"Confucities"

Political Contestability and Strategic Confusion in Public Policies

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Abstract

In private markets, firms may find it profitable to strategically exacerbate consumers' difficulties to compare offers through strategic confusion in order to increase their market power; such situations are described as "confusopolies". Does this phenomenon of strategic confusion, which is highly common in private markets, exist in the case of public services? In other words, can elected officials make their public policy more difficult to evaluate and compare, to gain power on the electoral market? In this paper, we argue that confusion can be a fitting tool for political authorities to hide unpopular decisions. Indeed, by sending conflicting signals, decision-makers limit the analytical capacity of their constituents to estimate the impact of some policies. Using a comprehensive set of French cities for a standard service and relying on a quasi-natural experiment, we explore the link between political competition and strategic confusion. Our results show that mayors who face strong political competition are more likely to use strategic confusion, i.e. they have a strategic interest in making a reform ambiguous in order to limit its political weight.

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1 Introduction

Before to purchase a good or a service, consumers may spend time to gather information to make the best possible choice. But gathering and processing information is costly, in terms of money, time and effort. In practice, firms have multiple channels (advertising, product design, pricing strategies) to affect these costs, marking easier or harder for consumers to assess whether a product or service is a good match for their needs or preferences (Bar-Isaac, Caruana, and Cuñat [2010]). Consumers often fail to choose the best product because they search too little, become confused comparing prices and/or show excessive inertia through too little switching away from past choices or default options (Grubb [2015]). As a consequence, firms may find it profitable to strategically exacerbate these problems in order to increase their market power. Adams [1997] and Kalayci [2015] describe as "confusopolies" the markets in which firms soften competition through strategic confusion. Many empirical evidences prove that intentional obfuscation does occur and highlight the detrimental effects for consumers.

Surprisingly, the investigation of strategic obfuscation is still limited to "private markets", and there is no investigation of this phenomenon in the case of public services. The main reason is the fact that, in this particular case, consumers are citizens and they generally do not have the possibility to choose between different service providers, neither the price they are willing to pay. Citizens cannot punish public services providers as consumers can do for firms by switching to another one offering lower prices and/or higher quality. However, it does not mean that they do not have any way to express bad feelings: local elections allow to sanction unsatisfactory behaviors from public decision makers. As a consequence, the analysis of strategic confusion in the case of public services leads to take political factors into account.

This is precisely what we do in this paper. First, we build upon previous literature to establish a relationship between political competition and the strategic use of confu-

sion for public services. Then, we rely on an original database of 400 French cities of more than 20,000 inhabitants in the car park sector to provide empirical evidence. Our results show a link between political contestability (that is, political competition) and the use of obfuscation for public services. When political competition is high, mayors tend to adopt ambiguous pricing systems or policies. More specifically, they tend to lower the fare of parking services while adopting other measures that increase the final price paid by users. In other words, mayors have a strategic interest in making a reform ambiguous in order to limit its political weight. These results are important because they extend the knowledge on strategic obfuscation to an understudied context, and because they contribute to a recent strand of literature that explores the influence of political competition on public decisions that have a strong impact on citizens' welfare (Beuve, Moszoro, and Saussier [2019]). Our analysis allows to derive policy implications that are discussed in this paper.

The rest of the paper stands as follows. First, we build on the literature on strategic obfuscation and political contestability to derive two propositions. Then, we present the empirical context, and translate the propositions into testable hypotheses. We then present the data and empirical strategy. Lastly, we present and discuss our results, and provide conclusive comments.

2 Literature review and propositions

In this section, we build bridges between two strands of literature: the first one investigates the effects of political competition on public policies, and the second one describes how firms use strategic confusion to increase their market share. We draw parallels between firms and politicians to formulate original propositions.

2.1 Political competition and public policies

When studying public services, the question of political competition appears central (Beuve, Moszoro, and Saussier [2019]). Just like firms who adopt strategies to increase their market share, politicians have incentives to manipulate policy outcomes in order to increase their share on the electoral market. This idea dates back to Stigler [1972] who makes an analogy between market competition and political competition in elections, and argues that the beneficial effects of political competition are analogous to the effects of market competition on economic efficiency. In this line of research, recent theories of political economy claim that political competition produces a positive effect on the quality of politicians and their performance. For instance, Polo [1998], Persson and Tabellini [2000], Besley, Persson, and Sturm [2010] and Galasso and Nannicini [2011] argue that when voters are motivated by ideological reasons rather than by evaluations based on the effective performance of politicians, the level of competition among parties is reduced and the party enjoying an electoral advantage will tend to select politicians of lower quality.

A large electoral advantage is likely to moderate the extent to which politicians are accountable for their choices, leading to negative performance outcomes. Indeed, tight political competition raises incumbent politicians' costs of engaging in opportunistic behavior (for example, rent extraction or corruption) because opponents would probably make corruption a campaign issue. Moreover, the absence of strong political competitors spur incumbent politicians to pursue distorted policies, since their probability of being reelected is hardly affected by these choices (Skilling and Zeckhauser [2002]).

Those theoretical contributions have been corroborated by empirical evidences. De Paola and Scoppa [2011] demonstrate a correlation between the quality of Italian municipal political representatives and political competition. Similarly, using data from a sam-

ple of Flemish municipalities, Ashworth, Geys, Heyndels, and Wille [2006] show that political competition at elections has a beneficial effect on the efficiency of municipal administration. Using an individual-level dataset on Members of the Italian Parliament, Galasso and Nannicini [2011] show that the degree of contestability or uncertainty in races between office-seeking candidates positively affects politician quality and performance. Padovano and Ricciuti [2009] examine the effects of political competition on the economic performance of Italian regions: they show that regions where competition is stronger tend to grow faster. Positive effects can also be found in terms of transparency (Berliner and Erlich [2015]) and accountability (Ferraz and Finan [2011]). As argued by Berliner and Erlich [2015], when competitive political environments create high uncertainty over future political control, transparency reforms serve as insurance mechanisms enabling ruling groups to protect their access to government information, and to preserve means of monitoring future incumbents, in case they lose power.

The works mentioned above describe the positive effects of political competition, but this paper takes a different angle and explores its potential pernicious effects. If market competition encourages firms to search ways to alleviate or even eliminate competition through unethical (i.e. anti-competitive) practices, electoral competition may have the same kind of effects. Political representatives use taxes and public spending as tools to support their reputation and, ultimately, their chances of re-election (e.g. Rogoff and Sibert [1988], Persson and Tabellini [2000], Martinez [2009]). Hence, several analyses demonstrated the causality between political competition and the amount of local public spending in the run-up to elections (Petry, Imbeau, Crête, and Clavet [1999] , Veiga and Veiga [2007], Foucault, Madies, and Paty [2008]).

In addition to an increase in spending, the very nature of spending is influenced by the degree of political competition. Veiga and Veiga [2007] show that political competition leads to a transfer of expenditure to items that are visible to citizens in Portuguese municipalities. Visible projects (buildings, street and road renovation) are favoured

over expenses that are less identifiable by voters (renovation of machinery, equipment). Chong, Klien, and Moore [2014] corroborate these results by analysing public contracts issued by French municipalities: when a mayor runs for his reelection, the timing and the type of public procurement projects are affected, as political competition pushes mayors to coordinate the end of the work with election periods, and to direct spending towards visible items (sport, culture, schools, religious buildings).

This first strand of literature establishes a link between political competition and public policies. When they face high levels of political competition, politicians may be more accountable to citizens. But they may also be willing to adopt public policies that lead to more visible outcomes, and that appear more favorable to voters, in order to increase their chances of reelection. This reasoning leads to our first proposition, which is not directly linked to strategic confusion but must be seen as a first step in the reasoning.

Proposition 1. *In contexts of high political competition, politicians will distort public policies towards outcomes that appear favorable to voters.*

This first proposition is specific to a public setting. We now wish to understand more precisely how competition can affect behaviours, and we mobilize another strand of literature on strategic confusion.

2.2 Strategic confusion in public settings

The power of obfuscation to increase profits is well-known since the fifties (Scitovsky [1950]). From a theoretical point of view, Diamond [1971] shows that the difference between competitive and monopolistic outcomes can turn on even very small differences in the cost of comparing items, while Salop and Stiglitz [1977] shows that imperfect

consumer information allows firms to maintain prices above marginal costs. Since spurious differentiation can work as well as real product differentiation, firms may find it profitable to obfuscate their prices, making them more complex and less transparent so as to make it harder for consumers to compare different offers (e.g. Spiegler [2006], Carlin [2009], Gaudeul and Sugden [2012], Chioveanu and Zhou [2013]). If blurring tariffs is the most efficient way to confuse consumers, firms can also rely on the diversity of advertising and marketing strategies in order to intentionally limit offers' comparison and to soften competition. Ellison and Wolitzky [2012] describe a general model of obfuscation that includes both pricing and attributes as means of ensuring that prices cannot be compared. Surprisingly, their model suggests that an individual firm may have an interest to make its own prices difficult to find because it can raise consumers' expected cost of searching elsewhere.

Empirical evidence shows that strategic obfuscation does occur and that markets plausibly consist of savvy and non-savvy consumers, and firms that are more willing to exploit this fact (Armstrong [2015]), particularly in complex markets. Evidence exists on a variety of markets such as retail (Clerides and Courty [2017], Richards, Klein, Bonnet, and Bouamra-Mechemache [0210]), electronic markets (Ellison and Ellison [2009]), comparisons sites (McDonald and Wren [2018]) or even mortgage market (Woodward and Hall [2010]). As strategies of obfuscation can take multiple forms, Mitchell and Papavassiliou [1999] propose a typology to organize this variety. A first set of strategies originates in the volume of information provided to the consumer. The amount of information or the too wide variety of offers is confusing for the consumer (*Proliferation* strategies). Obfuscation can also arise from too much similarity between several offers. Consumers think they are dealing with the same product because of the similarity between the offers, and companies come to copy certain products to capture part of the demand (*Parasitism* strategies). Finally, obfuscation can come from an informational ambiguity linked to contradictory signals for the same product (*Ambiguity* strategies). The classic example of confusion related to ambiguity is the company that increases

the prices of its products in advance of a sale period to simulate a significant price reduction. However, obfuscation related to informational ambiguity is not only based on prices. All the facets of a product can be used (quality, quantity, packaging) to create ambiguity as illustrated by the example of Coca Cola who, in response to the Soda Tax of July 2018, substituted its 1.5L and 2L bottles with 1.25L and 1.75L bottles without changing prices but by adopting a different packaging that keeps the size of the old bottles.

The effects of obfuscation are negative for consumers. Furthermore, several empirical studies have shown a positive relationship between obfuscation and sales (Mitchell and Kearney [2002] and financial gains (Haan and Berkey [2002]) and have confirmed the voluntary nature of these confounding practices (McDonald and Wren [2018]; Woodward and Hall [2010]). It is therefore, when it is voluntary, an anti-competitive practice that leads to two major effects. Firstly, obfuscation makes it possible to increase prices to supra-competitive levels without influencing consumers' purchasing decisions (McDonald and Wren [2018], Crosetto and Gaudeul [2017]). Secondly, obfuscation benefits to the company who has the highest market share. Indeed, in response to the confusion, consumers will tend to maintain their consumption habits.

Just like firms who adopt strategies to increase their market share, politicians have incentives to manipulate policy outcomes in order to increase their share on the electoral market. This can be done by introducing confusion when adopting policies that are unpopular, such as increases in the price of public services. However, to our knowledge, strategic confusion has never been investigated in public contexts. It rather comes at a surprise given that, in a context of declining public allocations to municipalities and facing a debt problem that is increasingly becoming a political burden, mayors who face strong political competition cannot easily increase their expenses and/or decrease fees for public services to facilitate their re-election. Confusion can therefore be a fitting tool for political authorities to hide unpopular decisions. In private markets,

strategic confusion allows to maintain supra-competitive prices and to support price changes (such the Soda tax). In a public setting, strategic confusion has two advantages for a sitting mayor. Firstly, it makes it possible to support difficult reforms. By sending conflicting signals, decision-makers will limit the analytical capacity of their constituents to estimate the price impact of a political decision. Secondly, it makes the electorate more captive. The latter, unable to interpret or differentiate public policies, will be more likely to remain "faithful" in their political choices. Consequently, the benefits of strategic confusion will be all the more important that elected decision-makers are in a situation of strong political competition.

Proposition 2. *In contexts of high political competition, politicians will be more willing to use strategic confusion to adopt unpopular reforms.*

3 Empirical setting and testable hypotheses

In order investigate the link between political competition and strategic confusion, we rely on an original database in the French car park sector. This sector is relevant for several reasons. Firstly, parking facilities are a local public service which falls within the competence of municipalities. Local settings are very suitable to investigate the impact of political competition on public policies, because mayors are particularly accountable to local voters. The vote of citizens at local elections is more guided by pragmatic reasons, such as the policies adopted by the incumbent mayor, than ideological reasons. By contrast, national elections are more affected by ideological reasons, and voters are more faithful to political parties. Secondly, parking policies involve several dimensions such as price, duration and geographical extent of parking, thus allowing and facilitating the use of confusing strategies. Thirdly, an evolution of the legislation of parking policies in 2018 constitutes a natural experiment that allows to compare parking policies before and after the reform. Finally, parking policies are very visible

to voters, and are likely to impact their satisfaction; in this sector, political decisions may induce high political costs. In this section, we present the main characteristics of the empirical setting, and translate the propositions into testable hypotheses.

3.1 The characteristics of parking policies

In France as in most European countries, local public authorities are responsible for parking policies. The latter are a strong tool to regulate car traffic, which has a large impact on citizens' welfare through different and complex channels (Shoup [2021]). On the one hand, maintaining low prices for car parks has positive socio-economic benefits, including urban development: an increase in parking prices to limit congestion negatively impacts the economic activity of cities (Foster, J., and Krizan [2006]). On the other hand, car traffic is associated with substantial negative externalities among which noise and air pollution. From another point of view, financial objectives can be one of the aims of parking policies, as parking revenues constitute a substantial part of the cities' budgets.

Because of the coexistence of multiple objectives centralized on a single regulatory tool, parking policies are complex. Beyond the diversity of objectives, mayors face different stakeholders (residents, visitors, workers) that may have conflicting interests. However, even if a portion of voters may be favorable to policies that banish cars from city centers, policies that increase the price of parking are particularly unpopular because they impact the purchasing power and living conditions of a large portion of residents. But the fare is not the only tool of parking policies, and mayors can also modify the paid-parking geographical area or time period. These dimensions are much less visible and understandable to citizens, and we believe they can be mobilized to create confusion around parking policies.

3.2 A quasi-natural experiment

In France, the MAPTAM law, voted in 2014 for an entry into force on the 1^{st} of January 2018, considerably modified parking policies by decriminalizing fines. This reform led to four major changes for French municipalities.

Firstly, a discretionary choice of the amount of fines for non-payment. Before the reform, the amount of the fine was of 17 euros in each municipality. By decriminalizing fines, the reform allows a differentiation of local rules. This new freedom also gives municipalities a greater choice of parking fees. Indeed, the parking fees were quickly capped because of the low dissuasive nature of the fine. In Paris, for example, before the reform, it was more advantageous to pay the fine than to pay for the fees, as long as the parking duration was higher that two hours and a half.

Secondly, the possibility to charge several fines for non-payment. Before the reform, the criminal nature of the offence did not allow a default in payment to be sanctioned more than once a day. After the reform, municipalities must institute a fine duration at their sole discretion. This fine duration corresponds to the time from which it is possible for the municipality to repeat the verbalization.

Thirdly, the collection of the full amount of fines. Before the reform, criminal fines were paid directly to the national State, and municipalities could only collect the fees of parking. By decriminalizing fines, the reform allows municipalities to recover both the fees for parking but also the fines, thus providing a monetary incentive to punish motorists.

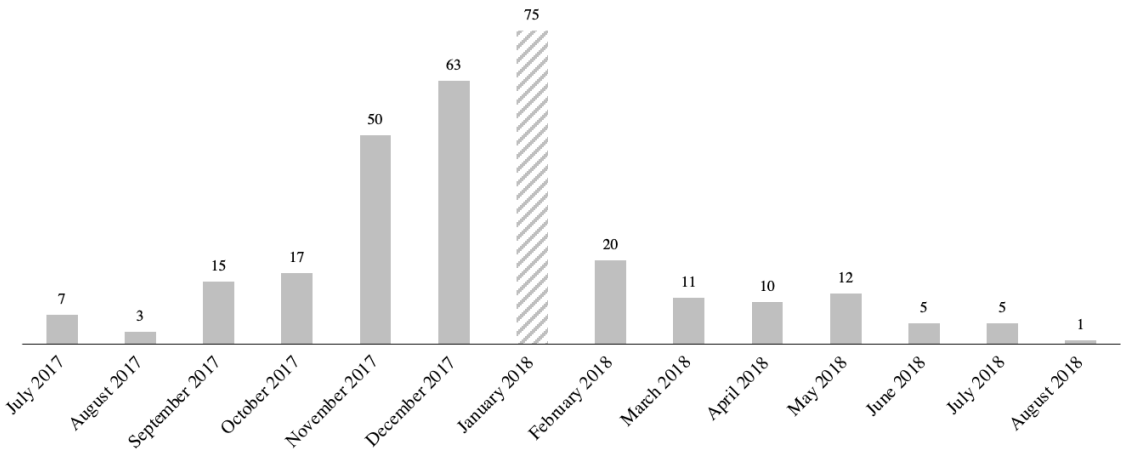
Fourth and lastly, the possibility of privatization. According to settled case law, it is prohibited to entrust a police mission to agents who are not placed directly under the authority of an administration. Before the reform, the control and management

of parking lots could not be entrusted to a private operator. The reform bypasses this prohibition and allows municipalities to privatise parking control.

To sum up, this reform makes significant changes to parking policies by offering monetary incentives to municipalities and greater freedom in the choice of management, fees and fine. At the same time, it is an exogenous shock common to all municipalities in France because it is a national reform with an obligation to comply: in the absence of any municipal decision, parking could no longer be sanctioned as of the 1^{st} of January 2018. This is important from an empirical point of view because it implies that all municipalities had to consider the definition and implementation of a new parking policy, allowing us to work in a quasi-natural experiment context.

Finally, it is important to note that this reform was highly visible for citizens. Paid-park policy is, as other car-related issues (e.g. fuel prices, fees of highways), a common topic in newspapers. Figure 1 displays the number of newspaper articles published in daily regional press (*i.e.* 39 different press titles all over France) and containing the three words: "parking", "fee" and "fine". This picture of media coverage indicates that the reform was clearly identified as an important topic for local newspaper audience. Indeed, the number of articles clearly rises during the two months preceding the reform, and reaches its highest level in January 2018 (see the hatched bar area in Figure 1), suggesting that the reform was under public scrutiny and subject to political issues for elected mayors.

Figure 1: Press coverage of paid-parking policies



Source : Authors from data collected on Europresse

3.3 Testable hypotheses

The empirical setting allows to formulate two testable hypotheses, which relate to the two propositions coming from the literature review. The first proposition posits that in contexts of high political competition, politicians distort public policies towards outcomes that appear favorable to voters. Since the price of parking is the most visible dimension of parking policies, and price increases are unpopular, we believe that mayors who face high levels of political competition will take the opportunity of the reform to decrease the price.

Hypothesis 1. *High levels of political competition should be correlated to a decrease in the price of parking after the reform.*

This first hypothesis actually allows to test for the relevance of the empirical setting. Indeed, before to study strategic confusion, we want to be sure that the price of parking is sensitive to political competition. A second step in the reasoning is to test for the correlation between political competition and strategic confusion, as formulated in the second hypothesis.

Hypothesis 2. *High levels of political competition should be correlated to high probabilities to introduce confusion around parking policies.*

Next section describes the empirical strategy that is employed to test for these two hypotheses.

4 Empirical analysis

In this section, we describe the dataset that was constructed for the empirical investigation, the variables that were constructed, and the empirical strategy.

4.1 Data

All parking data was collected in every french municipalities of more than 20,000 inhabitants (400 municipalities) on two different dates: in July 2017, i.e. 7 months before the reform, and in August 2018, i.e. 8 months after the reform. The 8-month period makes it possible to take into account potential adjustments by municipalities linked to gains in experience. All the other variables relating to the political dimension and control variables about the municipalities are taken from public and royalty-free databases available via the French national institute for statistical and economic studies (INSEE.fr) and the official website of French public open data (data.gouv.fr).

4.2 Explained variables: measures of strategic confusion

Our measurement of strategic confusion is based on a mixed approach. First, we construct our own measure of confusion by inferring contradictory signals received by voters in a municipality following the reform. We then validate our measure through a questionnaire sent to a panel of students.

After the reform, mayors could modify three aspects of parking policies:

- **The fees**, which correspond to the price of parking, or parking fare. We observe half-hourly fees in city centers, before and after the reform. The variable *Fee increase* (respectively *Fee decrease* and *Fee stagnation*) identifies municipalities that increased (respectively decreased, and did not modify) fees after the reform.

- **The fine**, which corresponds to the amount of the fine in case of insufficient or non-payment of parking fees. Before the reform, the amount of the fine was of 17 euros. The variable *Fine increase* (respectively *Fine decrease* and *Fine stagnation*) identifies municipalities that increased (respectively decreased, and did not modify) the fine after the reform.

- **The fine duration**, which corresponds to the time laps after which another fine can be given to an offender. The variable *Short fine duration* is a dummy that identifies municipalities where the fine duration is lower than two hours.

We consider as confusing policies the situations when decisions are ambiguous, i.e. when there are contradictions between these different levers of public policy. Firstly, mayors can create "price confusion": as there are two components in the price of parking (fees and fine), a first way to introduce confusion is to decrease one of the components and increase the other. As stated previously, such ambiguity will limit the ability of car owners to assess whether the reform is more or less costly for them. Secondly, mayors can play around the fine duration to introduce "time confusion". Assuming that fees are the most visible dimension, a confusing strategy could be to decrease fees while imposing a short fine duration. The reform would then appear favorable to voters, while the amount collected through fines would actually increase. Table 1 summarizes the construction of the two confusion variables.

Table 1: Confusion variables

Price confusion	*Fee increase*=1 and *Fine decrease*=1 ; or *Fee decrease*=1 and *Fine increase*=1
Time confusion	*Fee decrease*=1 or *Fee stagnation*=1 and *Short fine duration*=1

Of course, there are other ways to create confusion, for instance by playing on more than two levers at the same time. But we voluntarily limited the cases in order to test for our measures of strategic confusion through a questionnaire. The latter (available in Appendix 1) invites under-graduate students in economics to take position on the evolution of several pairs of public policies. More precisely, they are asked to determine whether the changes made to the municipal parking policy are favourable or unfavourable to motorists. The results, presented in Table 6 in Appendix, show that students have difficulties to evaluate whether policies that include price or time confusion are friendly or hostile for motorists.

Finally, two other dimensions can play a role in parking policies: the time amplitude and geographical area of paid-parking in cities. The variable *Time amplitude variation* takes the value -1 when the paid time slot was decreased (for example, end of pricing at 6pm instead of 7pm), 0 if no change has occurred, and 1 if the paid time slot was increased. The variable *Paid-area variation* is constructed on the same logic, but refers to the geographical area. Again, in the interest of simplification, these variables are not mobilized to study strategic confusion, but they are still used in the empirical analysis.

4.3 Explanatory variables: political competition

In their seminal contributions about the effect of political competition on policy in US states, Besley and Case [2003] and Besley et al. [2010] measure the distance fraction of seats held by one party to 0.5. This measure fits well in bipartisan political setups. In France, political fragmentation is usually higher: even if two parties can be legitimately defined as dominant (i.e., the left-wing party *Parti Socialiste* and the right-wing parties *Les Républicains*), other political forces—extremist, centrist, and green parties—play an important role and it is common to have city mayors who belong to one of these not-dominant parties. Consequently, we adopt different measures of political competition

to capture party fragmentation. Following Laakso and Taagepera [1979], Ferraz and Finan [2011], Berliner and Erlich [2015], and Beuve et al. [2019], we base our measure on the Herfindhal-Hirschman Index (HHI) and effective number of parties. The *Number of Effective Parties* (NEP) is defined as the inverse of the sum of squared vote shares for each party (HHI):

$$HHI_m = \sum_{i=0}^{n} {P_{i,m}}^2 \tag{1}$$

$$NEP_{m,t} = \frac{1}{HHI_m} \tag{2}$$

where $P_{i,m}$ is the vote share of each party i in municipality m during the first round of municipal elections of April 2014 (3,5 years before the reform).

NEP lower than two corresponds to a single-party domination, while increasing values beyond that reflect the extent to which effective competition is between two or more than two parties. NEP is an intuitive measure of political concentration and displays a normal distribution, whereas HHI is right-skewed. According to our Hypothesis 2, we expect politically competitive municipalities to utilize more strategic confusion (either *Price confusion* or *Time confusion*).

In order to take into account the second round of the municipal election and the possible alliances that may be formed at the end of the first round, we also measure political contestability via the gap in the second round between the winner of the election and his main political opponent. Our variable *Win margin* thus corresponds to the difference in votes between the first two protagonists of the election, i.e. the winning party (WP) and the runner-up party (RUP), on the total sum of votes (V):

$$WinMargin_m = \frac{WP_m - RUP_m}{\sum_{i=0}^{n} V_{i,m}} \tag{3}$$

We then define two discrete variables taking the value 1 when the difference in votes between the first two political opponents is less than 10%, 0 otherwise (*Win margin < 10%*) ; and less than 20%, 0 otherwise (*Win margin < 20%*).

4.4 Controls

Parking policies cover, as mentioned above, multiple issues. Several motivations such as financial motivations, congestion or air pollution issues can be used to justify political decisions. As a consequence, we cannot test the potential link between political competition and strategic confusion without taking additional variables into account.

To control for those different motivations, we first use the debt annuity (per habitanst, in thousands of euros) to capture the financial autonomy of the municipality (*Debt*). In order to take into account the particularities of the cities studied, we monitor the standard of living of the inhabitants (*Living standard*, i.e. the disposable income of the household divided by an equalized number of persons in the household (in thousand of euros)), the urbanized surface area of the municipalities (*Urban surface area*, in percentage of the total surface) and the population density (*Density*). Then, traffic-related externalities are proxied through the variables *Noise pollution* (measured through acoustic disturbance at the city level) and *Air pollution* (measured through air pollutant emissions responsible of greenhouse effect at the regional level) specifically related to cars.

Restrictive political decisions regarding car users are consistent if citizens have a substitute to travel. We measure elasticity by measuring the proportion of citizens who commute to work by public transport (*Public transport*). We also take into account the possibility for motorists to avoid on-street parkings and to go to underground parks through the number of the latter (*Private paid-parks*).

Obviously, parking policies also depend on the credibility of the sanction. In accordance with the theory of deterrence, sanctions are not dissuasive if the probability of receiving it is not sufficiently high. This probability of sanction is captured in our analysis by the number of Public road monitoring agents (*PRMAs*) per municipality and by the control technology used by the city. We assume that the probability of receiving a fine is an increasing function of the level of technology used by the municipality to collect parking fees and fines. The variable *Parking technology* is ranked from 1 to 4 : 1 stands for simple "blue disc" (car owner should put a paper-crafted blue disc in their car, provided by the municipality, where it is indicated when they parked and, according to the disc, when they are supposed to leave); 2 corresponds to usual parking-meters (coins and/or credit card) which prints tickets to put visibly in the car; 3 stands for modern parking-meters allowing motorists to enter their licence-plate and this way avoiding the print of multiple tickets ; 4 corresponds to a system of cars scanning license plates and geolocating fraudsters. We thus create the discrete variable *Technology* which is equal to 1 when the municipality seize the occasion of the reform to improve its level of technology, 0 otherwise. We also have information about how car park policy is enforced at the municipal level. Indeed, the decriminalization reform of parking has allowed cities to privatize parking control. Our variable *Privatization* thus takes the value 1 when the city has privatized, otherwise 0.

Ultimately, we introduce additional controls about the ideology of constituents through the variable *Ideology* which is equal to 1 if the mayor is left-wing extremist, 2 if he is left-wing, 3 if he belong to center party, 4 if he is right-wing and 5 if he is right-wing extremist ; and citizenship through the variable *Abstention* which stands for the level, in percent, of observed abstention during the first round of municipal elections.

Table 2 provides descriptive statistics of the variables used in the empirical analysis. All the variables corresponding to the category "Changes following the reforms" and "Confusion variables" are measured between July 2017 and August 2018, the "Po-

litical variables" are based on the municipal elections of 2014 ad all the "Controls" are measured in August 2018.

Table 2: Descriptive statistics

Variable	Mean	St. Dev.	Min	Max
Changes following the reform				
Fee decrease	0.06	0.24	0	1
Fee stagnation	0.68	0.47	0	1
Fee increase	0.26	0.44	0	1
Fine decrease	0.11	0.31	0	1
Fine stagnation	0.29	0.46	0	1
Fine increase	0.60	0.49	0	1
Fine evolution	0.49	0.67	-1	1
Short fine duration	0.68	0.47	0	1
Time amplitude variation	0.09	0.42	-1	1
Paid-area variation	0.24	0.54	-1	1
Confusion variables				
Price confusion	0.05	0.21	0	1
Time confusion	0.51	0.50	0	1
Political variables				
NEP	3.19	0.94	1.34	6.56
Win margin	0.21	0.15	0.00	0.64
Win margin < 10	0.30	0.46	0	1
Win margin < 20	0.52	0.50	0	1
Ideology	3.30	1.00	1	5
Abstention	44.57	6.03	20.72	62.28
Controls				
Debt	1.53	1.24	-6.91	5.71
Noise pollution	0.15	0.09	0.02	0.27
Air pollution	0.57	0.13	0.10	0.95
Public transport	0.21	0.16	0.02	0.64
Private paid-parks	0.30	0.13	0.03	0.61
Urban surface area	0.69	0.26	0.03	1
Living standard	20.30	10.00	12.87	203.66
Density	3.84	3.92	0	25.83
PMRAs	25.90	90.72	9	1800
Privatization	0.18	0.38	0	1
Parking technology	2.51	0.76	1	4
New technology	0.50	0.50	0	1

4.5 Empirical strategy

Equation 4 allows to test for the first hypothesis: we investigate whether the probability to modify fees is correlated to the level of political competition.Recall that fees are not the only component of the final price of parking, which also includes fines. Since it is

difficult to infer the "price of parking" from fees and fine, so we test for the sensitivity of fees to political contestability. Again, this first step allows to test for the relevance of the empirical setting, by investigation whether what we consider as a visible aspect of parking policies is sensitive to political factors.

$$FEE\_CHANGE_m = \alpha + \beta.POLITICS_m + \gamma.CONTROLS_m + \epsilon_m \quad (4)$$

Where *FEE CHANGE* alternatively corresponds to the different measures in municipality m (*Fee increase*, *Fee stagnation*, *Fee decrease*), *POLITICS* stands for the alternative variables that capture political contestability (i.e. *NEP* [Number of Effective Parties] and *Win Margin*), *CONTROLS* encompasses the entire set of control variables previously defined and ϵ is the error term.

The second hypothesis is tested through equations 5 and 6. We run logit estimations on the dummy variables indicating whether a municipality implement a confusing ($Confusion = 1$) or an easy to evaluate ($Confusion = 0$) strategy.

$$Price\_Confusion_m = \alpha + \beta.POLITICS_m + \gamma.CONTROLS_m + \epsilon_m \quad (5)$$

$$Time\_Confusion_m = \alpha + \beta.POLITICS_m + \gamma.CONTROLS_m + \epsilon_m \quad (6)$$

Where *Price Confusion* and *Time Confusion* corresponds to our measures of strategic confusion previously described in each municipality m, *POLITICS* stands for the alternative variables capturing political contestability, *CONTROLS* is the set of control variables and ϵ is the error term.

5 Results

5.1 Descriptive statistics

According to the descriptive statistics provided in Table 2, parking fees increased by an average of 4 cents in France for half an hour of parking, with a large variance across cities. The fine increased by almost 6 euros on average (+35%) with a maximum of 60 euros (+253%). The reform has also led to many changes in the time and geographical area of paid-parking: 18.5% of cities changed the paid time slot (including 13.5% upwards) and 34.75% of cities changed their paid zone (including 29.5% upwards). In addition, 18% of cities chose to privatize parking control. The issue of technological variation also deserves some attention. The variable *New technology* identifies changes in technology that occurred between July 2017 and August 2018. Half of the cities took the reform as an opportunity to upgrade the technological functioning of their paid-parking policies. These modifications can partly be explained by the privatization of the service following the regulations. Indeed, 78% of cities that have adopted the most sophisticated technology also have privatized their service.

5.2 The sensitivity of parking fees to political competition

Table 3 shows the link between changes in parking fees, political contestability and other dimensions of parking policies. The results show that municipalities that face high levels of political competition (i.e. high levels of NEP, or a wing margin lower than 10%) are more likely to decrease parking fees (see Models 3 and 6), and less likely to increase the latter (Models 1 and 4). These results support Hypothesis 1: political contestability directly influences pricing choices. This first finding is important, because it validates the choice of the empirical setting: parking policies, and more specifically fee evolutions, seem to be sensitive to the political environment.

Results in Table 3 also show a correlation between fee modifications and other levers of parking policies. Fee increases are more likely to happen with fine evolution and paid-area variations (see Models 1 and 4). By contrast, municipalities where neither the fine nor the paid-area was modified are also less likely to modify the price (Models 2 and 5). Finally, municipalities where fees decreased are also more likely to have imposed a short duration of fine, and to have modified the time amplitude of paid-parking (Models 3 and 6). These results further justifies to investigate the use of confusion in parking policies.

Table 3: Price evolution - Logit estimates

.	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
.	Increase	Stagnation	Decrease	Increase	Stagnation	Decrease
NEP	-0.330**	0.099	0.213*			
	(0.149)	(0.140)	(0.116)			
Win Margin < 10				-0.529**	0.027	1.164**
				(0.223)	(0.268)	(0.462)
Short fine duration	-0.167	-0.342	2.920**	-0.110	-0.342	2.925***
	(0.294)	(0.268)	(1.170)	(0.295)	(0.268)	(1.089)
Fine evolution	0.548**	-0.445**	-0.184	0.531**	-0.442**	-0.235
	(0.247)	(0.201)	(0.388)	(0.241)	(0.199)	(0.386)
Time amplitude variation	0.149	-0.436	1.814*	0.166	-0.433	1.897*
	(0.325)	(0.318)	(1.102)	(0.336)	(0.322)	(1.068)
Paid-area variation	0.691**	-0.606**	0.005	0.651**	-0.582**	0.059
	(0.283)	(0.255)	(0.756)	(0.280)	(0.253)	(0.748)
Ideology	0.053	-0.147	0.354	0.059	-0.158	0.368
	(0.152)	(0.140)	(0.284)	(0.153)	(0.139)	(0.280)
Abstention	-0.031	0.027	0.024	-0.028	0.025	0.023
	(0.030)	(0.026)	(0.066)	(0.030)	(0.026)	(0.059)
Debt	0.046	0.012	-0.242	0.010	0.028	-0.262
	(0.121)	(0.100)	(0.210)	(0.117)	(0.096)	(0.205)
Noise pollution	-0.903	-0.532	5.575+	-1.071	-0.562	6.746*
	(2.148)	(2.012)	(3.441)	(2.148)	(2.006)	(3.456)
Air pollution	0.254	0.095	0.088	0.310	0.105	-0.019
	(1.052)	(0.913)	(1.660)	(1.048)	(0.913)	(1.645)
Public transport	1.814	0.166	-6.667**	1.946	0.138	-6.757**
	(1.583)	(1.528)	(3.034)	(1.591)	(1.526)	(2.809)
Private paid-parks	0.037	-0.016	-0.052	0.038	-0.015	-0.055
	(0.030)	(0.027)	(0.050)	(0.029)	(0.027)	(0.054)
Urban surface area	-0.520	0.470	-0.719	-0.523	0.486	-0.940
	(0.800)	(0.709)	(1.056)	(0.790)	(0.707)	(1.087)
Living standard	-0.074*	0.056	0.003	-0.070*	0.052	0.023
	(0.042)	(0.039)	(0.099)	(0.042)	(0.039)	(0.056)
Density	0.050	-0.067	0.058	0.051	-0.067	0.055
	(0.054)	(0.050)	(0.084)	(0.053)	(0.050)	(0.088)
PMRAs	-0.017+	0.015+	0.000	-0.019+	0.016+	0.000
	(0.011)	(0.010)	(0.016)	(0.012)	(0.010)	(0.017)
Privatization	0.916**	-1.072***	1.269	0.835**	-1.040***	1.563+
	(0.369)	(0.348)	(1.004)	(0.367)	(0.353)	(1.017)
Technology	0.774***	-0.200	-2.040***	0.789***	-0.207	-2.053***
	(0.195)	(0.200)	(0.592)	(0.193)	(0.201)	(0.639)
Constant	0.975	-0.504	-6.925	0.037	-0.028	-7.056*
	(1.927)	(1.753)	(5.022)	(1.809)	(1.604)	(3.704)
Pseudo-R^2	0.1617	0.1231	0.1703	0.1620	0.1223	0.1957
N	400	400	400	400	400	400

5.3 Confusion and political competition

Table 4 presents the estimation results of equations 5 and 6 testing the potential relationship between political contestability and the use of strategic confusion, either related on *Price* or on *Time* dimensions. Positive coefficients associated with variables *NEP* and *Win margin < 10* provide corroborative evidence to Hypothesis 2. For instance, it suggests that for an otherwise "average city" (meaning all the other variables being at their mean values), an additional effective party increases the probability of strategic price confusion by 10.4% (i.e. the probability changes from 4.7% to 5,19%) while a small margin of victory increases price confusion by 26.2%. On the contrary, the effect disappears when win margin is higher. Similar patterns are observed when *Time confusion* is used as explained variable. Note that the explanatory power of the models and the coefficients associated to the political variables are lower when studying time confusion. This is consistent with the fact that modifications of fine duration are less visible than modifications of the amount of the fine. Time confusion may then be less used in environments of high political competition. Altogether, those results validate Hypothesis 2 suggesting that confusion can be considered as a political tool for the mayor to make ambiguous decisions that are politically costly.

Interestingly, results in Table 4 reveal a positive influence of *Abstention* on the probability to use price confusion strategies, while we recall it had no impact on fee evolution before (see Table 3). This is also consistent with Hypothesis 2. Indeed, by limiting the consumers/voters ability to evaluate the quality of an offer/a public policy, a main effect of strategic confusion is to generate consumers/voters inertia in their past choices. In other words, voters will maintain their choice of candidates and non-voters will maintain their choice to not go to the polls. As non-voters create uncertainty for elected officials, they rather prefer to face the same (and known) set of constituents in situation of high political contestability. The non-significance of coefficients in the last three columns is again consistent with the fact that *Time confusion* is less efficient

than *Price confusion*.

Ultimately, while there is a positive correlation between price increases and privatization, Table 4 reveals a negative correlation between service privatization and time confusion. Two arguments can be put forward to justify this influence. On the one hand, since privatization is subject to strict procedural rules linked to the application of the public procurement code, it provides a guarantee of transparency. On the other hand, in the context of privatization, the private manager will bear part of the political cost. Indeed, in case of malfunction or negative reactions, the mayors have a fuse, an intermediary to whom they can attribute the errors.

Table 4: Price and time confusion - Logit estimations

.	Price confusion			Time confusion		
NEP	0.487**			0.240**		
	(0.199)			(0.120)		
Win Margin < 10		1.227**			0.580**	
		(0.481)			(0.237)	
Win Margin < 20			0.796			0.511
			(0.628)			(0.520)
Ideology	0.444	0.505+	0.443	0.013	0.003	0.010
	(0.317)	(0.318)	(0.316)	(0.113)	(0.113)	(0.113)
Abstention	0.100*	0.086+	0.101*	0.023	0.019	0.024
	(0.054)	(0.055)	(0.053)	(0.023)	(0.022)	(0.022)
Debt	0.104	0.221	0.165	0.031	0.057	0.037
	(0.208)	(0.222)	(0.201)	(0.095)	(0.096)	(0.097)
Noise pollution	4.024	4.353	4.799+	-0.636	-0.373	-0.343
	(2.977)	(3.282)	(3.226)	(1.778)	(1.788)	(1.790)
Air pollution	0.620	0.724	0.503	-0.474	-0.485	-0.457
	(1.831)	(1.941)	(1.680)	(0.905)	(0.901)	(0.886)
Public transport	-12.228***	-11.799***	-11.936***	1.342	1.141	1.081
	(4.229)	(3.804)	(3.685)	(1.307)	(1.300)	(1.311)
Private paid-parks	-0.128***	-0.126**	-0.110**	-0.034	-0.032	-0.028
	(0.048)	(0.050)	(0.048)	(0.024)	(0.024)	(0.024)
Urban surface area	1.182	1.007	1.248	0.188	0.182	0.223
	(1.677)	(1.913)	(1.953)	(0.611)	(0.608)	(0.603)
Living standard	0.023+	0.018	0.019	-0.005	-0.006	-0.006
	(0.015)	(0.017)	(0.017)	(0.009)	(0.009)	(0.009)
Density	-0.039	-0.023	-0.032	-0.067	-0.065	-0.062
	(0.209)	(0.194)	(0.207)	(0.058)	(0.056)	(0.055)
PMRAs	-0.019	-0.013	-0.017	-0.000	-0.000	-0.000
	(0.026)	(0.025)	(0.025)	(0.001)	(0.001)	(0.001)
Privatization	-0.232	-0.003	0.023	-1.038***	-0.955***	-1.012***
	(0.634)	(0.669)	(0.666)	(0.328)	(0.328)	(0.327)
Technology	2.099***	1.751**	1.714**	0.230	0.200	0.195
	(0.701)	(0.743)	(0.707)	(0.425)	(0.424)	(0.434)
Constant	-10.672***	-9.353***	-9.727***	-1.218	-0.448	-0.824
	(3.082)	(2.767)	(2.755)	(1.255)	(1.150)	(1.163)
Pseudo-r^2	0.1605	0.1824	0.1460	0.0534	0.0583	0.0521
.	.	.	.	.	.	.
N	400	400	400	400	400	400

6 Discussion and policy implications

The central objective of this paper is to allege or refute the existence strategic confusion when implementing public policies. To do so, we draw a parallel between competition on the markets for goods and services, and competition on the political market. We show that politicians who face high levels of political competition are more likely to introduce confusion around unpopular public policies; just as firms use strategic confusion when facing high levels of competition on their market. However, the effectiveness of policy confusion over the re-election chances of a mayor is difficult to evaluate. By posing the hypothesis of similar results between the two types of confusion, we nevertheless question the relevance of a regulation of political confusion practices, in the same way as on private markets.

Today, strategic confusion on private markets is severely restricted. Each of the potential sources of confusion is subject to regulation. Several regulations set out the mandatory information to be displayed on a product and their formats to homogenize and clarify the different offers for the consumer. Parasitism is also strongly controlled. The latter is sanctioned as soon as a practice "confuses potential customers in their minds between two products". French legislation also regulates the ambiguity of offers, the third source of confusion for consumers. Article L. 121-1 of the Consumer Code regulates the use of certificates and labels. Price reductions, particularly during sales periods, have been regulated since 2015 and are subject to new restrictions with the so-called "Consumption" law of January 2019. On the contrary, the limits on public action are relatively narrow. They concern illegal taking of interests, i.e. decisions taken to promote the personal interests of decision makers and public procurement. In order to protect public funds and fight corruption, the public procurement system has adopted special rules to ensure the transparency of procedures. However, outside these two circles there are no rules governing or limiting the choices of political decision-makers.

The implementation of sanctions is subject to the same difficulties as in private markets. It is necessary to identify the voluntary nature of the confusing manoeuvres and their cost to society. Indeed, differentiating offers (packaging, quantity, tied offer...) is supposed to be beneficial for the market because it offers consumers a greater variety of choices. Similarly, hindering mayors' freedom of action would be tantamount to limiting the adaptation of legislation to local circumstances and would therefore be nonsensical. Legislation regulating confusion must therefore not punish public action but regulate it by providing citizens with tools to assess the concrete and immediate impact of a political decision. Indeed, the mandatory display of the unit price valued by Yao and Oppewal [2016] do not call into question the ability of firms to differentiate themselves but limits the risks of underlying confusion. It is also important to provide citizens with reliable and easily interpretable information. It is not a question of proposing yet another observatory to monitor public action and inform citizens through annual reports, but of giving the opposition and pressure groups the informational keys to interpret the effectiveness of political action. This includes making city budget information available, for example by refining the typology of income and expenditure. In this study, the share of parking in the cities' revenues is unavailable information that should be shared. Rules of transparency should be applied to all political actions and not only in the context of public procurement.

7 Conclusion

The main contribution of this article is to intertwine two previously independent theories. We combine political economy and literature on market confusion practices and we show that confusing practices are used by mayors in situations of strong political contestability. We plead for transparency rules, that should to apply outside the restrictive framework of public procurement. We also suggest the potential use of opportunistic manoeuvres by mayors who send positive price signals to citizens to ultimately hide harmful decisions.

Several limitations of our study should be noted. First, cannot differentiate between unintentional and voluntary confusion practices. This lack of information therefore makes it impossible to discern with certainty opportunistic manoeuvres. Second, we do not have the tools to measure the effectiveness of policy decisions. Indeed, a decision that is considered confusing in our sample can be technically effective and fully meet the municipality's objective (increase in revenue, decrease in road traffic). This difficulty in analyzing the purpose of cities directly affects the generalization of results. Ultimately, our study focuses on only one source of confusion: ambiguity. It would be interesting to adapt the other two sources to the political sphere. Is the volume of information transmitted to voters positively correlated with political competition? Is there, in the image of parasitism on the market, attempts by some candidates to merge with political opponents to capture part of the voters' votes? Our study thus opens up a new field of analysis, to be grasped and deepened.

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8 Appendix

8.1 The questionnaire and the confusion variables

The following text presents the questionnaire distributed to students to validate our selection of confounding variables. We directly report in the Table 6 (which was to be completed by the students) the average of the 184 responses obtained.

Questionnaire

A mayor wants to change his parking policy. He has three levers at his disposal (see Table 5).

Table 5: The three levers of paid-parking policies

Levers	**Definition**	**Example**
Fee	Amount owed to the parking meter	1€to park for an hour
Fine	Sanction in the event of insufficient and/or non-payment	A fine of 20€
Fine duration	Duration from which a motorist can receive a new fine for non-payment	If the duration is 1 hour, I can be fined at 2 p.m., 3 p.m., 4 p.m. and so on indefinitely

In the following table, you are asked to evaluate seven different public parking policies. More precisely, you need to assess, depending on your point of view, whether the policy changes are "friendly" or "hostile" to motorists. If in doubt, you can check the box "unclear".

Important remark: for each situation, the lever of parking policies not mentioned (fee, fine or fine duration - see Table 5) is considered unchanged.

Table 6: Evaluation of public policies

Example of policies	**Friendly**	**Hostile**	**Unclear**
1. Fee increased, fine increased	2.7%	**94.6%**	2.7%
2. Fee decreased, fine increased.	34.2%	34.8%	31%
3. Fee decreased, fine decreased	**87%**	6%	7%
4. Fee increased, fine decreased	21.8%	35.7%	42.4%
5. Fee increased, fine duration $>$ 2 hours	18.3%	**76.2%**	5.6%
6. Fee decreased, fine duration $<$ 2 hours	32.6%	25.5%	41.8%
7. Fee stagnated, fine duration $<$ 2 hours	21.7%	45.6%	32.6%

According to the answers, we can distinguish three clear policies (***1***, ***3*** and ***5***) and four ambiguous ones (***2***, ***4***, ***6*** and ***7***). Situations ***2*** and ***4*** are grouped together to create our variable *Price confusion* ; situations (***6*** and ***7***) are grouped together to create our variable *Time confusion*.