

Contract Renewals, Prices and Deprivatizations

The Case of Water in France

Alexandre Mayol *
Stéphane Saussier †

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Abstract

In this paper, we studied the influence of contract renewals on water prices in France. When studying French water contracts in force between 2008 and 2018, we found that contract renewals have little influence on the prices paid by consumers. However, at contract renewal times, the share of the price that goes to the firms decreases. This price decrease is compensated by an increase in the share of the price that is retained by the municipalities. We interpret this result as a willingness by municipalities to retake control of water services. In addition, we show that the higher the municipalities' shares are, the higher the probability of switching to direct public management at contract renewal times. This suggests that local authorities increasing their responsibilities in providing water services (i.e., increasing their price shares) may switch later to direct public management more easily.

JEL Classification: H11; L33; L95.

Keywords: Public-private partnerships; contract renewals; private management; water prices

***Corresponding author:** Université de Lorraine, Université de Strasbourg, CNRS, BETA. Correspondence: Université de Lorraine, BETA, 13 place Carnot C.O. 70026, 54000 Nancy. Contact: alexandre.mayol@univ-lorraine.fr
†IAE de Paris - Université Paris 1 Panthéon-Sorbonne. Contact: Saussier@univ-paris1.fr

1 Introduction

Contracting out public services to private firms is a longstanding practice to promote efficiency and responsiveness in local government service delivery (Osborne, David and Gaebler, (1993)). Empirical papers have suggested that local authorities are guided primarily by pragmatic concerns such as information, monitoring, transaction costs and service quality (see, for example, Warner and Hebdon (2001), for the United States; Bel and Miralles (2003), for Spain; Tavares and Camões (2007), for Portugal; and Ménard and Saussier (2002), for France). A more general finding of this literature is that there do not appear to be many ideological arguments influencing politicians' decisions (Bel and Fageda (2009), Bel and Fageda (2017), Chong et al. (2015)), although some studies have highlighted the role of electoral terms and political fragmentation in determining the probability of privatizing local public services (Gradus and Budding (2018), leaving the debate open.

In Europe, the privatization of municipal public service provision has been a phenomenon since the 1980s, but in the last decade, there is increasing evidence of trends in the opposite direction. Contract reversals to direct public management are increasingly frequent. This is especially the case for water services. Kishimoto et al. (2015) found that between 2000 and 2015, at least 67 cities in 37 countries contracted back their water services, affecting at least 100 million people. The number of contract reversals doubled in the 2010-2015 period compared with the 2000-2010 period, illustrating a tendency toward deprivatization, <https://www.overleaf.com/project/5ea05eee3eaa0000012fcb50> especially in high-income countries, where the majority of those cases occurred.

The French case exemplifies this issue. For more than a century, private provision has been the rule rather than the exception in the French water sector (more than 65% of the population is served by private water utilities). However, there is a new tendency toward deprivatization, as illustrated by the city of Paris, which decided to deprivatize water services in 2009 after decades of private management. As mentioned by Kishimoto et al. (2015), nearly 50% of such cases observed worldwide took place in France.

In this paper, we shed light on the contract reversal issue. We collected information on French water contracts in force between 2008 and 2018. Focusing on renewal stages, we first found that there is no visible competition effect (i.e. calls for bids at renewal stages have no impact on prices), confirming previous studies such as Chong et al. (2006) or Chong et al. (2015). However, we then decomposed the price, identifying the part that goes to the firm and the part that goes to the municipality, and we found a strong influence of contract renewals and a clear correlation between

the two price components. Contract renewals decrease the part of the price that goes to the firm. This price decrease is compensated by an increase in the part of the price that is kept by the municipality. In addition, we found that the larger the price share kept by the municipality, the higher the probability of contract reversal at contract renewal times. Our interpretation is that the higher the price share kept by local authorities, the higher their ability to remunicipalize with low switching costs.

Our paper is connected to a set of previous papers that have examined the impact of privatization on prices in the water sector. The vast majority of those papers performed comparative analyses of prices between public and private management (see, for example, Garcia-Valinas et al. (2013), Lannier and Porcher (2014) or González-Gómez and García-Rubio (2018), for a survey Porcher and Saussier (2018)). Others have examined the influence of public interference in water prices during the execution stage through government-led opportunistic renegotiations (Valero (2015), Guasch et al. (2007)), frequently preceding election years (Picazo-Tadeo et al. (2020)). The paper that is the closest to our study is Chong et al. (2015). The authors examined the probability of switching from public to private and from private to public provision of water in France at contract renewal. Chong et al. (2015) focused on price differences between public and private delivery to explain observed switches. In this paper, we are not interested in the public vs. private efficiency debate. Instead, we focus on the private delivery of water services and investigate the influence of contract renewals on prices paid by consumers and on how prices are shared between the firm and the municipality. We argue that contract renewal times are windows of opportunity for municipalities to retake control of their water services. Full control through contract termination or increased control through a higher share of the price being kept by the municipality and a shorter contract duration for the private firm.

We believe that our paper contributes to the literature on how municipalities organize their public services by highlighting that they do not face a binary choice between make or buy. More fundamentally, how municipalities organize their water services depends on the level of control they wish to achieve over water services. Full control would translate into direct public management. Intermediate levels of control are also possible, through the share of the price that is retained by municipalities. In addition, we highlight that the level of control that municipalities are exercising influences their ability to switch back to direct public management.

This paper is organized as follows. Section 2 presents the French institutional context and our propositions. Section 3 is dedicated to a presentation of our data and empirical strategy. We present our results in Section 4 and discuss them in Section 5, and our conclusions follow.

2 Water Prices in France

2.1 Institutional details

In France, as in many countries, drinking water is a local public service under municipal responsibility. As in most European countries, municipalities can decide to provide drinking water through "direct public management" or through private providers. Of the 12,450 French drinking water services, 30% are managed by a private operator and 70% by the public. However, these private contracts serve 58% of the French population.

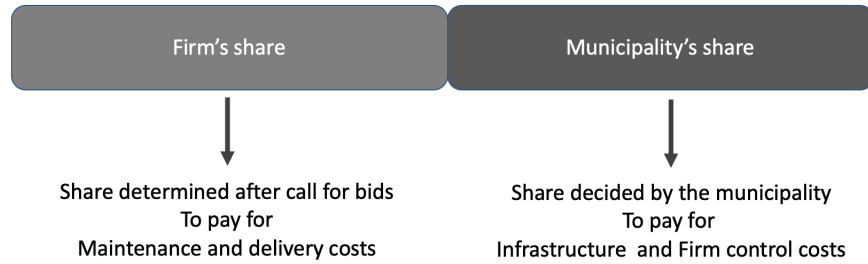
The decision to contract out water services is made through periodic calls for tenders to select private providers. The private provider that wins the contract has a local monopoly for the duration of the contract. Chong et al. (2015) indicates that the duration of such contracts in France is approximately 12 years on average. The end of the contract implies a compulsory re-competition that can lead to the renewal of the operator in place or its replacement by a more efficient competitor. This mechanism is thought of as an incentive for contractual performance, a periodic auction.

The debate in France concerning the efficiency of public vs. private management is lively. This is especially true because prices have increased over time and do not appear to be influenced by contract renewals. As a consequence, an increasing number of municipalities have decided to remunicipalize drinking water management over the past several years, generally contending that the water price is too high or complaining of a loss of control over investments that have been made.

2.2 Water price structure

When municipalities decide to select a private firm to provide water to their citizens, they nevertheless retain some of the responsibilities for the service. Notably, they are usually in charge of infrastructure investment. This is why the final price of water paid by end users consists of several shares (see Figure 1).

Figure 1: Water Price Shares



One share goes to the private operator to pay for infrastructure maintenance and water delivery costs. This part is determined after private firms compete through a call for bids at contract renewal. The final price paid by consumers also consists of one share that goes to municipalities to pay for infrastructure investments and costs to control the private firm in charge of delivering the water. This "public" share thus reflects the level of control that is maintained by municipalities. It reflects the cost born by municipalities to run the service in cooperation with the private provider.¹

2.3 Contract Renewals, Prices and Remunicipalizations: Propositions

If we denote as $Price_F$ the price share retained by firms and $Price_M$ as the price share retained by municipalities, the total price of water is given by $Price = Price_F + Price_M$

At contract renewal, municipalities organize competition for the market through a call for bids. Firms are periodically placed in competition. They compete to be a monopolist for the duration of the contract, which has a price cap. If there is competition in the market, we should therefore observe a price decrease between former and new contracts following contract renewals (see, for example, Amaral et al. (2013) in the case of bus transport in London), at least concerning the firm's share, $Price_F$.

Proposition 1. (Competition effect) At contract renewal times, the price paid by consumers to private firms decreases, all things being equal.

¹In France, cross-subsidies are prohibited. The principle is that "water pays for water", i.e., the service must be able to entirely finance itself. This principle is stipulated in the Art. L2224-12-3 of the CGCT (General code of local and regional authorities): "Drinking water and sanitation charges cover expenses resulting from investments, operation and renewals necessary for the provision of services, as well as charges and taxes of any kind relating to their execution".

Concerning the price share that is going to municipalities, $Price_M$, we expect it to increase or decrease depending on the level of control municipalities are willing to exercise in water service provision. If municipalities are willing to increase their control at the contract renewal stage, we expect a negative correlation between $Price_M$ and $Price_F$ (i.e., $Price_F$ is decreasing in the contract renewal stage partly because municipalities are retaking some (costly) responsibilities).

This leads us to our second proposition:

Proposition 2. (Control effect) At contract renewal times, the price paid by consumers to municipalities that are willing to increase their control over water services is negatively correlated with the price paid by consumers to private firms, all things being equal.

When municipalities decide to contract out the provision of their public services, they lose knowledge and capabilities that are often difficult to reacquire. In other words, switching costs associated with remunicipalization are important and may explain why many municipalities complain about how public services are provided by private firms but do not decide to remunicipalize (see, for example, Chong et al. (2015)). However, municipalities that kept responsibilities in providing water services to secure knowledge and capabilities might more easily consider providing water services through direct public management (i.e. lower switching costs).

Proposition 3. (Remunicipalization) At contract renewal times, the larger the share of the price retained by a municipality, the higher the probability that the municipality will switch to direct public management, all things being equal.

3 Data and Empirical Strategy

3.1 Data

In this paper, we use an official database that is provided by the French Ministry of Environment.² It permits us to work on unbalanced panel data set of water services provided by private firms, from 2008 to 2018, with information concerning more than 3700 services, observed on average for more than 5 years.

²The data set is open access and available here: <http://www.services.eaufrance.fr/donnees>

The data set gives us information about prices. We constructed price variables (in euros), all calculated on a standardized basis for the annual consumption of 120 cubic meters. The variable *Price* is the total price paid by the end consumer. Fixed tariff components and taxes are excluded. The variable *Price-M* is the price share retained by the municipality. The variable *Price-F* is the price share retained by the firm. The descriptive statistics table indicates that, on average, the price share of the municipality represents 38% of the total price paid by the final consumer, against 61% for the private share.

We also constructed a set of variables related to contract renewal. The binary variables R_i (where $i = [2008; 2018]$) are dummies indicating the year of contract renewal for a given contract. The dummy variable *Renewed* is equal to 1 the year that the observed contract was renewed if it was renewed during the period we study. The average contract duration is less than 13 years, and nearly all of those contracts were renewed during the studied period.

Finally, we also constructed a set of variables that will be used as control variables, *Population*, *Renewal Rate*, *Network Efficiency*, *Biological conformity*, *Chemical conformity* and *Contract Duration*. Table 1 presents the different variables used in our regressions.

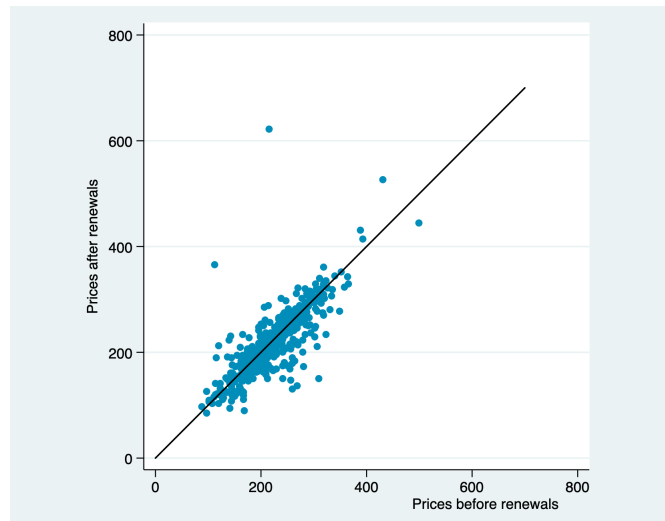
Table 1: Descriptive Statistics of our Variables

Variables	Definition	Mean	SD	Min.	Max.	N
Price	Total water price for 120 cubic meters in euros, taxes and fixed fee excluded	204.232	58.876	34	748	20323
Price-M	Price share kept by municipality in euros	77.740	42.538	15	373	20323
Price-F	Price share kept by firm in euros	126.492	46.037	18	395	20323
Renewed	Dummy variable taking value 1 the specific year the contract is renewed	0.044	0.205	0	1	20323
Contract Duration	Duration of the contract, in years	12.90	6.63	1	96	13969
Renewal Rate	(network of km renewed per year / number of km of network)	0.49	2.07	0	94	15267
Network Efficiency	(Total sold water quantity / Total produced water quantity)*100	78.68	10.17	18	100	19815
Prop-Public	Proportion of water services managed through direct public management in the local county ("departement" in France)	0.679	0.227	0	1	20323
Population	number of inhabitants (in thousands) concerned by the contract	10.887	103.012	0.24	4401.751	20135
Biological Conformity	Percentage of biological tests made during the year that are conform	99.266	4.78	1	100	19734
Chemical Conformity	Percentage of chemical tests made during the year that are conform	97.566	9.23	0	100	19698

3.2 Water Prices

Regarding our data, we see that, at first glance, there is no clear effect of contract renewals on total water prices paid by consumers (see Figure 2).

Figure 2: Water Price Before (t-1) and After Renewals (t+1)

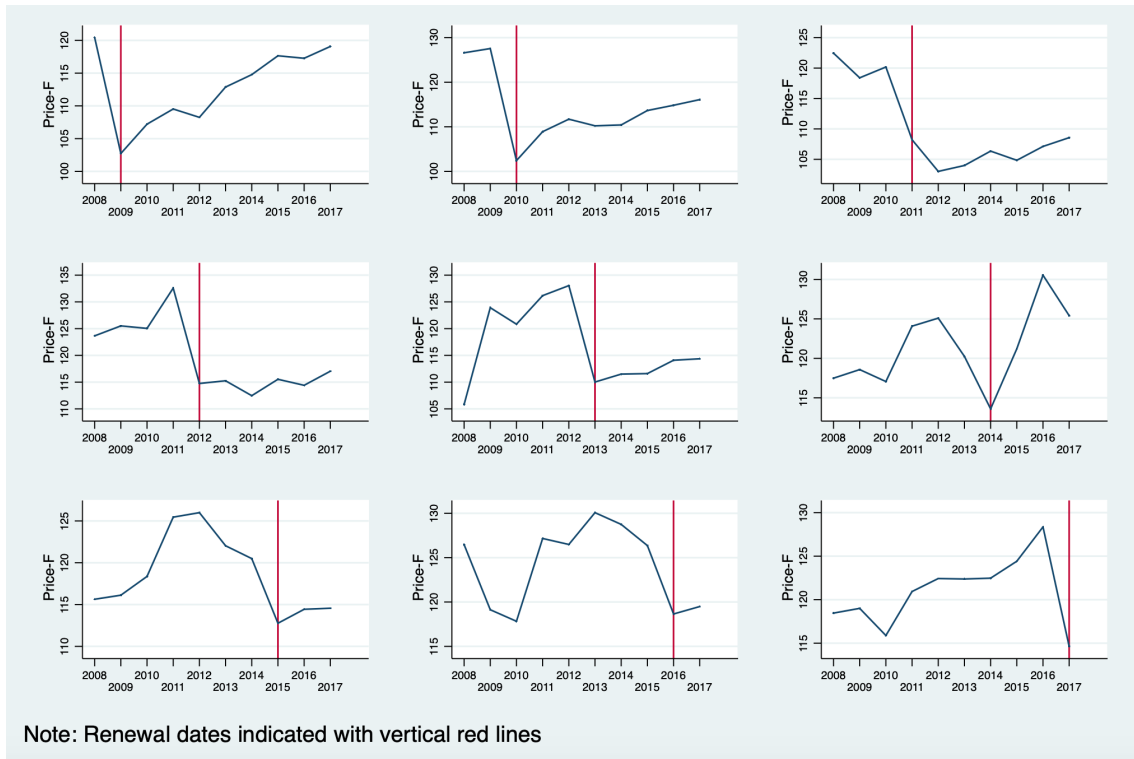


This figure depicts the total water price paid the year before and the year after contracts were renewed. Contracts are represented by dots. Dots below (above) the straight line are contracts for which renewals decreased (increased) prices.

However, as described above, the total price paid by consumers consists of two shares, one going to the firm and one going to the municipality. In the following figures, we highlight the influence of contract renewals on those two price shares.

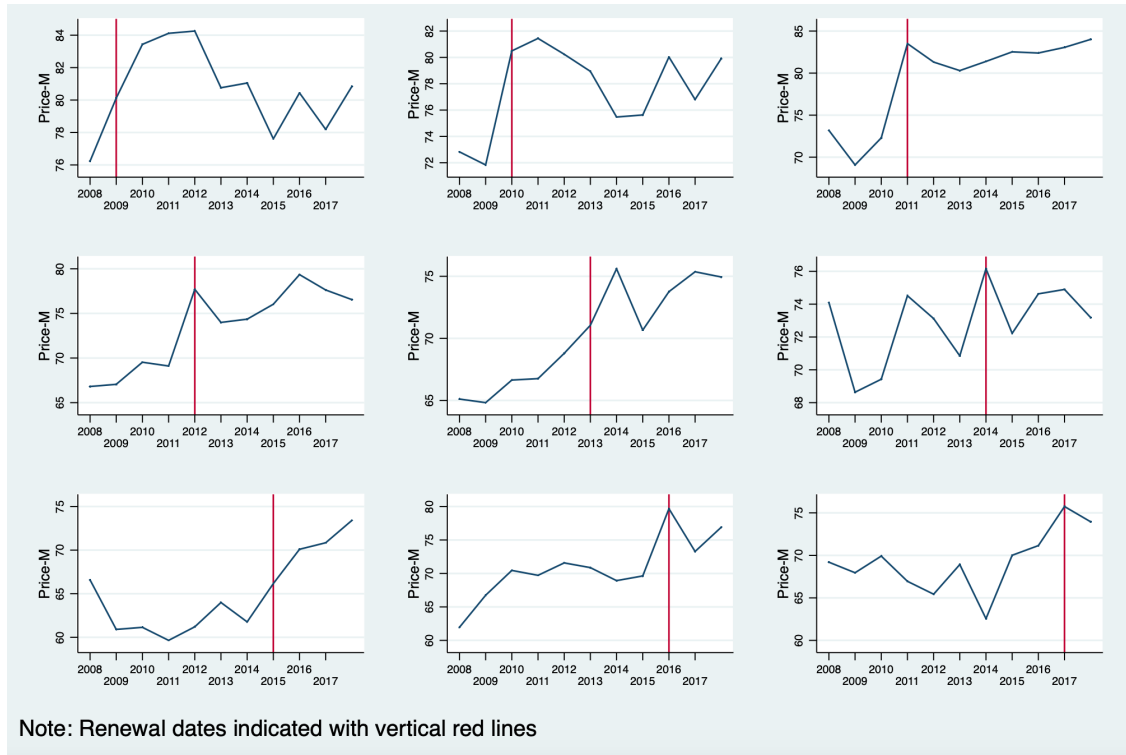
In Figure 3, we observe that contract renewals decrease, on average, the firm's share of the water price. The magnitude of the decrease depends on the year considered, but regardless of the year considered, contract renewals negatively impact the share of the price that is retained by firms.

Figure 3: Firm Price Shares and Contract Renewals (Deflated prices)



This figure depicts the price paid to private firms for water services. Each chart addresses contracts renewed in a specific year (e.g., the upper-left chart concerns only contracts renewed in 2009).

Figure 4: Municipality Price Shares and Contract Renewals (Deflated prices)



This figure depicts the price paid to municipalities for water services. Each chart addresses contracts renewed in a specific year (e.g., the upper-left chart concerns only contracts renewed in 2009).

In Figure 4, we observe that contract renewals increase, on average, the municipality’s share of the water price. The magnitude of the increase depends on the year considered, but regardless of the year considered, contract renewals positively impact the share of the price that is retained by municipalities.

3.3 Empirical Strategy

3.3.1 Contract Renewals and Prices

In this paper, we are interested in how contract renewals affect water prices, how prices are shared between private firms and municipalities and how this may translate into remunicipalization.

To explore whether water prices are affected by contract renewals, we estimate the following model:

$$Price_{i,t} = \alpha + \beta Renew_{i,t} + \delta_t + \gamma_i + \epsilon_{i,t} \quad (1)$$

where the price of water services at time t in municipality i is given by $Price_{it}$.

γ_i is the time-consistent unobserved heterogeneity. $\epsilon_{i,t}$ is the idiosyncratic error, or time-varying unobserved heterogeneity. $\gamma_i + \epsilon_{i,t}$ is the composite error term.

Note that price varies with many elements that influence the cost of providing the service, such as the kind of water treatment used or the region that concerned. However, to correct for the endogeneity caused by unobserved time-consistent effects,³ we use within estimates. Variables that do not change over time are thus not included in our estimates. We also add some year fixed effects to control for time-varying but panel-constant unobserved effects. Introducing such fixed effects is a way to capture possible political cycle effects (see, for example, Picazo-Tadeo et al. (2020))

3.3.2 Municipalities' Price Shares and the Decision to Switch to Direct Public Management

To explore how the way in which prices are shared between municipalities and firms affects the decision to contract out or provide water services through direct public management, we estimate the following probit model:

$$Public_{it} = 1[Public_{it}^* = \alpha + \beta PriceM_{it} + \delta_t + \gamma_i + \epsilon_{i,t} > 0] \quad (2)$$

where 1 is the indicator function, which takes a value of 1 whenever the statement in brackets is true, zero otherwise; $Public_{it}$ is a binary variable that indicates whether municipality i at contract renewal t decided to provide water services through direct public management (i.e., to remunicipalize).

Our hypothesis is that the higher the price share retained by municipalities, the more likely we should be to observe remunicipalization.

³Because $Cov(\gamma_i, x_{i,t}) \neq 0$, the OLS estimator applied to (1) is inconsistent.

4 Results

4.1 Contract Renewals and Water Prices

We first regress the total water price. The results are presented in Table 2.

Several results worthy of comment. First, water contract renewals do not influence the total price paid by consumers (Model (1)). The effect is small (i.e., less than 2 euros per 120 cubic meters, corresponding to a less than 1% price decrease), and the coefficient is significant only at the 10% level. It is not anymore significant as soon as we introduce the contract duration (Model (2)) and control variables (Model (3)). Interestingly, we find a positive correlation between the water price and the contract duration that might reflect transaction costs (i.e. renegotiations).

Table 2: Contract Renewals and Water Prices

	(1)	(2)	(3)
	Price	Price	Price
Renewed	-1.5621*	-1.7072	-1.7127
	(0.9352)	(1.6517)	(1.7083)
Duration		0.7922***	0.8282***
		(0.1582)	(0.1585)
Constant	207.5014***	197.3431***	186.1618***
	(0.5520)	(2.0582)	(3.5094)
Years F.E.	Yes	Yes	Yes
Controls	No	No	Yes
r2	0.014	0.042	0.043
N	20323	13985	13284

Within estimates. Heteroskedasticity-robust standard errors are reported in parentheses. Every estimate includes municipality fixed effects. Prices are deflated. * denotes significance at 10%, ** significance at 5%, and *** significance at 1%.

Turning to the impact of contract renewals on the share of the price that is retained by firms (See Table 3), we see that the competition effect is strong (Models (4) (5) (6)). When a contract is renewed, the price decreases by more than 4 euros on average, corresponding to a 3% firm price decrease. This impact is stable even when introducing contract duration and control variables in

our regressions.

We also observe a negative correlation between the two parts of the price (Model (7)). The higher the price for the municipalities is, the lower the price for firms. This result was expected because the price shares reflect the responsibilities and level of control of contracting parties over water services. The higher the control of the municipality is, the higher its price share and the lower the price share going to the private firm.

Table 3: Contract Renewals and Firms' Price shares

	(4)	(5)	(6)	(7)
	Price-F	Price-F	Price-F	Price-F
Renewed	-4.2736*** (0.8484)	-5.1866*** (1.4437)	-4.9226*** (1.5035)	-3.8272*** (1.4415)
Duration		1.0285*** (0.1716)	1.0463*** (0.1599)	0.9782*** (0.1506)
Price-M				-0.3055*** (0.0620)
Constant	126.3409*** (0.5090)	115.2895*** (2.2422)	110.5028*** (2.9801)	134.1739*** (5.5329)
Years F.E.	Yes	Yes	Yes	Yes
Controls	No	No	Yes	Yes
r2	0.008	0.028	0.031	0.102
N	20323	13985	13357	13357

Within estimates. Heteroskedasticity-robust standard errors are reported in parentheses. Every estimate includes municipality fixed effects. Control variables: Population; Rate of chemical conformity; Rate of biological conformity; Renewal rate. Prices are deflated. * denotes significance at 10%, ** significance at 5%, and *** significance at 1%.

Contract renewals also significantly impact the share of the price retained by municipalities (See Table 4). We found a positive price impact greater than 2.5 euros on average, corresponding to an increase of more than 3% in the municipality price (Models (8), (9), (10)). This impact is stable even when introducing contract duration and control variables. We also observe again a negative correlation between the two parts of the price (Model (11)).

Table 4: Contract Renewals and Municipalities' Price Shares

	(8)	(9)	(10)	(11)
	Price-M	Price-M	Price-M	Price-M
Renewed	2.7115*** (0.6607)	3.4794*** (1.0666)	3.5859*** (1.1149)	2.4043** (1.2081)
Duration		-0.2364** (0.1193)	-0.2228** (0.1097)	0.0283 (0.1065)
Price-F				-0.2401*** (0.0392)
Constant	81.1605*** (0.4300)	82.0536*** (1.5497)	77.4873*** (2.5961)	104.0139*** (5.3501)
Years F.E.	Yes	Yes	Yes	Yes
Controls	No	No	Yes	Yes
r2	0.040	0.032	0.031	0.102
N	20323	13985	13357	13357

Within estimates. Heteroskedasticity-robust standard errors are reported in parentheses. Every estimate includes municipality fixed effects. Control variables: Population; Rate of chemical conformity; Rate of biological conformity; Renewal rate. Prices are deflated. * denotes significance at 10%, ** significance at 5%, and *** significance at 1%.

4.2 Municipalities' Price Shares and the Decision to Switch to Direct Public Management

One of our hypothesis is that the price shares between firms and municipalities influences the probability for municipalities to remunicipalize. To put it to the test, we introduce new variables. The first is *Price-F Share*, defined as the share of the total price that is retained by the private firm (price-F/Total price). We also constructed a new variable *Prop-Public*, which is the proportion of water services delivered through direct public management in the department.⁴ This variable captures the fact that the more water services in areas near the municipality that are delivered through direct public management, the easier it is for a municipality to switch back to public management.

The results are presented in Table 5. We found that the higher the price share retained by firms,

⁴In the administrative divisions of France, the department is one of the three levels of government under the national level.

the less likely municipalities are to remunicipalize water services (Model 12). This result is in line with our proposition 3. Our interpretation is that when the price share retained by firms is high, municipalities have lost the control and capabilities to directly manage water services. Remunicipalization, if only possible, would be costly in such a case. However, our results suggest that this cost is also connected to the presence of neighboring municipalities operating their water services through direct public management (Model 13).

Table 5: Switches back to public management at contract renewal times

	(12)	(13)
	Public	Public
Lag Price-F-Share	-13.0853*** (2.9729)	-16.3179*** (3.3165)
Prop-Public		6.8939*** (1.9473)
Constant	0.9622 (0.9228)	-2.6049* (1.4386)
Years F.E.	Yes	Yes
ll	-150.863	-138.155
N	1058	1058

Probit within estimates. The variable Price-F Ratio is lagged. Heteroskedasticity-robust standard errors are reported in parentheses. Every estimate includes municipality fixed effects. Prices are deflated. * denotes significance at 10%, ** significance at 5%, and *** significance at 1%.

5 Conclusion

In this paper, we studied the influence of contract renewals on water prices in France between 2008 and 2018. We found that contract renewals have little influence on the prices paid by consumers. However, at contract renewal times, the share of the price that goes to the municipalities increases. We interpret this result as a willingness by municipalities to retake control of water services. In addition, we show that the higher the municipalities' shares are, the higher the probability of switching to direct public management at contract renewal times. This suggests that local authorities increasing their responsibilities in providing water services (i.e., increasing their price shares) may switch later to direct public management more easily.

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