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# The political cost of integration: A natural experiment on local governments

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Working Paper

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

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# 1 Introduction

Many industrialized countries are striving to reduce the inefficiencies associated with excessive subnational jurisdictions by promoting cooperation or mergers between municipalities for shared public service (Bartolini, 2015; Di Porto et al., 2016). While these reforms aim to enhance economic efficiency through economies of scale and by internalizing externalities, they often come with political trade-offs (see, e.g., Alesina and Spolaore, 1997; Bolton and Roland, 1997). In particular, larger jurisdictions can dilute local autonomy, potentially decreasing citizens' engagement with governance and lowering voter turnout (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 exacerbating a context in which democracy is facing challenges (see e.g. International Institute for Democracy and Electoral Assistance, 2016). This paper investigates the causal impact of local government integration on electoral participation in municipal elections, leveraging a setting uniquely suited for causal inference.

The empirical literature on local public finance has primarily focused on the economic effects of integration, such as those arising from mergers or intermunicipal cooperation (e.g., Reingewertz, 2012; Luca and Modrego, 2021; Tricaud, 2023). However, the political implications of these arrangements have received less attention. Notable exceptions include Lapointe et al. (2018), who found that the merger of small municipalities in Finland reduced voter turnout by 4 percentage points over the long term, and Allers et al. (2021), who demonstrated that municipal amalgamation in the Netherlands led to a 2.2 percentage point decline in turnout during local elections.

Despite these insights, mergers and amalgamations are not ideal setting for isolating the causal impact of integration on democratic outcomes. This limitation arises because these reforms replace preexisting jurisdictions with entirely new administrative entities, introducing electoral and socio-economic changes that complicate causal analysis. For example, in the new and bigger jurisdictions disparities and perceived benefits or costs among residents are completely different. In contrast, intermunicipal cooperation (IMC) maintains the autonomy and structure of individual municipalities. Under IMC, municipalities preserve their boundaries, local governments, and some degree of authority, while transferring specific responsibilities and fiscal revenues to a shared intermunicipal entity. This continuity enables the study of the political consequences of integration without the confounding effects of administrative restructuring, offering a more suitable context for causal inference.

Using data from France, where intermunicipal cooperation (IMC) has been extensively implemented since 2000, we investigate how different levels of integration influence voter turnout in municipal elections. France serves as an ideal context for this analysis, as municipalities that join highly integrated intermunicipal communities transfer substantial responsibilities and fiscal resources to the intermunicipal

entity.

Identifying the causal impact of IMC on voter participation is challenging because the adoption of an integrated form of cooperation is not exogenous to fiscal or political outcomes. To address this challenge, we employ an instrumental variable design, leveraging a discontinuity created by one of the integration requirements. Specifically, when the total population of an intermunicipal community exceeds 50,000 inhabitants, the group faces stronger incentives to adopt a highly integrated form of cooperation.

This IMC population threshold provides a source of exogenous variation for small municipalities within the intermunicipal community. First, the municipalities analyzed are already part of an intermunicipal structure when the 50,000 population threshold is crossed, and their individual populations are too small to significantly influence whether the threshold is exceeded. Second, a single municipality lacks the decision-making power to oppose the higher level of government's choice to adopt a highly integrated form of cooperation.

By focusing on municipalities within IMC that are subject to the 50,000-resident threshold—where higher levels of integration are incentivized—we use this quasi-experimental variation to identify causal effects. This threshold-driven mechanism ensures that the integration process is exogenous to the political dynamics of any single municipality, strengthening the validity of our results. Our results reveal that integration into highly cooperative intermunicipal arrangements significantly reduces voter turnout in municipal elections. Importantly, we observe that this negative impact persists even after the 2014 electoral reform, which introduced direct voting for intermunicipal councils. This suggests that, despite the increased formal participation opportunities, citizens continue to perceive these institutions as distant and less relevant to their immediate local concerns. The enduring decline in turnout underscores the political costs of integration, as voters feel less connected to decisions over which their local representatives have diminishing influence.

To explore the mechanisms behind these effects, we analyze changes in municipal and intermunicipal budgets following integration. Our findings indicate that municipalities in highly integrated IMC experience a substantial reduction in fiscal revenues, particularly in state grants and local business taxes, for about two years post-integration. To offset these losses, municipalities tend to increase property tax rates. This fiscal tightening further distances voters, who perceive local governments as less capable of addressing their needs. Moreover, we find that the negative impact on turnout is more pronounced in municipalities with lower levels of educational attainment and in those where fiscal resources at stake are significant. Conversely, municipalities with higher proportions of educated residents exhibit a mitigated decline in turnout, possibly reflecting greater civic engagement and capacity to navigate the complexities of intermunicipal governance.

This study contributes to the literature on electoral participation at the local level by examining

how institutional reforms, specifically IMC, affect voter turnout. While the determinants of turnout in national elections are well-documented, less attention has been given to subnational elections (Henderson and McEwen, 2010; Cancela and Geys, 2016). Recent evidence highlights that turnout determinants differ significantly across governance levels, with factors like population size and electoral systems playing a larger role in subnational elections (Cancela and Geys, 2016).

Additionally, our work extends the literature on the political consequences of fiscal decentralization, which has shown that greater local autonomy can enhance voter engagement in subnational elections (Blais et al., 2011; Andersen et al., 2014; Michelsen et al., 2014). Finally, this study builds on research into the effects of municipal cooperation, which has primarily focused on economic outcomes (Luca and Modrego, 2021; Charlot et al., 2015; Tricaud, 2023) while underexploring political impacts. By investigating the effects of IMC, where municipalities retain autonomy but delegate responsibilities, our findings reveal how integration levels influence electoral participation, shedding light on the trade-offs between economic efficiency and democratic engagement.

The remainder of the paper is structured as follows. Section 2 outlines the institutional context, while sections 3 and 4 describe the data and empirical strategy. Section 5 discusses the results, and section 6 concludes with broader implications for policy and governance.

# 2 Institutional setting

## 2.1 Fiscal decentralization in France

In France, there are four layers of government: the central government, regional governments (13 regions), departments or counties (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.

Between the department level and the municipality level, the creation of a new level of local government was encouraged by the state: intermunicipal communities (IMCs) (or in French "Etablissements Publics de Coopération Intercommunale", EPCI). The integration process between municipalities remained voluntary from the 1970s until 2010, when integration became mandatory. In 1999, a major law was passed to improve voluntary intermunicipal cooperation through high state grants to the IMCs. Most municipalities (95%) had already voluntary joined an IMC by 2010 and the whole territory was finally covered in 2014.[1] These IMCs are mainly in charge of economic development through urban planning and promotion of local businesses.

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

Depending on population size, there are four possible jurisdictional forms of IMCs 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 IMC population threshold. 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. 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** | **IMC pop. threshold** | **Compulsory missions** | **Tax regime** |
|---|---|---|---|
| MC | None | Econ. dev., urban planning | ADD or SBT |
| AC | $> 50,000$ inhab. | Same as CC + housing | SBT |
| UC | $> 250,000$ inhab. | Same as AC + environment | SBT |
| Metropolis | $> 400,000$ inhab. | same as UC + county/regional missions | SBT |

This study focused on a form of high integration that is very common in urban areas in France: the agglomeration community (AC), which can be created if the IMC population exceeds 50,000 inhabitants. Although it is not mandatory, once a community reaches the population threshold, it has strong financial and economic incentives to switch from a low level of integration (MC) to a high level of integration (as an AC).[2] The primary reason is that they receive a higher state grant: 20.02 EUR per capita for a 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.

Finally, let us mention that, from 2000 to 2015, three laws have affected the integration process.[3] However, all these law affected all the communities and not specifically the AC form of integration that

2. All ACs were MCs before adopting this more integrated form of cooperation.

3. The 2010 RCT law ("Réforme des collectivités territoriales") made intermunicipal community mandatory, set a minimum IMC size, and increased the level of policy integration. The 2014 ALUR law ("accès au logement et un urbanisme rénové") transferred the urban planning powers to IMCs. Finally, the NOTRe law ("Nouvelle Organisation Territoriale de la République") of 2015 that further increased the size of IMC and their levels of integration.

we study here.

### 2.2 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 councillors. The term of office is, in principle, six years. The last municipal election years were 2001, 2008, 2014 and 2020. [4]

Before a specific law on intermunicipal elections enacted in 2014, intermunicipal councillors were indirectly elected by each of the municipal councils concerned. Since 2014, intermunicipal councillors 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.

More details on the election process are given in Appendix A.1

## 3 Data

We use two different sets of data for our analysis: (i) a longitudinal set of data over the period 2002-2018 that is the record linkage of 3 administrative sources which contain the variables on budget decisions, municipal and intermunicipal characteristics; (ii) a series of cross sectional data covering the information on municipal elections in 2001, 2008 and 2014.

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

Our main dataset include 265,183 municipalities in the period 2002–2018. [5]

We focus on municipalities that have a high level of integration, i.e. the AC. The municipalities included in our sample have, on average, about 1,610 inhabitants (see Table 2), while the average number of inhabitants of an IMC is about 31,000. Over the period, we observe that almost 14% of municipalities belong to an IMC with a total population above the threshold of 50,000 inhabitants. About 12% of the municipalities belong to an AC.

4. The voting takes place by municipality, except for Paris, Lyon and Marseille for which voting is by sector (arrondissement).

5. Before 2002 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 |

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 (see Appendix Table A2).

The cross sectional data on municipal voter turnout was obtained from the Ministry of Interior for three election years: 2001, 2008 and 2014.[6] [7] 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 in the election process described in Appendix A.1. Therefore, our second dataset included 921 municipalities in 2001, 1,186 municipalities in 2008, and 1,326 municipalities in 2014. Descriptive statistics are shown in Appendix Table A3. The main characteristics of these municipalities by treatment status (AC or not AC) are reported in Table 3. 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 – Mean of municipal characteristics and elections in 2001, 2008 and 2014 by treatment status (AC or not AC). Income, grants and revenues at the municipal level 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 | |

6. 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, we remove these three cities from our sample.

7. We 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.

# 4 Estimation strategy

We aim to analyze the causal impact of integration on municipal voter turnout using the IMC experience. However, within 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. A consequence of this requirement is that municipalities near the cut-off should be very similar in their observable characteristics.

It is also worth noting that it is very unlikely that the 50,000 threshold would be manipulated by a municipality by simply attracting new inhabitants. One single municipality—whose average size is very small (1,610 inhabitants) regarding the whole community (50,000 inhabitants)—plays a marginal role. Moreover, by law, to leave an intermunicipal group, a municipality should be located at the border of the community. This reduces considerably the probability of manipulation. Appendix A.2 provides further evidence.

Therefore the setting described above is suitable to set up a natural experiment and use an instrumental variable design to identify the causal impact of high integration on voter turnout.

## 4.1 Instrumental variable approach

To estimate the impact of municipalities losing responsibilities at the local level on voter turnout in municipal elections we employ an identification strategy suited to the characteristics of our data, which lacks longitudinal variation in voting patterns. Specifically, we exploit the population threshold for classification as an AC as an exogenous source of variation. We assume that (i) the population threshold of an IMC is exogenous to each municipality, and (ii) crossing this threshold significantly alters the probability for a specific municipality of becoming an AC. Under these assumptions, the population threshold serves as a valid instrument in a two-stage least squares (2SLS) framework.

In this setup, we estimate the local average treatment effect (LATE) of becoming an AC on voter turnout. The coefficient of interest reflects the relative difference in voter turnout between municipalities which have lost certain local responsibilities by becoming an AC, and those that have not. The municipalities within IMC above the threshold that lose responsibilities constitute the compliers in our natural experiment.

Although the proposed framework suggests the possibility of using a regression discontinuity design to estimate causal effects, several challenges must be discussed. First, the outcome variable, voter turnout,

is measured at the municipal level, while the running variable, population, is measured at the IMC level, meaning that all municipalities within the same IMC share the same population value. This creates clustering in the running variable, with multiple municipalities grouping around the same population value. The variance in voter turnout within IMCs is relatively low—approximately 34% in 2001 and 2008, and 37% in 2014—which exacerbates the clustering effect. This lack of variability in the running variable at the municipal level can undermine the estimation process in several ways. The presence of mass points might violate the smoothness assumption central to discontinuity design, potentially introducing bias in estimating the treatment effect. Local regressions may struggle to accurately capture the relationship near the cutoff, leading to unreliable estimates. Additionally, the clustering of observations around the same population values reduces the effective number of independent observations, as municipalities within the same cluster contribute less distinct information. [8]

Moreover, the clustering of municipalities around certain population values reduces the granularity of the running variable, violating the assumption of a continuous running variable near the cutoff (Lee and Card, 2008). While methods such as the nearest-neighbour variance-covariance estimator could adjust standard errors to account for clustering within IMCs, these adjustments may not fully mitigate the biases arising from the lack of smoothness in the distribution of the running variable. One potential solution to address these issues is to aggregate the outcome variable—voter turnout—to the IMC level. This would align the unit of observation with the running variable, effectively eliminating the problem of mass points. However, this approach introduces significant drawbacks. Aggregating the data reduces the number of observations, particularly those near the cutoff, which are critical for estimating local treatment effects. [9] In our case, aggregation reduces the number of groups near the cutoff to such an extent that confidence intervals may become excessively wide or the treatment effect may become unidentifiable. [10]

Given these challenges, we use the population threshold as an instrumental variable. This approach allows us to prevent the issues related to mass points and clustering while utilizing the variation in population to identify a local effect that lies near our research interest.

To this aim 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 with high level of integration (AC type) and 0 otherwise. $V_{it}$ is the voter turnout. In particular, we distinguish between the potential treatment $T_{it}$ (the municipalities belonging to a community with a population above 50,000) and the actual treatment $D_{it}$, the municipalities belonging to an AC. We estimate a two-stage least-squares model where the first- and

8. For instance, in 2001, while there were 439 municipalities below and 533 above the cutoff, the effective number of observations decreased to 42 and 48, respectively. This reduction in the effective number of observations, especially when controlling for municipal characteristics, weakens the precision of the estimated treatment effect.

9. "Grouped Regression Discontinuity Designs require a larger sample size than individual-level regression discontinuity due to the need for sufficient data points at the group level to estimate the treatment effect." See https://researchmethodsresources.nih.gov/methods/grdd.

10. Moreover, aggregation can smooth out meaningful variations in voter turnout at the municipal level, further diminishing the model's ability to detect significant effects associated with crossing the population threshold.

second-stage regression equations, respectively, are given by:

$$D_{it} = \alpha + \delta T_{it} + \beta X_{it} + \epsilon_{it} \tag{1}$$

$$V_{it} = \mu + \gamma \hat{D}_{it} + \omega X_{it} + u_{it} \tag{2}$$

$\gamma$ is the LATE of the binary treatment on voter turnout. Given that the IMCs are made up of municipalities, we cluster the errors at the IMC level. We also control for the socio-demographic and economic characteristics of the municipality (median income, percentage of inhabitants between 15 and 24-years-old,[11] percentage of inhabitants over 55-years-old, percentage of women, percentage of highly educated inhabitants).

## 4.2 Event study design

To understand the mechanisms driving voter turnout decisions, we investigate the dynamics of municipal budget characteristics, particularly how fiscal outcomes—such as grants per capita and various tax revenues—change after becoming an AC. This analysis provides insights into how much remains at stake at the municipal level following integration, which is crucial for explaining the observed decline in voter participation. Additionally, it allows us to verify the presence of parallel trends before the decision to adopt a highly integrated status, ensuring that municipalities do not strategically manipulate their fiscal outcomes, and thereby strengthening the validity of our main instrumental variable analysis.

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 assumption to identify the causal effect of having an IMC 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:

$$Y_{it} = \sum_{k=-6}^{6} \alpha_k M_{it}^k + \sum_{k=-6}^{6} \beta_k M_{it}^k \times T_i + \gamma_i + \delta_t + \varepsilon_{it}. \tag{3}$$

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 (i.e. highly integrated IMC), per capita grants, total tax revenues, housing tax revenues, property tax revenues and business tax revenues at the municipal level, $\gamma$ and $\delta$ are vectors of municipal- and year-fixed effects, respectively. We are interested in the estimated $\beta$, which tracks the evolution of the dependent variable before and after the event of passing the threshold. $\beta_{-1}$ is normalized to 0; hence, our baseline year is the year before the event.

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

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 and that the average treatment effect is heterogeneous. Specifically, we use the Callaway and Sant'Anna (2020) estimator for staggered roll-out designs using not-yet-treated units and 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.

# 5 Estimation results

## 5.1 Results on voter turnout

To test the causal impact of a high level of integration on local voter turnout, we used a two stage least square estimation with the IMC population threshold as an instrument. Estimation results are reported in Table (4) for the first and second stages. Appendix Table (A5) presents a series of analysis showing that municipal characteristics were smooth over the threshold, results that confirm the validity of our identification strategy.

TABLE 4 – Estimations of the first stage Eq. (1) and the second stage Eq. (2) controlling for covariates. IMC clustered standard errors in parentheses. The sample consists of the municipalities for which we have information on the voter turnout in 2001, 2008 and 2014 (where 2014 is used for an alternative analysis on different voting system at the IMC level).

| | *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 |
| $\dot{D}$ | $-1.9^{**}$ | $-1.5^{**}$ | $-2.0^{***}$ | $-4.2^{**}$ | $-3.5^{***}$ | $-3.3^{***}$ |
| | (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*: The average values of Voter turnout is 66.5%, 65.8% and 63.3% for 2001, 2008 and 2014 respectively. $^{*}$p<0.1; $^{**}$p<0.05; $^{***}$p<0.01

Estimation results of the first stage confirm that the population threshold ($> 50,000$ inhabitants) had a positive and significant impact on becoming a highly integrated IMC. This probability is estimated to be around 70% and 80% higher after reaching this threshold. We confirm that there is a high and significant incentive to become highly integrated once an IMC crosses the population threshold, as the community receives a high level of state grants. This result is crucial in our analysis, as it shows that our exogenous policy channel is a valuable instrument in the analysis on turnout.

In the second stage, we find that, in municipal elections in the integrated municipalities where less is at stake and the municipal government has lost responsibilities, voter turnout decreases significantly. This confirms the prediction that citizens feel less involved in elections as they perceive that officials have less influence on 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 hydro-power plants, voter turnout increased in municipal elections.

Further results on the impact of control variables and heterogeneity on voter turnout are shown in Appendix Tables A6-A7. We find 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. However, we do not find the expected positive effect for female voters.

Appendix Table A7 presents the estimation results of Eq. 2, including an interaction with highly educated citizens and municipalities with high state grants per capita (i.e. with more at stake). These heterogeneity analysis show that in cases in which the percentage of educated people is higher, there is a reduction in the negative effect of the loss of responsibilities. Inversely, as expected, we observe that the negative impact of high integration is reinforced in the municipalities with relatively higher municipal grants per capita, where there is more at stake.

Additionally, we study the effect of the change in the electoral system on local voter turnout. Whereas before 2014 intermunicipal councillors 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.

Our findings in Table (4) indicate that the new law enacted in 2014 instituting direct suffrage for intermunicipal councillors had no significant effect on turnout. There are two plausible explanations for this.

A first possible explanation is that multilevel governance results in greater 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. The second 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 Appendix Table A3,

which do not show a significant increase of blank ballots or ballot errors in 2014.

### 5.2 Mechanisms

Figure (1a) reports the estimated results of our event studies. We start with the probability that a municipality chooses a highly integrated AC given an IMC threshold of 50,000 inhabitants. We confirm that the probability of becoming highly integrated as an AC is significantly influenced by the population threshold. This probability is estimated to be 60% higher in the two years after reaching this threshold and about 40% higher in the four following years.

Figure (1b) shows a notable, negative, and statistically significant impact on municipal grants resulting from crossing the 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 at the municipal level is associated to a decrease in business tax revenues due to the transfer of this tax instrument to the IMC level and a sharp decrease in municipal housing tax rates due to a higher tax rate set by the IMC (see Figures (1d)-(1f)). Municipalities tend to offset the reduction in their tax revenues by increasing property tax revenues (as depicted in (1e)). These results are also confirmed by the cohort-specific average treatment effects (see Appendix Table (A4)). [12]

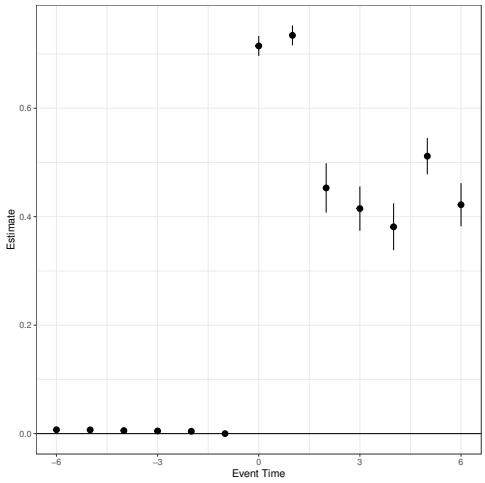
Overall, we find that integration of municipalities into an AC reduces municipal state grants and, in the short run, tax revenues at the municipal level. This provides evidence that less is in the hands of the municipal government at least two years after this switch toward a high level of cooperation. 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. We confirm that municipalities do not strategically anticipate the change in cooperation status of their group by moving their tax schedules.

## 6 Conclusion

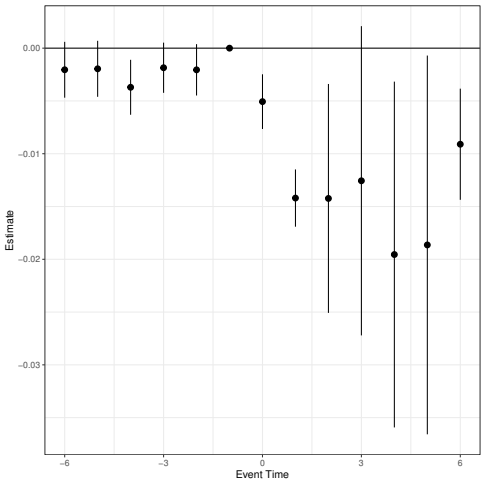
In this paper, we contribute to the ongoing debate on the trade-off between economic efficiency and democratic participation in local governance by analyzing the causal impact of municipal integration on fiscal revenues and voter turnout. Using data from French local governments over nearly two decades,

12. Let us mention that housing tax rates and property tax rates are set by both levels of governments (municipal and IMC) on the same tax base respectively. We here observe a compensation between the two rates set by each level of local governments. As housing tax rates decrease at the municipal level to allow an increase at the IMC level, we see the reverse for the property tax rates since the latter increase at the municipal level while decreasing at the IMC level (see Appendix Figure (4)).

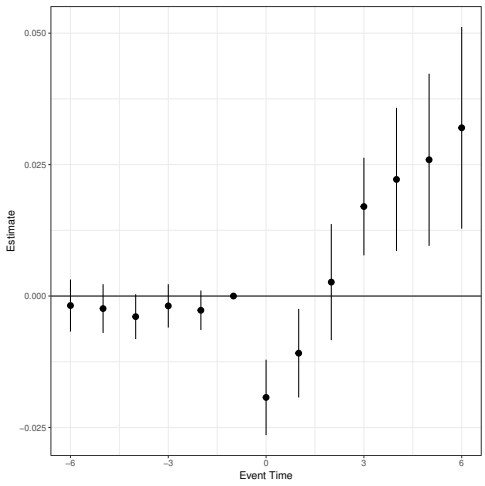
FIGURE 1 – Callaway and Sant'Anna (2020) estimation of the treatment (belonging to an IMC with more than 50,000 inhabitants) on different outcomes. Bars represent 95% confidence intervals calculated with IMC clustered standard errors.



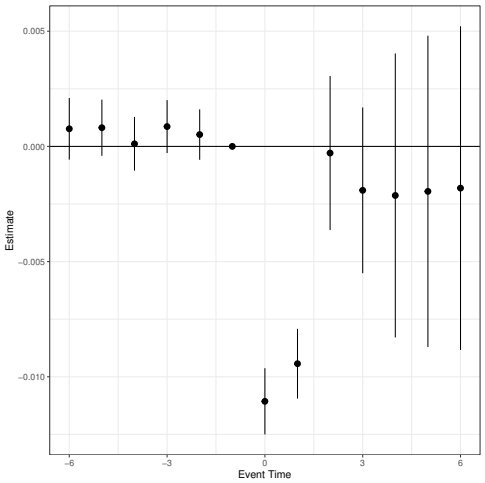

(a) Impact of treatment on the probability of choosing the AC form of cooperation.



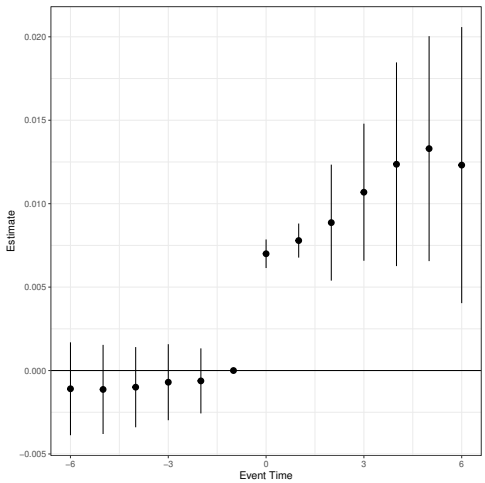

(b) Impact of treatment on pc municipal grants.



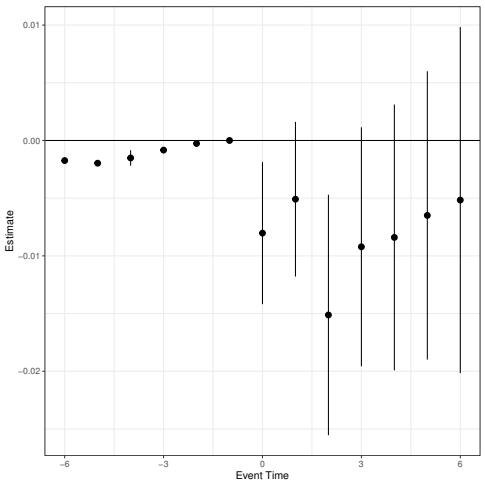

(c) Impact of treatment on pc total tax revenues.




(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.

we show that high levels of intermunicipal cooperation lead to a significant and persistent decline in voter turnout, even after the introduction of direct suffrage for intermunicipal councils. This finding underscores the political costs of integration: when responsibilities and fiscal control are transferred to higher governance levels, citizens feel disconnected, leading to reduced democratic engagement.

This study raises important questions for policymakers. While intermunicipal cooperation may deliver economic efficiencies, our results suggest that such benefits can come at the expense of democratic legitimacy. Governments considering similar reforms should carefully weigh these trade-offs and explore complementary measures, such as enhancing transparency and citizen participation, to mitigate the political costs.

Further research should be done on how integration might also affect the supply side, i.e. political competition and the entry decisions of local politicians. Indeed, surveys conducted by CEVIPOF (see Foucault, 2020) show a growing dissatisfaction of French mayors in 2020, who decided not to run again. The impact of this renewal in the candidates is likely to have an impact on voter turnout. As shown by Cassette et al. (2013), voter fatigue, the erosion of power and a better knowledge of incumbents' preferences may decrease voter turnout.

# 7 Acknowledgements

This research was partly funded by the project Citizens from the French Agence Nationale de Recherche (ANR-22-CE26-0019).

# A Appendices

## A.1 Election process

The election process depends on the size of the municipality. For municipalities with less than 1,000 inhabitants, the election of municipal councillors 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 with a majority bonus. The election of councilors follows a list system in two rounds with proportional representation: candidates are presented in complete lists. [13]

After a specific law in 2014, the IMC councillors 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.

## A.2 Manipulation of the threshold

The likelihood of municipalities manipulating the 50,000 population threshold by increasing the number of inhabitants appears to be very low. Evidence indicates that only 16 IMC crossed this threshold (see Appendix Table A1 and Appendix Figures 2-3). However, not all of these cases involved an enlargement of the IMC, and many are excluded from the final dataset due to the balancing required when incorporating other variables.

These 16 IMCs that crossed the 50,000 population threshold represent approximately 0.6% of the initial dataset and only 0.2% of the final dataset used (indeed, only IMC 242900694 is present in the final dataset). Among these, several examples illustrate varied population growth trajectories (see Appendix Table A1):

— IMC 249100546 increased its population by incorporating new municipalities, growing from 43,981 in 2003 to 60,684 in 2019. It crossed the threshold but did not achieve AC status (see Figure 2a). The same applies to IMC 248100380, IMC 244400503, and IMC 243400520.

— IMC 248900334 expanded and grew from 41,224 in 2002 to 60,379 in 2019, becoming AC in 2016 (see Appendix Figure 2b). Similarly, IMC 248300394 and IMC 247800600 became AC in 2015; IMC

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

Table A1 – IMCs that are potentially subject to manipulation of the population threshold over the observed period

| IMC code | IMC pop. (first year) | IMC pop. (last year) | First year | Last year | Become AC (year) |
|---|---|---|---|---|---|
| 249100546 | 43981 | 60684 | 2003 | 2019 | Never |
| 248900334 | 41224 | 60379 | 2002 | 2019 | 2016 |
| 248300394 | 28956 | 62072 | 2002 | 2019 | 2015 |
| 248100380 | 35760 | 52433 | 2000 | 2016 | Never |
| 247800600 | 37083 | 57723 | 2004 | 2016 | 2015 |
| 246800247 | 40565 | 54004 | 2000 | 2016 | 2016 |
| 244400503 | 20467 | 62337 | 2000 | 2019 | Never |
| 244000865 | 45323 | 66114 | 2003 | 2019 | Never |
| 243800778 | 44554 | 53098 | 2000 | 2018 | Never |
| 243500741 | 40542 | 68537 | 2000 | 2019 | 2018 |
| 243400520 | 41757 | 50240 | 2000 | 2019 | Never |
| 243301504 | 48159 | 66632 | 2004 | 2019 | 2018 |
| 242900694 | 30829 | 57117 | 2000 | 2019 | 2016 |
| 200040574 | 47612 | 53111 | 2014 | 2019 | Never |
| 200040442 | 47605 | 56156 | 2014 | 2019 | 2017 |
| 200017846 | 35813 | 54511 | 2009 | 2019 | 2016 |

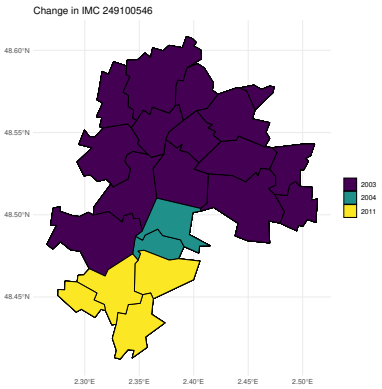
246800247, IMC 242900694, and IMC 200017846 in 2016; IMC 200040442 in 2017; and finally, IMC 243500741 in 2018.

— IMC 243301504 rose from 48,159 in 2004 to 66,632 in 2019 without incorporating new municipalities and became AC in 2018 (see Appendix Figure 3c). Similarly, IMC 244000865, IMC 243800778, and IMC 200040574 increased their populations without expanding and becoming AC.

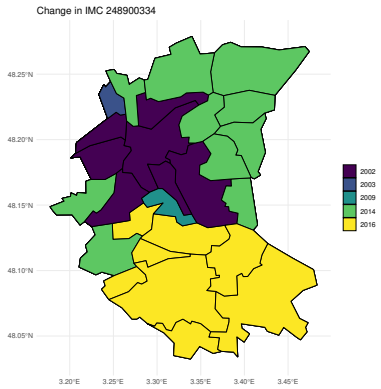
These cases demonstrate that while some IMC incorporated new municipalities to surpass the threshold, not all transitions were linked to becoming AC. Out of the 16 IMC that passed the threshold, eight eventually achieved AC status, but only one of these is present in our final dataset. Therefore, the limited representation of these IMC in our final dataset, due to necessary balancing, further minimizes any potential bias from manipulation.

Thus, the manipulation of the population threshold is both numerically and practically marginal, ensuring the robustness of our instrumental variable approach.

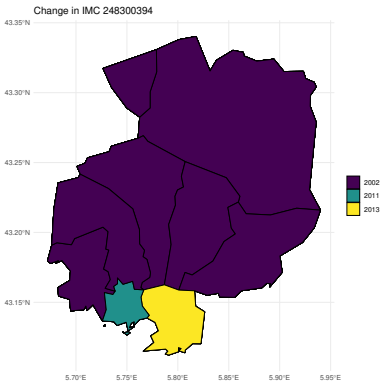
FIGURE 2 – Temporal evolution of the IMCs that are potentially subject to threshold manipulation



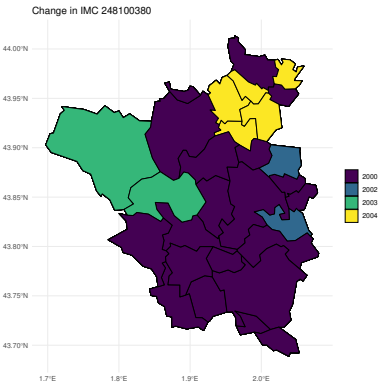

(a) Never AC



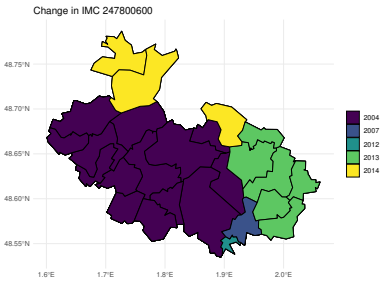

(b) AC in 2016



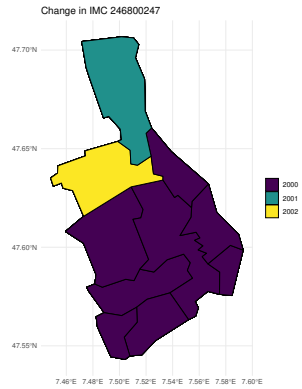

(c) AC in 2015



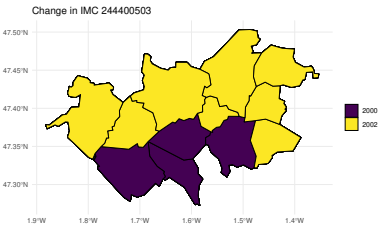

(d) Never AC



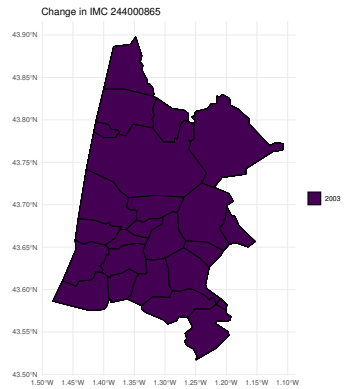

(e) AC in 2015



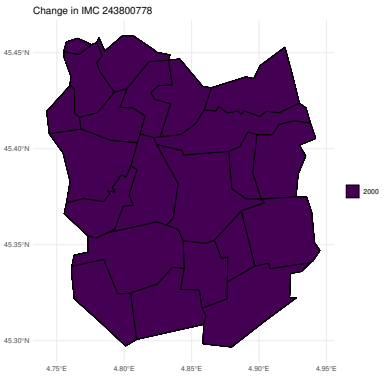

(f) AC in 2016




(g) Never AC

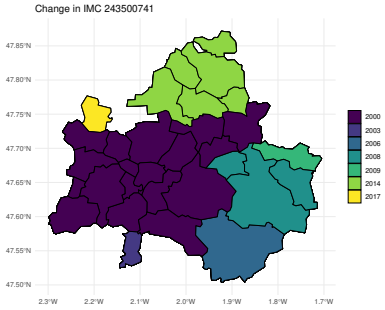



(h) Never AC

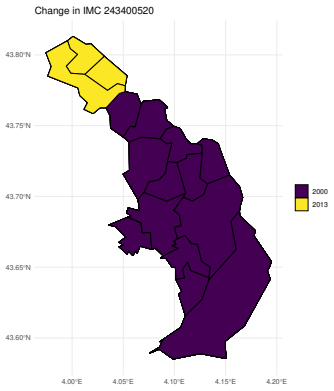



(i) Never AC

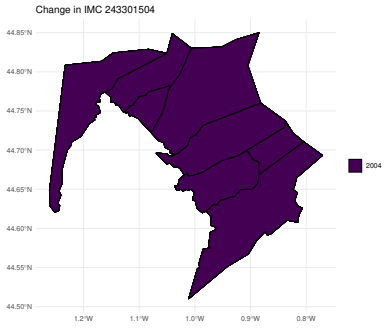
FIGURE 3 – Temporal evolution of the IMCs potentially subject to threshold manipulation.



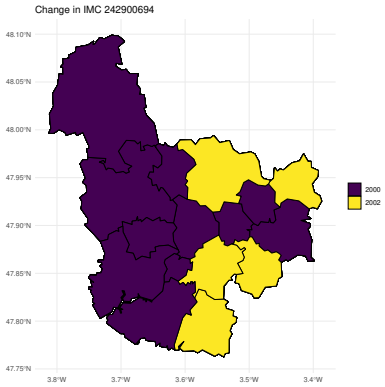

(a) AC in 2018



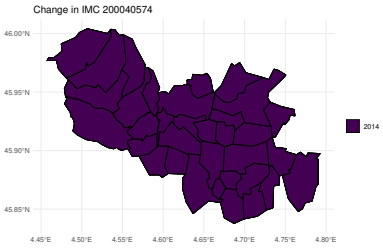

(b) Never AC



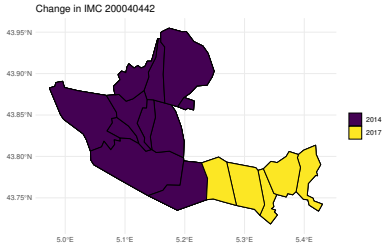

(c) AC in 2018



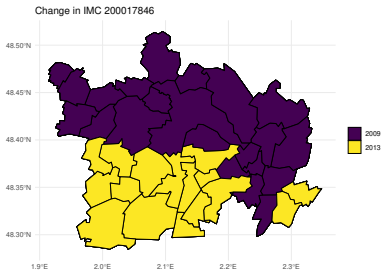

(d) AC in 2016




(e) Never AC




(f) AC in 2017




(g) AC in 2016

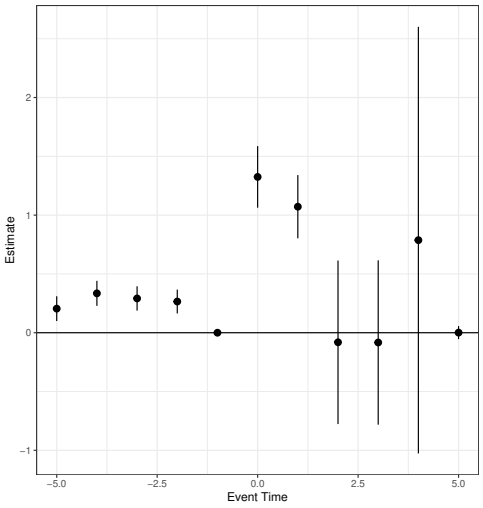
TABLE A2 – Number of municipalities becoming treated (exceeding the IMC population threshold or becoming an AC) each year. *Inf* refers to never treated municipalities. 2002 are already treated.

| 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 |

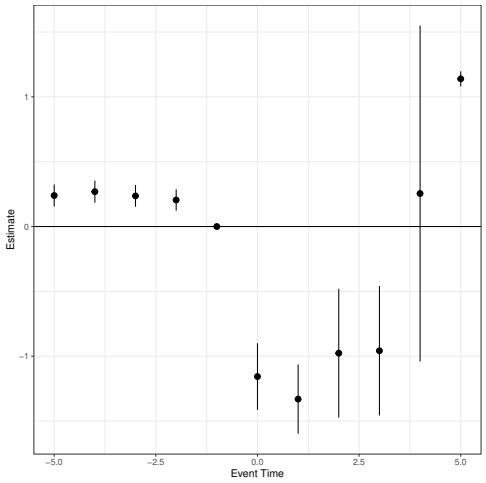
TABLE A3 – Descriptive statistics on municipal characteristics and elections in 2001, 2008 and 2014. Income, grants and revenues are expressed in 1,000 EUR per capita.

| | 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 | | | |

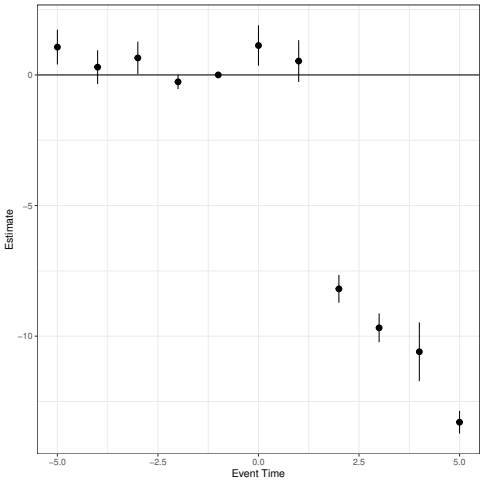
FIGURE 4 – Callaway and Sant'Anna (2020) estimation of the treatment (belonging to an IMC with more than 50,000 inhabitants) on different outcomes. Bars represent 95% confidence intervals calculated with IMC clustered standard errors.




(a) Impact of treatment on pc housing tax revenues at IMC level.




(b) Impact of treatment on pc property tax revenues at IMC level.




(c) Impact of treatment on pc business tax revenues at IMC level.

TABLE A4 – 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 A5 – 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 A6 – Estimation of the second stage of the IV of Eq. (2) controlling for covariates. IMC clustered standard errors in parentheses. 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 A7 – Estimation of the second stage of the IV 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 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

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