Abstract

This research looks at the determinants and spatial interactions in the decisions leading to the adoption of the school-rhythm reform by French municipalities. The possibility opened to mayors to adopt the reform sooner (2013) or later (2014) offers the opportunity to measure how much the neighbors’ actions have weighted on the local decision. Our results reveal strong spatial interactions. We also study the feedback effect from the (non-)adoption on the subsequent electoral results.

Keywords: Reforms, Spillovers, Yardstick Competition, Elections, Municipalities.

JEL Classification: D72, H70, H73
1. Introduction

From Oates’ (1972) decentralization theorem, it is widely recognized that decentralization generates welfare gains in allowing local governments to tailor the local public policies to the particular tastes and other characteristics of the local population. Another advantage from decentralization is that it encourages experimentation and generates learning about which policies are the right ones. Known as “laboratory federalism” (Oates, 1999), this second advantage has recently spurred a literature dedicated to policy innovation at the local level and diffusion of best practices inside decentralized countries (see, for example, Strumpf, 2002; Volden, 2006; Kotsogiannis and Schwager, 2006; Cai and Treisman, 2009).

These arguments may be particularly true for education, a domain in which local preferences may vary and experimentation and learning are critical (Peterson, 1995). Evaluations of the impact of decentralization on the performance of pupils are scarce but their conclusions are optimistic, especially for rich areas. Increased local autonomy over academic content, personnel, and budgets has been shown to exert positive effects on pupils achievements in industrialized countries although negative effects have been exhibited in some developing and low-performing countries (Hanushek et al., 2014). The same mixed results have been obtained at the local level in Argentina: decentralization has an overall positive impact on student test scores in wealthier municipalities, while the impact is less favorable in poor municipalities (Galiani et al., 2008).

However, the “laboratory” dimension is reinforced when political decentralization, is also present as according to its backers, it endorses local authorities with the full responsibility of the implementation of local policies. This delivers an edge to politicians (especially incumbents), as they may use the policy as a signal of competence to their electorate. However, they may care more about the political gain than about the policy success (Gilardi, 2010). In such a case, they will tend to imitate policy experimentations undertaken by neighbors and strategically use local public policies in order to get reelected, whatever the actual impact of the policy.

Also, if elections work as a disciplining device, yardstick competition will have a role, and good policies will get diffused as a result. Decentralization is thus a double-edged sword for local politicians, who receive more power but find themselves subjected to higher scrutiny. Unfortunately, the two effects tend to favor the diffusion of policy experiments, whatever the (positive or negative) effects of the policies.
Quite weirdly, there have been only few attempts to study the diffusion of educational experiments across local jurisdictions. Studies mainly deal with policy diffusion between US school districts with regard to inter-district open enrollment policy (Rincke, 2006) and diffusion of charter schools among California school districts (Rincke, 2007; Zhang and Yang, 2008). Logically, there have been even fewer studies on more centralized countries. This is in particular the case for France, where issues related to education have traditionally been managed at the national level, with few margins of maneuver – and even suspicion - for experiments by the local authorities. Hence, there has been no study dealing with diffusion of educational policy variations between French local jurisdictions. Recently, however, the adoption of the (nationally-promoted, locally-implemented) school rhythm reform offers an unprecedented opportunity to understand how municipalities seize a chance to adapt the terms and conditions of a reform to their specific contexts.

Since the institution of universal public education in the late 19th century in France, schoolchildren have benefited from a weekly day off (for a long time on Thursdays, for religious reasons, then on Wednesdays - since 1972). To make up for the lost teaching times, schools opened their doors on Saturday mornings but, in 2008, under Conservative President Nicolas Sarkozy, it was decided to compress the school week into a four day schedule and Saturday has become a no-school day. Shortly after the 2012 Presidential and legislative elections, the Socialist-led government announced reforms to the academic calendar and week structure. It was first proposed to shorten the school day for primary school pupils, which is currently deemed as too long to allow for effective learning. Teaching hours would be spread out over the week to make up the hours by extending the current system of 4 days of classes per week to 4.5 days.

This reform presents several interesting characteristics. First, the measure went into effect in September 2013 but municipalities (and their elected mayors) had the option to delay the implementation of the reform for one year, upon decision of the city council. The adoption of the reform will thus come into full effect over the whole of France in September 2014 at the latest. Second, municipalities are supposed to add the fifth day of classes on Wednesday but they can also choose to make the additional half-day a Saturday morning (upon derogation), in effect returning back to the situation as it was before 2008. This choice is further complicated by varying views between chronobiologists, by the opinion of (often warring) parents and by powerful influence of the national tourism lobby. Third, class-days should
finish 45 minutes earlier but municipalities can choose another school schedule for organizational concerns (more time for lunch, or 2-3 slightly shortened teaching days, among many other possibilities). Fourth, class time being shortened, kids will be kept on school grounds until at least 4:30 p.m. to facilitate after-school child care. Municipalities have to organize these new city-funded extracurricular activities (cultural or sporting activities, or in some cases, just free play in schoolyards). In the absence of a statewide organization, mayors face numerous options among which they have to find the ones that are the most appropriate to local needs (and funds). There is thus considerable scope for experimentation and, potentially, imitation.

These elements combine to make the French reform a case study in “laboratory federalism”. Mayors are not only free to take into account the specificities and the preferences of the local population in the implementation of the reform, but they also can choose to postpone the implementation to 2014, giving them an opportunity to learn from school schedule choices of their neighbors and mimic successful policies (in order to get reelected).

In this paper, we highlight the determinants of an early adoption (i.e., in 2013) of the reform, instead of 2014, and evaluate the consequences of this choice on the incumbent mayor reelection, in March 2014. We thus bring two contributions to the literature. First, combining the popularity of the incumbent mayor and the adoption of the school rhythm reform permits to determine the source of horizontal diffusion of the reform and provides a comprehensive test of the yardstick competition hypothesis. Second, we measure the voters’ taste for experimentation by looking at the consequences of the policy-maker’s choices, in terms of electoral fortunes of the mayors: do the ones that postpone the application of the reform benefit from higher vote shares in municipal elections than those who decide to implement the reform as soon as 2013. In other words, does the latecomer advantage compensate the innovator premium in voters’ mind?

A closely related study is Cassette and Farvaque (2014), who focus on the internal determinants that explain the choice to implement the reform quickly, such as social, economic and political characteristics of the municipality. The approach here is to concentrate on the diffusion of the reform, i.e., analyzing if the probability of a municipality adopting the reform is higher/lower if neighboring municipalities have already chosen to adopt it. On the one hand, different sources of mimetic behavior may explain horizontal diffusion of a reform. First, municipalities ruled by the same party can be expected to mimic in their decision to
adopt the reform in 2013 or to postpone it. This political trend may operate because politicians belonging to the same party have similar preferences and follow party discipline (Geys and Vermeir, 2008, Santolini, 2009). Second, voters may update their electoral preference with the information on the adoption of the school rhythm reform in the domestic and in the nearby municipalities. The less competent incumbents are incentivized to mimic neighbors to signal a good competence level on educational grounds to the voters and to increase their probability of reelection. Yardstick competition is not only an explanation of mimetism in national income tax rates (Redoano, 2007) or departmental expenditures on welfare services (Elhorst and Fréret, 2009) but also a source of policy diffusion (Schnyder, 2011). By observing the adoption of the reform in nearby municipalities, a voter can increase the information at his disposal on the difficulty to implement the reform. Third, mimetism in the adoption (i.e., of the year) of the reform could be the consequence of interstate competition for mobile production (Heyndels and Vuchelen, 1998; Ladd, 1992). On the other hand, municipalities can choose to learn from their neighbors’ mistakes. Compared to a uniform national application of school policy, decisions taken at the municipal level act as a laboratory, with trial-and-error learning. Municipalities that choose to postpone the adoption of the reform seek to benefit from former experimentations undertaken by their neighbors and plan to follow the most successful arrangements. In that case, negative spillovers are expected: if municipality $j$ implements the reform, the municipality $i$ chooses to postpone it in order to learn from municipality $j$’s experimentation.

The remainder of the paper is structured as follows. The next section offers theoretical insights on which our empirical strategy, exposed in section 3 (with some details on the French educational system and the adoption of the reform), is based. Section 4 discusses the results, while section 5 concludes.

2. Theoretical background

3. Institutional context and empirical strategy

3.1. Key features of the French education system and of the reform

In France, the organization and functioning of education is traditionally under the jurisdiction of the central government except in the domains where jurisdiction is conferred to local governments. However, in the 1980s, a general trend of decentralization has operated in
France, including on education, and some competences have been devolved to municipalities, departments and regions.

Actually, municipalities are in charge of building, renovating and maintaining the public schools that are located in their territory, and they manage all related expenditures, whatever they concern (investment or functioning). If several schools are present, the municipal council decides upon the rules of allocation of children to schools (zoning). Municipalities can (but are not obliged to) organize any complementary activity (educational or cultural as well as sports) they consider relevant, and they decide upon the opening hours. For the kindergarten and elementary schools, they also manage and organize the canteens, taking care of everything, from prices to menus to staff recruitment (outsourcing is of course allowed, although it is quite customary to have municipal staff in charge of the provision). Parents contribute financially to the feeding of their children, with contributions depending on their revenues. Municipalities also are in charge of the non-teaching staff, especially in kindergartens.

The school rhythm reform essentially concerns kindergartens and elementary schools, hence directly impacting the municipalities, in the following ways. First, given the reduced school time, municipalities may have to organize more extracurricular activities, which has a direct financial impact (if only for petty stuff – paper, pens, balls, etc.) Second, if they ask (or request) from the teachers to take care of the extracurricular activities, the extra-hours will have to be paid by municipalities (although the teachers are civil servants paid by the Ministry of Education for the normal time spent in class). Of course, municipalities could chose to rely on extra staff, which they will nevertheless have to pay. The transition period can also be costly, as they have to recruit and (potentially learn to) manage new workers (in particular, specialized helpers in pre-school and after-school activities and extra canteen staff). Third, and important, the school transportation system will have to adapt, with an extra day of transport to be organized. The municipality may nevertheless share this last impact with its neighbors, if it belongs to a union of cities, or if the transportation system is managed by the upper-level of government (the “département”). The presence of such vertical links with the departmental council in turn may affect the diffusion of the reform.

More precisely, the official launch of the reform is a decree (dated 26th, January 2013) stating that municipalities had to decide upon the adoption of the reform before the 31st, March 2013 (i.e., a “decision window” of more or less 60 days). If the mayor refuses to answer or to ask the council to take a formal vote (as they have done in a majority of cases), the Ministry would consider the refusal as an obligation to implement the reform in 2013.
Figures 1 and 2 show the dynamics of the adoption of the reform. Figure 1 reveals that many municipalities have decided quite late, at the end of the decision window, even though this is even truer for the ones that have decided to adopt the reform early (in 2013). This can notably be explained by the fact that, for those who had a positive bias towards the reform, lots of discussions (with parents’ delegates, music schools, etc.) took place before the formal vote. It also happened that some votes were suspended until the upper-level of government itself decided upon the reform (as they had to adapt transportation networks and schedules, in particular). Interestingly, as figure 1 exhibits, some municipalities apparently decided even before the formal decree was published, which can signal either hostility or, on the contrary, a strong endorsement of the reform. This is confirmed by the data displayed in figure 2, which reveals that the gap between the municipalities that have adopted the reform in 2013 and the ones that have pushed it back to 2014 increases over time (during the decision window).
Figure 1. Chronology of municipal decisions

Source: Authors

Figure 2. Choices made by municipalities having already decided: share of municipalities having decided to implement the reform in 2013 or to postpone it to 2014

Source: Authors
3.2. Method

The conventional wisdom suggests that governments should not introduce reforms close to elections as reforms lead to electoral losses (Dewatripont and Roland, 1992, 1995, Padovano and Petrarca, 2013). The French government has apparently followed this conventional path, implementing the reform quickly, maybe anticipating that the costs will be borne by the local politicians, and that they will be gone by the next Presidential election. But then the question of why about 20% of the municipalities have embraced quickly the reform rises even more strongly.

To ensure that voters hold the incumbent accountable of the implementation of the reform, we follow the comprehensive approach developed by Padovano and Petrarca (forthcoming) which consists in estimating both a vote popularity equation and a local tax setting equation. Their empirical strategy also provides a useful way to check the source of policy diffusion and especially the existence of yardstick competition.

3.2.1. Early implementation of the reform

The choice of early implementation (Reform2013\(_i\)) is our binary dependent variable in this first part of the model. This observed decision takes the value 1 if the municipality decided to implement the reform in 2013 and 0 otherwise. This choice depends on the difference in utilities between the two alternatives (early reform and postponed reform): \(U_{1;\text{i}} - U_{0;\text{i}}\). The probit model assumes this difference \(U^* = U_{1;\text{i}} - U_{0;\text{i}}\) follows a normal distribution. \(U^*\) is not observable, only the choices made can be, which are reflected in:

\[
\begin{align*}
\text{Reform2013}_i & = 1 \text{ if } U^*_i \geq 0 \\
\text{Reform2013}_i & = 0 \text{ if } U^*_i < 0
\end{align*}
\]

In the baseline model, we focus on the internal characteristics of the municipality (INTERNAL\(_i\)) and the vertical links with higher level administrative tiers (VERTICAL\(_i\)) over the net utility of the municipal council and thus on the probability to implement the reform in 2013. The probit decision model used in this study is thus (Model 1):

\[
\text{Reform2013}_i = 1 \text{ if } U^*_i = \alpha \text{INTERNAL}_i + \beta \text{VERTICAL}_i + c + e_i > 0
\]
Reform2013$_i = 0$ otherwise

where $U^*_i$ is the inobservable latent dependent variable, $c$ is the intercept and $e_i \sim N(0,1)$ is a disturbance term. In addition to the standard White correction for heteroskedasticity, we correct for clustering using the Froot's correction (Froot, 1989). We therefore correct for the correlation of errors between municipalities within a specific department.

To account for the horizontal diffusion of the reform, we need to take into account the timing of municipal councils’ choice to (potentially) postpone the implementation of the reform. We have cross-sectional data on municipalities. Even if we know decision dates, our data set is not bi-dimensional (as the decision is taken once and for all). When municipality $i$ takes her decision at time $t$, she only knows decisions taken previously by neighbor municipalities (at time $t-x$). As a consequence, some of the municipalities did not have decided at the time municipality $i$ voted her decision. We take this absence of information on municipality $j$ preference and choice into account ($WDONTKNOW_{j,t}$) to know if it influenced municipality $i$’s choice (Model 2), or:

$$Reform2013_{i,t} = 1$$

if

$$U^*_i = \alpha INTERNAL_i + \beta VERTICAL_i + WReform_{j,t-x} + WDONTKNOW_{j,t} + c + e_i > 0$$

= 0 otherwise

Past decisions of neighboring municipalities exert an impact on present net utility of municipality $i$. Using time-lagged spatial effects instead of contemporary ones we can assume that neighbor's lagged choices are exogenous to municipality $i$’s current decision. As a consequence, this second model can also be estimated as a standard probit model.

We further need to make assumptions on the potential sources of diffusion across municipalities and to compute the relevant weight matrix.

First, we consider a case with uniform weights among municipalities, i.e. $w_{i,j}^{\text{UNIFORM}} = 1$ if municipality $i \neq j$ and 0 otherwise. This tests the hypothesis proposed by Manski (1993) of a common intellectual trend that steers countries’ choices in the same direction, without strategic consideration. In this case, there is no need to define any criterion for proximity.

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3 Reform$_{j,t-x} = Reform_{j,t} \times \text{Already decided}_{i,t}$ and DONTKNOW$_{j,t} = 1 - \text{Already decided}_{j,t}$

4 The model is thus close to the variant of the spatial probit model proposed by Qu and Lee (2012) and Soetevent and Kooreman (2007) where the latent dependent variable $Y^*$ depends on observed choices represented by $WY$ rather than unobserved ones.
Even if this hypothesis is not at the core of the paper, it is useful to describe and build this weight matrix, if only to contrast its explanatory power with other hypotheses tested below.

Second, we assume that a municipality is more likely to emulate its geographic neighbors than to emulate other municipalities and we consider a definition of neighborhood based on a geographical definition. Empirical studies testing both for yardstick competition or learning effects traditionally use weight matrices based on geographical distance. Here, we build a first weight matrix $W^{\text{Dist}}$ that includes as neighbors all municipalities which are less than 100 km distant and we give equal weights to all these neighbors whatever their distance to municipality $i$:

$$w_{ij}^{\text{Dist}} = 1 \text{ if } \text{Distance}_{ij} < 100\text{km}$$

$$w_{ij}^{\text{Dist}} = 0 \text{ otherwise}$$

The drawback of this definition is that some municipalities have more than 200 neighbors while others have just 10. We thus propose a second weight matrix in which we treat the 10 nearby jurisdictions of municipality $i$ as neighbors. These two weighting schemes can give a first clue to distinguish between yardstick competition and learning externality, although the assumption of yardstick competition should be confirmed by the estimation of the vote popularity equation.

Third, to account for the possibility that a municipality is more likely to emulate other municipalities controlled by the same political party or with the same ideological leanings (i.e., a political trend hypothesis), and in order to distinguish the influence of municipalities that belong to the same party from the effect of competing municipalities that do not belong to the same party, we use a decomposition of the uniform weight matrix. We now consider a linear combination of partial weights. Starting from the uniform weight matrix $W^{\text{UNIFORM}}$, we define four partial interaction matrices such that $W^{\text{UNIFORM}} = W^{LL} + W^{RR} + W^{LR} + W^{RL}$. All elements in the weighting matrices $W^{LL}$ and $W^{RR}$ are equal to zero if the $i$ and $j$ municipalities are from different political parties:

$$w_{ij}^{LL} = 1 \text{ if municipality } i \text{ and } j \text{ belong to party on the left and } w_{ij}^{LL} = 0 \text{ otherwise} ;$$

$$w_{ij}^{RR} = 1 \text{ if municipality } i \text{ and } j \text{ belong to party on the right and } w_{ij}^{RR} = 0 \text{ otherwise} ;$$

$$w_{ij}^{LR} \text{ if municipality } i \text{ belongs to a party on the left while municipality } j \text{ belong to a party on the right and } w_{ij}^{LR} = 0 \text{ otherwise} ;$$
$w_{i,j}^{RL} = 1$ if municipality $i$ belongs to a party on the right while municipality $j$ belongs to party on the left and $w_{i,j}^{LR} = 0$ otherwise.

As the influence of ideology is not likely to spread to every municipalities in the country, we alternatively use a decomposition of the distance matrix such that: $W^{DIST} = W^{LL,DIST} + W^{RR,DIST} + W^{LR,DIST} + W^{RL,DIST}$.

Fourth, we allow a municipality to be more likely to emulate neighbors defined in terms of the similarity of demographic characteristics. We consider four strata of municipal population: less than 20,000 inhabitants (S1), between 20,000 and 50,000 inhabitants (S2), between 50,000 and 100,000 inhabitants (S3), more than 50,000 inhabitants (S4). As previously done, we define five partial interaction matrices such that $W^{UNIFORM} = W^{S1S1} + W^{S2S2} + W^{S3S3} + W^{S4S4} + W^{top} + W^{bottom}$ where all elements in the weighting matrix $W^{S1S1}$, $W^{S2S2}$, $W^{S3S3}$ and $W^{S4S4}$ are equal to zero if the $i$ and $j$ municipalities are from different strata. Moreover, $w_{i,j}^{top} = 1$ if municipality $j$ belongs to a lower stratum than municipality $i$ and 0 otherwise: $w_{i,j}^{bottom} = 1$ if municipality $j$ belongs to a lower stratum than municipality $i$ and 0 otherwise.

### 3.2.2. Vote popularity estimation

Here, we study the incumbent’s share of votes in the first round of the 2014 municipal election ($INC2014_i$) by standard linear equation (Cassette et al., 2013). First, we just test whether the implementation of the reform in 2013 affects the incumbent’s result in municipal elections held in March 2014. A large set of political variables ($POL_i$) is introduced:

$$INC2014_i = \delta REFORM2013_i + \theta POL_i + \varepsilon_i$$

The expected share of votes for the incumbent in the first round clearly influences the probability of adopting an electorally risky reform in 2013. Endogeneity concerns in a dummy variable should be controlled for by estimating a treatment effect model based on Heckman control function. Endogeneity arises in this case because the treatment ($REFORM2013$) is correlated with the error term in the outcome (vote function) equation. The treatment effect

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5 For example, $w_{i,j}^{LL,DIST} = w_{i,j}^{LL} * w_{i,j}^{Dist} = 1$ if municipality $i$ and $j$ belong to a party on the left and are less than 100km distant and $w_{i,j}^{RR} = 0$ otherwise.
model simultaneously estimates equations for the likelihood of treatment (REFORM2013) and
the outcome of the treatment (share of votes received by the incumbent). This simultaneous
estimation allows the elimination of endogeneity, although with the trade-off of making the
assumption that the error terms are jointly normally distributed. Maximum likelihood
techniques were used to estimate the model.

Second, we consider if the decision of implementing the reform in 2013 taken by neighbors
has an impact on the incumbent’s result in municipality $i$:

$$INC_{2014_i} = \delta_{REFORM2013_i} + \rho_{WREFORM2013_j} + \theta_{POL_i} + \varepsilon_i$$

Contrary to the first estimated equation, the definition of neighborhood extends to all
neighbors (and not only the ones that had chosen before municipality $i$).

3.3. Data

Our sample includes all the municipalities with more than 3,500 inhabitants. This threshold is
related to the fact that two different voting rules exist, depending upon the size of the
municipality, with the two rounds list system applying above 3,500 inhabitants. 2608 French
municipalities (Corsica excluded) are subjected to this two-round electoral rule in 2008, i.e.,
7% of French municipalities, but 60% of the French metropolitan population. The threshold is
also induced by the absence of school in many of the smaller municipalities, meaning that
they often share the school with several other municipalities (often belonging to the same
inter-communal structure). In such a case, municipalities must cooperate to determine if they
wish to implement the school rhythm reform in 2013, which makes it more difficult to
identify the determinants of the choice. Applying the threshold induced by electoral legal
rules permits to avoid a selection bias in the estimations.

When horizontal diffusion is at stake, a subsample of 929 municipalities above 9,000
inhabitants is used. Generally, it is hard to identify the effect of neighbors’ decisions on
municipality $i$’s choice as effects in both directions intervene simultaneously. Here, we collect
the dates on which municipal councils vote the decision to apply the reform in 2013 or to
postpone it to 2014. The advantage is that we know the exact timing of municipal decisions
across the whole national territory. The drawback is that smallest municipalities, those that do
not have a website incorporating records of decisions of the Council or whose decisions are not fully reported by the local media, have to be omitted from the sample.

3.4. Factors contributing to the adoption of the reform

The dependent variable we consider is the probability of choosing to implement the reform in September 2013. $REFORM_{it}$ is defined as follows: it takes the value 1 if municipality $i$ has chosen to implement the reform in 2013 and 0 if a derogation has been requested to delay its implementation to 2014. Nearly 24% of the municipalities from the sample chose to implement the reform from the first year. Table 1 summarizes the data sources, the definitions of our variables and the expected signs of the related parameters.

--- Insert Table 1 about here ---

Following Cassette and Farvaque (2014), we include three sets of internal determinants. A first series of independent variables includes budget data, at the city level. As municipalities are endowed with competence over primary school, they must finance the after school activities generated by the reform. Municipalities and their representative bodies provide various estimates of the per-pupil cost of the reform, which suggests that budgetary concerns are an important determinant of the willingness to implement the reform. The government has created a specific subsidy (“fonds d’amorçage”) and has budgeted 250 millions euros to cover the transition costs for the fast-adopters. Viewed as an incentive to adopt the reform in 2013, this subsidy induces experimentation and reward municipalities for the risks they take in adopting the reform in 2013. Even though it has created the "fonds d'amorçage" to incentivize municipalities to adopt the reform fast, the central government is globally reducing the amount of general grants to local governments. Hence, municipalities may have to raise local taxes to finance the reform, and they may be reluctant to increase these taxes, especially right before the next election. By the same reasoning, the level of municipal debt should also affect mayors’ choices. We thus assume that local choices by mayors are constrained by the structure of their municipal budget.

The “Local taxes” and “Debt” variables are expressed in thousands of euros per capita in the basic set of estimates. 2012 data are used as the choice to implement the reform has been taken between January and March 2013.
A second set of data is related to the mayor. Two subgroups of variables are available to depict her characteristics: personal characteristics and political ones. Even if the municipal council is the decision-making body, power is centralized in the hands of the mayor who has authority over the municipality's civil servants and takes all decisions relative to the implementation of its budget. As a consequence, personal characteristics of the mayor could affect the probability of an early implementation of the reform.

Detailed information on personal characteristics of mayors is provided through the national directory of elected officials (French interior ministry). Age (AGE) is included as to reflect potential nostalgia for school weeks that run on four and a half days as it was the norm up to 2008. The proportion of women mayors is still extremely low. A dummy variable accounts for the fact that the mayor is a woman (WOMAN). Four dummy variables are built to describe the socio-professional categories of the mayors: TEACHER, CIVIL SERVANT, PUBLIC ENTERPRISES and PHYSICIAN. These specific socio-professional categories are used as proxies of the sense of public service and of the capacity to focus on the children's best interests. The dummy TEACHER equals 1 if the mayor is a teacher (from preschool teachers to higher-education teaching personnel). On the one hand, with a significant knowledge of how schoolchildren and students learn best, they should be the best motivated to an early implementation of the reform. On the other hand, they could be unfavorable to a reform that increases the weekly working hours of their fellows without pay compensation. Civil servants (other than teachers) and workers in public enterprises should bear in mind –to some extent—the public service values and the will to ensure quality education to children. Physicians should be responsive to the impact of the school time schedule on children’s health. They are in a position to promote a reform directed towards the interests of children, not their parents'.

The second subgroup of variables accounts for the links between the local and national political contexts. The dummy variable COALGOV equals 1 if the mayor is from the governmental coalition, and 0 otherwise. Mayors from the governmental coalition should be more prone to support the reform and to undertake it without delay. Mayors from other leftist parties (OTHER LEFT) should also favor the reform. A positive sign is thus expected for these variables. To account for the “cumul des mandats” that characterizes France's political personnel, we include two dummy variables that are equal to one if the mayor is a deputy (DEPUTY), or a senator (SENATOR), and 0 otherwise. We also take into account the score locally obtained by the elected (socialist) President at the preceding (2012) election, as this may reflect a partisan bias (left-leaning) in the municipality.
Finally, a weak electoral support should restrict the available policy space the mayor needs to implement an highly controversial reform, while strong past electoral results should provide more leeway for local public choices. Electoral support can be expressed either by a dummy variable equal to 1 if the mayor was elected in the first round in the last election (*I*^ST* ROUND), or by the absolute margin between the mayor and her main challenger at the final round (*MARGIN*). The number of consecutive mandates won by the mayor also deals with the past electoral support. We build three dummy variables to account for the number of terms of office and the ability of the mayor to be reelected: “2nd term”, “3rd term” and “more than 3 terms”. The expected sign for all these variables is positive: implementing a controversial reform should not prevent the reelection of the mayor, which could increase the probability of starting the new school schedule in 2013.

The third set of variables relates to the local school context itself. First, it has to be acknowledged that practical and budgetary difficulties may arise when applying the reform to larger numbers of school-age children and public schools. The larger the proportion of school-age children in the municipal population (*Share of school-age children*) is, the larger the global cost of extracurricular activities to be financed by the municipality. 80% of municipalities have 10 public schools at most. We thus introduce a dummy variable “Less than 10 schools” (equal to 1 if there are less than 10 public schools in the municipality). The large number of schools can create problems to hire and manage group leaders able to organize games, cultural and sporting activities during extracurricular activities. Also, school directors and parents could have conflicting preferences on the new organization of the school week between educational institutions, which may complicate the municipal choice and delay the implementation of the reform.

According to various reports and studies (see, e.g., Hugonnier, 2010, Suchaut, 2009, Davila and Delvolvé, 1994), if the low performance of French pupils can result from too long school days, the worst performances are experienced by children in deprived urban areas. Schools in those areas belong to a Priority Education Network whose objective is to attenuate the impact of socio-economic inequalities on school performance. We introduce a dummy variable that takes the value 1 if some schools in the municipality belong to a priority education network, and 0 otherwise. Children in these municipalities would greatly benefit from a reform whose aims are to improve learning and to foster educational success and we can expect mayors to be more inclined to quickly implement the reform. Besides, poorer municipalities receive additional grants from the State to implement the reform (atop from the "fonds d'amorçage", a lump-sum grant which amounts to 50€ per pupil and an additional grant of 40€ per pupil if the
municipality is located in a poor surrounding). This additional grant is designed to encourage mayors of poor municipalities to implement the reform quickly. The additional State aid is dedicated to the poorest municipalities, the ones that receive the targeted urban solidarity grant ("DSU-cible") or the targeted rural solidarity grant ("DSR-cible")⁴. To analyze if the additional State aid has an incentive effect on the probability to implement the reform in 2013, we introduce two dummy variables: the first one (“aid to poor urban municipalities”) is equal to 1 if the municipality receives the targeted urban solidarity grant and 0 otherwise, the second one (“aid to poor rural municipalities”) is equal to 1 if the municipality receives the targeted rural solidarity grant.

Besides horizontal diffusion of the decisions made by neighbors, we take account of vertical links between layers of government that come from their respective competencies relative to pre-schools and primary schools. As explained above, departments and city unions can be endowed with competencies over extracurricular activities and school transportation. Thus, not only do we take into account this sharing in responsibilities (through two variables that capture, respectively, if competences on extracurricular activities and school transport, have been devolved to the city union - Extraact_cityunion and Transport_cityunion), but also consider if the upper-level government is from the Left (GENERAL COUNCIL_LEFT).

### 3.5. Factors of the vote popularity

The adoption of the reform will not influence the incumbent’s probability of reelection but may affect her vote share in both rounds. We choose to focus on the effect of the reform in the first round incumbent vote share (as the election ends at the first round in many cities). Two sets of explanatory variables are gathered.

**Impact of the school rhythm reform**

To evaluate how voters valuate mayors that experiment risky and costly reforms, we introduce two dummy variables. Besides the REFORM2013 variable we presented above, we introduce a dummy variable BOYCOTT2014 which takes the value 1 if the municipality has decided to break the law and refused to implement the reform in 2014. If there is a latecomer advantage (an innovator premium, reciprocally), BOYCOTT2014 should have a positive (negative) effect on incumbent’s vote share while REFORM2013 should have a negative (positive) one.
Voters may also consider the modalities for the local implementation of the reform. They may punish the incumbent, even if the reform has not been already implemented in the municipality, if they do not agree on the additional day (Wednesday or Saturday) or on the daily scheme of extracurricular activities. While most chronobiologists state that it is better for children to work on Saturday morning (Delvolvé et Jeunier, 1999; INSERM, 2001; Touitou et Bégué, 2010; Leconte, 2012), parents and tourism industry do not share this point of view. A dummy variable \textit{SATURDAY} is thus introduced that takes the value 1 if the municipality has chosen to make the additional half-day a Saturday morning and 0 otherwise. There is no consensus on the best way to organize shorter class-days. Some municipalities allow more time for lunch, others choose to organize extracurricular activities on the four full school-days or alternatively shorten slightly two teaching days. Irregular school schedule may be feared by parents whereas longer lunch breaks could not be convenient for them. As a consequence, we introduce a dummy variable \textit{LUNCH} equal to 1 if extracurricular activities take place during lunch time and a dummy variable \textit{IRREG} equal to 1 if the new school schedule differs from day to day.

Political variables
As in Cassette et al. (2013) we include a large set of political variables, which fall into three subgroups. First, as in the set of variables used to explain the adoption of the reform, we consider variables related to the incumbent mayor’s past electoral results. We include the incumbent party’s share of the vote in the last municipal election as an expression of long-term strength or voter inertia. Another method for examining past electoral results is to introduce a dummy equal to 1 if the mayor was elected in the first round in the last election and 0 otherwise. Finally, we take into account the number of consecutive mandates won by the incumbent mayor. These variables might be a proxy for experience (positive) but could also be a measure of voter fatigue (negative). During her first term, the current mayor could profit from a “honeymoon”-effect, favoring easier reelection than in the case of a candidate from the same party who lacks experience. During subsequent terms, voter fatigue, erosion of power and more familiarity with the mayor’s preferences may be harmful to reelection prospects.

\footnote{Municipalities implementing the reform in 2014 should have given their modalities to Departmental services of the Ministry of National Education no latter than December 2013.}
The second subgroup of political variables addresses the intensity of electoral competition. As French political arena is multi-partisan, we include the number of competing candidates from the same or the opposite political wing.

The third subgroup of political variables accounts for the links between the local and national political contexts. We include a dummy equal to 1 if the incumbent mayor and the majority in Parliament are from the same political party and 0 if not. This variable controls for the potential influence of the national government’s popularity on local elections. French voters commonly consider municipal elections as mid-terms and use them to penalize government and the parliamentary majority for poor performance. We use a variable to control for the vote share received by presidential candidate from the incumbent mayor’s party in the second round of the last presidential election. Dummies for the incumbent’s national standing are included and are equal to 1 if she is a deputy or a senator, and 0 otherwise.

4. Results

Table 2 details, in the first two columns, our baseline regression results without spatial interactions. Column 1 reports results for all municipalities above the 3,500 inhabitants electoral threshold whereas column 2 deals with the subsample of municipalities above 9,000 inhabitants (subsample on which estimations including spatial interactions can be performed).

Results about internal determinants are similar to those obtained by Cassette and Farvaque (2014). The reform has been more easily embraced in smaller municipalities, the ones that host less than 10 schools. The proportion of school age children significantly, strongly and negatively influences the probability of adoption in 2013. Interestingly, belonging to the Priority Education Network has not influenced the adoption.

The level of taxes has been a clear impediment to the quick adoption of the reform, probably for fear of the increase in spending related to the extra-curricular activities. Interestingly, though, the level of debt has a positive impact on the dependent variable. A first interpretation is that mayors in relatively highly indebted municipalities embrace the reform because they

--- Insert Table 2 about here ---

7 NOTE : les ministres ne peuvent pas être maires en même temps, règle de non cumul des mandats
8 It has to be remembered that municipalities live under a "golden rule", i.e., a balanced-budget rule except for investment spending. As such, financing extra-curricular activities falls on the operating expenditures budget item line. On this issue and its influence on municipal elections, see Cassette et al. (2013).
are searching for new sources of funds, even if temporary ones, and thus respond to get the extra transfers from the government. A second interpretation is that they accept the extra costs, and will blame the government for the financial situation of the municipality\(^9\).

Few variables related to the mayor's appear to be significant, except for the age and a profession in the civil service. The latter can be understood as either a revelator of a form of loyalty towards the state legislation, or a bias towards values related to the Left (in relation to this result, it is worth noting that teachers and physicians have a positive leaning - although not statistically significant - towards the reform). The impact of age can be related to a nostalgia effect of the rhythm schools had before 2008.

However, the most important coefficients are the ones attached to the alignment of the mayor with regard to the governmental coalition. And the variables related to the local political context are not significant, highlighting the strong impact of the national situation. When President Hollande’s score at the 2012 presidential election in the municipality is high, the probability of adoption in 2013 increases. It means that left-leaning voters are taken into account by mayors who do not belong to the governmental coalition.

All in all, then, these first results reveal a strong impact of political, practical, and financial characteristics of the municipality.

As regards vertical links, we show that city union competencies have an impact on the early implementation of the reform but only in the subsample of municipalities above 9,000 inhabitants. When the city union has competency over extracurricular activities, it increases the probability of an early implementation in the municipality (which should not have to bear the cost of these activities). However, when the city union is in charge of school transportation, it significantly reduces the probability of early implementation as municipalities should then cooperate on the modalities of the reform. As for the links with the department level, political side of the department has no impact on the municipal choices.

These results are qualitatively identical and quantitatively very similar in all the subsequent estimations (table 2, columns 3 to 9 ; table 3, columns 1 to 3). We will thus focus on the horizontal diffusion of the reform. Let us first consider the results of the estimation with uniform weights given to all municipalities that took their decision before municipality I

\(^9\) In both cases, mayors rely on the voters' myopia, a feature supported by the large existing evidence on retrospective voting (see, e.g., Dubois, 2007).
The hypothesis of a common intellectual trend hypothesis that drives all municipalities in similar directions can be rejected because including a uniform influence of municipalities having already decided does not give significant results. Second, whatever the geographical definition of neighbourhood (100km or 10 nearest neighbours), we show that there is high mimetism related to geographic proximity. Municipality i implements the reform if, at the time of its decision, a high proportion of its geographic neighbours have already chosen to implement it. This spatial interdependence could be attributed to yardstick competition. This result needs to be further confirmed by estimation of the vote function. If a high proportion of its geographic neighbours has not already decided, municipality i is more inclined to accept the implementation in 2013 rather than to postpone it. Third, we provide a decomposition of the geographical weighting schemes by political sides. We observe that there is no conformity behaviour of right-wing mayors to decisions taken by other right-wing neighbours. Among left-wing mayors, we show that left-wing mayors conform her choice to the nearest left-wing neighbours’ decisions (table 2, column 7) but the political influence disappears when we consider a broader definition of neighbourhood (table 2, column 6). Quite interestingly, right-wing mayors are more likely to emulate left-wing geographic neighbours than to emulate right-wing ones (table 2, columns 6 and 7). Fourth we observe that a municipality is not more likely to emulate geographical neighbors sharing similarity of demographic characteristics (table 3, column 1). A positive and hardly significant coefficient is obtained for geographic neighbours inside the stratum of municipalities with less than 20,000 inhabitants while the coefficient is negative for geographic neighbours inside higher strata (municipalities between 20,000 and 50,000 inhabitants, between 50,000 and 100,000 inhabitants and more than 100,000 inhabitants). Negative interdependence suggests that big municipalities exhibit learning spillovers: they choose to learn from the neighbors’ mistakes and postpone the adoption of the reform to benefit from experimentations undertaken by neighbours belonging to the same stratum of population.

--- Insert Table 3 about here ---
Table 1: Summary statistics and expected effects

<table>
<thead>
<tr>
<th>Variables</th>
<th>Sources</th>
<th>Obs.</th>
<th>Summary statistics</th>
<th>Expected signs</th>
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<th>INCVOTE 2014</th>
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<td>Mean</td>
<td>Std Dev</td>
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<td>Max</td>
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<td><a href="http://www.clrdrs.fr/">http://www.clrdrs.fr/</a></td>
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<td>0,311</td>
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<td>Municipal Debt (thousands of euros per capita)</td>
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<td>0,311</td>
<td>0,311</td>
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<td>Ministry of Internal Affairs</td>
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<td>0,311</td>
<td>0,311</td>
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<td>TEACHER</td>
<td>1 if the mayor is a teacher, 0 otherwise</td>
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<td>0,364</td>
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<td>0,364</td>
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<td>CIVIL SERVANT</td>
<td>1 if the mayor is a civil servant, 0 otherwise</td>
<td>2608</td>
<td>0,149 0,172</td>
<td>0,356</td>
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<td>0,356</td>
<td>0,377</td>
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<tr>
<td>PUBLIC ENTERPRISES</td>
<td>1 if the mayor works in a public enterprise, 0 otherwise</td>
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<td>0,216</td>
<td>0,210</td>
<td>0</td>
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<td>Ministry of Internal Affairs</td>
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<td>0,049 0,046</td>
<td>0,216</td>
<td>0,210</td>
<td>0</td>
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<td>PHYSICIANS</td>
<td>1 if the mayor is a physician, 0 otherwise</td>
<td>2608</td>
<td>0,038 0,044</td>
<td>0,193</td>
<td>0,205</td>
<td>0</td>
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<td>Ministry of Internal Affairs</td>
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<td>0,038 0,044</td>
<td>0,193</td>
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</tr>
<tr>
<td>COALGOV</td>
<td>1 if the mayor and the majority in Parliament belong to the same political party, 0 otherwise</td>
<td>2608</td>
<td>0,329 0,386</td>
<td>0,047</td>
<td>0,487</td>
<td>0</td>
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<td>Ministry of Internal Affairs</td>
<td>929</td>
<td>0,329 0,386</td>
<td>0,047</td>
<td>0,487</td>
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<tr>
<td>OTHER_LEFT</td>
<td>1 if the mayor is from other leftist</td>
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<td>0,18 0,384</td>
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<td>0.151</td>
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<tr>
<td>Deputy</td>
<td>1 if the mayor is a deputy, 0 otherwise</td>
<td>2608</td>
<td>929</td>
<td>0.063</td>
<td>0.243</td>
<td>0</td>
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<td>Senator</td>
<td>1 if the mayor is a senator, 0 otherwise</td>
<td>2608</td>
<td>929</td>
<td>0.028</td>
<td>0.164</td>
<td>0</td>
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<td>PRESID_LEFT</td>
<td>Incumbent party share of votes at the presidential election</td>
<td>2608</td>
<td>929</td>
<td></td>
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<td>Mayors’ past electoral results</td>
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<tr>
<td>1ST ROUND</td>
<td>1 if the mayor was elected in the first round of the preceding election, 0 otherwise</td>
<td>2608</td>
<td>929</td>
<td>0.673</td>
<td>0.469</td>
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<td>INCprev</td>
<td>incumbent party’s share of the vote in the last municipal election</td>
<td>2608</td>
<td>929</td>
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<td>+</td>
</tr>
<tr>
<td>Margin</td>
<td>1 if the mayor was elected in the first round of the preceding election, 0 otherwise</td>
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<td>929</td>
<td>0.713</td>
<td>0.598</td>
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<td>2nd term</td>
<td>1 if the mayor spends her 2nd term in office, 0 otherwise</td>
<td>2608</td>
<td>929</td>
<td>0.378</td>
<td>0.485</td>
<td>0</td>
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<tr>
<td>3rd term</td>
<td>1 if the mayor spends her 3rd term in office, 0 otherwise</td>
<td>2608</td>
<td>929</td>
<td>0.156</td>
<td>0.363</td>
<td>0</td>
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<td>More than 3 terms</td>
<td>1 if the mayor already spent more than 3 terms in office, 0 otherwise</td>
<td>2608</td>
<td>929</td>
<td>0.147</td>
<td>0.354</td>
<td>0</td>
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<td>local school context</td>
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<td>POP2-14</td>
<td>Share of school-age children</td>
<td>2608</td>
<td>929</td>
<td>0.16</td>
<td>0.025</td>
<td>0.076</td>
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<td>Less than 10 schools</td>
<td>1 if there are less than 10 schools in the municipality</td>
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<td>929</td>
<td>0.814</td>
<td>0.388</td>
<td>0</td>
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<td>Priority Education Network</td>
<td>1 if some schools in the municipality belong to a priority education network, 0 otherwise</td>
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<td>929</td>
<td>0.206</td>
<td>0.405</td>
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<td>Aid to poor urban municipalities</td>
<td>1 if municipality received the targeted urban solidarity grant, 0 otherwise</td>
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<td>929</td>
<td>0.111</td>
<td>0.314</td>
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<td>Aid to poor rural</td>
<td>1 if municipality received the targeted rural solidarity grant, 0 otherwise</td>
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<td>929</td>
<td>0.156</td>
<td>0.363</td>
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<td><strong>Vertical links</strong></td>
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<tr>
<td>General Council Left</td>
<td>1 if General Council belongs to Left Ministry of Internal Affairs</td>
<td>2608 929</td>
<td>0,631 0,619</td>
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<td>Extraact _cityunion</td>
<td>1 if competences on extracurricular activities have been devolved to the city union</td>
<td>2608 929</td>
<td>0,211 0,178</td>
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<tr>
<td>Transport _cityunion</td>
<td>1 if competences on school transportation have been devolved to the city union</td>
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<td><strong>Intensity of electoral competition in 2014</strong></td>
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<td>NB1_same</td>
<td>Number of candidates at the first round, same wing</td>
<td>2608 929</td>
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<tr>
<td>NB1_opp</td>
<td>Number of candidates at the first round, opposite wing</td>
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* denotes significance at 10%; ** at 5%; *** at 1%. Marginal effects computed at means. Robust standard errors in parentheses. Froot (1989) correction for departmental-level cluster correlation.
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<td>(0.027)</td>
<td>(0.025)</td>
<td>(0.027)</td>
</tr>
<tr>
<td>2nd term</td>
<td>0.0146</td>
<td>0.0070</td>
<td>0.0085</td>
</tr>
<tr>
<td></td>
<td>(0.036)</td>
<td>(0.033)</td>
<td>(0.036)</td>
</tr>
<tr>
<td>3rd term</td>
<td>0.0584</td>
<td>0.0604</td>
<td>0.0559</td>
</tr>
<tr>
<td></td>
<td>(0.050)</td>
<td>(0.050)</td>
<td>(0.048)</td>
</tr>
<tr>
<td>more than 3rd term</td>
<td>0.0345</td>
<td>0.0228</td>
<td>0.0311</td>
</tr>
<tr>
<td></td>
<td>(0.055)</td>
<td>(0.053)</td>
<td>(0.055)</td>
</tr>
</tbody>
</table>

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* denotes significance at 10%; ** at 5%; *** at 1%. Marginal effects computed at means. Robust standard errors in parentheses. Froot (1989) correction for departmental-level cluster correlation.
References


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