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Integration and voter participation: Evidence from local governments in France

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Keywords:
Decentralization, integration, electoral participation, fiscal revenues, cooperation, quasi-natural experiment

JEL codes:
H2, H3, H7

Working Paper

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Edoardo di Porto [*] Angela Parenti [†] Sonia Paty [‡]

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1 Introduction

Many European countries have been attempting to reduce the excessive number of sub-national jurisdictions, as this can be the source of well-documented economic inefficiency. A common response is to implement institutional arrangements such as cooperation or mergers between municipalities for the joint delivery of local public services (Di Porto et al., 2016). Political economy literature has extensively studied this trend; for example, the optimal size of a coalition and its drawbacks (see, e.g., Alesina and Spolaore, 1997; Bolton and Roland, 1997). Yet while economic efficiency usually increases with size, a smaller scale is expected to promote democracy. Joint agreements between local governments may improve overall efficiency both by achieving economies of scale and internalizing cross-municipal externalities. However, when integrated municipalities lose autonomy over local policies, this might reduce their ability to respond to citizens' needs. As a consequence, when less is at stake in such municipalities, turnout is expected to be lower. (Downs, 1957; Tullock, 1967; Riker and Ordeshook, 1968). Estimating this loss in participation is an important issue as voter turnout has been in continual decline across the globe in recent decades in a context in which democracy is facing challenges.

The empirical local public finance literature to date focused mainly on the impact of mergers or cooperation on economic outcomes (e.g., Reingewertz, 2012; Luca and Modrego, 2021; Tricaud, 2023). With few exceptions, the political consequences of arrangements between municipalities have been little examined. Lapointe et al. (2018) found that the merger of small municipalities in Finland decreased voter turnout by 4 percentage points over the long term. Similarly, Allers et al. (2021), using data on Dutch elections in the 1986–2018, showed that municipal amalgamation reduced turnout in local elections by 2.2 percentage points.

In contrast to the amalgamation/mergers, in the case of cooperation, municipal and intermunicipal layers co-exist in the cooperation case, with the municipal jurisdiction transferring certain responsibilities and the associated fiscal revenues to the intermunicipal community. Municipalities do not disappear, nor do their local governments and administrative offices. Many countries around the world have thus preferred intermunicipal cooperation to find economies of scale for specific public services (Hulst et al., 2009; Bergvall et al., 2016).[1] In intermunicipal cooperation, while municipalities lose some fiscal flexibility and have fewer opportunities to influence outcomes for citizens, they nonetheless continue to exist, retaining authority in certain areas and a role in the provision of public services. In these systems, it is possible to invite citizens to vote for each layer of government in order to counteract the expected decline in voter turnout due to the loss of fiscal authority. However, the effect of intermunicipal cooperation on

1. For example, Austria and Sweden in the 1950s, Germany and Belgium in the 1970s and more recently, Switzerland, Greece, and Denmark have been encouraging their subnational jurisdictions to cooperate. Many other countries - notably Spain, Italy, France, Ireland, the Netherlands, and Portugal - allow neighbouring municipalities to set up intermunicipal agreements voluntarily.

participation is an empirical question that has been little tested. In this paper, we investigate the causal impact of the integration of local governments on electoral participation in municipal elections using the French case.

France has provided a rich laboratory for analyzing multilevel governance since 2000, when different forms of integration between municipalities were encouraged by the national government through different levels of state grants. In the most integrated communities, municipalities transfer a large set of responsibilities and fiscal revenues to the intermunicipal body. Although they remain multipurpose authorities, they lose autonomy in economic development and land planning. In cases in which functional cooperation between municipalities is implemented, a municipality may end up in two possible situations: (i) a high level of integration in which it loses most of its responsibilities and the associated fiscal revenues, or (ii) a low level of integration in which most responsibilities and fiscal revenues remain in the hands of the municipal government.

Identifying the causal effect of intermunicipal cooperation on participation is challenging, since the decision to become highly integrated is not exogenous to fiscal or political outcomes. To address this issue, we use a regression discontinuity design to explore the discontinuity created by one of the integration requirements: i.e. if the joint population of the municipalities exceeds 50,000 inhabitants, they can choose a highly integrated form of cooperation (communauté d'agglomération or AC).

We find that voter turnout significantly decreases in cases in which municipalities highly cooperate in this type of structure. In parallel, using a set of event studies, we find that newly highly integrated municipalities face a sharp decrease in their fiscal revenues for about two years after the arrangement. To compensate for the loss in both state grants per capita and local business tax revenues, they increase property tax rates.

These findings indicate that participation in municipal elections decreases in the integrated case in which municipalities lose responsibilities and fiscal revenues because less is at stake. Citizens seem to feel less involved when an election is less dependent on how strongly local officials can influence policies that voters care about.

We then use a similar empirical approach to see if we can identify a possible counteracting effect resulting from the fact that in intermunicipal cooperation it is possible to allow citizens to vote for the new layer of government. To this end, we compare data collected before and after a French law enacted in 2014 implementing direct suffrage for intermunicipal councilors, but do not find a significant positive impact on voter turnout. While citizens had the opportunity to vote directly for both levels of local governments, their participation did not increase. This suggests that citizens do not seem to believe that intermunicipal cooperation can improve their well-being within their municipality, perhaps due to the distance between them and the officials.

In section 2, we present the context and the contribution this paper makes to the literature. Section 3 presents the institutional setting, and sections 4 and 5 present the data and our empirical strategy. The results are discussed in section 6, and section 7 concludes the paper.

2 Related literature and contribution

This study adds to the existing literature on the determinants of electoral participation at the local level. While the literature has focused mainly on the determinants of voter turnout at the aggregate level, less attention has been paid to subnational elections (Henderson and McEwen, 2010; Blais et al., 2011; Cancela and Geys, 2016). As argued by Andersen et al. (2014), most theories of voter behavior predict that electoral participation will be higher in elections where more is at stake, such as national elections. However, one cannot simply assume a strict equivalence of turnout determinants irrespective of the type of election; recent empirical literature shows significant variation in voter turnout for three elections at different levels of government within the same country. In one meta-analysis, Cancela and Geys (2016) found that campaign expenditures, election closeness and registration requirements have more explanatory power in national elections, whereas population size and composition, concurrent elections, and the electoral system play a more important role in explaining turnout in subnational elections.

This study also contributes to the existing literature on the political consequences of fiscal decentralization. Blais et al. (2011) investigated the hypotheses that decentralization increases turnout in subnational elections, lowers participation in national elections, and reduces the gap between regional and national arenas. In Canada and Spain, they found that decentralization has contributed to reducing the turnout gap between regional and national elections. In Norway, using exogenous variation in local governments' financial flexibility due to the existence of hydropower plants, Andersen et al. (2014) showed that higher tax revenues at the local level increased participation in local relative to regional elections. In Germany, Michelsen et al. (2014) found that voter turnout was lowest in fully centralized municipalities and highest in federal municipalities compared to a reference group of confederal municipalities.

Finally, our study contributes to the existing literature on the consequences of cooperation between municipalities, including economic efficiency (see e.g. Luca and Modrego, 2021), tax rates, and/or spending (see e.g. Charlot et al., 2015; Tricaud, 2023).

To our knowledge, this is the first empirical analysis to identify the causal impact of municipal integration on electoral participation within a decentralized country. Our results add to the existing debate on the optimal size of local jurisdictions. While the literature has often highlighted the potential benefits of integration programs in terms of economic efficiency, the political consequences of such arrangements are usually overlooked. Our results provide evidence that the economic and political consequences of

integration may interact through the loss of autonomy.

3 Institutional setting

3.1 Fiscal decentralization in France

In France, there are four layers of government: the central government, regional governments (13 regions), departments (100 départements) and municipalities (more than 35,000 municipalities). The municipalities are multipurpose authorities responsible for the provision of public services such as primary schools, child care, road maintenance, etc. The other layers have more limited tasks. The departments are in charge of social assistance and lower secondary education. The regional level is mainly in charge of economic development, upper secondary education and regional transportation.

In 1999, a major law was passed on voluntary intermunicipal cooperation. Between the department level and the municipality level, the creation of a new level of local government was encouraged through grants from the state: intermunicipal communities (IMCs) (Etablissements Publics de Coopération Intercommunale). These intermunicipal communities are mainly in charge of economic development through urban planning and promotion of local businesses. [2]

Depending on population size, there are four possible jurisdictional forms of cities in France: metropolis (M) (métropole), requiring a minimum of 400,000 inhabitants; urban community (UC) (communauté urbaine), requiring a minimum of 250,000 inhabitants; agglomeration community (AC) (communauté d'agglomération), requiring a minimum of 50,000 inhabitants; and municipal community (MC) (communauté de communes), with no population threshold. [3] To deliver joint local public services, each community receives state grants and tax revenues through a single business tax rate (SBT) or an additional tax rate (ADD) on businesses and households (same tax base as each locality).

Table 1 shows the characteristics of each category of IMC in terms of population threshold, compulsory missions and tax regime.

Table 1 – Forms of integration and their characteristics

Integration form	**Pop. threshold**	**Compulsory missions**	**Tax regime**
CC	$> 15,000$ inhab.	Econ. dev., urban planning	ADD or SBT
AC	$> 50,000$ inhab.	same as CC + housing	SBT
UC	$> 450,000$ inhab.	same as AC + environment	SBT
Metropole	$> 400,000$ inhab.	same as UC + county/regional missions	SBT

2. See Di Porto et al. (2016) on the determinants of cooperation in France

3. The share of the French population covered by these structures increased from 28% in 1993 to almost 100% in 2014 (when cooperation became compulsory). In 2018, there were 22 M, 11 CU, 221 AC, and 1,005 CC. Currently, more than half of the French population belongs to one of the most integrated community forms (M, CU, AC) which are located in urban areas.

This study focused on a form of high integration that is very common in urban areas in France today: the agglomeration community (AC), which can be created if the population exceeds 50,000 inhabitants. [4] Although it is not mandatory, once a community reaches the population threshold, it has strong financial and economic incentives to switch from an MC to an AC (all ACs were MCs before adopting this more integrated form of cooperation). The primary reason is that they receive a higher state grant: 20.02 EUR per capita for an MC versus 45.50 EUR for an AC. Moreover, by law, an AC receives the complete tax revenues from a specific tax regime on businesses: the single business tax (SBT). In this case, municipalities lose control over local business tax rates, which is the main source of local tax revenues, while still setting the rate for the three remaining taxes (residential, property and land). The SBT case is therefore the most integrated form of tax cooperation. The share of the French population covered by these structures increased from 28% in 1993 to almost 100% in 2014 (when cooperation became compulsory). In 2018, there were 22 Ms, 11 UCs, 221 ACs, and 1,005 MCs. Currently, more than half of the French population belongs to one of the most integrated community forms (Ms, UCs, ACs), which are located in urban areas.

Along with the financial incentive of forming an AC, the body also gets a larger range of missions. Every transferred responsibility is managed and funded collectively by the community. The delegated responsibilities are services for which cooperation allows economies of scale to be achieved: e.g. waste management, public transportation, cultural and sports facilities. They also have more possibility to cooperate with higher levels of government, such as regions, to promote economic development.

3.2 Elections at the municipal and intermunicipal levels

Municipal elections in France allow citizens to elect the mayor, who chairs the city council, as well as city councilors. The term of office is, in principle, six years. The last municipal election years were 2001, 2008, 2014 and 2020. The voting takes place by municipality, except for Paris, Lyon and Marseille for which voting is by sector (arrondissement).

The election process depends on the size of the municipality. For municipalities with less than 1,000 inhabitants, the election of municipal councilors takes place by majority plurinominal voting in two rounds with panachage. In the first round, candidates are elected if they receive an absolute majority of votes cast and the vote of a quorum of at least a quarter of registered voters. In the second round, a simple majority is enough to win. Municipalities with more than 1,000 inhabitants implement proportional representation

4. There are a few specific cases in which municipalities can create an AC if one of the two following conditions are fulfilled:
— the group of municipalities has at least 30,000 inhabitants and comprises the most populated municipality of the department;
— the group of municipalities is coastal and has at least 25,000 inhabitants and comprises a municipality of at least 15,000 inhabitants.

with a majority bonus. The election of councilors follows a list system in two rounds with proportional representation: candidates are presented in complete lists. [5]

Before a specific law on intermunicipal elections was enacted in 2014, intermunicipal councilors were indirectly elected by each of the municipal councils concerned. Since 2014, intermunicipal councilors have been elected by direct universal suffrage via a system of "signposting" in municipal elections. Voters designate on the same day on the same ballot the elected representatives of their municipality and of the intermunicipal community. The IMC councilors representing the municipalities in the deliberative bodies of the IMC are the members of the municipal council appointed in the order of the ballot. Thus, the list of candidates for the seats of IMC councilor appears separately on the same ballot as the list of candidates for the municipal council. Candidates for intermunicipal councilor must appear in the order in which they appear on the list of candidates for municipal council.

4 Data

The data on municipal and IMC characteristics came from the French National Institute of Statistics and Economic Studies (INSEE) and the Ministry of Interior. The data on taxation and grants at both municipal and IMC levels come from the Directorate-General of Public Finance (DGFIP), which provided information on several variables related to municipality budget decisions. To take into account the different levels of integration of each municipality within a community that reduces the power of the municipal level, we use yearly information on intermunicipal cooperation provided by the Ministry of Interior.

Our main dataset include 265,183 municipalities over the period 2002–2018. [6] We choose to focus only on the municipalities allowed to create an AC (if the IMC has at least 50,000 inhabitants).

In our strategy (see section 5 for details), we keep municipalities that maintain their AC status once they acquired it. The municipalities included in our sample had, on average, about 1,610 inhabitants (Table 2), while the average number of inhabitants of an IMC is about 31,000. Over the entire period, we observe that almost 14% of municipalities belong to an IMC with a total population above the threshold of 50,000 inhabitants, and about 12% of the municipalities belong to an AC.

Over the years, the number of municipalities belonging to an IMC with a population above 50,000 increased, as well as those belonging to an AC (Table A1 in Appendix).

The data on municipal voter turnout was obtained from the Ministry of Interior and provided information for three election years: 2001, 2008 and 2014. As Paris, Lyon and Marseille have voting that takes place in arrondissements in the same way as in municipalities with more than 1,000 inhabitants,

5. Let us mention that before a 2013 electoral reform, the proportional list was used only in municipalities with more than 3,500 inhabitants.

6. For 2001 we do not have complete data both for taxation and grants.

TABLE 2 – Descriptive statistics of the sample of municipalities.

	Mean	SD	Min	Max
Percentage of municipalities in IMC above 50,000 inhabitants	0.14	0.34	0	1
Percentage of municipalities within AC	0.12	0.33	0	1
Municipal population	1,610	6,677	1	272,084
IMC population	30,999	57,219	198	441,888

we remove these three cities from our sample. We also choose to remove the municipal election of 2020 due to the very specific context of the COVID-19 crisis, as electoral participation was dramatically low. Voter turnout data was only accessible for municipalities with over 3,500 inhabitants in 2001 and 2008, whereas in 2014 it was available for municipalities with at least 1,000 inhabitants. To facilitate comparison between election years, we focused on a subsample of municipalities with over 3,500 inhabitants. This subsample was also convenient to remove the potential confounding effect of the change. For 2001 we did not have complete data for taxation or grants.

Our second dataset included 921 municipalities in 2001, 1,186 municipalities in 2008, and 1,326 municipalities in 2014. Out of all the municipalities, 533 were part of IMCs with a population exceeding 50,000 inhabitants, while 505 were classified as ACs in 2001. In 2008, there were 679 municipalities in IMCs and 637 in ACs. By 2014, there were 755 municipalities in IMCs and 686 in ACs.

The main characteristics of these municipalities are reported in Tables 3 and 4. Table 3 shows that across the three samples (2001, 2008 and 2014), the median municipal population was quite stable at around 6,500. While the percentage of females and young people remained the same, the 2014 sample exhibited a much higher percentage of the highly educated population (17%) with respect to the two other samples (respectively 4% and 6.5%). Both grants and tax revenue per capita were quite stable across samples. Median income increased from around 23,000 EUR in 2001 to 28,000 EUR in 2008, while decreasing to 20,000 EUR in 2014.

Table 4 shows mean characteristics distinguishing between non-AC and AC municipalities. As expected, the socio-demographics of AC municipalities are different since the population size is higher. Nevertheless, grants and tax revenues per capita, as well as percentage of females and young people do not differ significantly.

TABLE 3 – Descriptive statistics on municipal characteristics and elections in 2001, 2008 and 2014. Income, grants and revenues are expressed in 1,000 EUR per capita.

	2001				2008				2014			
	Median	SD	Min	Max	Median	SD	Min	Max	Median	SD	Min	Max
IMC population	60,698	110,393	4,141	419,453	67,548	109,307	4,248	403,743	67,413	117,711	4,465	434,309
Municipal population	6,520	20,500	3,500	229,100	6,580	20,700	3,200	253,000	6,317	20,300	3,500	268,200
Median income	22,700	5,400	13,700	44,800	28,000	6,900	15,700	62,200	20,300	4,200	9,800	43,200
% Female	50.2	2	32.4	57.6	51.7	1.9	32.9	60.1	51.1	2.3	33.1	78.3
% Age 15-24	12.2	2.7	6.2	42.8	12.0	2.8	4.2	34.1	11.0	2.7	4.7	35.3
% High educated	4.0	2.8	0.7	20	6.5	4.4	1.1	32.4	17.1	6.8	4.5	43
Enrolled	4,366	10,894	1,692	116,640	4,796	12,064	1,880	137,180	4,624	11,617	1,730	145,590
% White or null	5.5	6.2	1.8	51	4.0	5.5	0	39.7	4.1	9.7	0.8	57
% Voter turnout	67.1	7.7	43.2	100	66.6	7.7	43.2	100	64.3	7.7	43.20	100
Grants *pc*	0.2	0.1	0	1.2	0.2	0.1	0.1	1.1	0.2	0.1	0.1	1.2
Tax revenues *pc*	0.3	0.2	0.1	2.6	0.4	0.2	0.1	3.1	0.5	0.2	0.1	3.7
Housing tax revenues *pc*	0.1	0.1	0	1.1	0.1	0.1	0	1.5	0.2	0.1	0	1.8
Property tax revenues *pc*	0.1	0.1	0	1.2	0.2	0.1	0	1.5	0.2	0.1	0	1.9
Business tax revenues *pc*	0	0.2	0	2.3	0	0.1	0	1	0	0	0	0.4
Observations	921				1,186				1,319			

TABLE 4 – Mean of municipal characteristics and elections in 2001, 2008 and 2014 distinguishing between AC or not AC. Income, grants and revenues are expressed in 1,000 EUR per capita.

	2001		2008		2014	
	Mean among not AC	Mean among AC	Mean among not AC	Mean among AC	Mean among not AC	Mean among AC
IMC population	22,465	178,788	24,252	177,685	26,926	190,947
Municipal population	6,826	17,561	6,823	17,717	6,652	17,285
Median income	22,900	25,000	27,500	30,500	20,300	21,400
% Female	50	50.1	51.6	51.7	50.9	51.3
% Age 15-24	11.7	13.2	11.5	12.9	10.6	11.9
% High educated	3.8	5.5	6.1	8.8	16.2	20
Enrolled	4,503	10,229	4,937	11,333	4,688	11,069
% White or null	8.1	6.5	6.5	4.8	6.4	5.2
% Voter turnout	68.3	64.7	67.5	64.4	64.6	62
Grants *pc*	0.17	0.18	0.24	0.23	0.22	0.21
Tax revenues *pc*	0.36	0.32	0.39	0.42	0.46	0.51
Housing tax revenues *pc*	0.10	0.13	0.13	0.18	0.19	0.22
Property tax revenues *pc*	0.13	0.17	0.17	0.22	0.21	0.28
Business tax revenues *pc*	0.12	0.01	0.08	0.01	0.02	0
Observations	921		1,186		1,319	

5 Empirical strategy

We aim to analyze the impact of different levels of integration on French municipal voter turnout. However, in integrated municipalities, the decision to switch from a low level to a high level of cooperation cannot be considered exogenous either to fiscal outcomes or to political considerations. To overcome this issue, we adopt an approach that looks at the discontinuity created by one of the integration requirements: communities can create an AC if their IMC population exceeds 50,000 inhabitants. Considering this rule, we expect that the probability of a specific municipality joining an AC would be significantly and discontinuously higher above the 50,000 threshold. Another consequence of this requirement is that municipalities near the cut-off should be very similar in their observable characteristics. All these consequences were tested with data in our empirical analysis. It is also worth noting that it is very unlikely that the threshold would be manipulated by a municipality by simply attracting new inhabitants. One single municipality—whose average size (1,610 inhabitants) is very small regarding the whole community (50,000 inhabitants)—plays a very marginal role [7]. The setting described above is suitable for discontinuity designs aimed at identifying the causal impact of the level of integration on fiscal budget variables or on voter turnout.

7. Moreover, to leave an IMC, a municipality should be located at the border of the IMC and not in the middle of it, this reduces considerably the probability of manipulation

Before developing our main analysis, we investigate the dynamics of both observable and outcome data for the specific sample of municipalities to determine the presence of parallel trends before the decision to become an AC. This is valuable, as it reveals, firstly, if a municipality strategically manipulates its fiscal outcomes (i.e. the probability of becoming AC, grants per capita and different types of tax revenues) just before changing status (becoming an AC), and secondly, it provides information about the effect of becoming an AC on fiscal outcomes conditioned on time invariant characteristics. Understanding the strategic behavior of municipalities in terms of manipulating around the threshold is crucial in order to assess the validity of our main discontinuity analysis.

Evaluating the effect of becoming an AC on fiscal outcomes is also crucial in understanding the mechanisms behind voter turnout decisions, as it helps to define how much remains at stake at the municipal level. With this aim, we specify a series of event study designs, assigning treatment status to those municipalities belonging to an IMC above 50,000 inhabitants, and then rely on parallel trends to identify the causal effect of having a population larger than 50,000 on outcomes of interest.

We consider the treatment T_i as a binary indicator for municipality i which takes the value 1 if the municipality belongs to an IMC above 50,000 inhabitants. We then estimate the following model:

$$Y_{it} = \sum_{k=-6}^{6} \alpha_k M_{it}^k + \sum_{k=-6}^{6} \beta_k M_{it}^k \times T_i + \gamma_i + \delta_t + \varepsilon_{it}. \tag{1}$$

Here $M^k \equiv \mathbb{1}(t = t_i^* + k)$, where t_i^* is the event year for municipality i and Y is an outcome of interest, i.e., the probability of being AC (highly integrated), per capita grants, total tax revenues, housing tax revenues, property tax revenues and business tax revenues at the municipal level, γ and δ are vectors of municipal- and year-fixed effects, respectively. We are interested in the estimated β, which tracks the evolution of the dependent variable before and after the event of passing the threshold. β_{-1} is normalized to 0; hence, our baseline year is the year before the event.

We use a difference-in-differences method for a staggered design, which allows for the possibility that municipalities are treated at different points in time: i.e. that municipalities and the IMC they belong to chose the AC form of cooperation. Specifically, we use the Callaway and Sant'Anna (2020) estimator for staggered roll-out designs using not-yet-treated units (including never-treated units) as controls. This set of regressions is an intention-to-treat analysis, therefore the coefficient of interest has to be interpreted as a lower bound of the direct effect of being an AC on municipal outcomes.

To estimate the effect on municipal election voter turnout of losing responsibilities at the municipal level, our main subject of interest, we use a different identification strategy, mainly driven by the nature of non-longitudinal voting data. Given that the population threshold can be considered exogenous for a specific municipality and that the threshold significantly affects the probability of becoming an AC, we

are able to use the threshold as a valid instrument in a naive RDD estimation, in which we estimated the local average effect of being an AC on voter turnout. The estimated coefficient of interest in this analysis could be interpreted as the relative difference in voter turnout for those municipalities that belong to an IMC above 50,000 and have lost responsibilities (by becoming an AC). These municipalities are the compliers in our natural experiment.

We consider the treatment as a binary indicator for municipality i at time t which takes value 1 if the municipality belongs to an IMC of AC form of integration and 0 otherwise. V_{it} is the voter turnout and Z_i is the forcing variable, that is the IMC population. In particular, we distinguish between the potential treatment T_{it} (the municipalities belonging to IMCs with a population above 50,000) and the actual treatment D_{it}, the municipalities belonging to an AC. We estimate the fuzzy RDD in a two-stage least-squares approach where the first- and second-stage regression equations, respectively, are given by:

$$D_{it} = \alpha + h(\tilde{Z}_{it}) + T_{it}\left[\delta + h(\tilde{Z}_{it})\right] + \epsilon_{it} \tag{2}$$

$$V_{it} = \mu + f(\tilde{Z}_{it}) + \hat{D}_{it}\left[\gamma + f(\tilde{Z}_{it})\right] + u_{it} \tag{3}$$

where $h(\cdot)$ and $f(\cdot)$ are flexible and smooth (differentiable) functions for the population $\tilde{Z}_{it}$ centred around the cut-off, i.e., 50,000 inhabitants. The functions $h(\cdot)$ and $f(\cdot)$ are estimated separately for the potential (actual) treated and non-treated observations and include linear and quadratic terms. γ is the local average treatment effect (LATE) of the binary treatment on voter turnout.

Given that IMCs are made up of a group of municipalities, in the estimate we cluster the errors at the municipal level. In line with the existing literature on voter turnout determinants (see e.g. Blais et al., 2011; Cancela and Geys, 2016), we also control for the socio-demographic and economic characteristics of the municipality (median income, percentage of inhabitants between 15 and 24-years-old, [8] percentage of inhabitants over 55-years-old, percentage of women, percentage of highly educated inhabitants).

6 Estimation results

6.1 Event study results

We make a series of event studies estimations for our outcome of interest. We start with the probability that a municipality chooses a highly integrated AC given an IMC threshold of 50,000 inhabitants.

Figure (1a) reports the estimated results. These show that the probability of becoming highly integrated as an AC is significantly influenced by the population threshold. This probability is estimated to

8. Although citizens can vote at age 18, we do not have data on the specific 18-24-year-old population at the municipal level.

be 60% higher in the two years after reaching this threshold and about 40% higher in the four following years.

There is a high and significant incentive to become an AC once an IMC passes the population threshold, as the community receives a high level of state grants. This regression is crucial in our analysis, as it demonstrates that our exogenous policy channels work and establishes that the population threshold can be used as a strong instrument in an analysis on turnout. Figure (1b) shows a notable, negative, and statistically significant impact on municipal grants resulting from surpassing the IMC population threshold. The results depicted in Figure (1c) reveal that a decrease in municipal grants, especially in the initial two years following reaching the population threshold, corresponds with a reduction in tax revenues per capita. Tax revenues per capita return to growth just after four years from reaching this threshold.

More specifically, the short-term decline is associated to a decrease in housing and business tax revenues (see Figures (1d)-(1f)). Municipalities tend to offset the reduction in tax revenues by augmenting property tax revenues (as depicted in (1e)). [9]

Overall, we find that integration of municipalities into an AC reduces state grants and, in the short run, tax revenues at the municipal level. This provides evidence that less is in the hands of the municipal government at least two years after this switch toward a high level of cooperation. To rebound from this effect, the municipality strategically raises their property tax revenues by increasing tax rates. All the estimations show a robust parallel trend for every outcome of interest. This confirms the fact that municipalities do not strategically anticipate the change in cooperation status of their IMC by moving their tax schedules.

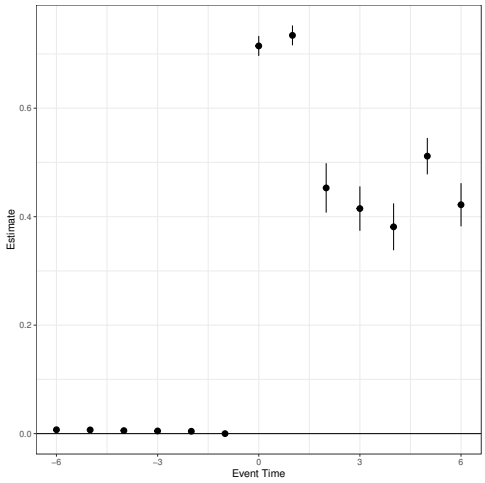
6.2 Results on voter turnout

To test the causal impact of a high level of integration on local voter turnout, we used a fuzzy RDD estimation with the population threshold as an instrument. Estimation results are reported in Table (5) for the first and second stages of the fuzzy RDD. Table (A3) in the Appendix presents a series of analysis showing that municipal characteristics were smooth over the threshold, results that confirm the validity of our identification strategy.

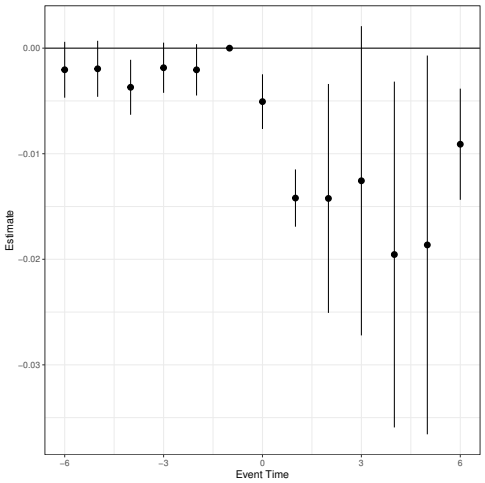
Estimation results of the first stage of the fuzzy RDD confirm that the population threshold of the IMC had a positive and significant impact on becoming a highly integrated AC. In the second stage of the fuzzy RDD, we found that participation in municipal elections significantly decreased. In the integrated municipalities, where less is at stake and the municipal government has de facto lost responsibilities, this suggests that citizens feel less involved in elections as they perceive that officials have less influence on

9. These results are also confirmed by the cohort-specific average treatment effects (see Table (A2) in Appendix).

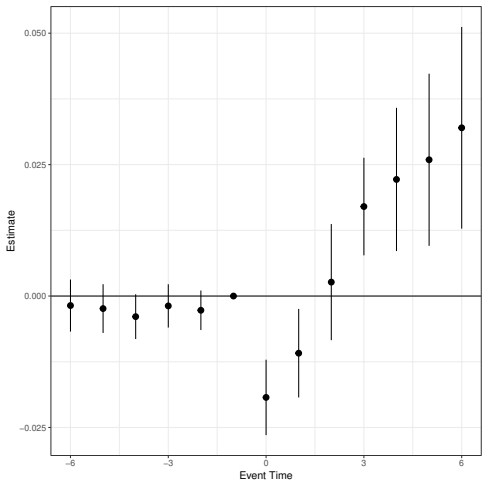
FIGURE 1 – Callaway and Sant'Anna (2020) estimation of the treatment (belonging to an IMC with more than 50,000 inhabitants) on different outcomes. Bars represent 95% confidence intervals calculated with IMC clustered standard errors.



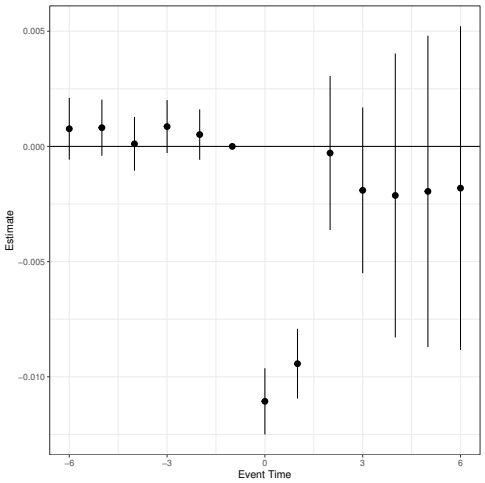
(a) Impact of treatment on the probability of choosing the AC form of cooperation.



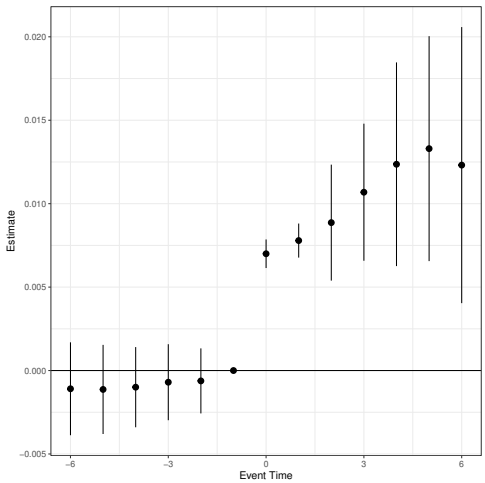
(b) Impact of treatment on pc municipal grants.



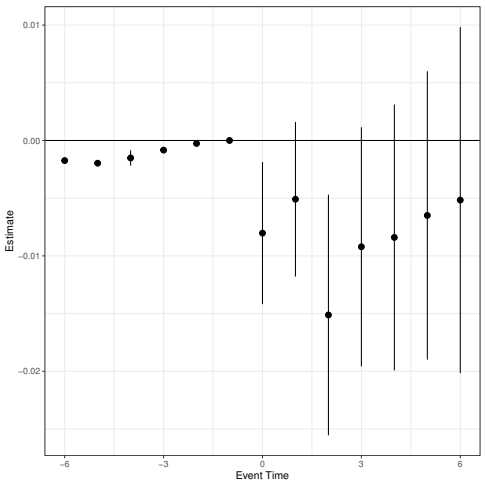
(c) Impact of treatment on pc total tax revenues.



(d) Impact of treatment on pc housing tax revenues.



(e) Impact of treatment on pc property tax revenues.



(f) Impact of treatment on pc business tax revenues.

TABLE 5 – Estimations of the first stage of the fuzzy RDD of Eq. (1) (top panel) and the second stage of the fuzzy RDD of Eq. (2) controlling for covariates (bottom panel). IMC clustered standard errors in parentheses. The polynomial functions are allowed to have different parameters to the left and the right of the threshold. The sample consists of the municipalities for which we have information on the voter turnout in 2001, 2008 and 2014.

	Dependent variable: Probability of becoming AC					
	2001	2008	2014	2001	2008	2014
T	0.8***	0.8***	0.7***	0.8***	0.7***	0.7***
	(0.1)	(0.1)	(0.1)	(0.12)	(0.1)	(0.1)
Controls	YES	YES	YES	NO	NO	NO
Observations	921	1,186	1,319	921	1,186	1,319
Adjusted R^2	0.9	0.9	0.9	0.9	0.9	0.9
	Dependent variable: Voter turnout					
	2001	2008	2014	2001	2008	2014
$\hat{D}$	−1.9**	−1.5**	−2.0***	−4.2**	−3.5***	−3.3***
	(0.8)	(0.8)	(0.6)	(0.8)	(0.8)	(0.7)
Controls	YES	YES	YES	NO	NO	NO
Observations	921	1,186	1,319	921	1,186	1,319
Adjusted R^2	0.2	0.2	0.2	0.1	0.04	0.03
Note:		*p<0.1; **p<0.05; ***p<0.01				

outcomes that voters care about.

Our results align with those in Andersen et al. (2014), who found that in Norway, when more was at stake due to higher financial tax revenues from hydropower plants, voter turnout increased in municipal elections.

Further results on the impact of control variables and heterogeneity on voter turnout are shown in Tables A4-A5 and discussed in the Appendix.

Other results on the impact of a high level of integration on fiscal revenues are shown in Table (A6) in the Appendix, which presents the estimation results of Eq. 2, including the municipal fiscal revenues: total tax revenues, business tax revenues, property tax revenues and housing tax revenues.

Lastly, we study the effect of the change in the electoral system on local voter turnout. Whereas before 2014 intermunicipal councilors were elected by indirect suffrage, from 2014 on, citizens can vote directly for them in municipal elections. We analyze whether citizens who have the opportunity to vote directly for both levels of local government have more incentive to participate. The findings indicate that the new law enacted in 2014 instituting direct suffrage for intermunicipal councilors had no significant effect on turnout. There are two plausible explanations for this. The first is related to possible misunderstandings around the new election rules in 2014 resulting in the coexistence of both candidates (at the municipal and intermunicipal levels) on the same ballot. However, this possibility is not substantiated by the descriptive statistics in Table 2, which do not show a significant increase of blank ballots or ballot errors in 2014.

A second possible explanation is that multilevel governance results in distance between citizens and incumbents and therefore decreases citizen involvement. This may be reinforced by mistrust in the ability of the intermunicipal community to improve citizens' well-being. As shown in a recent survey by the

French Institute of Public Opinion (IFOP) on intermunicipal communities (IFOP, 2022), more than 50% of French citizens believe that intermunicipal cooperation is likely to increase local taxation, bring complexity to local public management, make municipalities disappear, and distance elected officials from citizens. This is in line with a study by Tricaud (2023), which shows that some municipalities are reluctant to integrate to avoid an increase in congestion in urban areas or a decrease in the quality of public services in rural areas.

7 Conclusion

In this paper, we try contribute to the existing debate on the optimal size of local jurisdictions by investigating the causal impact of different levels of municipal integration on fiscal revenues and voter turnout. The study uses data on French local governments in the period from 2001 to 2018, during which newly integrated municipalities transferred some responsibilities and tax revenues from the municipal level to the intermunicipal level.

We find that newly highly integrated municipalities face a sharp decrease in their fiscal revenues for about two years after the arrangement. Using an exogenous population-based rule, the analysis confirms that participation in municipal elections decreases in integrated municipalities that lost responsibilities and fiscal revenues. This suggests that citizens feel less involved when they perceive that officials have less influence on local policies that voters care about. Nor did a new law enacted in 2014 establishing direct suffrage for intermunicipal councilors have the expected positive impact on voter turnout. These results indicate the political cost of a loss of municipal autonomy. As most of the existing literature tends to focus on the economic rationale for intermunicipal cooperation, our findings contribute to a more nuanced view of the democratic consequences of this trend.

8 Acknowledgements

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A Online Appendixes

TABLE A1 – Number of municipalities becoming treated (exceeding the IMC population threshold or becoming an AC) each year. *Inf* refers to never treated municipalities. 2002 are already treated.

Year	# of municipalities in IMC above 50,000 inhabitants	# of municipalities belong to an AC
2002	1,851	1,669
2003	1,853	1,670
2004	1,857	1,675
2005	1,861	1,679
2006	1,862	1,680
2007	1,874	1,680
2008	1,893	1,680
2009	1,904	1,681
2010	1,904	1,681
2011	1,932	1,687
2012	1,958	1,691
2013	1,978	1,704
2014	1,988	1,714
2015	1,996	1,729
2016	2,029	1,774
2017	3,854	3,155
2018	3,912	3,293
Inf	11,678	12,302

TABLE A2 – Average Treatment Effect on fiscal revenues averaged by cohorts. Neyman standard errors in parentheses. Grants and revenues are expressed in 1,000 EUR per capita.

	ATE
Grants pc	-0.0101***
	(0.0013)
Tax revenues pc	-0.0154***
	(0.0039)
Housing tax revenues pc	-0.0105***
	(0.0008)
Property tax revenues pc	0.0077***
	(0.0007)
Business tax revenues pc	-0.0070***
	(0.0032)
Note:	*p<0.1; **p<0.05; ***p<0.01

TABLE A3 – Discontinuity in covariates. Clustered standard errors at IMC level in parentheses. The polynomial functions are allowed to have different parameters to the left and the right of the threshold.

	Dependent variable in 2001:				
	Municipal Population	Median income	% Female	% Age 15-24	% High educated
T	3.667*	−2.334	−0.224	−0.266	0.186
	(2.186)	(2.581)	(0.470)	(0.500)	(1.102)
Observations	921	921	921	921	921
Adjusted R^2	0.1	0.1	0.002	0.2	0.1
	Dependent variable in 2008:				
	Municipal Population	Median income	% Female	% Age 15-24	% High educated
T	1.1	−0.2	0.04	−1.2**	0.4
	(2.2)	(2.4)	(0.5)	(0.5)	(1.2)
Observations	1,186	1,186	1,186	1,186	1,186
Adjusted R^2	0.1	0.1	0.002	0.1	0.1
	Dependent variable in 2014:				
	Municipal Population	Median income	% Female	% Age 15-24	% High educated
T	0.6	−2.8	0.1	−1.1**	−3.6
	(1.5)	(1.9)	(0.7)	(0.5)	(2.7)
Observations	1,319	1,319	1,319	1,319	1,319
Adjusted R^2	0.1	0.05	0.02	0.1	0.1
Note:					*p<0.1; **p<0.05; ***p<0.01

TABLE A4 – Estimation of the second stage of the fuzzy RDD of Eq. (2) controlling for covariates. IMC clustered standard errors in parentheses. The polynomial functions are allowed to have different parameters to the left and the right of the threshold. The sample consists of the municipalities for which we have information on the voter turnout in 2001, 2008 and 2014.

	Dependent variable:		
	Voter turnout		
	2001	2008	2014
$\hat{D}$	-1.9^{**}	-1.5^{**}	-1.9^{***}
	(0.8)	(0.8)	(0.6)
Municipal Population	-0.1^{***}	-0.1^{***}	-0.1^{***}
	(0.02)	(0.02)	(0.01)
Median Income	−0.04	−0.03	-0.3^{**}
	(0.1)	(0.1)	(0.1)
% Female	-0.3^{**}	−0.2	-0.3^{**}
	(0.1)	(0.2)	(0.1)
% Age 15-24	-0.5^{***}	-0.6^{***}	-0.6^{***}
	(0.2)	(0.2)	(0.1)
% High Educated	−0.01	−0.01	0.3^{***}
	(0.2)	(0.1)	(0.1)
Observations	921	1,186	1,319
Adjusted R^2	0.2	0.2	0.2
Note:			*p<0.1; **p<0.05; ***p<0.01

Table A4 shows the expected results of the impact of the municipal population, the population aged 15–24, and the higher educated. In line with existing literature, voter turnout is lower in the most populated municipalities and where the percentage of young people is higher. Municipalities with more educated people exhibit higher voter turnout in 2014. The negative coefficient associated with median income may reflect municipalities with more at stake (i.e. with relatively higher municipal grants per capita). However, we do not find the expected positive voter effect in female voters.

TABLE A5 – Estimation of the second stage of the fuzzy RDD of Eq. (2) with heterogeneous effect due to the level of education (% High educated) and the level of municipal grants pc (i.e., "more at stake"). IMC clustered standard errors in parentheses. The polynomial functions are allowed to have different parameters to the left and the right of the threshold. The sample consists of the municipalities for which we have information on the voter turnout in 2001, 2008 and 2014.

	Dependent variable: Voter turnout					
	Below Median			Below 75% percentile		
	2001	2008	2014	2001	2008	2014
$\hat{D}$	−0.3	0.3	−0.1	1.6	0.7	−0.5
	(0.9)	(0.9)	(0.8)	(1.5)	(1.5)	(1.3)
High educated	1.5**	1.0	−0.2	2.8**	1.9	−0.02
	(0.8)	(0.8)	(0.7)	(1.2)	(1.2)	(1.2)
$\hat{D}$∗High educated	−3.2**	−3.5***	−3.6***	−4.5**	−2.7*	−1.5
	(1.4)	(1.2)	(1.1)	(1.6)	(1.6)	(1.4)
	Dependent variable: Voter turnout					
	Below Median			Below 75% percentile		
	2001	2008	2014	2001	2008	2014
$\hat{D}$		−10.9***	−0.8		−36.5**	−2.2
		(3.3)	(1.6)		(16.4)	(5.2)
More at stake		−6.9**	−1.5		−10.9**	−4.6**
		(3.5)	(1.1)		(4.2)	(2.2)
$\hat{D}$∗More at stake		18.4***	−1.6		44.5**	−0.6
		(5.8)	(2.7)		(19.7)	(6.6)
Observations	921	1,186	1,319	921	1,186	1,319
Note:		*p<0.1; **p<0.05; ***p<0.01				

Table A5 presents the estimation results of Eq. 2, including the interaction with educated people and municipalities with high state grants per capita (i.e. with more at stake). We find that there is a reduction in the negative effect of lost responsibilities in cases in which the percentage of educated people was higher. Inversely, as expected, we also observe that the negative impact of high integration is reinforced in the municipalities where there is more at stake, i.e. with relatively higher municipal grants per capita.

TABLE A6 – Estimation of the second stage of the fuzzy RDD of Eq. (2) controlling for covariates. IMC clustered standard errors in parentheses. The polynomial functions are allowed to have different parameters to the left and the right of the threshold. The sample consists of the municipalities for which we have information on the voter turnout in 2001, 2008 and 2014.

	Dependent variable:		
	Tax revenues (per capita)		
	2001	2008	2014
$\hat{D}$	−0.1***	−0.004	0.01
	(0.02)	(0.02)	(0.02)
	Dependent variable:		
	Housing tax revenues (per capita)		
	2001	2008	2014
$\hat{D}$	−0.1***	−0.004	0.01
	(0.02)	(0.02)	(0.02)
	Dependent variable:		
	Property tax revenues (per capita)		
	2001	2008	2014
$\hat{D}$	−0.1***	−0.004	0.01
	(0.02)	(0.02)	(0.02)
	Dependent variable:		
	Business tax revenues (per capita)		
	2001	2008	2014
$\hat{D}$	−0.1***	−0.004	0.01
	(0.02)	(0.02)	(0.02)
	Dependent variable:		
	Grants (per capita)		
	2001	2008	2014
$\hat{D}$	−0.1***	−0.004	0.01
	(0.02)	(0.02)	(0.02)
Observations	921	1,186	1,319
Note:	*p<0.1; **p<0.05; ***p<0.01		

In Table (A6), we find similar results with the staggered DiD estimations only for 2001, while the coefficients were not significant in 2008 and 2014. This result may be explained by the fact that we measured the effect of the level of integration on municipal fiscal revenues for election years only, without taking into account the possible impact of the electoral cycle on municipal budgets.

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