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# Cultural Biases in Public Service Delivery: Evidence from a Regression Discontinuity Approach\*

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## Abstract

What determines the share of public employment, at a given size of the State, in countries of similar levels of economic development? While the theoretical and empirical literature on this issue has mostly considered technical dimensions (efficiency and political considerations), this paper emphasizes the role of culture and quantifies it. We build a representative database for contracting choices of municipalities in Switzerland and exploit the discontinuity at the Swiss language border at *identical* actual set of policies and institutions to analyze the causal effect of culture on the choice of how public services are provided. We find that French-speaking border municipalities are 50% less likely to contract with the private sector than their German-speaking adjacent municipalities. Technical dimensions are much smaller by comparison. This result points out that culture is a source of a potential bias that distorts the optimal choice for public service delivery. Systematic differences in the level of confidence in public administration and private companies potentially explain this discrepancy in private sector participation in public services provision. **Keywords:** Public service delivery, Contracting out, Make-or-buy decision, Culture, Regression discontinuity design

**JEL codes:** D23, D73, H11, H4, L33, Z10

## 1 Introduction

Once the decision to deliver a public service is made, governments have to choose between public and private provision. The issue of how effectively to deliver public services to populations is among the most hotly debated economic policy issues, and is a main focus on policy debates in the world. Public services are a key determinant of quality of life that is not measured in per capita income, and they are also an important means of reducing poverty. However, the public economic literature has historically paid little

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attention to how public services are delivered. The traditional model centers on the State as the main actor in delivering services and most of the focus has been on setting taxes and public expenditure levels. But it is now widely acknowledged that government failure may be as important as market failure and that government intervention should not correspond to direct provision by government. Government intervention could be indirect through contracting with the private sector, and the experience of recent years has often put weight on private alternatives, such as public private partnerships and contracting out, for a wide range of services ranging from education, health care and transportation to waste collection and street repair.

To explain government make-or-buy decisions, the theoretical and empirical literature has mostly considered technical dimensions. One dimension relies on transaction costs and is similar to private sector make-or-buy decisions, that is, decisions are guided by efficiency considerations. A central prediction of these efficiency-based theories is that services that are asset specific or difficult to measure are less likely to be contracted with a private firm (Williamson, 1985; Hart, Shleifer, and Vishny, 1997). This is a pure economic trade-off, taking as given the preferences of public officials. But these preferences may be subject to political considerations: The private benefits to politicians of keeping service provision inside the government (Boycko, Shleifer, and Vishny, 1996). This view holds that factors that increase the political benefits from in-house provision make private provision less likely. A mixture of both views is given by Levin and Tadelis (2010): Services that are characterized by high transaction costs of contracting and services that are ranked high by city managers in terms of resident sensitivity to quality are less likely to be privately provided. Empirical studies have corroborated the significance and importance of these efficiency and political dimensions to explain provision mode choices for public services. For instance, Levin and Tadelis (2010) find that a one standard deviation increase in contracting difficulty is associated with about 40% less private contracting.

As the choice of how public services are provided (conditional on delivering the public service anyway) is neither a question of “more or less state” nor a question of redistributive policy, the literature has shown none interest and concern about the effect of cultural background on this economic decision. However, the Figure 1 highlights that, at a given size of the State, the share of public employment differs widely across countries of similar levels of economic development, and these differences have been persistent. For instance, the ratio of public employment over public spending is more than three times bigger in France than in Germany. This paper challenges the view that there is no room for culture<sup>1</sup>, and hence cultural biases, in public service provision.

Our approach to the question is to study the determinants of the make-or-buy decision for the provision of public services at the level of Swiss municipalities. The municipal level is an interesting case to deal with contracting choices as many municipalities make decisions about service provision in parallel while they provide a wide range of services, from very simple to very complex ones. Switzerland, with its four languages that are geographically clearly delimited, is a great case to study the impact of culture. The explanations

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<sup>1</sup>We adopt here a popular definition of culture among economists, as being the beliefs and values that are transmitted fairly unchanged from generation to generation. As beliefs and values affect individual and group behaviors, they are a central determinant of institutional arrangements: “*Institutional arrangements and policies, norms, and everyday practices express underlying cultural value emphases in societies.*” (Schwartz, 2004). This is corroborated by a growing empirical literature: Algan and Cahuc (2009) establish a link between cultural differences and the fact that countries adopt different policies related to employment protection and unemployment insurance; Eugster, Lalive, Steinhauer, and Zweimüller (2011) show in turn that culture has a causal effect on implemented redistributive policies.

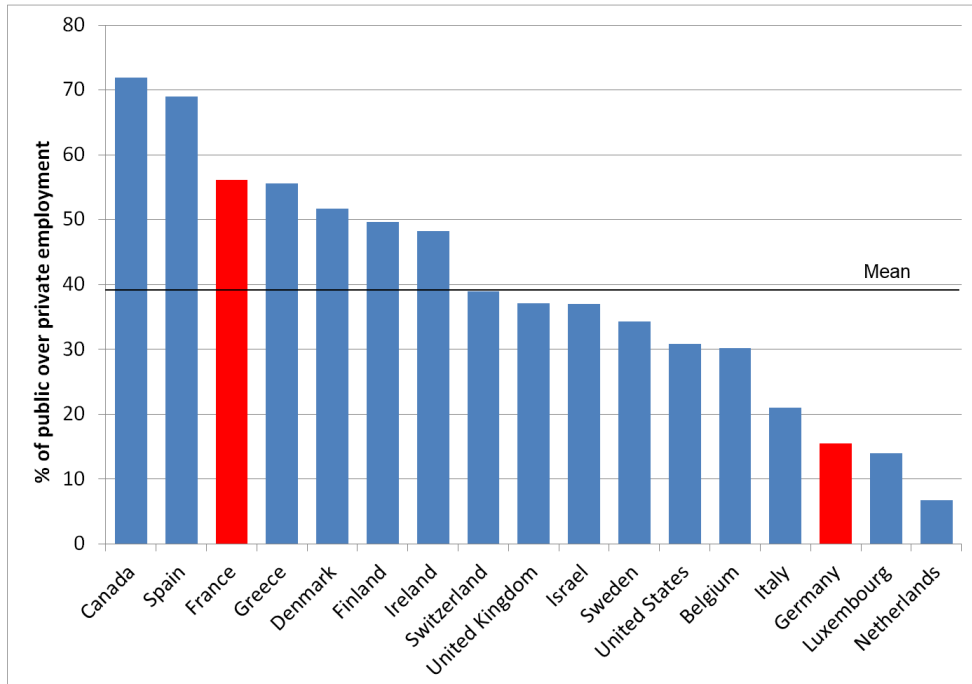


Figure 1: Public over private employment, by public spending p.c.

*Source.* United Nations Economic Commission for Europe (2000).  
Public spending in USD \$ constant 2000. PPP.

of the links between culture and language are manifold. The so-called *Sapir-Whorf hypothesis* (Sapir (1921), Whorf (1940)) focuses on intrinsic characteristics of the languages. Grammatical structures as well as the vocabulary are supposed to affect the perception of concepts (e.g. time and space, colors, past, present and future) and the worldview. Recent contributions in this field include Boroditsky, Fuhrman, and McCormick (2011), who show that language patterns provide Mandarin speakers and English speakers with a very different perception of the concept of time. Language also captures the vertical and horizontal transmission of values (Bisin and Verdier, 2001). The vertical channel to the extent that the native language to which we are exposed during childhood and adolescence is likely to be an important predictor of our values during adulthood. The horizontal channel in the sense that language is central to any type of social interaction. People sharing a common language are more likely to form a social network, and then, to share common values and common cultural traits. Finally, among the channels of transmission of cultural traits, language is the mostly inherited factor, which allows avoiding any problem of reverse causality.

The fact that language is a good proxy for culture is especially true in the Swiss context (Büchi, 2000) where the language border between French and German areas is called *Roestigraben*<sup>2</sup>, emphasizing the fact that this language border is a cultural border. In addition, as highlighted in Eugster, Lalive, Steinhauer, and Zweimüller (2011), Novembre, Johnson, Bryc, Kutalik, Boyko, Auton, Indap, King, Bergmann, Nelson, Stephens, and Bustamante (2008) find that genetic markers differ more strongly between people living

<sup>2</sup>Referring to Röstli, a popular potato-dish in the German area (but not in the French part) of the country.

in Latin Swiss areas and the German Swiss area than within those regions.

This *Roestigraben* is all the more interesting that it is a sharp geographic border: within a distance of 5 km, the fraction of French-administratively speaking Swiss municipalities falls from 100 % to 0% across the border (and vice versa for German-administratively speaking Swiss municipalities). Furthermore, there is no associated change in geography at this language border, and large parts of the language border run *within* Swiss States (Cantons). This is important since most policies in Switzerland are set at the state (rather than the federal) level. Thus, within these bilingual states, municipalities of different sides of the language border face the same regional set of policies and institutions. Within-state contrasts on either side of the border measure therefore to what extent public authorities make different make-or-buy decisions for public-services delivery even if they face identical levels of policy guidelines. From an econometric point of view, these features call for a spatial regression discontinuity design (RDD), using the *Roestigraben*, combined with a within-state estimation strategy (state fixed effects), *i.e.* we contrast *border* municipalities on either side of the segments of the language border that run *through* states. The assumption is that within-state municipalities that are just of either side of the border are very similar (firms and individuals' location decisions are likely to be balanced) so that the unobserved heterogeneity is assumed to be the same across the border<sup>3</sup>. This allows us to avoid the omitted variables bias (generally present in studies on public service delivery) due to the unobserved heterogeneity at the municipal level: the efficiency of public provision, especially, which might be linked to the language.

Thus, this roestigraben approach strikes us as a near-to-ideal object of inquiry in order to capture the causal effect of culture on public service delivery, but also to explain the discrepancy in the share of public employment between Germany and France.

The results show a very large impact of the language border on the modes of provision of public services in Swiss municipalities. We find that French-speaking border municipalities are 50% less likely to contract with the private sector than their German-speaking adjacent municipalities. Importantly, this effect does not prevail when we do not adopt a RDD strategy. Our results indicate that the cultural factor is the most important one in municipalities' make-or-buy decisions and point out that culture is a source of a potential bias that distorts the optimal choice for public service delivery.

We also investigate the possible channels to explain the impact of culture, and conclude that the cultural gap we observe at the language border can be explained by systematic differences in terms of confidence toward public administration and private firms.

The remainder of the paper is as follows. Section 2 provides an abbreviated overview of the institutional background. Section 3 provides a literature review on the determinants of contracting choices for the provision of public services. Section 4 provides a detailed description of the data we use while Section 5 presents our estimation results. Section 6 discusses the transmission channels and Section 7 concludes.

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<sup>3</sup>This *Roestigraben* identification strategy is followed by some studies, e.g. Eugster, Lalive, Steinhauer, and Zweimüller (2011), Eugster and Parchet (2011).

## 2 Institutional Background

### 2.1 Languages in Switzerland

Switzerland was founded in 1291 by the alliance of the three States of Uri, Schwyz and Nidwalden, the so-called *Waldstätten* (literally *forest States*)<sup>4</sup>. Swiss territory expanded through successive enlargements but remains confined to the German-speaking area until several campaigns in the first decade of the 15th century leading to the annexation of some Italian-speaking territories in the actual state of Ticino as well as in the Lombardy and the Piedmont; however, these regions had a status of subject territories. The first territorial expansions in the French-speaking occurred as a result of Burgundian Wars (1474-1477) and the entry of Fribourg in the Confederation (1481). At the federal level, the Constitution of 1848 recognized German, French and Italian as the official national languages of the Swiss Confederation. Romansh is also considered as a national language (since 1938) but it is subject to a special status<sup>5</sup>. In year 2000, 72.5 percent of Swiss citizens were German-speaking, 21.0 percent French, 4.3 percent Italian and 0.6 percent Romansh. Amongst the 26 States (Cantons), 4 are French-speaking<sup>6</sup>, one is Italian-speaking and 17 are German-speaking. Three states are officially bilingual French-German (Bern, Fribourg and Valais) and one is trilingual (the Graubünden state: Romansh, German and Italian). If the French-German border does not correspond to important topological barriers, the Italian-speaking area for its part is clearly separated from the other language areas by mountain chains. Finally, in the trilingual Graubünden state, the language areas correspond mainly to valls.

The Figure 2 displays a map of Switzerland shaded according to the administrative language of each municipality. We can observe in particular a sharp cut off between French and German areas. Within a distance of 5 km, the fraction of French-administratively speaking Swiss municipalities falls from 100 % to 0% (and vice versa for German-administratively speaking Swiss municipalities)<sup>7</sup>. However, there is no associated change in geography at this language border, and large parts of the language border run *within* Swiss states (cantons). Note also that the administrative language of municipalities have not changed over time.

### 2.2 Municipalities in Switzerland

Switzerland is composed of 26 States (Cantons), divided in 184 districts that are further divided in 2584 municipalities (in 2010). Compared to other European countries, Switzerland is one of the countries where the municipalities are amongst the smallest, with a median size of 1'152 inhabitants and 26.7 percent of municipalities having less than 500 inhabitants. The smallest municipality (Corippo TI) has only 15 inhabitants, whereas the biggest, Zurich, has about 370'000 inhabitants.

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<sup>4</sup>The informations provided in this historical part are taken from Büchi (2001) as well as Ducrey (1983).

<sup>5</sup>"The official languages of the Confederation shall be German, French and Italian. Romansh shall also be an official language of the Confederation when communicating with persons who speak Romansh." (Art. 70§1 of the Federal Constitution)

<sup>6</sup>The Jura state is officially a French-speaking State, even if one of its municipalities is German-speaking.

<sup>7</sup>To be completely precise, we are aware of one municipality in the French part, called Mont Tramelan, which administrative language is German since 1952.

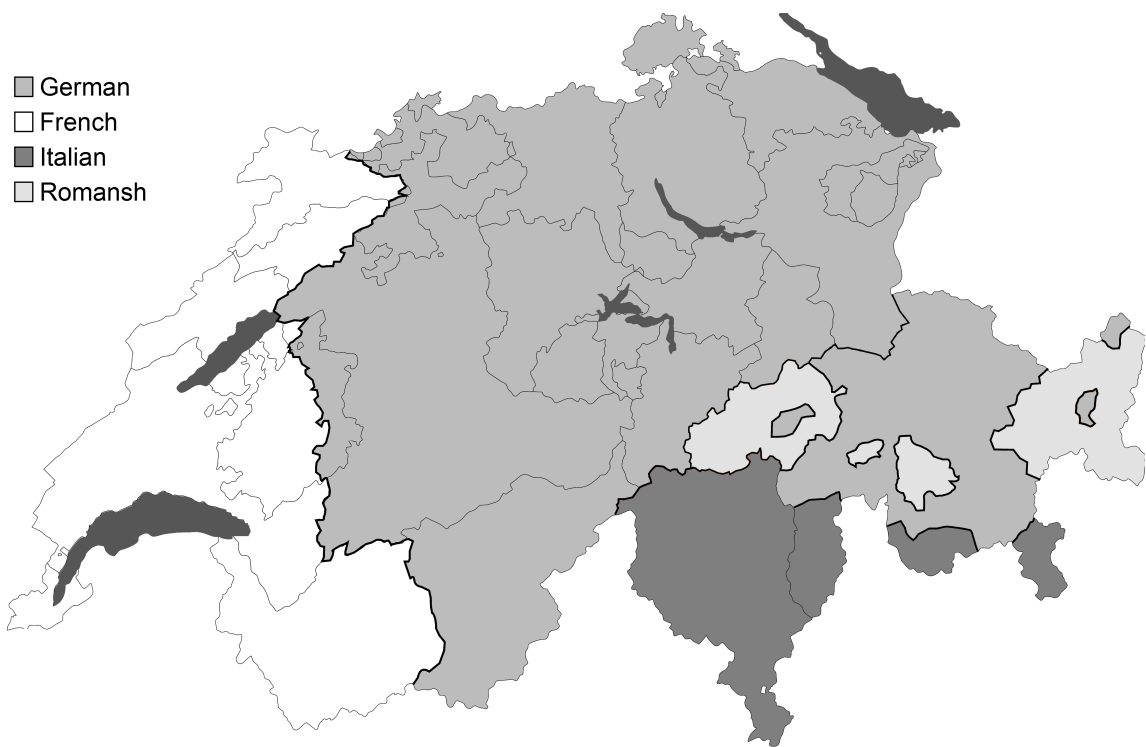


Figure 2: Administrative Language, by Municipality

*Source.* Swiss Federal Statistical Office.

The territorial structures have remained essentially unchanged since the creation of the Federal State in 1848, with the exception of the creation of the Canton of Jura in 1979. The number of municipalities has only slightly decreased since 1848, decreasing from 3'203 to 2'584, which means a reduction of less than 20 percent. Furthermore, the main part of this reduction is accounted by a couple of States, especially Thurgau, Fribourg and Tessin, who have pursued incentive policies to foster voluntary merger of municipalities. This voluntary policy contrasts with some countries who achieved ambitious reforms of the territorial structures, leading to a drastic reduction of the number of municipalities. This was the case for example in Belgium who virtually divided the number of its municipalities by four in 1977, as well as Denmark who divided this number by 2.7 in 2007.

Table 1: Size of Swiss municipalities

Municipalities					Inhabitants			
Population	Number	Cum. Number	Percentage	Cum. Percentage	Number	Cum. Number	Percentage	Cum. Percentage
0-100	82	82	3.17%	3.17%	5'163	5'163	0.07%	0.07%
101-200	143	225	5.53%	8.71%	21'305	26'468	0.27%	0.34%
201-500	466	691	18.03%	26.74%	160'631	187'099	2.04%	2.38%
501-1'000	504	1'195	19.50%	46.25%	374'739	561'838	4.77%	7.14%
1'001-5'000	1'057	2'252	40.91%	87.15%	2'468'734	3'030'572	31.39%	38.54%
5'001-10'000	194	2'446	7.51%	94.66%	1'344'092	4'374'664	17.09%	55.63%
10-50'000	128	2'574	4.95%	99.61%	2'154'508	6'529'172	27.40%	83.03%
50-100'000	4	2'578	0.15%	99.77%	256'668	6'785'840	3.26%	86.29%
> 100'000	6	2'584	0.23%	100.00%	1'078'172	7'864'012	13.71%	100.00%

Source. Swiss Federal Statistical Office.

The executive power is exerted by an elected government which is headed by a mayor. As it is the case in the Federal government, the mayor has not extended decision power than his colleagues, but acts as a *primus inter pares*. An important feature of Swiss municipalities is that it is frequent in municipalities — especially the small and medium ones — that local executive members are not elected as representatives of political parties<sup>8</sup>. This mitigates the impact of ideological choices, but more importantly this gives them a bigger independence and thus greatly reduces the risk of conflicts between the general interest and partisan interests. On the other hand, there are different modes of legislative power. In some municipalities, the legislative power is exerted by an elected parliament whereas in other ones this power is exerted by a general meeting of all citizens. Depending on the State, the choice of a legislative mode may be left to the municipalities or it may be imposed by the State. In general, elected parliaments tend to exist in cities and in larger municipalities whereas general meetings are more common in small to medium municipalities. Finally, even in municipalities with elected parliaments, citizens may vote on some issues, through popular initiatives and referenda. The scope of these political rights are decided at the State level.

<sup>8</sup>According to Geser, Meuli, Horber-Papazian, Ladner, and Steiner (2012), 39.6% of the 15'000 Swiss local executive members are not member of any political party, and 4.8% are members of political groups that only exist at the local level. The proportion of non partisan executive members reaches 80% in municipalities smaller than 500 inhabitants. Only one executive member of every two is member of one of the four biggest national parties (Swiss People's Party, Social Democratic Party, The Liberals, and Christian Democratic People's Party).



### 3 Literature Review on the Determinants of Government Contracting Choices

Both the theoretical and empirical literature related to the *make-or-buy* decision of public authorities services divide in two streams, namely an efficiency-based approach and a public choice approach.

#### 3.1 Efficiency-based determinants

The transaction-cost approach of the *make-or-buy* decision (above all Williamson (1985)) may be represented as the result of two opposing kinds of forces: centrifugal forces (economies of scale, costs of internal organization) fostering the market (*buy*) solution, and centripetal forces (transaction costs) fostering the internal production (*make*). Factors that increase the transaction costs are expected to increase the propensity of public authorities to keep the provision in-house, or possibly to contract with other public jurisdictions. By contrast, factors that reduce transaction costs foster contracting with the private sector.

**Contractual difficulty** Knowing that opportunistic behaviour increases transaction costs, an important issue is to know which parameters foster such behaviour. The first relevant element is the difficulty of specifying and measuring the outcome. The more difficult it is for the public authority to specify precisely *ex ante* in the contract relevant and measurable properties of the quality of the service considered, the more likely the private provider will reduce its costs at the expense of the service quality (Hart, 2003). Moreover, a weak measurability also means that *ex post* control mechanisms are to be costly, while at the same time being necessary because of opportunism. As a consequence, measuring difficulty is a parameter which facilitates opportunistic behaviour, and thus increases transaction costs. This question has been addressed by Hart, Shleifer, and Vishny (1997) who showed that, whereas the cost of an inmate is about 10 percent smaller in private prisons than in public ones, the reason to these economies is to be found essentially in a reduction in labour costs. Private prisons use to have a smaller staff and to hire less qualified workers. The consequence of this is that the reported number of injuries to staff and prisoners as well as the number of incidents of the use of force are significantly higher in private correctional institutions than in public.

The contracting difficulty is empirically captured through survey data. The results of the empirical studies are overall in line with the theoretical prediction (Brown and Potoski (2003), Levin and Tadelis (2010), except for Pouder (1996))<sup>9</sup>, and the effect can be substantial: Levin and Tadelis (2010) find that a one standard deviation increase in contracting difficulty is associated with about forty per cent less private contracting. In addition, Brown and Potoski (2003) and Levin and Tadelis (2010) show that higher difficulties in measuring the quality of a service fosters a production by the public sector through an increase in the propensity to stipulate contracts with other governments. In other words, measuring difficulty fosters neither the *make* (in the sense of an internal production), nor the *buy* (in the sense of contracting out with the private sector), but an

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<sup>9</sup>These empirical studies analyse the make-or-buy choices based on samples of services in U.S. cities (10 services in 88 cities in Pouder (1996), 64 services in 1449 cities in Brown and Potoski (2003) and 64 services in 1043 cities in Levin and Tadelis (2010)).

intermediary solution allowing to take profit from the advantages of contracting out while at the same time fending off the risks associated with such difficulty.

**Uncertainty** Renegotiation may have to occur because unforeseen circumstances emerge over the duration of the contract. This requires an efficient adaptation mechanism for contractual terms to the extent that opportunistic agents may try to take profit from the result of changing circumstances. As the adaptation of the contract is costly, the theoretical prediction is that uncertainty fosters the *make* decision, *ceteris paribus*. Athias and Saussier (2010) show in particular that high degree of uncertainty anticipated by the contracting parties (survey-based measured) leads to more flexible price provisions.

**Asset specificity** Whatever the ease or difficulty of measurement, another essential factor which fosters opportunism is the so-called *hold up problem* (Klein, Crawford, and Alchian, 1978; Williamson, 1979; Williamson, 1985). This problem occurs when a party would incur a significant loss if the other party withdrew from the contract. In that case, the latter would be able to behave opportunistically, putting pressure on the former to obtain some advantages and threatening it to terminate the contract if it does not accept to renegotiate the conditions. This *ex post* asymmetry in bargaining power can occur when one party has done an important investment in specific assets, e.g. human or physical assets whose productivity would be significantly lower when used for purposes other than those initially intended. This investment is then a sunk cost for the firm which has made it. As a result, higher degree of asset specificity is less likely to be associated with *buy* decision, *ceteris paribus*. Empirical studies most often do not find a clear relationship between contracting choices and their survey measure of asset specificity. This is mainly due to issues with their specificity measure. For instance, Brown and Potoski (2003) define a service as specific if it uses assets that are service-specific, not relationship-specific.

**Competition** In addition to the transaction costs related issues presented above, another source of inefficiency may come from the lack of competition of the private market. A large empirical literature supports the intuitive fact that the degree of competition of the private market is a key issue affecting the relative cost-efficiency of public and private procurement. Numerous studies show that in the best case, a non-competitive market, even if it is regulated, does not provide the service at a lower cost than a public provider (Färe, Grosskopf, and Logan, 1985; Atkinson and Halvorsen, 1986; Kay and Thompson, 1986; Parker, 1995; Wallsten, 2001; Zhang, Parker, and Kirkpatrick, 2008). In the worst case, the private mono- or oligopolist is clearly less cost-efficient than the public provider. As sketched out by Werkman and Westerling (2000): "*The most important influence on the performance of an enterprise from the standpoint of efficiency is competition – not public or private ownership*". Brown and Potoski (2003) included this factor in their analysis of the size of the cities and their urban status, regardless of the service. However, the degree of competition might also depend on service characteristics: even small rural municipalities may have access to a very competitive market for certain services, whereas some other services face a monopolistic market even for large cities.

### 3.2 Public Choice determinants

When translating the make-or-buy framework from the industry to the public sector, the personality of the deciders becomes a critically important issue. In the case of the

make-or-buy decision for a firm, it is reasonable to assume that there is a convergence of goals between the decider and the firm. When the decider is a political authority, this assumption becomes very strong. For Stigler (1971, p.3): "*[P]olitics is an imponderable, a constantly and unpredictably shifting mixture of forces of the most diverse nature, comprising acts of great moral virtue [...] and the most vulgar venality.*"

**Political ideology** The first source of deviation between the social optimum and the decisions taken by the authority comes from the fact that elected politicians may base their decisions not only on pragmatic efficiency considerations, but also on their ideological point of view. This can lead them to contract out public services despite significant risks and drawbacks, or on contrary to refuse to contract out a service while this would increase the efficiency and the social welfare. Consequently, the ideological bias may act towards public provision (make) as well as towards contracting out (buy). López-de-Silanes, Shleifer, and Vishny (1997) find that the voting results obtained in a county by the Republican candidate at the last gubernatorial election is significantly correlated with the propensity of this county to contract out services. Levin and Tadelis (2010) for their part find no significant relationship between the make-or-buy decision in a city and the voting results in its county. Picazo-Tadeo, González-Gómez, Wanden-Berghe, and Ruiz-Villaverde (2012) refine the analysis of ideological motivations firstly in taking into account the political variables when the decision of contracting out was taken instead of when the study was run, secondly in taking into account not only the party which was in power in Andalusian municipalities, but also the fact that this party was in majority or in minority. In addition, they observe the effects of a discrepancy between the ideology in the municipality and in its provincial government (that is to say if the right was in power in the municipality while the left was in power in the province, or vice-versa), as well as variables related to political cycles and to recently elected governments. This study confirms that municipalities governed by center-right or center-left parties are significantly more prone to contracting out than those governed by left-wing parties, regardless of the fact that the leading party has the majority or not. It also shows that political cycles matter.

Bel and Fageda (2009) note for their part in their literature review on local government choices for the provision of services that, in small municipalities, direct interactions between elected officials and the citizens have a bigger impact than ideology *per se* and conclude that there is no evidence for a systematic impact of ideology on privatization decisions at the local level. This is particularly true in Switzerland, due to the fact that a large fraction of local executive members are not members of any political party (*cf supra*).

**Rent and re-election seeking** The cornerstone of rent seeking theories rely on relaxing the assumption that civil servants and policy makers are benevolent agents who seek selflessly to serve the interests of the citizens. On the contrary, Public Choice advocates (Buchanan and Tullock, 1962; Niskanen, 1971; Boycko, Shleifer, and Vishny, 1996) assume that elected politicians are selfish profit maximisers whose goal is to capture a rent while ensuring their re-election. From that perspective, policy makers' contracting choices may either favour the private sector or not. Municipalities who face strong unions are however assumed to have a higher propensity to keep the services in the hands of public authorities, *ceteris paribus*. In addition, policy makers are less likely to contract with the private sector particularly salient services, for which resident sensitivity to quality is high.

In a study based on 12 services in U.S. counties, López-de-Silanes, Shleifer, and Vishny (1997) focused on the so-called *Clean Government Laws* (purchasing standards, merit system, prohibition of political activities for civil servants). They find that clean government laws foster the private provision of public services. However, the positive correlation between clean government laws and the propensity to privatize may also be explained by the fact that these laws in fact increase the cost of the public procurement, making it less competitive against private procurement. Levin and Tadelis (2010) for their part found different effects depending on which law is observed. Whereas the prohibition of political activity by city employees shows the same effect as in López-de-Silanes, Shleifer, and Vishny’s (1997) study, they observe a totally opposite effect, albeit weakly significant, for the existence of a merit system. For her part, Kodrzycki (1998) found no significant impact of clean government laws on the decision to contract with the private sector. Finally, Brown and Potoski (2003) as well as Levin and Tadelis (2010) found that municipalities governed by appointed managers were significantly more prone to contract with the private sector than those governed by elected mayors, who are subject to reelection. They also show a significant connection between the make-or-buy decision and the sensitivity of the citizens to the quality of the service. These results are in line with previous results from Warner and Hebdon (2001) who also showed that sensitivity is a relevant element to retain municipalities to contract services with the private sector. In other words, politically salient services are more likely to be delivered in-house as they are part of politicians’ electoral constraint.

**City Finances** The relationship between contracting decisions and efficiency-based considerations might also be dulled by the city’s financial condition. It is often argued that contracting with the private sector is a good way to alleviate the budget of public authorities because a part more or less important of funds comes from the private sector. But this argument is doubtful due to the Ricardian Equivalence: The resources saved by the government by not paying the investment should be equal, in present value, to the revenue foregone to the private provider. Thus, the political view would suggest that if cities have an important debt, they may be more likely to contract the service provision with the private sector.

## 4 Data

### 4.1 Contracting Choices of Swiss Municipalities

We collected data on the contracting choices of Swiss municipalities by survey. The survey asks city administrators to identify the mode of provision their municipality had chosen to provide each of the 22 services we were interested in (reported in Table 2). We selected the most important services at the local level, ranging from very simple ones (public works and office cleaning) to more complex ones (safety, education). The various modes of provision are: in-house provision (either by city employees or by a public company), contracting with another public agency (which also includes local government associations), contracting with a private sector firm, and other forms (the services is provided by another level of government, or by non-for-profit organizations). Finally, the service can also not be provided by the State, i.e. the provision is left entirely to the market (*pure privatization*). We view public contracts as a substitute for in-house provision for a city that is too small to provide a certain service effectively but which

Table 2: The 22 services

Office cleaning	Sewage treatment
Snow-cleaning	Child day-care centres
Road-clearing	School canteen
Road maintenance	Specialized services in school
Parking control	Maintenance of school buildings
Refuse collection	Security in public spaces
Solid waste disposal	Local parks and gardens
Animal carcasses removal	Cemeteries
Street lights	Trimming of trees
Drinking water distribution	Forests
Maintenance of water facilities	Public transport

wants to retain more control over provision than may be the case with a private provider. We obtained responses from 377 municipalities among which 54% are German-speaking and 46% are French-speaking. The relevant subsample for the purpose of this study is that of the three bilingual States (Berne, Fribourg and Valais), *i.e.* 142 municipalities among which 84 are German-speaking and 58 are French-speaking.

Table 3 reports the descriptive statistics for our dependant variable. In our whole sample, 52% of the services provided are provided in house, 23% through contracts with the private sector and 22% through contracts with other public entities. The distribution within French-speaking municipalities is quite similar (49% in-house, 22% public contracting, 25% private contracting) although the share of services privately provided is a little bit higher. By contrast, we can observe that, within German-speaking municipalities, less services are provided by the private sector (21% of the services provided) and more services are provided in-house (54%).

Table 3: Descriptive statistics of the modes of provision (provided services only)

	All		German		French	
	Mean (Std dev.)	Min Max	Mean (Std dev.)	Min Max	Mean (Std dev.)	Min Max
Services provided	18.592 (2.782)	0 22	18.250 (2.212)	10 22	19.088 (2.081)	13 22
– In House	10.021 (3.568)	0 18	10.095 (3.284)	2 18	9.914 (3.971)	0 16
– Public contract	4.134 (2.304)	0 13	4.012 (2.300)	0 10	4.281 (2.328)	0 10
– Private contract	3.880 (2.380)	0 22	3.655 (2.352)	0 10	4.158 (2.396)	0 10
– Other	0.556 (0.911)	0 6	0.488 (0.814)	0 3	0.667 (1.041)	0 4
Observations	2640		1533		1107	
Municipalities	142		84		58	

The repartition of the modes of provision for each service is provided in Fig.3. We can observe that there is an important variation of contracting choices across services, even though the three procuring methods are used in all services. Some services such as maintenance of school buildings are provided by municipal employees in 91% of the municipalities of our sample. Other services such as refuse collection are privately contracted

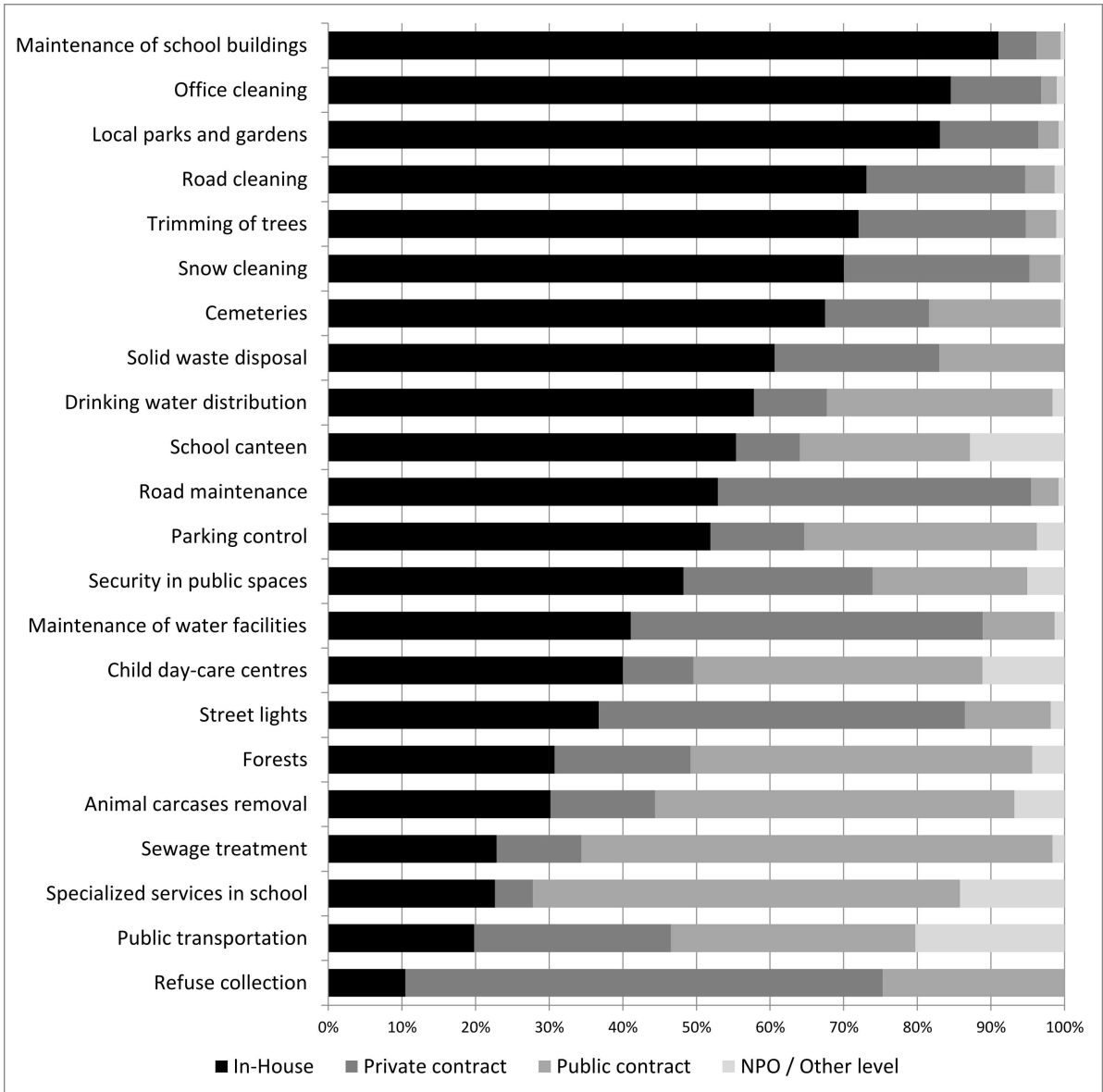


Figure 3: Modes of provision by services

over 65% of the time. Specialized services in school, sewage treatments, forests maintenance and animal carcasses removal services are in a majority of municipalities publicly contracted. The service with the lowest share of municipalities resorting to the private provision is specialized services in school (e.g. school psychologists, logopedics).

## 4.2 Service and Municipality Characteristics

Our data consist in both *Municipal*, *Service* and *Municipal* × *Service* variables taken from different sources.

A central prediction of efficiency-based theories is that difficulties in specifying and monitoring performance requirements are likely to reduce private provision. To quantify these difficulties, we surveyed ten city administrators as well as MBA students (to provide some external validity) asking them to assess the 22 services along four contracting dimensions: (1) the difficulty of specifying in the contract the expected service and the

quality requirements (*ex-ante* contracting difficulty); (2) the difficulty of observing and measuring the quality of the service once provided (*ex-post* contracting difficulty); (3) the difficulty in replacing contractors due to knowledge or physical specificity; (4) the burden laid by the service on the municipal budget (to capture economies of scale when contracting the service provision). We standardized the answers of each respondent for all questions to have zero mean and unit variance. We then averaged the standardized responses to construct an average response to each question for each service. There was a tight correlation between the survey responses of different city administrators and MBA students, which corroborates our implicit assumption that dimensions of contracting difficulty are largely related to service characteristics rather than being idiosyncratic to a given municipality-service pair. However, the first three contracting dimensions turn out to be so highly correlated across services as to be nearly collinear in multivariate regression analysis. Therefore for the regression analysis we use a principal components approach to identify a single contracting difficulty variable. The first principal component explains 74% of the variation in our four survey variables.

In addition to asking the set of ten city administrators about these four dimensions (which denote *Service* aspects), we included three questions in the survey sent to every city administrator to know the provision mode of services, in order to capture *Service*  $\times$  *Municipality* aspects. We asked them to assess (1) the sensitivity of residents to the quality of each service; (2) the uncertainty surrounding the future requirements of each service; (3) the level of competition for each service if they were considering contracting with a private sector firm for the service provision. We assume hence that these three dimensions are idiosyncratic to individual municipality-service pairs. Indeed, the citizens of a large urban municipality have different needs for some services than the citizens of a mountain village or of a small municipality in the countryside. Hence, it is highly likely that their sensitivity is quite different. In the same way, uncertainty also changes from one municipality to another, due to, for instance, the fact that a municipality is experiencing strong demographic growth or increasing urbanization or not. Finally, municipalities of different sizes or in different regions face different transportation infrastructures and different markets, and hence face different degrees of competition. We standardized each variable (Sensitivity, Competition and Uncertainty) to have zero mean and unit variance.

Table 4 reports service characteristics. The first five columns report overall contracting difficulty and its four components. The sixth column reports the budget weight of each service. The last three columns report the means by service of the variables uncertainty, sensitivity and competition. The relative difficulties of contracting for some services are in line with our intuition. For instance, office cleaning and buildings maintenance are two of the easiest services to contract. These services are routine, easy to measure and monitor and do not involve a great deal of specialized equipment or knowledge. Child day care centres and specialized services in school are two of the most difficult services to contract. For both services, performance is difficult to assess accurately and specialized knowledge can play an important role. We also observe that services provided directly to citizens are, as expected, subject to a bigger sensitivity than internal services (e.g. office cleaning). This is particularly true for services that directly affect the everyday life (refuse collection, drinking water distribution, snow cleaning).

For each municipality, we also collected information from official sources on the size of the population<sup>10</sup> (as municipalities may need to be a certain size to produce a given

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<sup>10</sup>As the number of large municipalities is quite low, we chose to cluster the size of population in three classes — small ( $\leq 1500$ ), medium (1501-5000), big ( $< 5000$ ) — instead of using it as a continuous

service in-house with any sort of efficiency), the area, the local per capita yield of the Federal Direct Tax (FDT, as a proxy for income), the municipal dependency ratio (as a proxy for investment needs), the municipality passive interests per capita (as a measure of indebtedness). Finally, we control for religion with a binary variable *Catholic* taking the value 1 if the number of Catholics in the municipality is bigger than the number of Protestants. Table 5 presents a summary of municipality characteristics.

## 5 Estimation and Results

### 5.1 Estimation

We want to quantify the relationship between the alternative forms of service provision and efficiency-based factors, public choice factors, and cultural factors. In order to describe the choice between the three alternatives, we use a standard multinomial logit approach combined with a spatial regression discontinuity design<sup>11</sup>. In the following model, we compare the probability that municipality  $i$  provides service  $j$  using the provision mode  $m \in \{\text{Private contracting, Public contracting}\}$  against the base category *In-House*:

$$\ln \left[ \frac{\Pr(Y_{ij} = m)}{\Pr(Y_{ij} = \text{InHouse})} \right] = \alpha_{lm} + \delta_m F_i + \sum_{k=1}^2 \beta_{lkm} D_i^k + \sum_{k=1}^2 \beta_{rkm} D_i^k \cdot F_i + \mathbf{Eff}'_{ij} \gamma_m + \mathbf{Polit}'_{ij} \zeta_m + \mathbf{X}'_{ij} \eta_m + \epsilon_{ijm}, \forall m, \quad (1)$$

with  $F_i$ , for *French*, being a dummy taking the value 1 for French-speaking municipalities. The running variable  $D_i$ , for *Distance*, which measures the distance to the closest cross-border municipality, takes positive values for French-speaking municipalities (at the right,  $r$ , of the language border) and negative values for municipalities in the German side (at the left,  $l$ , of the language border)<sup>12</sup>. We allow for different spatial trends. When the variable  $D_i$  takes the value 0, our measure of culture changes discontinuously at the language border.  $\mathbf{Eff}_{ij}$  is a vector of efficiency-based variables,  $\mathbf{Polit}_{ij}$  is a vector of public choice variables and finally  $\mathbf{X}_{ij}$  is a vector of additional controls, including State fixed effects (dummies). Note that the vector  $\mathbf{Eff}_{ij}$  includes *Service* and *Service*  $\times$  *Municipality* variables,  $\mathbf{Polit}_{ij}$  encompasses *Municipality* and *Service*  $\times$  *Municipality* variables and  $\mathbf{X}_{ij}$  encompasses *Municipality* and *Service* variables.

The key parameter in this regression is  $\delta_m$ . Indeed,  $\delta_m$  estimates the contrast in the probability of contracting choices at the border, that is, the difference in the mean probability of contracting choices between French and German-speaking municipalities at the border (i.e., when  $D_i = 0$ ).

$\alpha_{lm}$  measures the mean of the outcome variable in French-speaking border municipalities if they were German-speaking. The parameters  $\beta_{lkm}$  measure the spatial trend in contracting choices outcomes in the Swiss German area, whereas the parameters  $\beta_{rkm}$  allow for a completely different spatial trend in the French area.

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variable, so as to avoid heteroscedasticity.

<sup>11</sup>See Lee and Lemieux (2010) for a comprehensive discussion of spatial regression discontinuity design.

<sup>12</sup>To implement the local border contrast, we determined each municipality's distance to the language border. To do so, we computed the Euclidian distance, using geodata provided by the Swiss Federal Office of Topography, to proxy for economic distance between pairs of cross-border municipalities. We then took the nearest cross-border neighbour as the value for the distance to the language border.



Table 4: Summary Statistics for Services

Service	Difficulty (PCA)	<i>Ex-ante</i> <i>diff.</i>	<i>Ex-post</i> <i>diff.</i>	<i>Physical</i> <i>specificity</i>	<i>Knowledge</i> <i>specificity</i>	Budget weight	Uncertainty (mean)	Competition (mean)	Sensitivity (mean)
Office cleaning	-3.1	-1.7	-1.5	-1.4	-1.1	-1.2	-1.2	1.5	-1.9
Maintenance of school buildings	-2.3	-1.1	-0.9	-1.4	-1.0	-1.2	-1.2	0.5	-0.8
Snow cleaning	-1.9	-0.9	-1.0	-0.3	-1.0	0.0	-0.2	0.5	1.4
Refuse collection	-1.7	-0.8	-1.0	0.9	-1.1	0.0	-0.2	1.5	1.1
Road cleaning	-1.3	-0.3	-0.6	-0.7	-0.9	0.0	-0.2	0.5	0.6
Cemeteries	-1.2	-0.9	-0.2	-0.4	-0.7	-1.2	-0.2	0.5	-0.1
Parking control	-1.2	-0.9	-0.4	-0.7	-0.2	-0.6	-1.2	-1.3	-1.1
Trimming of trees	-0.6	-0.2	-0.4	-0.6	-0.1	-1.2	-1.2	0.5	-1.1
Local parks and gardens	-0.6	-0.5	0.4	-0.5	-0.7	0.0	-1.2	0.5	-0.9
Animal carcasses removal	-0.5	0.1	-0.4	-0.6	-0.2	-1.2	-1.2	-1.3	-0.6
Solid waste disposal	-0.3	-0.2	-0.3	1.1	-0.6	0.0	-0.2	-0.4	0.9
Road maintenance	-0.2	0.3	-0.3	0.2	-0.4	-0.6	0.7	1.5	0.6
Forests	0.0	0.2	-0.3	-0.4	0.2	-0.6	-1.2	-0.4	-1.0
Sewage treatment	0.9	0.2	-0.1	1.6	0.7	1.9	-0.2	-1.3	0.3
Security in public spaces	1.0	1.6	0.1	-1.3	0.4	0.6	-0.2	0.5	-0.2
Maintenance of water facilities	1.1	-0.2	0.9	0.7	0.8	0.6	-0.2	-1.3	0.3
Street lights	1.1	0.5	0.3	1.2	0.4	0.0	-0.2	0.5	0.5
Drinking water distribution	1.4	0.5	0.4	1.4	0.6	1.3	-0.2	-1.3	1.5
School canteen	1.5	0.3	1.1	0.6	0.6	0.0	0.7	-1.3	0.1
Public transportation	2.3	1.2	0.8	1.4	0.9	2.5	1.6	-0.4	0.2
Specialized services in school	2.5	1.0	1.2	-0.6	1.9	-0.6	1.6	-1.3	0.0
Child day-care centres	3.4	1.6	2.3	-0.3	1.6	1.3	0.7	-1.3	0.3

Table 5: Summary Statistics for Municipalities

	Mean	Std Dev	Min	Max	Source of the data
<b>City × Service characteristics</b>					
Sensitivity	0.00	1.00	-1.10	1.75	Athias Wicht Municipal survey
Uncertainty	0.00	1.00	-1.17	2.57	Athias Wicht Municipal survey
Competition	0.00	1.00	-1.28	2.38	Athias Wicht restricted survey
<b>City characteristics</b>					
Size	Small 0.44	Medium 0.38	Big 0.18		Swiss Federal Statistical Office
Urban	Urban 0.39	Rural 0.61			Swiss Federal Statistical Office: "Niveaux géographiques de la Suisse 2012"
FDT Yield p.c. [1000 CHF]	1.17	1.40	0.13	12.2	Federal Tax Administration
Dependency ratio	64.79	8.79	22.2	85.3	Swiss Federal Statistical Office
Debt	0.03	0.02	0.00	0.13	State and municipal Finance Offices
Mountain	Yes 0.49	No 0.51			Swiss Federal Statistical Office: "Niveaux géographiques de la Suisse 2012"
Catholic	Yes 0.40	No 0.60			Swiss Federal Statistical Office

Number of municipalities: 142.

In order to capture the pure effect of the language, we focus on the three bilingual States (Bern, Fribourg and Valais) to the extent that French and German municipalities of a same State face the same institutional framework, which we capture through State fixed effects. We confine the analysis on the municipalities located not more than 40 km from the language border. In order to check for the robustness of our results, we run our regressions with different ad-hoc bandwidths of 20, 25, 30 and 40 km, with both a linear spatial trend for all distances and a quadratic spatial trend at 30 and 40 km. This model is estimated with robust standard errors clustered at the municipal level.

To check the robustness of our results, we also run a logit regression, merging the categories *Public contracting* and *In-House provision*, thus directly opposing private and public provision, with an identical specification. In this case, we are able to estimate the model with robust standard errors clustered at both the *municipal* and *service* levels.

## 5.2 Estimation Issues

The key identifying assumption of our RDD is that factors other than culture — that potentially influence municipalities' make-or-buy decisions — do not change discontinuously at the language border. In other words, the assumption boils down to conditional independence of outcome and potential language group membership at the language border.

This assumption is plausible for the segments of the language border that run through States. As already highlighted above, States have much discretion in setting legal and policy rules. But the within-State segments allow us to adopt a within-State estimation strategy, that is, to add State fixed effects. Appendix C.1 provides evidence that is consistent with this assumption.

## 5.3 Results

Throughout the paper, rather than reporting hard-to-interpret coefficients from the logit model, we report the marginal effects on the choice probabilities. Table 6 reports results from the fully specified RDD multinomial logit with different spatial specifications (20, 25, 30 and 40 km linear and 30 and 40 quadratic). Table 7 reports results from logit

regressions as a robustness check. Table 8 reports results from our model without spatial trend, the cultural aspect being operationalized only through the binary variable *French*.

Our main empirical findings can be summarized as follows. The RDD approach allows us to observe the effect of the language border at *identical* actual set of policies and institutions and at *identical* actual relative efficiency of public and private provision. This effect is substantial: French-speaking border municipalities are around 50% less likely to contract with the private sector than their German-speaking adjacent municipalities (recall that on average about 23% of services are contracted privately and the estimated probability change is between -11 and -17 percentage points depending on the specification). We do not observe a robust evidence of an impact of the language border in the propensity to contract with the public sector. These results are confirmed when we merge the categories *public contracting* and *in-house provision* and run a (binary) logit regression, thus opposing private and public provision (Table 7). Once again, French municipalities exhibit a significantly and substantially lower propensity to contract the provision of their services with the private sector. The marginal effects associated with distance or distance *times* language are for their part not significant, neither in multinomial logit nor in binary logit. Interestingly, no effect of culture can be observed without the RDD approach (Table 8). Thus, the cultural dimension is important and significant and might not be orthogonal to the efficiency-based dimensions, which might introduce a bias in government choices.

Regarding the efficiency-based predictions, they are partly corroborated. First, we observe, as expected, that greater contracting difficulty – services for which it is harder to write and administer performance contracts – is associated with more public contracting and less private sector contracting. This finding is consistent with Brown and Potoski (2003) and Levin and Tadelis (2010). The impact of contracting difficulty on public contracting might be explained by the fact that public contracting is a substitute for in-house provision for a municipality that wishes to take advantage of economies of scale while retaining more control over provision for services for which the contracting difficulty is high. However, the marginal impact is rather low and much lower than in Levin and Tadelis (2010) : A one standard deviation increase in contracting difficulty is associated with a change in the probability of being contracted with the private sector of 6%. Second, we find a striking effect of competition. Municipalities facing a strong competitive private sector market for a given service are significantly more prone to contract it with private firms, which is in line with our expectations. More precisely, a one standard deviation change in the perceived degree of private sector competition is associated with 22% increase in the likelihood of private contracting. This is the variable which has the most important effect on the likelihood of private contracting after the cultural variable. The fact that we observe a negative impact of competition on public contracting suggests that public contracting acts as a substitute for private contracting when the degree of competition is low. Third, we observe that services for which future requirements are difficult to anticipate (variable *Uncertainty*) are more often contracted with private sector firms. This result is not in line with the prediction according to which uncertainty is associated with higher transaction costs. It may suggest that municipalities try to outsource to a third part the risks associated with uncertainty (e.g. the risk of having an over- or under-capacity in the future). This might however improve productive efficiency if the third part is best able to manage this risk at the lowest cost, *i.e.* is best able to affect the risky outcome and minimise any negative impact of the underlying uncertainty on the project (Debande, 2002; Väililä, 2005). Our results suggest that municipalities think that private

	25 km		30 km		30 km		40 km		40 km	
	Public	Private	Public	Private	Public	Private	Public	Private	Public	Private
<b>Cultural aspects</b>										
French	0.0616 (0.0453)	-0.1382*** (0.0504)	0.076* (0.0424)	-0.1165** (0.0536)	0.035 (0.0537)	-0.1773*** (0.0666)	0.0566 (0.0416)	-0.1049** (0.0508)	0.063 (0.0506)	-0.1164* (0.0634)
Dist	-0.0017 (0.0019)	0.0016 (0.0017)	-0.0027 (0.0016)	0.0001 (0.0017)	-0.0026 (0.0016)	0.0031** (0.0014)	-0.002 (0.0013)	0.0005 (0.0014)	-0.0029 (0.002)	0.0005 (0.0028)
French × Dist	-0.0016 (0.0037)	0.0023 (0.0036)	-0.002 (0.0031)	0.0023 (0.0031)	0.0077 (0.01)	0.0122 (0.0111)	-0.0012 (0.0022)	0.0031 (0.0028)	-0.0012 (0.0074)	0.0057 (0.01)
Dist <sup>2</sup>					0 (0.0001)	0.0001 (0.0001)			0 (0.0001)	0 (0.0001)
French × Dist <sup>2</sup>					-0.0004 (0.0004)	-0.0006* (0.0003)			0.0001 (0.0002)	-0.0001 (0.0003)
<b>Efficiency</b>										
Contracting diff.	0.0716*** (0.0092)	-0.0132* (0.008)	0.0697*** (0.0085)	-0.0162** (0.0076)	0.0698*** (0.0086)	-0.016** (0.0076)	0.0704*** (0.0076)	-0.0171** (0.0071)	0.0703*** (0.0076)	-0.0171** (0.0071)
Uncertainty	-0.0023 (0.0142)	0.0504*** (0.0119)	-0.0038 (0.0131)	0.0489*** (0.0116)	-0.0035 (0.0132)	0.0494*** (0.0116)	-0.0053 (0.0115)	0.0422*** (0.0119)	-0.0052 (0.0117)	0.0418*** (0.0118)
Competition	-0.0833*** (0.013)	0.0502*** (0.0135)	-0.0841*** (0.0118)	0.0573*** (0.0132)	-0.084*** (0.0118)	0.0569*** (0.013)	-0.0805*** (0.0112)	0.0558*** (0.012)	-0.0808*** (0.0113)	0.0558*** (0.0121)
<b>Political</b>										
Sensitivity	-0.0062 (0.0095)	0.0172* (0.0096)	-0.0075 (0.0089)	0.0177* (0.0093)	-0.0079 (0.009)	0.0178* (0.0094)	-0.0075 (0.0084)	0.0243*** (0.009)	-0.0077 (0.0083)	0.0242*** (0.0092)
Debt	-0.0883 (0.6658)	-0.607 (0.6939)	-0.0073 (0.5967)	-0.4512 (0.6704)	-0.1024 (0.6235)	-0.4931 (0.6708)	0.054 (0.5365)	-0.3727 (0.649)	0.0347 (0.5673)	-0.396 (0.6564)
<b>Control</b>										
Big	-0.0648 (0.0402)	-0.0866*** (0.0305)	-0.0859** (0.0369)	-0.0888*** (0.0294)	-0.0805** (0.038)	-0.0799** (0.0312)	-0.0694* (0.0375)	-0.1006*** (0.0268)	-0.069* (0.038)	-0.1*** (0.0272)
Small	0.1109*** (0.0354)	0.0182 (0.0282)	0.1054*** (0.0327)	0.0117 (0.0268)	0.1092*** (0.0335)	0.0124 (0.0266)	0.1021*** (0.029)	-0.0048 (0.0272)	0.1029*** (0.0299)	-0.0036 (0.0276)
Urban	0.074** (0.032)	-0.0018 (0.0295)	0.0594** (0.0285)	-0.0118 (0.0272)	0.0639** (0.0294)	-0.0076 (0.0274)	0.0768** (0.0308)	-0.0223 (0.027)	0.0756** (0.0316)	-0.0217 (0.0273)
FDT Yield p.c.	0.0436* (0.0251)	0.0502* (0.0271)	0.0234 (0.0299)	0.0512** (0.0229)	0.0226 (0.0297)	0.0495** (0.0236)	0.025 (0.0305)	0.0522** (0.0252)	0.0257 (0.0307)	0.0526** (0.0254)
Budget weight	0.0045 (0.0139)	0.0294** (0.0145)	0.0013 (0.0129)	0.0338** (0.0134)	0.0014 (0.013)	0.0333** (0.0134)	0.0002 (0.0122)	0.0378*** (0.0119)	0.0004 (0.0122)	0.0378*** (0.0119)
Dependency ratio	-0.0015 (0.0022)	0.004* (0.0021)	-0.0022 (0.002)	0.0045** (0.002)	-0.0024 (0.002)	0.0044** (0.002)	-0.0013 (0.0018)	0.0026 (0.002)	-0.0013 (0.0018)	0.0026 (0.002)
Mountain	-0.0695* (0.0372)	0.0456 (0.0282)	-0.0503 (0.0325)	0.0396 (0.025)	-0.0471 (0.0319)	0.0396 (0.0251)	-0.0548* (0.0308)	0.0307 (0.0264)	-0.0518 (0.0315)	0.0301 (0.0269)
Catholic	0.0654 (0.0641)	-0.0265 (0.0512)	0.0741 (0.0626)	-0.0341 (0.0498)	0.0619 (0.0606)	-0.0553 (0.0547)	0.0648 (0.0611)	-0.0402 (0.0487)	0.0658 (0.061)	-0.0448 (0.0516)
Observations	1627	1627	1809	1809	1809	1809	2157	2157	2157	2157
Municipalities	91	91	100	100	100	100	120	120	120	120
French/German	45/46	45/46	46/54	46/54	46/54	46/54	50/70	50/70	50/70	50/70

Table 6: RDD-Multinomial Logit Models for Frequency of Private and Public Contracting

Notes: Reported coefficients are marginal effects on probability of different modes of service provision. In-house provision is the base outcome. Standard errors are clustered at the municipality level. All regressions include State dummies. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

Table 7: RDD-Logit Models for Frequency of Private Contracting

	25 km Linear	30 km Linear	30 km Quadratic	40 km Linear	40 km Quadratic
<b><i>Cultural aspects</i></b>					
French	-0.1299*** (0.0449)	-0.1138** (0.0466)	-0.1687*** (0.0562)	-0.1041** (0.0452)	-0.1125** (0.0556)
Dist	0.0016 (0.0018)	0.0003 (0.0019)	0.0032 (0.0021)	0.0006 (0.0012)	0.0009 (0.0034)
French × Dist	0.0019 (0.0035)	0.0022 (0.0028)	0.011 (0.0107)	0.0031 (0.0022)	0.0045 (0.0095)
Dist <sup>2</sup>			0.0001** (0.0001)		0.0000 (0.0001)
French × Dist <sup>2</sup>			-0.0005** (0.0003)		-0.0001 (0.0002)
<b><i>Efficiency</i></b>					
Contracting diff.	-0.0162 (0.0279)	-0.0188 (0.0295)	-0.0186 (0.0295)	-0.0195 (0.0302)	-0.0194 (0.0302)
Uncertainty	0.0448*** (0.0156)	0.0443*** (0.0145)	0.0444*** (0.0146)	0.0384*** (0.0144)	0.0382*** (0.0147)
Competition	0.0481** (0.0238)	0.055** (0.0251)	0.0549** (0.025)	0.0538** (0.0239)	0.0539** (0.0241)
<b><i>Political</i></b>					
Sensitivity	0.0177 (0.0177)	0.0182 (0.0178)	0.0183 (0.0182)	0.0243 (0.018)	0.0243 (0.0181)
<b><i>Control</i></b>					
Big	-0.0722** (0.0333)	-0.0761** (0.0321)	-0.0679** (0.0345)	-0.0894*** (0.0298)	-0.0891*** (0.0305)
Small	0.0114 (0.0308)	0.0066 (0.0305)	0.007 (0.0309)	-0.0076 (0.0297)	-0.007 (0.0317)
Urban	-0.0044 (0.02)	-0.0131 (0.0181)	-0.0086 (0.0175)	-0.0219 (0.0202)	-0.0215 (0.0198)
FDT Yield p.c.	0.0301 (0.0242)	0.0387 (0.0237)	0.0362 (0.0242)	0.04 (0.0263)	0.04 (0.0267)
Budget weight	0.0253 (0.0387)	0.03 (0.0398)	0.0295 (0.0395)	0.034 (0.0385)	0.034 (0.0383)
Dependency ratio	0.0041 (0.0026)	0.0046** (0.0023)	0.0045* (0.0023)	0.0028 (0.0023)	0.0027 (0.0023)
Mountain	0.0425* (0.0229)	0.037** (0.0174)	0.0364** (0.0173)	0.0283 (0.0205)	0.0273 (0.0197)
Catholic	-0.034 (0.0411)	-0.0402 (0.0425)	-0.0599 (0.0393)	-0.0448 (0.0422)	-0.0476 (0.0415)
Debt	-0.5898 (0.671)	-0.4315 (0.6538)	-0.4691 (0.6431)	-0.3592 (0.5874)	-0.3677 (0.5946)
Observations	1627	1809	1809	2157	2157
Municipalities	91	100	100	120	120
French/German	45/46	46/54	46/54	50/70	50/70

*Notes:* Reported coefficients are marginal effects on probability of private contracting. Standard errors are clustered at the municipality and service levels. All regressions include State dummies. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

Table 8: Multinomial Logit Models for Frequency of Private and Public Contracting, without RDD

	Public Contr.	Private Contr.	Public Contr.	Private Contr.	Public Contr.	Private Contr.	Public Contr.	Private Contr.	Public Contr.	Private Contr.	Public Contr.	Private Contr.
<i>Cultural aspects</i>												
French	-0.002 (0.028)	-0.0002 (0.027)	0.0178 (0.0319)	-0.0188 (0.0276)	-0.0091 (0.0273)	-0.0242 (0.0304)	0.0058 (0.0292)	-0.025 (0.033)	-0.0147 (0.0315)	-0.0273 (0.038)	-0.0138 (0.0315)	-0.0303 (0.0373)
<i>Efficiency</i>												
Contracting diff.			0.0685*** (0.006)	-0.0049 (0.0058)	0.0694*** (0.0058)	-0.005 (0.0059)	0.0694*** (0.0057)	-0.0051 (0.006)	0.0694*** (0.0057)	-0.0052 (0.0061)	0.071*** (0.0072)	-0.0185*** (0.0068)
Uncertainty			0.0001 (0.0116)	0.0419*** (0.0113)	0.0024 (0.0112)	0.0448*** (0.0114)	0.0025 (0.011)	0.0447*** (0.0115)	0.0034 (0.011)	0.0443*** (0.0114)	0.0033 (0.011)	0.0445*** (0.0112)
Competition			-0.084*** (0.0111)	0.0531*** (0.0118)	-0.0818*** (0.0108)	0.0541*** (0.0116)	-0.0802*** (0.0105)	0.053*** (0.0116)	-0.0798*** (0.0105)	0.053*** (0.0115)	-0.0804*** (0.0106)	0.0558*** (0.0115)
<i>Political</i>												
Sensitivity			-0.0094 (0.0079)	0.0288*** (0.0083)	-0.0092 (0.0076)	0.0289*** (0.0083)	-0.0102 (0.0075)	0.0294*** (0.0083)	-0.01 (0.0076)	0.0301*** (0.0083)	-0.009 (0.008)	0.0208** (0.0089)
Debt			-0.168 (0.5292)	-1.0967* (0.6174)	0.0759 (0.5048)	-0.8698 (0.6169)	0.1664 (0.4792)	-0.8826 (0.622)	0.2908 (0.4876)	-0.7181 (0.6297)	0.2821 (0.487)	-0.7025 (0.6293)
<i>Control</i>												
Big					-0.0338 (0.0364)	-0.0808*** (0.0294)	-0.0558* (0.0317)	-0.0693** (0.0294)	-0.0718** (0.0344)	-0.0796*** (0.0274)	-0.0715** (0.0345)	-0.0795*** (0.0272)
Small					0.0824*** (0.0245)	-0.025 (0.0239)	0.104*** (0.0265)	-0.0371 (0.0254)	0.1127*** (0.0271)	-0.0335 (0.0261)	0.1125*** (0.027)	-0.0324 (0.0261)
Urban							0.0811*** (0.0276)	-0.045* (0.0236)	0.0901*** (0.0288)	-0.0438* (0.0237)	0.09*** (0.0288)	-0.0434* (0.0236)
Mountain							-0.0486* (0.0271)	0.0083 (0.0253)	-0.0383 (0.0293)	0.0219 (0.0249)	-0.0383 (0.0293)	0.0216 (0.0249)
Dependency ratio							-0.0009 (0.0014)	0.0001 (0.0017)	-0.001 (0.0014)	0.0002 (0.0016)	-0.001 (0.0014)	0.0003 (0.0016)
FDT Yield p.c.									0.0323 (0.0302)	0.0435 (0.0269)	0.0316 (0.0303)	0.0433 (0.0265)
Catholic									0.0596 (0.0575)	-0.0361 (0.0387)	0.0584 (0.0572)	-0.035 (0.0388)
Budget weight											-0.0043 (0.0119)	0.0408*** (0.0113)
Observations	2561	2561	2355	2355	2355	2355	2355	2355	2355	2355	2355	2355
Municipalities	142	142	132	132	132	132	132	132	132	132	132	132
French/German	58/84	58/84	51/81	51/81	51/81	51/81	51/81	51/81	51/81	51/81	51/81	51/81

Notes: Reported coefficients are marginal effects on probability of different modes of service provision. In-house provision is the base outcome. Standard errors are clustered at the municipality level. All regressions include State dummies. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

firms have more skills to manage the risks happening during the operation phases.

Results related to public choice predictions are mitigated. We find no effect of municipality finances on make-or-buy decisions (*Debt* variable) and we find a significant positive correlation between private contracting and the measure of resident sensitivity to quality, which is not consistent with the view that municipalities want control over the services that are more salient for the residents. This might be however consistent with the view that public authorities resort to private contracting to reduce their accountability (see Ellman (2006) and Athias (2013) for theoretical insights into this issue).

Regarding control variables, we find a striking pattern in municipality size. We observe that, compared to medium-sized municipalities, large municipalities are significantly less prone to contract both with the private and the public sector. Small municipalities for their part are more prone to contract with other public entities, but exhibit no significant impact towards private contracting. These results are to be explained by the fact that large municipalities have the critical size to provide local public services by themselves whereas medium-sized and small municipalities have to contract to take advantage of economies of scale. Moreover, small municipalities do not always dispose from sufficient means and competencies to manage efficiently certain services. Turning to a logit model, we observe no significant impact of size for small municipalities. This element, as well as the fact that we observe no impact on private contracting in the multinomial model regarding small municipalities, suggest that small municipalities use exclusively public contracting (*inter alia* Local Government Associations) as a substitute for in-house provision. Regarding large municipalities, the results of the logit estimation also confirm the results of the multinomial logit.

## 6 Possible Explanations

This Section discusses one potential channel by which cultural background translates into lower implication of the private sector in the provision of public services on the French side of the language border. This channel is systematic differences in the confidence in the public and private sectors.

Using data from the World Value Survey 2007, we compare the answers given by French-Swiss and German-Swiss respondents when they were asked to rate *How much confidence do you have in the Civil Service* and *How much confidence do you have in major companies*. The first question wants to measure individual's confidence towards the public administration while the second wants to measure individual's confidence towards the private firms. Results are reported in Table 9. In both cases, we observe that French-Swiss respondents are less confident than German-Swiss respondents, although the difference is bigger (and more significant) regarding companies. More interesting is to observe the discrepancy between the individual levels of confidence in companies and the Civil service. This allows us to control for individual characteristics. This shows that on average, German-Swiss respondents have higher confidence in major companies than in the public administration, whereas it is the exact opposite for French-Swiss respondents, and the difference is significant. These results are confirmed when we run ordered logit regressions for each question, so as to control for individual characteristics (see Appendix A). These results suggest that individual preferences relative to the private and public sectors exhibit clear differences across both language group memberships. Hence, individual preferences are a potential channel of transmission of cultural traits that might explain the gap that we observe in the make-or-buy decisions of Swiss municipalities.

Table 9: Comparison of survey results between German-Swiss and French-Swiss respondents

Question	Data	# Resp.	Mean German	Mean French	Mean Total	Diff.	Pr(Diff≠0)	
1. How much confidence do you have in: The Civil Service	WVS (2007)	902	2.565 (0.7253)	2.683 (0.707)	2.636 (0.715)	-0.119	0.015**	From (1) = A great deal to (4) = None at all
2. How much confidence do you have in: Major companies	WVS (2007)	890	2.467 (0.719)	2.780 (0.757)	2.658 (0.757)	-0.313	0.000***	From (1) = A great deal to (4) = None at all
3. Discrepancy between the confidence towards Public administration (Q2) and Companies (Q3)		859	-0.095 (0.8146)	0.094 (0.8201)	0.020 (0.823)	-0.189	0.001***	Positive value = more confidence towards Public administration

These different views can be reinforced by the feedback mechanism highlighted by Piketty (1995) and Bénabou and Tirole (2006). Indeed, actual differences in the modes of provision of public services lead to choices that reinforce diverging confidence in public administration and private firms. This interplay of beliefs and real-life experience with respect to private provision has been investigated by Di Tella, Galiani, and Schargrodsky (2012). In this paper, the authors try to assess the effect of propaganda versus reality in the formation of beliefs about privatization. They run a lab experiment immediately after the re-nationalization in 2006 of the main water company in Argentina. Within people who did not have access to water before "privatization", they distinguish two groups of people: (1) those who obtained access after privatization; (2) those who did not obtain access. They want to explain the difference of opinions between the benefits of privatization of water services and benefits of privatization in general (so as to control for individual characteristics). They show that a person's beliefs of the benefits of the water privatization were almost 30% more negative (relative to other privatizations) if his/her household did not gain access to water after the privatization. Thus, reality can change beliefs.

## 7 Conclusion

While it might seem natural to consider that cultural factors are not the principal determinants to explain economic decisions, our paper shows that the economic choices — make-or-buy decision — made by municipalities for the provision of their services are mainly explained by cultural factors. We focus on the language border in Switzerland to capture the pure effect of culture on make-or-buy decisions of Swiss municipalities, using a regression discontinuity design. We disentangle between three accounts for the make-or-buy decisions: efficiency-based determinants, public choice determinants, and cultural determinants. Our results show that cultural factors deeply shape municipalities decisions. French-speaking border municipalities are 50% less likely to choose the private provision than their German-speaking adjacent municipalities. This result points out that culture is a source of potential bias that distorts the optimal choice for public service delivery.

We explain this cultural gap between French-speaking Swiss municipalities and German-



speaking Swiss municipalities by systematic differences in confidence in public administration and private firms between French-Swiss and German-Swiss citizens. Using data from the World Value Survey 2007, we observe that German-Swiss respondents have higher confidence in private companies than in public administration, whereas French-Swiss respondents have higher confidence in public administration than in private companies, and the difference is highly significant.

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# Appendix

## A Culture and Confidence

	(1) Civil Service	(2) Companies	(3) $\Delta$ Confidence
French	0.310** (0.136)	0.738*** (0.138)	0.398*** (0.145)
Male	0.273** (0.134)	-0.173** (0.0783)	-0.461*** (0.132)
< 30 yrs old	-0.103 (0.190)	-0.226 (0.161)	-0.120 (0.134)
$\geq$ 50 yrs old	-0.166 (0.147)	0.0966 (0.139)	0.292** (0.139)
Lower educ. level	0.189 (0.177)	0.0504 (0.270)	-0.102 (0.268)
Upper educ. level	-0.0425 (0.228)	-0.0624 (0.336)	-0.0919 (0.262)
Catholic	-0.0889 (0.141)	-0.405*** (0.136)	-0.241* (0.127)
Raised religiously	-0.431*** (0.139)	-0.0255 (0.137)	0.304*** (0.0981)
Married	-0.160 (0.142)	-0.150 (0.110)	0.00136 (0.167)
Observations	875	864	835

Ordered logit regression. Robust standard errors clustered at State level in parentheses; \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . Positive coefficients mean negative impact on confidence (cols 1-2). Positive coeff. mean higher confidence towards civil service compared to major companies (col. 3).

## B Correlation Matrix

	Contracting diff.	Sensitivity	Uncertainty	Budget weight	FDT Yield p.c.	Dep. Ratio	Debt	Competition
Contracting diff.	1.000							
Sensitivity	0.191	1.000						
Uncertainty	0.343	0.209	1.000					
Budget weight	0.648	0.312	0.217	1.000				
FDT Yield p.c.	0.000	0.018	0.050	0.001	1.000			
Dep. Ratio	0.001	0.028	0.024	-0.001	-0.103	1.000		
Debt	0.000	0.033	0.019	0.002	-0.116	-0.089	1.000	
Competition	-0.242	0.043	-0.052	-0.183	0.031	0.016	0.074	1.000

## C Robustness checks

### C.1 Continuity of explanatory variables at the language border

A key issue in regression discontinuity designs is that all other explanatory variables do not exhibit any discontinuity at the cutoff. In order to check the balance of covariates at the language border, we estimate the following regression model:

$$Y_i = \alpha_0 + \alpha_1 \cdot F_i + \alpha_2 \cdot D_i + \alpha_3 \cdot F_i \times D_i + \mathbf{X}'_i \beta + \varepsilon_i \quad (2)$$

where  $Y_i$  is the variable to test for municipality  $i$ ,  $F_i$  a dummy taking the value 1 for French municipalities and  $D_i$  the distance to the language border.  $\mathbf{X}'_i$  is a vector of State dummies. For binary variables, we use a logit model with the same specification.

Results are provided in Table 10. Column 1 reports the mean of a characteristic in the French region, column 2 reports the corresponding mean in the German region, column 3 reports the contrast Swiss French versus Swiss German municipalities, column 4 provides an estimate of the local contrast with a bandwidth of 25 km. In columns 1 and 2, standard deviations are in parentheses; in columns 3 and 4, for municipality data, heteroscedasticity robust standard errors are in parentheses whereas for municipality-service characteristics (*uncertainty, sensitivity, competition*), standard errors are clustered at the municipality level.

Table 10: How do border municipalities compare?

	Mean French	Mean German	Difference All	Difference 25 km, linear
FDT Yield p.c. [1000 CHF]	0.809 (0.092)	0.613 (0.046)	0.196** (0.094)	0.133 (0.144)
Dependency ratio	66.410 (1.063)	66.689 (0.989)	2.721* (1.482)	8.710*** (0.028)
Debt	0.038 (0.003)	0.031 (0.002)	0.012 (0.004)	-0.010*** (0.020)
Mountain	0.517	0.512	-0.005	-0.523*** (0.163)
Catholic	0.828	0.107	-0.720***	1.850*** (0.163)
Urban	0.225	0.357	-0.132*	-0.128 (0.199)
Small	0.569	0.405	0.164	0.399** (0.187)
Medium	0.345	0.417	-0.072	-0.244 (0.199)
Big	0.086	0.179	-0.093	-0.156 (0.152)
Uncertainty	0.131 (0.029)	-0.147 (0.022)	0.278*** (0.043)	0.483** (0.194)
Sensitivity	-0.069 (0.035)	-0.079 (0.033)	-0.010 (0.049)	-0.154 (0.187)
Competition	-0.052 (0.027)	-0.163 (0.022)	0.110*** (0.035)	0.366* (0.197)
Number of municipalities	174	225		92
Number of observations	3823	4934		1645

Results indicate that there are significant but slight differences in age structure at the language border. Swiss French border municipalities are also most often smaller than their German neighbours. While there is no significant difference between French and German municipalities of the whole sample, there are significant differences between border municipalities, with a higher rate for private sector competition within French border municipalities. This might be explained by the fact that there are more German border municipalities in a mountain area than French ones (which can impede access to markets and make transportation less efficient).

Regarding the degree of competition, we observe a stronger competition in the French area. This may be a factor explaining why we observe a *higher* proportion of services contracted out in the French area, while at the same time observing a pure effect of the language border going in the opposite direction. The same is true regarding the variable Uncertainty. hence, these results confirm the importance of controlling for these variables in our models.