# Mayoral partisanship and city size heterogeneity

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# Introduction
## General context

Voter turnout is an essential indicator of the quality of a democracy (Schmitter 2004). However, voter turnout has declined worldwide from 76% in the late 1980s to 66% in 2011 (Solijonov 2016; Kouba, Novák, and Strnad 2021):

- Voter turnout declines with each election in France:

  $\hookrightarrow$ From 67.4 % in 2001 to 44.7% in 2020 for the municipal (and intermunicipal) elections

  $\hookrightarrow$ From more than 60% in 2004 to 35% in 2021 for regional and departemental elections.

$\hookrightarrow$ Since government **budget transparency** is directly linked with an **increase in participation** (Benito and Bastida 2009), understanding the **effects of partisanship on local public expenditures** may invigorate voter turnout.

## Introduction
### Literature Review

*Existing literature has shown mixed evidence of the effects of partisanship on local budgets.*

- **Some authors emphasize the role played by political parties in economic outcomes** (Pettersson-Lidbom 2008; Le Maux, Rocaboy, and Goodspeed 2011; Gerber and Hopkins 2011; de Benedictis-Kessner and Warshaw 2016; Beland and Oloomi 2017; Hill and Jones 2017)

- **Others highlight the lack of partisanship effects on public expenditures** (Ferreira and Gyourko 2009; Leigh 2008).

↪ Ferreira and Gyourko (2009) and de Benedictis-Kessner and Warshaw (2016) analyse partisanship effects in U.S. municipal elections (with almost the same database) but reach contradictory results.

↪ The main difference between these studies is the lower bound on city size (75,000 population with partisan effects versus 25,000 population with no effects)

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# Introduction
## Literature Review

The impact of political parties may **differ by population size**, which interacts with local public expenditures through **economies of scale or economies of sharing**

- Buettner, Schwager, and Stegarescu 2004; Breunig and Rocaboy 2008; Buettner and Holm-Hadulla 2013.

The literature also highlights the effects of **density** on public expenditures

- Ladd 1992; Holcombe and Williams 2008; Breuillé et al. 2020.

$\hookrightarrow$ Focusing on the average effect of political parties is therefore incomplete and masks many heterogeneous mechanisms.

## Introduction
Contribution

- Analysis of the **causal effect** of partisanship on public expenditures at the French *commune* (Municipality) level after the 2008 elections

  ↪ In France, studies show *correlations* (see Le Maux, Rocaboy, and Goodspeed (2011), Foucault, Madies, and Paty (2008))

- We use a **Regression Discontinuity Design** (RDD) based on the continuity assumption

  ↪ Less hypothesis are required than the random assignment assumption broadly used in the literature (de la Cuesta and Imai 2016)

- Robust investigation of **heterogeneous treatment effects using clustering algorithms**

  ↪ Shed light on the role of size and density not addressed in the literature
  ↪ With more than 35,000 municipalities, **France is an ideal field of investigation** to study this heterogeneity.

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## Institutional Background

- There are almost 36,000 (in 2008) *communes* in France

  ↪ They are the first level of democracy in the territory, followed by inter-municipal groups, *départements* and regions.

- A municipal council headed by a mayor is elected each 6 years

  ↪ Some competencies: security (municipal police), urban planning, education (elementary school), sports (infrastructure), culture (libraries).

- French *communes* have different obligations depending on their size

  ↪ Cities with more than 3,500 inhabitants have to break down their expenses by spending areas.

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## Data
### Municipal Data

*We select municipalities of more than 3,500 inhabitants. We focus on the 2008-2014 municipal mandate (Political boundaries for the 2014 and 2020 elections are less clear-cut).*

- Municipal electoral data of 2008 for cities with +3,500 inhabitants from the Ministry of Home Affairs

  $\hookrightarrow$ We exclude far right, far left and centrist parties

- Public Expenditures for cities with +3,500 inhabitants during the 2008-2014 period (one term) from DGFIP

- Socio-economic characteristics for municipalities with +3,500 inhabitants during the 2002-2007 period from INSEE

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# Data
## Classification of political parties

Table: Classification of political parties

| Code | Signification | Number of elections won | Classification |
|------|---------------|------------------------|----------------|
| LEXG | Liste d'extrême gauche | 0 | |
| LCOM | Liste du Parti Communiste | 55 | |
| LUG | Liste d'union de la gauche | 552 | |
| LSOC | Liste du Parti Socialiste | 337 | Left |
| LVEC | Liste des Verts | 0 | |
| LDVG | Liste divers gauche | 370 | |
| LGC | Liste gauche-centristes | 50 | |
| LAUT | Autre liste | 14 | |
| LREG | Liste régionaliste | 3 | |
| LCMD | Liste centre-MoDem | 30 | |
| LMC | Liste majorité-centristes | 61 | |
| LMAJ | Liste de la majorité (UMP) | 584 | Right |
| LDVD | Liste divers droite | 647 | |
| LFN | Liste du Front National | 0 | |
| LEXD | Liste d'extrême droite | 0 | |

*Source:* Cevipof modified by the author

# Data
## Territory coverage

Figure: Territory coverage of our sample



■ Election lost by left-wing parties  ■ Election won by left-wing parties

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# Data
## Description

Table: Spending items

| Spending Item |
| --- |
| General services |
| Security |
| Education |
| Culture |
| Sports and youth |
| Social and public health |
| Family |
| Housing |
| Urban planning and environment |
| Economic action |
| Total expenditures |

- The credibility of these variables (except for total expenditures) is correlated with the size of the municipality.

  ↪ If we assume that the transcription error is random, the RDD allows us to interpret the coefficients, despite noisy results.

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## Data

Our sample do not contain all French municipalities with a population of more than 3,500 inhabitants :
we need to have a direct confrontation between right and left.

Table: Sample Descriptive Statistics

| | Our Sample (N=1,593) | | | | All French Cities (N=2,647) | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| | Min | Mean | Max | | Min | Mean | Max |
| Population | 3394.5 | 14290.47 (22400.72) | 347890.5 | | 1054 | 13899.04 (25209.17) | 472317.5 |
| Share of graduate of higher education | 5.26 | 21.04 (8.59) | 60.58 | | 5.13 | 21.13 (9.18) | 64.46 |
| Unemployment rate | 3.78 | 11.26 (4.19) | 30.4 | | 2.54 | 11.22 (4.29) | 30.4 |
| Share of social housing | 0 | 16.36 (11.64) | 71.09 | | 0 | 15.85 (11.75) | 71.09 |
| Share of 65+ years old in the population | 2.38 | 17.32 (5.33) | 40.09 | | 2.38 | 17.21 (5.42) | 40.95 |
| Median income | 9228.25 | 17663.6 (3385.75) | 34311 | | 599.58 | 17778.11 (3753.24) | 41495.5 |
| Number of municipalities in the inter-municipal cooperation | 0 | 16.86 (16.21) | 128 | | 0 | 16.89 (15.77) | 128 |
| General Operating Grant per capita | 73.18 | 237.58 (101.27) | 1142.75 | | 73.18 | 236.65 (106.86) | 1376.93 |

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# Research Design
## Regression Discontinuity Design

Figure: Difference in vote shares
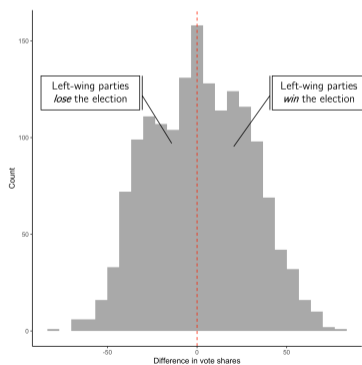


- The difference in vote shares between left-wing and right-wing parties will be used as the forcing variable.
  $\hookrightarrow Diff = V_L - V_R$

- $Diff > 0 \Leftrightarrow$ Left-wing parties win the election

- $Diff < 0 \Leftrightarrow$ Left-wing parties lose the election

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# Research Design
Regression Discontinuity Design - How does it work?

Figure: Regression Discontinuity Design
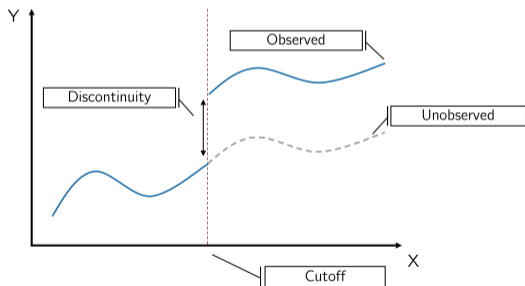


- If we assume that the conditional outcome Y is continuous, the discontinuity at the cutoff is equal to the average treatment effect.

  $\hookrightarrow$ Here it means that the same mayor will behave identically if he wins the elections with e.g. 55% or 56% of vote shares.
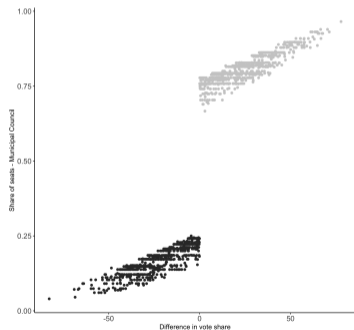
  $$\mathbb{E}(Y(1) - Y(0)|X = c) =$$

  $$\lim_{x \to c^+} \mathbb{E}(Y|X = x) - \lim_{x \to c^-} \mathbb{E}(Y|X = x).$$

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# Research Design
## Regression Discontinuity Design

Figure: RD plot



• Left-wing parties lose the election    · Left-wing parties win the election

- We build our forcing variable as the difference in vote shares: % left - % right

- Majority bonus in cities of +3,500 inhabitants: the list gathering the largest vote share gets automatically 50 % of the seats available.

  $\hookrightarrow$ A large discontinuity appears between candidates with $(50 - \epsilon)$% and $(50 + \epsilon)$% vote shares.

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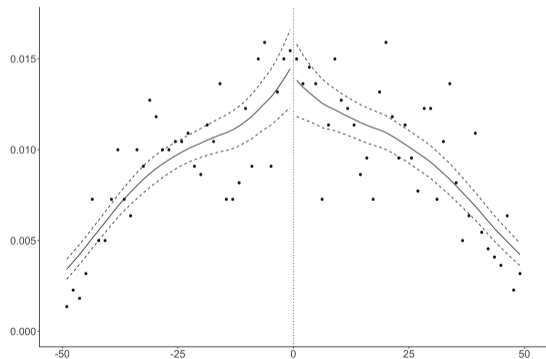# Research Design
Regression Discontinuity Design

- Regression Discontinuity Design (RDD) on the difference of vote shares with the continuity assumption.

  $\hookrightarrow$ Weaker than the random assignment assumption used in the literature (de la Cuesta and Imai 2016).

- Addition of covariates selected with post-lasso to increase efficiency.

  $\hookrightarrow$ The post-lasso is a two-step regularization less biased than the widely used lasso (Belloni and Chernozhukov 2013).

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# Research Design
Validation

- The RDD validity is conditioned by the absence of sorting mechanisms which invalidate the hypothesis of exogenous treatment.

  - In this context, this means that some candidates are more likely to be on one side of the cutoff than the other (e.g. incumbency).

- This result is confirmed by the McCrary test: with a p-value of 0.76, we cannot reject the null hypothesis of continuity of the forcing variable
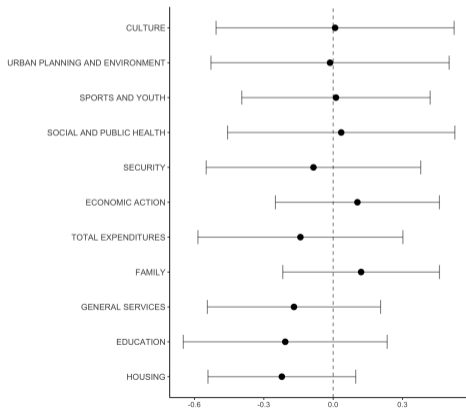
Figure: McCrary test

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# Research Design
## Validation



Figure: Placebo effect

- Assumption : Predetermined covariates should not be affected by the forcing variable at the cutoff

- Since we perform many tests, we use Benjamini-Hoschberg correction to control for false discovery rate.

- We cannot reject the null hypothesis of continuity at the cutoff of any of these predetermined covariates along the forcing variable.

  ↪ **The RDD is valid**

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## Results
### Main Results

#### Table: Partisanship effect on public local expenditures

| | Capital expenditures | | Current expenditures | |
|---|---|---|---|---|
| | Euros per capita | Percentage points | Euros per capita | Percentage points |
| General services | 2.375 | 0.128 | -5.406 | 0.125 |
| | (8.9) | (2.193) | (19.492) | (1.892) |
| Security | -2.44*** | -0.744*** | -9.374* | -1.093** |
| | (0.854) | (0.207) | (4.99) | (0.462) |
| Education | 8.976 | -0.562 | 2.777 | -0.406 |
| | (6.621) | (1.828) | (8.844) | (0.798) |
| Culture | 6.745 | -0.244 | 6.069 | 0.331 |
| | (5.573) | (1.735) | (7.941) | (0.716) |
| Sports and youth | -0.426 | -1.968 | 2.693 | 0.122 |
| | (8.32) | (1.943) | (7.062) | (0.64) |
| Social and public health | 0.288 | -0.239 | 0.906 | 0.181 |
| | (2.11) | (0.543) | (4.716) | (0.459) |
| Family | 3.69** | 0.766 | 7.68 | 0.602 |
| | (1.831) | (0.69) | (7.857) | (0.739) |
| Housing | 0.129 | -0.349 | -0.093 | -0.1 |
| | (1.781) | (0.481) | (1.852) | (0.201) |
| Urban planning and environment | 30.219*** | 4.12 | 7.853 | 0.577 |
| | (11.71) | (2.76) | (12.589) | (1.204) |
| Economic stimulus | 0.14 | -0.227 | -2.864 | -0.205 |
| | (2.144) | (0.525) | (3.814) | (0.243) |
| Total expenditures | 65.48*** | | 3.744 | |
| | (22.455) | | (28.427) | |

\* Significant at 10%
\*\* significant at 5%
\*\*\* significant at 1%

# Results
## Heterogeneity

*Is it relevant to compare partisanship effects in a large city such as Lille, Bordeaux or Dijon with those in a small municipality of 3,500 inhabitants?*

- We build several clusters of French *communes* on city size and density
  - ↪ clusters are formed with a data-driven method to avoid endogeneous thresholds.

- I perform a k-means clustering on the logarithm of city size and density (Hartigan and Wong 1979).
  - ↪ Following the Calinski-Harabasz criterion, two clusters are created (Calinski and Harabasz 1974)

- Unsurpervised method
  - ↪ Easy interpretation and reproducible

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## Results
Heterogeneity - Clusters

Table: Cluster characteristics

| | Cluster 1 ($N = 1,231$) | | | Cluster 2 ($N = 499$) | | |
|---|---|---|---|---|---|---|
| | Min | Mean | Max | Min | Mean | Max |
| Population | 3015.5 | 6878.01 (3211.72) | 27658.5 | 7644.5 | 36567.36 (41055.92) | 438584 |
| Density | 5.79 | 27.25 (12.54) | 99.22 | 17.6 | 80.4 (58.66) | 573.25 |
| Proportion of left-wing municipalities | | 0.53 (0.5) | | | 0.52 (0.5) | |

*Notes:* Standard deviations are in parentheses. Columns (2) and (5) report the mean and standard deviation for each variable.

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# Results
## Heterogeneity - Clusters



Figure: Population and density of clusters
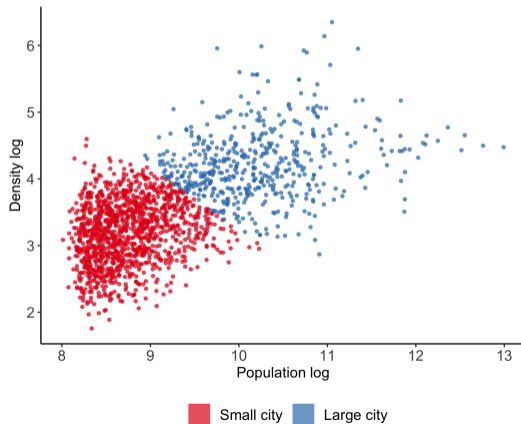
# Results
## Heterogeneity

Table: Heterogeneous partisanship effects on local public expenditures

| | Small municipalities | | | | Large municipalities | | | |
|---|---|---|---|---|---|---|---|---|
| | Capital expenditures | | Current expenditures | | Capital expenditures | | Current expenditures | |
| | Euros per capita | Percentage points | Euros per capita | Percentage points | Euros per capita | Percentage points | Euros per capita | Percentage points |
| General services | 12.61 | 1.884 | -20.531 | -0.501 | -9.588 | -6.141** | -2.659 | -1.251 |
| | (11.819) | (3.083) | (22.396) | (2.391) | (11.454) | (2.654) | (38.028) | (3.405) |
| Security | -2.24* | -0.58** | -12.702** | -1.526*** | -2.479*** | -1.151*** | 0.607 | -0.627 |
| | (1.277) | (0.277) | (5.667) | (0.507) | (0.893) | (0.33) | (10.334) | (0.962) |
| Education | 7.114 | -0.923 | -3.137 | -0.818 | 28.107** | 4.071 | 9.118 | 0.986 |
| | (7.858) | (2.277) | (9.417) | (0.971) | (13.406) | (3.138) | (14.943) | (1.271) |
| Culture | 8.01 | 0.677 | 8.02 | 0.323 | -1.38 | -1.428 | 2.935 | 0.321 |
| | (7.497) | (2.29) | (7.795) | (0.779) | (6.941) | (2.08) | (15.013) | (1.217) |
| Sports and youth | -2.988 | -2.217 | 9.563 | 0.188 | 5.797 | 1.231 | 2.44 | -0.073 |
| | (9.599) | (2.491) | (8.326) | (0.725) | (7.013) | (1.524) | (15.29) | (1.159) |
| Social and public health | -2.139 | -0.631 | 3.632 | 0.421 | 2.727 | 0.454 | 1.59 | 0.002 |
| | (1.807) | (0.456) | (6.645) | (0.637) | (4.834) | (1.469) | (8.839) | (0.846) |
| Family | 5.32** | 1.194 | 7.346 | 0.601 | -0.04 | -1.194 | -2.687 | -0.923 |
| | (2.42) | (0.874) | (8.03) | (0.812) | (2.097) | (0.84) | (14.142) | (1.164) |
| Housing | -1.539 | -0.62 | 0.076 | -0.137 | 5.61 | 0.588 | -0.007 | -0.158 |
| | (1.757) | (0.517) | (2.494) | (0.242) | (3.685) | (0.855) | (3.742) | (0.371) |
| Urban planning and environment | 22.393 | 1.393 | -0.031 | 0.433 | 40.314** | 5.574 | 12.508 | 0.935 |
| | (15.25) | (3.438) | (14.835) | (1.556) | (16.617) | (3.582) | (19.192) | (1.547) |
| Economic stimulus | 1.086 | -0.026 | -0.239 | 0.033 | -0.539 | -0.592 | -6.065 | -0.584 |
| | (2.597) | (0.503) | (4.043) | (0.252) | (3.522) | (1.061) | (6.218) | (0.408) |
| Total expenditures | 50.595** | | 10.927 | | 66.643* | | 6.58 | |
| | (25.16) | | (34.281) | | (39.911) | | (44.469) | |

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## Conclusion

**On average**

- Partisanship effects on capital expenditures are large in average for all French cities of more than 3,500 inhabitants.

- Partisanship effects on current expenditures concern only security

**Heterogeneous treatment effects**

- Partisanship effects for both small and large municipalities.

- Effects on investment are substantial for large municipalities

- There are partisanship effects on current expenditures only in small municipalities

$\hookrightarrow$ Further research should investigate the effects and heterogeneity of the local public spending and assess their efficiency in terms of criminality, education success and territory attractiveness.