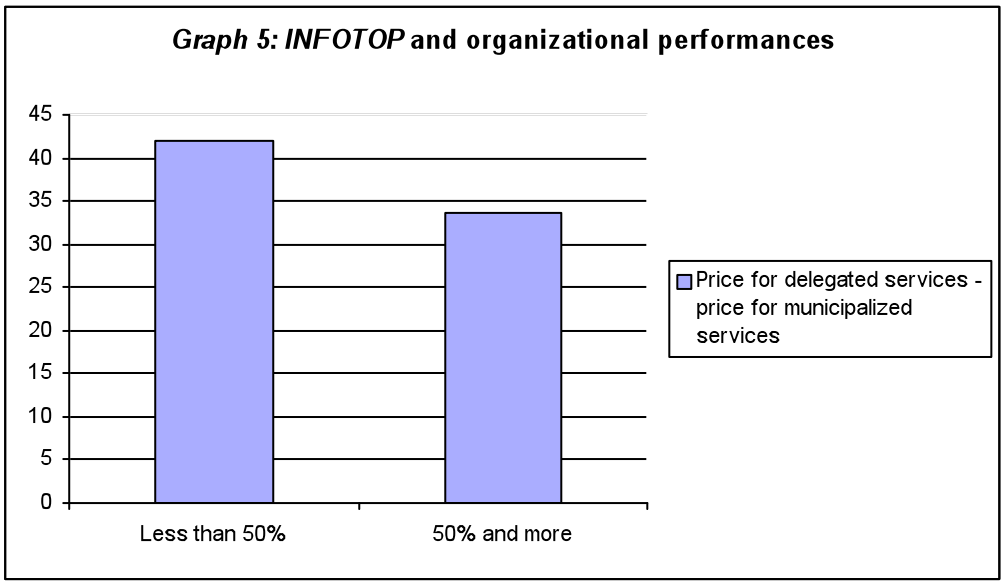
[26] See Chong *et. al* [2006] for more details about the reasons why prices are higher in delegated services.

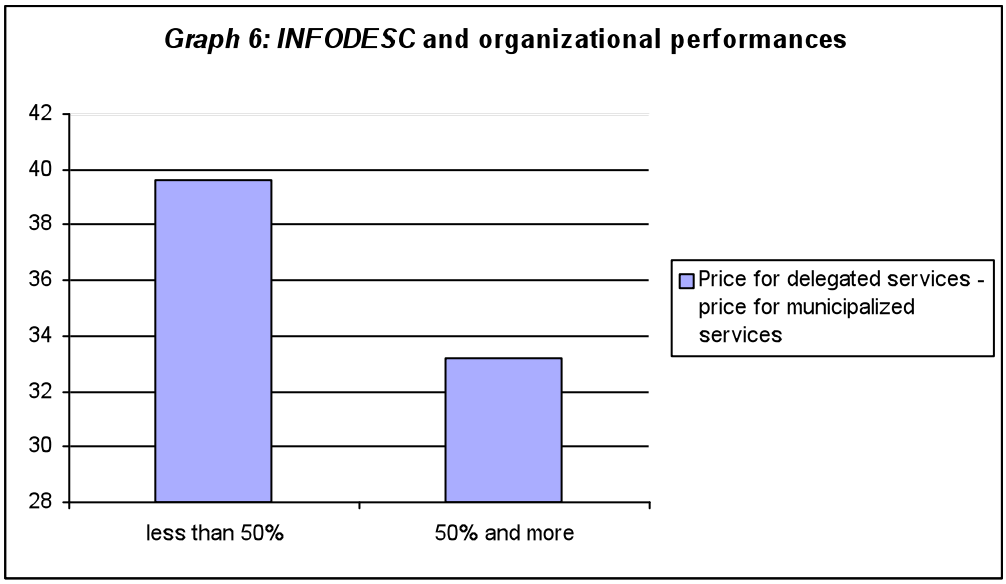


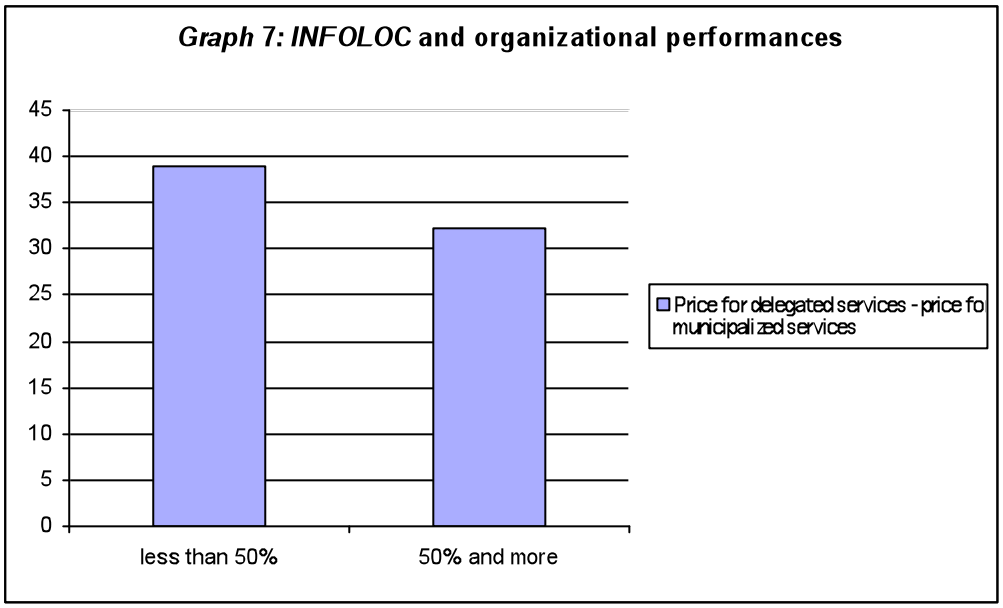
The first stick of graph 4 can be interpreted as follows: when less than 20% of the network maps are actualised in 2004, the average price difference between delegated services and municipalized services approximately attains 42 euros. This difference is just above 30 euros when network information is excellent (i.e. when the values for ***INFO*** exceed 80%).

The decrease in price difference across organizational modes can also be observed if we consider each of the three information variables separately. This is what is shown in graph 5, 6 and 7[27]. According to the variable used, the price difference varies between 6 to 8 euros.

[27] A problem arose here since we lack variance when we consider each information variable separately. More precisely, the three information variable often takes extreme values (0% and 100%) but more rarely intermediate values. That's why, in order to obtain relevant and homogeneous group of observations, only two classes were considered for these variables: a first class accounting for the observations with less than 50% of the network maps actualized in 2004 and a second class accounting for the observations with 50% of the network maps or more actualized in 2004.


Graph 5: INFOTOP and organizational performances
45
40
35
30
25
20
15
10
5
0
Less than 50%
50% and more
Price for delegated services - price for municipalized services


Graph 6: INFODESC and organizational performances
42
40
38
36
34
32
30
28
less than 50%
50% and more
Price for delegated services - price for municipalized services


Graph 7: INFOLOC and organizational performances
45
40
35
30
25
20
15
10
5
0
less than 50%
50% and more
Price for delegated services - price fo municipalized services

3.2. Discussion

Our results suggest that the improvement of network information clearly increases prices in municipalized services, but this seems to be less obvious in delegated services. To the extent that prices are on average higher in delegated services, our statistical analysis then concludes that the price difference between the two organisational modes reduces when information quality improves. The question is why an improvement of network information does not impact the price performance of each organizational mode the same way? Relying to our analytical framework, we can advance three arguments to answer this question. First, when network information increases, short-run benefits may be identical in both organizational modes but short-run costs may be higher in municipalized services. This may be the case if producing new information is costly and controlling private firms' behaviour is easier than controlling public employees' behaviour. Second, when network information increases, short-run costs may be identical in both organizational modes but short-run benefits may be higher in delegated services. For instance, this may be the case when the increase in network information has a strong impact on the reduction of informational advantage of private firms. The reduction of firms' informational rents may then compensate the costs incurred to improve network information in delegated services. Third, short-run costs may be lower *and* short-run benefits may be higher in delegated services.

3.3.Regulatory implications

The fact that the costs undergone to acquire more network information outweigh the benefits in the short-run may explain why municipalities are reluctant to get more information about their network. As emphasized above, the French public Court of Auditors deplores such behaviour to the extent that in the long-run, a bad network's knowledge may result in inefficient investments programs and a deterioration of the network's quality. But some municipalities may only be preoccupied by short-run concerns and therefore, they may not necessarily be willing to increase the burden of consumers' water bills[28].

Arguably, municipalities' incentives to acquire network information should be all the greater than this information is cheap to collect and/or involves high short-run benefits. Put differently, incentives will be all the greater than increasing network information induces a weak impact on water prices in the short-run. The statistical evidence presented above seems

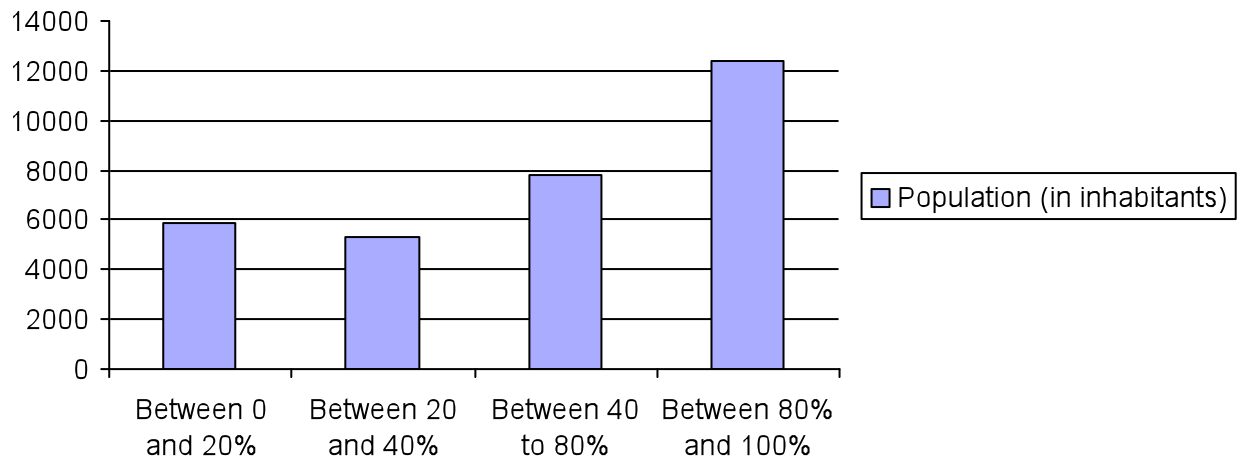
[28] Referring to our model, this is the reason why municipalities may not be willing to reach the optimal level for the information variable (that is to say **I*)**.

to indicate that this will be more likely the case when a franchise bidding contract is used. Therefore, we can expect the level of explicit information to be higher for delegated services. Our data are consistent with this idea since the average level for the ***INFO*** variable is 60% for delegated services whereas it reaches 52% for municipalized services.

We can also expect information to be cheaper to collect in high populated municipalities for two reasons. First, these municipalities generally dispose of more important internal skills than low populated ones, which enables them to exert a relatively easier (and then less costly) control of their private operator or public employees. Second, when a franchise bidding agreement is used, high populated municipalities represent an attractive market for private firms, which means that if shirking is detected, firms will have more to lose if their contract is not renewed. As a consequence, assuming that the probability for the municipality to detect shirking is constant, moral hazard issues may be less acute in high populated municipalities, which may result in less monitoring costs on average.

As graph 8 clearly shows, the quality of network information is positively correlated to the size of the municipality. When network information is excellent (***INFO*** > 80%), the average size of municipalities exceeds 12000 inhabitants. This is more than twice as much as the average size of municipalities where network information is bad (***INFO*** < 20%). This result may reflect the fact that high populated municipalities invest more in information acquisition, precisely because gathering new information is less costly for them.

Graph 8: percentage of the network maps actualized in 2004 (INFO) and size of the municipality



To sum up, all this statistical evidence is consistent with the idea that municipalities' incentives to collect new network information may depend on the relative short-run costs and benefits induced by such a policy. However, these relative costs and benefits may in turn depend on municipalities' size as well as an endogenous factors, namely the organizational mode. Therefore, the main regulatory implication of our work is that municipalities should choose the organizational mode that maximizes their incentives to collect network information, *ceteris paribus,* that is to say the organizational mode for which network information can be collected with the lowest impact on the price charged to consumers.

CONCLUSION

In this article, we presented some preliminary results concerning the incidence of the acquisition of network information on organizational performance in public services with natural monopoly features. For our study, we relied to a dataset of 5000 municipalities observed in the French water industry in 2004. We found that acquiring explicit information on the network increase prices in the short-run, which may explain why some municipalities are reluctant to invest in such a task. Municipalities may be reluctant to increase consumers' water bills to get more network information, which may result in a deterioration of the network's quality in the long run. However, our results show that if water prices are higher in delegated services, the price difference between franchise bidding and municipalized services shrink as network information improves. We tried to give a plausible explanation for this result, relying to a Principal/Agent framework and to the French institutional context. One our argument lies in the existence of information asymmetries in franchise bidding contracts that do not exist when the service is municipalized. When network information improves, firms' informational rents are reduced, which may contribute to offset the costs incurred to acquire this information and then, to limit price increases in franchise bidding contracts.

We are aware that our interpretation may be open to criticism; other explanations based on other analytical frameworks may exist. What's more, the results presented are still preliminary and have to be confirmed by a rigorous econometric analysis.

However that may be, our study raises an important implication. Many municipalities may be reluctant to acquire new network information because they may not want to charge too high prices to consumers. Now, our work showed that various organizational modes may result in

different short-run costs and benefits of information acquisition, which may in turn be reflected in consumers' bills. Consequently, municipalities should opt for the organizational mode that maximizes their incentives to acquire network information, *ceteris paribus*, that is to say the organizational mode for which network information can be collected with the lowest impact on consumers' bills. This may be perceived as a trivial result. However, it seems that this argument is not developed in the empirical literature focusing on the trade-off between public and private provision. This literature emphasizes other important parameters that may affect this trade-off, such as municipalities financial constraints, the complexity of the service, the difficulty (or not) to introduce an effective *ex ante* competition between several suppliers, etc. Nevertheless, to the extent that a bad network knowledge may significantly impede the performance of water services in the long-run, municipalities should not underestimate the impact that their organizational choice may have on their own incentives to acquire network information.

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