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Is Now the Turn for the Youth?  
An Empirical Analysis of Young Spanish Mayors'  
Influence on Welfare Policies

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## **Abstract**

The goal of this research is to explore whether age becomes a determinant for the policy preference of mayors of Spanish municipalities, particularly in light of the global ageing demographic trend. Relying on political competition models that predict the preferences of electoral candidates, this study hypothesises the plausible relation between younger political leaders and higher expenditure preferences for age-related welfare programs, such as long-term care and preschool. This framework allows for the implementation of a Regression Discontinuity Design (RDD) as the preferred empirical method. Specifically, a close-election *fuzzy* RDD is employed to focus on the quasi-random variation of the winner's election in closely contested mixed races. Using administrative data from the municipal terms between 2007 and 2015, the study finds no evidence that mayors younger than the median age of the voting population have higher preferences for these welfare policies compared to their older counterparts.

## **Acknowledgements**

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# 1 Introduction

The consolidation of the welfare state post-World War II significantly increased the role of the government in society, aiming to maximise the preferences of their citizens. While this paternalistic motive has improved many lives, it has also resulted in higher taxes to sustain public services. In a context where the balance between beneficiaries and contributors may be hampered by an ageing society and low fertility rates, the question arises: will public finances remain sustainable in the long run if current welfare policies persist?

In Europe, the expansion of welfare has led to increased life expectancy, causing an upward shift in the age distribution towards older demographic (ECFIN, 2024). This demographic shift has also influenced the policymakers themselves, potentially leading to intergenerational conflicts that could impact our democracies (Tepe and Vanhuyse, 2009). In a society where the young are increasingly disenfranchised relative to the old, there is a concern that older politicians might prioritise policies that secure the vote of their age group. Although existing literature has often focused on the influence of gender or ethnicity on politician's policy preferences (e.g., Chattopadhyay and Duflo, 2004), the role of age remains somehow unexplored. Therefore, this study aims to dismantle the plausible impact of politicians' age on the allocation of public expenditures, particularly concerning age-related welfare policies such as long-term care and preschool education.

Spain is chosen as the setting for this study for various reasons. Firstly, Spain is experiencing a rapid and prolonged ageing process compared to its European neighbours. Projections indicate that by 2037, Spain's baby boom generation will account for 26% of the population aged 65 and above (INE, 2022).<sup>1</sup> This large share of retirees will have a prolonged impact due to the country's high life expectancy.<sup>2</sup> However, while mortality rates are expected to decline, fertility rates are projected to continue their negative trend.<sup>3</sup> Additionally, the aftermath of the Great Recession and country-specific factors have resulted in high youth unemployment, which remains the highest in the European Union (EU) despite some improvement over time (Eurostat, 2024c). This growing elderly population, coupled with a declining labor force, will negatively affect the old-age dependency ratio increasing from 33% in 2022 to a projected peak of 64.5% by 2054 (Deboeck, 2023).

Although these figures are based on forecasts, the initial consequences of this demographic transition are already evident in public expenditures patterns. For instance, gross public pension expenditure accounts for 13.1% of GDP and is expected to rise to 17.3% by 2050 (Deboeck, 2023). This critical situation rises questions about how politicians will manage these challenges. How will they increase labor productivity to sustain economic growth when labour force is shrinking

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<sup>1</sup>Baseline projections on the old-age dependency ratio (population 65 years or over to population 15 to 64 years) will be the fourth highest in the EU from 2040 to 2095. Only Malta, Lithuania, and Italy have higher forecasts (Eurostat, 2024a).

<sup>2</sup>United Nations' projections estimate that by 2064 Spain will have the second highest life expectancy in the world after Japan (UN, 2024).

<sup>3</sup>As per Eurostat data, the fertility rate in Spain in 2024 is 1.19 live births per women, 0.40 percentage points below the EU average (Eurostat, 2024b).

and investment in human capital is insufficient?<sup>4</sup> How will the government ensure an efficient allocation of resources when almost 40% of the public budget is devoted to the pension system?<sup>5</sup>

This study aims to address these broad questions by focusing on the impact of mayors' age in Spanish municipalities on the allocation of public funds. Specifically, it analyses whether younger mayors (i.e., those under the median voting-age population) influence public expenditures on the two municipal age-related welfare-programs: long-term care and preschool programs. The study employs a theoretical framework that raises hypotheses based on political competition models and the influence of politician's characteristics to investigate this potential causal effect.

Using budget, electoral, and demographic data collected from Spain's Ministries of Finance, Interior and Territorial Policy, I analyse the plausible effects of these mayors on the allocation of funds to these social programs. An eight-year panel data has been created, covering the municipal terms of 2007 to 2015, which includes the main descriptive statistics necessary for empirical analysis. To evaluate the relation of interest, I employ a Regression Discontinuity Design (RDD) as the preferred identification strategy. By simulating Lee (2008)'s close-election RDD design, I draw empirical conclusions from the variation derived from vote shares in narrowly contested municipal elections. Focusing on mixed races where a young candidate won against an old candidate by a small vote share margin, I aim to elucidate the impact of younger candidates' policy preferences once they reach office. The main results of the study, however, show no evidence that young mayors are more likely to implement age-related policies. The reported point estimates are relatively low and consistently statistically insignificant, suggesting that there is no difference between old and young mayors in their likelihood to allocate public funds toward the analysed welfare programs. Additional sensitivity analyses are conducted to reinforce the credibility of these findings.

The remainder of this paper is structured as follows: Section 2 gives the institutional context of the local governments and describe the relevant welfare policies. Section 3 develops the theoretical framework introducing the model analysing the effects derived from an increase in the representation of younger politicians. Subsequently, existing literature on this topic is explored in Section 4. The data for the empirical analysis is described in Section 5. Section 6 presents the empirical strategy. Results are illustrated in Section 7. Section 8 analyses the robustness of the main results. Section 9 concludes.

## 2 Institutional Context

This sections contains an overview of Spain's municipal government, the role of the mayor and the local electoral system. It concludes with a discussion on the two primary welfare policies aimed at addressing the challenges of an ageing population.

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<sup>4</sup>In 2020, Spain's total annual public and private expenditures in education were below those of the OECD and EU25 (MEFP, 2023, p.83), and these expenditures have remained unchanged from 2015 to 2020 (OECD, 2020, p.170).

<sup>5</sup>Figures related to the 2023 government budget can be found here: <https://www.sepg.pap.hacienda.gob.es/sitios/sepg/es-ES/Presupuestos/PGE/PGE2023/Paginas/Presupin.aspx>.

## 2.1 Local Government and Electoral System

Spain has more than 8,000 municipalities, each governed by local councils, the smallest entities in the public administration hierarchy. Despite their size, these councils manage 15% of total public expenditures, accounting for 6% of Spain’s GDP (Bagues and Campa, 2021). They also levy various taxes, such as property taxes, to fund their services.<sup>1</sup> Local governments are formed by councillors from the political parties that secured seats in the council. Nonetheless, the key role in these governing bodies is played by the mayor (Navarro Gómez et al., 2017).

According to the law regulating the legal framework of the municipalities, mayors serve as the president of the local corporations.<sup>2</sup> They are responsible for the promotion of the municipal services and have the capacity to incur expenses within the approved municipal budget. Often, these political leaders have been characterised as strong decision-makers who set the political agenda and propose new initiatives and regulations for council approval (Sweeting, 2009). For instance, a recent survey collecting data from mayors from Spanish municipalities with more than 10,000 inhabitants revealed that among their top priorities include ensuring the quality of the local services, with the implementation of social policies being one of their main tasks during their terms.<sup>3</sup>

Local councils under the rule of these leaders have a term limit of four years, after which local elections are held simultaneously across all municipalities. The electoral system varies depending on the municipality’s size. Municipalities with fewer than 250 inhabitants use an open-list system where voters choose directly their preferred candidates, regardless of their party affiliation. In contrast, municipalities with more than 250 inhabitants employ a closed-list proportional system.<sup>4</sup> This system is “closed” because voters select parties rather than individual candidates and is “proportional” because seats in the local government are allocated based on the D’Hondt method with a 5% threshold for representation (Alba and Navarro, 2003).<sup>5</sup>

The mayors are not elected directly under this system. Instead, once the elected candidates of the different parties form government, they appoint the mayor of the council. The exception to this rule is given when the party with the majority of the votes hold the majority of the seats in the council. In such case, they are entitled to elect as mayor the candidate listed first.<sup>6</sup> However, if no party has a majority, a coalition period takes place where first-in-the-list candidates must secure council support to be elected as mayor.<sup>7</sup>

A common characteristic of elected Spanish mayors is their age. Tightly linked to the ageing trend, these political figures tend to be relatively old on average (see Figure 2.1 (a)). The flagrant lack of youth presence in the local government is persistent over time, with their share

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<sup>1</sup> Approximately 55% of local budgets come from taxes levied by the municipality itself (Sweeting, 2009).

<sup>2</sup> Article 21, Ley 57/2003 de medidas para la modernización del gobierno local.

<sup>3</sup> For more information about the research and survey, see the study by Heinelt et al. (2018).

<sup>4</sup> Ley Orgánica 5/1985 del Régimen Electoral General.

<sup>5</sup> D’Hondt method assigns seats in the local council based on the proportion of votes gained by each party in the municipal elections. A minimum of 5% of votes is required for a party to obtain a seat in the council.

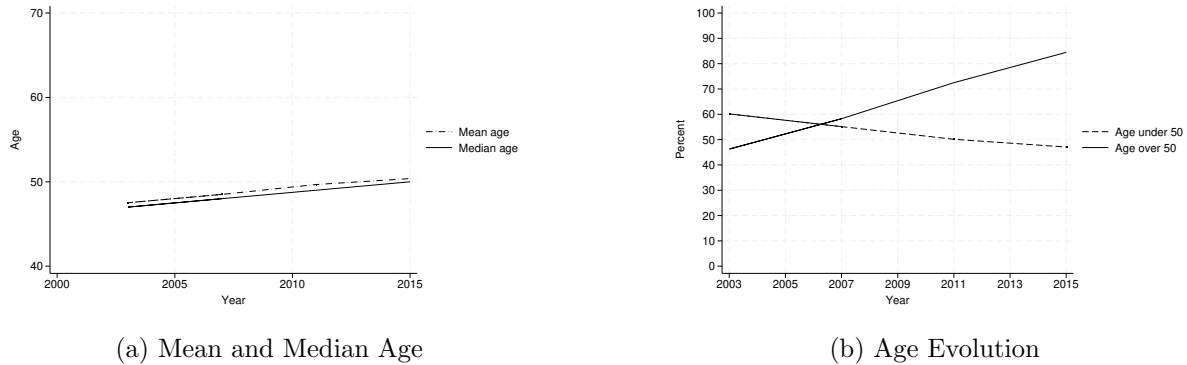
<sup>6</sup> In the 2007 and 2011 municipal elections, the People’s Party (PP) and the Spanish Socialist Workers’ Party (PSOE), the two predominant political parties, won absolute majorities in approximately 35% and 25% of the 8,131 Spanish municipalities, respectively (<https://resultados.elpais.com/elecciones/2007/municipales/>).

<sup>7</sup> Political parties decide the order of their candidates on the list. Based on the number of seats allocated and the number of votes received, the candidates will enter the local government following the preference order chosen by the party. In most cases, the candidate listed first by the party is appointed as the mayor, but the final decision is made by a vote within the newly elected municipal council.



compared to their older colleagues diminishing even further in recent decades. Figure 2.1 (b) illustrates how the percentage of mayors with age above 50 has increased 30 percentage points from 2003 to 2015, while the percentage of mayors with age under 50 have decreased over the same period of time by roughly 10 percentage points. Some authors argue that factors such as the stereotype of inexperience or the psychological biases favouring cultural norms may explain this underrepresentation of the youth (Stockemer et al., 2023).

Figure 2.1: Trends in Mayors' Age



*Note:* Figure (a) illustrate the mean and median age of Spanish mayors during municipal terms 2003 to 2015. Figure (b) shows age trend in percentage points of Spanish mayors aged above or below 50 during municipal terms 2003 to 2015. *Sources:* Ministry of Territorial Policy and Democratic Memory (MPT). Graphs created by the author.

## 2.2 Ageing Costs

Municipalities have own and delegated competencies. Services such as public lightning, waste collection or street cleaning are provided by all kind of municipalities irrespective of the size of their population.<sup>8</sup> Nonetheless, upper administrative levels can delegate the autonomy to the local government in managing the provision of welfare programs. Notably, the rise of social inequalities derived from the change in demographics have fostered the approval and delegation of certain expenditure programs at the municipal level. In this study, we focus primarily on two: long-term care (LTC) and preschool programs.

### 2.2.1 Long-Term Care

One of the most influential welfare policies arising from the ageing phenomenon and its further impact on the Spanish health care system is detailed in the Dependency Law or *Ley de Dependencia* (Law 39/2006). This Law aims to create a system promoting personal autonomy for the elderly and other dependent individuals, providing a safety net for those who are unable to care for themselves due to age, illness or disability. Some of the key features prescribed by this Law includes public funded provision and non-discriminatory universal access for all dependents to social services (Peña-Longobardo et al., 2016).

While regional governments control the provision and funding of these services, certain autonomy has been delegated to the local governments aiming to alleviate the duplicity of

<sup>8</sup>Article 26 of the Ley 7/1985, Reguladora de las Bases del Régimen Local.

competencies at the different administrative levels. In particular, through this Law the municipalities have the legal capacity to decide the amount of public expenditures they are willing to allocate towards social services programs such as services to dependent persons and social assistance, and creation and maintenance of nursing homes.<sup>9</sup>

Additionally, these programs have had an important effect on the younger segment of the population. For instance, a survey conducted by the Spanish Center of Sociological Research (CIS) on dependent individuals illustrated that primary caregivers tend to be their sons or daughters, providing care more than five days a week (CIS, 2014). Thus, these programs may also serve the purpose of alleviating the burden suffered by these individuals when taking care of their older relatives.

### **2.2.2 Preschool**

These demographic challenges have also impacted citizens' ability to balance work and family life. In addition to an ageing population, Spain has been subject to a sharp decline in fertility rates in recent decades. This decline has been partly motivated by the incorporation of women to the labor market but also by the economic and societal circumstances affecting the country.<sup>10</sup>

Aiming to address these structural challenges, several policies have been implemented to facilitate childbearing among families. A particular one affecting the role of the municipalities is disposed in the Education Law (Law 2/2006), which grants local governments the discretionary capacity to participate in the planning of education and cooperation with the educational administration in the creation, construction and maintenance of public educational services.

This delegated capacity becomes crucial role when providing free preschool education. Despite first-stage primary school (for children aged 0-3 years) not being mandatory, municipalities have been tasked with various responsibilities to ensure accessibility and maintenance. Local governments alleviate some of the burden associated with childcare through short-term services such as parent support, after-school care or transportation facilities helping parents better balance their work and family responsibilities. Additionally, the local bodies ensure the maintenance of the education services by creating and renovating nursery schools (Macho, 2024).

## **3 Theoretical Framework**

The following section will draw on various theoretical predictions aiming to explain the plausible effects derived from the increase in the representation of younger politicians towards the size and the composition of social expenditures.

### **3.1 A Political Competition Model**

Initially, Downs (1957) described a model where democracy and the median voter theorem implied that political parties would offer similar platforms to secure electoral victory. Accordingly,

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<sup>9</sup>See article 29 from Orden EHA/3565/2008.

<sup>10</sup>Socioeconomic factors such as precarious temporary labor contracts, unaffordable housing, and unsatisfactory work-life balance are some of the main drivers of the sharp decline in fertility (Chislett, 2022).

the personal preferences of the politicians and their consequent policy stances had little influence, as the ultimate objective for political parties under this model is to achieve electoral success. However, later theoretical frameworks such as those advanced by Alesina (1988) and Besley and Coate (1997), challenged the Downsian propositions, illustrating that parties do not only compete for electoral victory but also care about the implementation of the policies aligned with their candidates' preferences and attributes. Expanding on Alesina (1988)'s citizen-candidate model, this study illustrates how the policy inclinations of parties competing in municipal elections may vary on constituencies characterised by a significant older electorate.

In line with Alesina's theoretical predictions, there are two competing political parties in the model with different preferences regarding policy variable  $l$  (e.g., primary education). The author denotes the party's policy preferences by the concept of 'bliss point', which represents the ideal or optimal level of the particular policy variable (e.g., increasing public expenditures in primary education). Furthermore, both parties share an identical discount factor  $q$  and attribute positive utility to electoral victory in the elections held at the beginning of each term  $t$ .<sup>1</sup>

In our model we have two political parties running for municipal elections. On the one hand, the *Youth's Party*, with mayoral candidate below the median voting-age population (VAP), emphasises policies tailored to appeal young voters and has a bliss point  $c$  towards policy  $l$  (e.g., has preferences towards increasing the expenditures in primary education). Thus, the party's objectives during the political campaign are represented by the following objective function:

$$U(l) = \sum_{t=0}^{\infty} q^t u(l) = - \sum_{t=0}^{\infty} \frac{1}{2} q^t (l - c)^2, \quad c > 0, \quad 0 < q < 1. \quad (3.1)$$

On the other hand, *Party for the Elderly*, positioned second among competitors, presents a mayoral candidate aged older than the median VAP, known for advocating policies divergent from *Youth's Party*. Specifically, this party focuses its campaign on promoting policies that could capture the votes from elderly voters, thus normalising the bliss point of policy variable  $l$  at zero. In this case, their objective function will be defined as follows:

$$V(l) = \sum_{t=0}^{\infty} q^t v(l) = - \sum_{t=0}^{\infty} \frac{1}{2} q^t (l)^2. \quad (3.2)$$

Furthermore, voters in this model are rational and forward-looking individuals, and have different preferences on  $l$ . They are informed about the objective functions and utility from both parties, and their voting decisions are based on rational expectations concerning the policies each parties would enact once elected.

Considering this setting, assume that during the electoral campaign the *Youth's Party* sets its preferred policy variable  $x_t$  (e.g., increasing the quality of primary education), whereas the *Party for the Elderly* chooses  $y_t$  (e.g., promoting better long-term care for the elderly). Moreover, voters form rational expectations of these policies ( $x_t^e$  and  $y_t^e$ ) before the elections. Given that electoral results are uncertain, for any given expectation in both policies, there is an associated

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<sup>1</sup>Note that in Alesina (1988)'s theoretical model, there is no distinction made between candidates and political parties.

probability of *Youth's Party's* victory equal to

$$P_t = P(x_t^e, y_t^e). \quad (3.3)$$

A key element from this electoral process is that each voter will cast their vote for the party that delivers “the policy closest to his own bliss point” (Alesina, 1988).<sup>2</sup> However, given that there is uncertainty about the distribution of the voter’s bliss points, in particular that of the median voter, *Youth's Party* must balance its preferred policy with the one proposed by the rival party to capture the votes of the median voters and, therefore, have higher chances of winning the elections. In other words, in an electoral setting where the two main political parties propose policies aimed at capturing the vote of age groups at the both ends of the VAP distribution, the party that (partly) converges with the policy proposed by the other political party will have a higher likelihood of capturing the votes of the middle voter and thus winning the electoral campaign.

**Hypothesis 1 (H1):** *Younger politicians are more likely to prioritise and implement policies that benefit younger populations while considering the preferences of older voters, particularly in constituencies with a higher proportion of older voters.*

### 3.2 Politician’s Time Horizons

Younger politicians bear a heavier fiscal burden stemming from the ageing population phenomenon. The increase in the retiree population translates into a higher old-age dependency ratio, yielding two direct effects (i) diminished contributions from a smaller workforce toward retirees’ pensions and (ii) an unsustainable trajectory that jeopardises the future pension prospects of current workers upon retirement. This trend, affecting a large portion of developed countries like Spain, is expected to influence the policy preferences of both old and young politicians.

In this context, I argue that younger politicians, given their longer time horizons, have a higher propensity to allocate public funds in long-term policies that can act as investments benefiting the younger generations, such as fostering human capital through increases in primary education expenditures (Heckman, 2000). Conversely, their older counterparts are more inclined to favor short-term policies that could satisfy the needs of their demographic cohort, potentially at the expense of long-term societal welfare.

To give shape and credibility to this argument, I will begin by introducing the main impediments to enacting long-term policy reforms, drawing briefly from sources outlined by Jacobs (2016) regarding the prevalence of “policy short-termism” among the legislators in developed countries. Subsequently, I will rely on the theoretical framework depicted by Alesina and Passarelli (2019) to establish a correlation between the age of politicians and the political behaviours perpetuating this phenomenon. In particular, I will illustrate how, in a context of policy status quo (i.e., when no policy reforms are undergone by government in office), younger voters are more willing to support policy reforms given their longer time horizons.

Upon assuming office, politicians face an inter-temporal dilemma, weighting the choice

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<sup>2</sup>A voter’s bliss point is the specific policy outcome that maximises their personal utility.

between maximising welfare today or investing in future societal benefits. Jacobs (2016) argue that legislators tend to outweigh immediate over long-term policies due to factors such as policy myopia, fragile political commitments, and opposition from influential societal groups.

The first factor is straightforward: voters tend to have poorer information about future conditions and policy outcomes, leading them to rationally vote for policies that can be evaluated in the near term. This psychological behaviour can be explained by the concept of ‘hyperbolic discounting’, where individuals prefer smaller immediate rewards over larger but uncertain future payoffs (Fang et al., 2006). Furthermore, uncertainty about the future coupled with the potential time inconsistencies in politician’s actions (i.e., when their policy proposals are not deployed when they reach office), may foster skepticism among voters regarding long-term policy commitments. Lastly, if implementing long-term policies incurs costs for well-organised societal groups, such as the retirees, the latter may resist such changes to protect their interests.

Despite the obstacles hampering the adoption of long-term policies, I contend that young politicians are less susceptible to this ‘inter-temporal dilemma’ compared to their older counterparts, primarily due to their longer residual lives.

To illustrate this, Alesina and Passarelli (2019) predict younger voters have a higher propensity to support policy reforms compared to old voters, as psychological factors that drive reluctance for change, such as loss aversion, impose a lesser burden for the individuals that have longer time horizons.

The authors present a model featuring a continuum of voters, each characterised by heterogeneous policy preferences  $t_i$ .<sup>3</sup> Society has to choose a policy  $p$  that is subject to benefits ( $B$ ) and costs ( $C$ ). Therefore, the (indirect) utility of individual  $i$  is expressed as:<sup>4</sup>

$$V(t_i, p) = B(t_i, p) - C(t_i, p) \quad (3.4)$$

Furthermore, the parameter  $p^s$  represent the status quo policy (i.e., the reference point for the voters or the current policy). An increase in the policy  $p > p^s$  entails both higher benefits and higher costs. These increased costs will generate a psychological experience of loss (i.e., loss aversion or  $\lambda$ ) in the individuals.<sup>5</sup> Consequently, when the policy is increased the individuals experience loss aversion equivalent to  $\lambda[C(t_i, p) - C(t_i, p^s)]$ , whereas when the policy is decreased  $p < p^s$  the psychological component is equivalent to  $\lambda[B(t_i, p^s) - B(t_i, p)]$ . Following the authors indications,  $\lambda$  is uniform across all individual  $i$ . Thus, incorporating loss aversion, the (updated) indirect utility function becomes:

$$V(t_i, p|p^s)$$

Therefore, the voter  $i$  will set his or her desired policy,  $p$ , according to the following rule:

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<sup>3</sup>Note that  $t_i$  reflects the type of voter and their policy preferences based on factors such as ideology, income, wealth or productivity.

<sup>4</sup>Following this equation, the authors assume that, for any  $p$  and  $t_i$ , the types of voters are indexed such that higher types bear lower marginal costs and/or enjoy higher marginal benefits from the policy (Alesina and Passarelli, 2019).

<sup>5</sup>This psychological behaviour is explained by the authors through the concept of *decomposability* (Tversky and Kahneman, 1991), whereby individuals evaluate the indirect policy benefits and costs separately.

$$\begin{cases} (1 + \lambda)B_p(t_i, p) - C_p(t_i, p) = 0 & \text{if } t_i > \check{t} \\ p = p^S & \text{if } \check{t} \leq t_i \leq \hat{t} \\ B_p(t_i, p) - (1 + \lambda)C_p(t_i, p) = 0 & \text{if } t_i > \hat{t} \end{cases}$$

where:

- The first condition would represent the lower types  $\check{t}$  who prefer smaller level of policy compared to the intermediate types  $t_i$ .
- The last condition represent the higher types  $\hat{t}$  who would desire a higher policy level relative to the status quo policy  $p^S$ .

Expanding upon this initial model, we can infer that the presence of loss aversion results in present costs today but a more favourable policy status quo tomorrow. Thus, if we compare individuals with different time horizons we could deduce that younger voters with longer time horizons can benefit from a better status quo compared to old voters once both groups have borne the psychological repercussions of the policy change today.

To explore this further, Alesina and Passarelli (2019) extend from the previous model by including the following changes:

1. Society comprises two distinct voting groups: The old voters ( $o$ ) living one period and young voters ( $y$ ) spanning two periods.
2. Status quo policy: Voting occurs at the onset of each period, with the status quo being the policy from the previous period.
3. Distribution of population by age: With the addition of constant birth rates ( $b$ ), the share of the young would be represented as  $\sigma = (1 + b)/(2 + b)$  and the share of the old as  $1 - \sigma = 1/(2 + b)$ , where higher birth rates imply larger share of the young.
4. Utility of younger voters: Focusing only on period 1, the utility of the younger voter equals his or her current and future utility, wherein  $p^1$  represents policy choice in period 1 but serves as a reference point for period 2 policy,  $p^2$ .

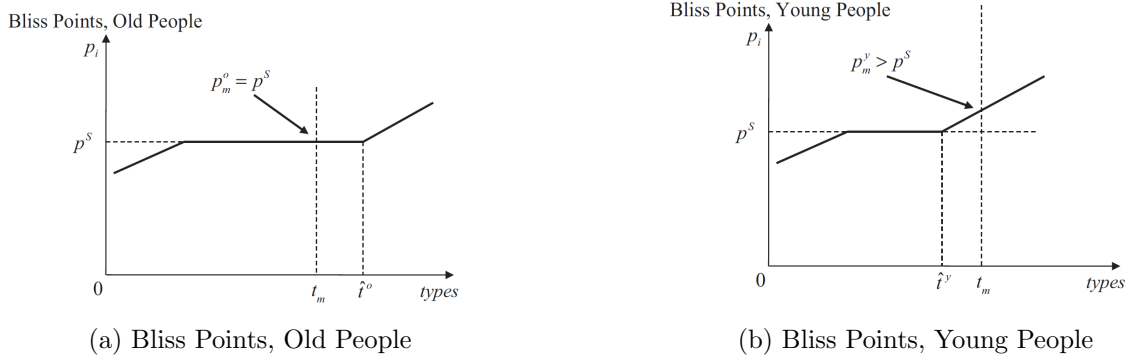
The key factor from this model lies in the disparity in the *perceived* loss aversion between the old and the young voters. Specifically, since the young live two periods, their perceived loss aversion is equal to  $\frac{\lambda}{2}$ , while for the old it remains  $\lambda$ . This age-based discrepancy group implies that the young generation perceives a lower degree in loss aversion than the old, indicating a higher inclination among the latter age group to maintain the status quo.

The rationale behind this divergence derives from younger voters being able to spread the psychological costs over two periods instead of one. Therefore, despite both age groups sharing the same loss aversion, the young *perceive* less loss aversion than the old. This translate into having a majority of younger voters favoring a change in policy compared to the majority of the older voters. This phenomenon is illustrated in Figure 3.1 (a), where the majority of old would aim for a policy equal to the status quo ( $p_m^o = p^S$ ), and Figure 3.1 (b), where the majority of young voters seek a policy surpassing the current one ( $p_m^y > p^S$ ).<sup>6</sup>

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<sup>6</sup>Note that  $t_m \in [\check{t}, \hat{t}]$ , where  $t_m$  refers to the intermediate type in a median voter model.

Figure 3.1: Willingness for Policy Reform by Age Group



Source: Alesina and Passarelli (2019).

In summary, considering the prevalent reluctance among politicians to advocate for policies deviating from the status quo due to the factors such as those associated with the inter-temporal dilemma, I contend that younger politicians with longer time horizons, are less susceptible to the influence of loss aversion. Therefore, they are more inclined to strive for policies that have higher benefits in the long-term but larger costs in the present.

**Hypothesis 2 (H2):** *Younger politicians demonstrate higher willingness to increase public expenditures towards long-term investments relative to short-term investments, as longer time horizons will lead them to place greater weight in long-term policies.*

### 3.3 Life-Stage Preferences

Additionally, I contend that politician's age not only influences on the scale or duration of the policy (long-term vs short-term policies), but also the nature and preferences of policies enacted during their tenure due to their different life stage.

According to the aforementioned Downsian model of political competition, politicians' attributes do not significantly affect policy outcomes since candidates in elections tend to pursue policies appealing to the median voter (Downs, 1957). However, as illustrated earlier, in a citizen-candidate model electoral candidates are rational actors that weight policy preferences and ideological commitments. Hence, policy positions under this model are not solely determined by the preferences of the median voter but also considers the personal beliefs and goals of the candidates.

Following extensive literature suggesting that personal traits such as gender or ethnicity influence individuals' policy preferences (e.g., Pande, 2003, Washington, 2008), I argue that young politicians are more inclined than older counterparts to cater the preferences of their age group when allocating public funds towards welfare programs, primarily due to their differences in their life stages (McClean, 2021). For instance, younger politicians, how are often in the midst of raising children, may be more motivated to increase public expenditures towards welfare programs such as preschool initiatives to alleviate the "burdens" derived from raising a child. Conversely, older politicians, who already passed this stage, may not prioritise such expenditures.

Intuitively, if young politicians operate under the *veil of ignorance*, seeking to implement policies that maximise individual utility regardless of their personal characteristics or self-interest (Rawls, 1971), age could significantly influence the allocation of public funds to benefit younger segments of the population.

Hence, I anticipate that while younger mayors may invest in policies benefiting all age groups (see H1), they might have stronger preferences for increasing expenditures on policies that increase individual utility. Particularly, I contend that young mayors are more likely to increase public expenditures on welfare programs such as preschool programs compared to their older counterparts.

**Hypothesis 3 (H3):** *Younger mayors will increase expenditures on welfare programs that satisfy the needs of families and younger segments of the population without diminishing expenditure levels for other programs benefiting the elderly.*

## 4 Literature Review

The persistent lack of involvement of young politicians in policy-making decisions is a reality among many developed countries. Factors such as limited capacity to run a campaign, barriers to joining political parties, and social pressure and stigma contribute to the underrepresentation of this age group within public institutions and governing bodies (Stockemer and Sundström, 2018). Although higher representation of young politicians could lead to more sustainable and responsive policy outcomes for all citizens, there is a substantial gap in the literature exploring this phenomenon. Thus, the purpose of this review is to explore the consequences of young politicians on policy expenditures through the lenses of the evidence found in other underrepresented groups.

To the best of my knowledge, the literature has predominantly studied the impact of increasing the representation of minorities groups, such as females or ethnic groups, on the efficient allocation of public expenditures across societies. Building on the idea that politicians are more likely to enact policies favouring those who share their characteristics, I will begin by exploring the existing evidence exploiting the consequences of quasi-experimental variation in the representation of minority groups in governing bodies. Subsequently, I will evaluate the limited published literature on the implications of age. Finally, I will highlight empirical studies analysing how politicians' characteristics, such as experience and seniority, influence their willingness to promote social spending.

### Gender

To analyse whether the identity of a decision maker influences policy decisions, Chattopadhyay and Duflo (2004) studied the effect of female policymakers on the provision of public goods in India. The study shows that implementing a system of political reservations for female politicians at the lowest levels of a decentralised government impact women's leadership on policy decisions. Specifically, they illustrate that the implementation of this reservation system generated a clear



distinction in the type of public investment desired by both genders, where female politicians were more willing to allocate public funds towards projects that could ultimately benefit their own gender. Furthermore, in an effort to shed light on this preference disparity, Hessami and da Fonseca (2020) collected evidence from various studies conducted in developing countries. They show that female politicians tend to increase expenditures towards health and education, corroborating the main findings from Chattopadhyay and Duflo (2004).

Despite the empirically strong impact of female leaders on policy decisions in developing countries, the evidence found in developed countries seems rather ambiguous. Ferreira and Gyourko (2014), for instance, examined the consequences of electing a female leaders for policy and political outcomes in various U.S municipalities. By analyzing female candidates who won close municipal elections against male candidates, they found no impact of female mayors on the size and composition of local government expenditures. In Europe, the study from Carozzi and Gago (2023) employed a close-election *fuzzy* RDD to explore the effect of female mayors in Spanish municipalities on the allocation of public funds towards various welfare policies. Their empirical analysis found no significant results indicating a causal relationship between the gender of the politician and their policy preferences. Conversely, Lippmann (2022) examined the quasi-random variation in the entry of women into the French upper and lower house via affirmative action and mixed-gender close elections and found that female legislators are more likely to author amendments on women’s issues or child and health issues than male legislators.

## **Ethnicity**

Besides gender diversity, the effect of ethnic diversity on the provision of public goods has been extensively studied. A relevant study conducted by Beach and Jones (2017) focused on the changes of ethnic composition in California city councils to analyse the potential variations in the type and the amount of public expenditures within these governing bodies. Surprisingly, they found that increase diversity on the council leads to less spending on public goods, particularly in cities with high segregation and more income inequality. The authors attribute this finding to what they denominated as the “gridlock hypothesis”, whereby ethnic diversity in a group leads to disagreement over the type of public goods and services to be provided and ultimately results in lower spending. The key takeaway from this study is that discrepancies in policy preferences lead to misalignments over the type of public good to provide, reducing the overall amount of expenditures.

## **Age**

Although the causes of the underrepresented young politicians have been recently explored by the literature (Stockemer and Sundström, 2019; Kurz and Ettensperger, 2023), the *consequences* of age-diversity among public institutions remains largely understudied. One of the few studies exploring this phenomenon is the one by Alesina et al. (2019), where the authors investigate the variation in house prices to identify the quality of policies implemented by young mayors in Italian municipalities. Considering the long-time horizons and the proximity in age to younger voters, they assumed younger mayors would have bigger preferences towards long-term policies rather than short-term strategic policies that aimed at securing re-election. Surprisingly, the

authors find that young politicians have higher tendency to strategically increase public spending right before the next elections.

## **Experience**

In addition to the plausible effect of external characteristics such as gender, ethnicity or age, the relation between the level of experience and the public expenditures of politicians has been empirically assessed. Fowler and Hall (2015) show evidence that U.S senior legislators bring no more “pork barrel” or government spending to their district than freshman legislators or minority-party members representing the same district at the same time. Contrary to this finding, Freier and Thomasius (2016) find that mayors in Germany that have been in office for more than a term tend to lower the aggregate level public debt and total municipal expenditures. Nevertheless, the statistical significance of their estimates seem context-dependent which could ultimately pose questions towards the external validity of their overall findings.

This review aimed to examine how underrepresented groups of politicians, due to their particular characteristics, can influence in the type and the amount of expenditures allocated towards public goods and services provided, in an attempt to understand whether young politicians have different tastes compared to older politicians when it comes to distributing welfare. While findings remain inconsistent when examining the impact of each of these groups individually, the literature tend to evidence that a change in the composition of the government can impact policy decisions.

Therefore, this study aims to contribute to the existing literature in three significant ways. First, it examines the implications of a decreasing presence of younger politicians on welfare expenditure, assessing whether the needs of specific societal segments are better addressed when these groups are more adequately represented in public offices. Second, it seeks to expand the relatively limited research in this area, particularly in light of the concerning trend of an ageing population and its potential impact on policy formulation. Third, and most importantly, this research aims to elucidate the potential effects that an increasing number of aged politicians and voters may have on the allocation of public funds for welfare programs.

## **5 Data**

The following section explains how the required data was collected and sampled to conduct the empirical analysis. I will begin by outlining the main data sources employed, then provide a detailed explanation of the data selection process, and conclude with relevant descriptives statistics about the data.

### **5.1 Data Sources**

To explore the effect of young mayors’ preferences on municipal spending, a panel dataset was created containing information about municipalities’ electoral, demographic, and budget data.

## Electoral Data

To conduct the analysis on municipal elections, administrative data containing electoral information about Spanish municipalities was publicly provided by Spain’s Ministry of Interior. Various datasets were collected containing information about the local elections that took place during the years 2007 and 2011, encompassing 16,262 elections across the 8,131 municipalities. These datasets included individual-level information such as the full name of candidates, gender, position on the lists, election status, number of votes won by their parties, and the number of seats won by the party in the local council.<sup>1</sup>

Despite the detailed nature of these datasets, they did not contain data on the ages of the candidates. Therefore, I requested this missing data through the Portal of Transparency of the Spanish Government.<sup>2</sup> The Ministry of Territorial Policy and Democratic Memory (MPT) provided a tailored dataset with granular information about the ages of the mayors and councillors from all the Spanish municipalities for the period of the study. In addition to the age and the role of the elected candidates, these datasets also included information on their level of studies, previous occupations, and political party affiliation. Consequently, both datasets were assembled to effectively link the age to each of the voted candidate in the sample. The following subsection will discuss the limitations associated to this linkage process and its implications for sample selection.

## Demographic Data

Understanding the profile of the elected candidates requires examining the underlying characteristics of their voters and, more generally, the municipality they rule. To account for the potential observed factors that may increase the bias in the relation interest, demographic data for each of the municipalities in the sample was collected from Spain’s National Institute of Statistics (INE). Population data, such as the share of male and female inhabitants, was primarily collected for the beginning of each term. However, other demographic information such as share of population born in different a country or population by age group, was obtained from the 2011 census elaborated by the INE (see Table A.1 from Appendix).

Furthermore, this data source facilitates the determination of the key variable for this study: the classification of a “young mayor”. When should a politician be considered *young*? The limited existing literature suggest that this classification should be tailored to the specific institutional and cultural setting of each country (McClean, 2021; Stockemer et al., 2023; Baskaran et al., 2024). However, this research has often relied on the median age of the voting population and the mayors for categorizing mayors as young. Following this approach, I adopt a similar method.

In particular, given that the electoral sample spans an 8-year time-frame from 2007 to 2015, the median year (2011) is chosen to analyze the median age for both the voting population and the mayors.<sup>3</sup> The reason for this selection is two-fold. First, the year 2011 is centrally located

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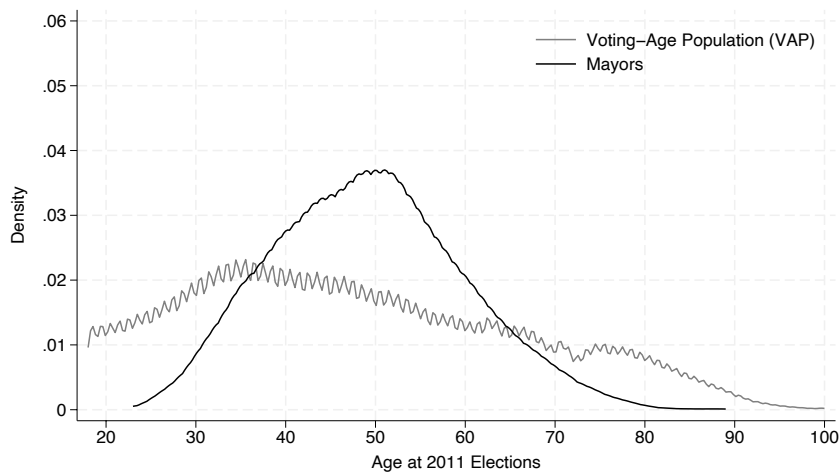
<sup>1</sup>For further information about the data see <https://infoelectoral.interior.gob.es/es/elecciones-celebradas/area-de-descargas/>.

<sup>2</sup>This Portal is specifically created to obtain non-publicly available information and data about the functioning of the public institutions (<https://transparencia.gob.es>).

<sup>3</sup>To be eligible to vote in any Spanish election you should be at least 18 years old on voting date.

within the study’s time-frame, providing a balanced representation of age distribution on both ends. Second, the age data of municipality inhabitants is normally provided by age-group, but only the 2011 population census by INE provides a comprehensive year-by-year breakdown of the population’s age for each Spanish municipality (see Table A.1). This detailed presentation allows for an easy comparison with the median age of the mayors. As illustrated by below Figure 5.1, the median age of the voting-age population in 2011 is approximately 42 years, while the median age for mayors is 50 years. Consequently, the “cut-off age” chosen for classifying mayors as young is 42, which represents roughly 28% of the elected mayors for that year.<sup>4</sup>

Figure 5.1: Age Distribution of Voters and Mayors in Spain



*Note:* This graph illustrate the age distribution of the voting-age population and the elected mayors for 2011. The approximate median age for the voting-age population (VAP) is 42 and for the mayors is 50. *Sources:* INE and MPT. Graph created by the author.

## Budget Data

To explore the variation in policy expenditures per local council, municipalities’ yearly budget data was obtained from Spain’s Ministry of Finance. Granular data about the expenditures in age-related programs was unavailable for the years outside the selected time period. Data for these periods captured spending per policy (e.g., health, education, culture) but not by program within that policy. Hence, this broad classification of policies prevented a detailed analysis of expenditure preferences based on mayors’ age. It was not until 2009 that Spanish law enabled the Ministry to provide detailed information about municipal spending per program.<sup>5</sup> However, this provision of rich datasets only lasted until 2014, as legal reforms mandated that this information be shared following the same guidelines as before 2009. Therefore, only the years 2010 to 2014 contain detailed information about the public expenditures in each of the municipality policy programs, particularly those of interest for this study: preschool and long-term care programs.

<sup>4</sup>The age distribution of the voting-age population considers all the municipalities in Spain. Alternatively, the median age is calculated for each municipality and compared to the age of the mayors from the sample. For further illustration refer to the sensitivity analysis results in Section 8 and Figure B.12 in the Appendix.

<sup>5</sup>Order EHA/3565/2008 entrusted the Ministry of Finance to share expenditure information in each of the policy programs affecting the municipalities (<https://www.boe.es/buscar/act.php?id=BOE-A-2008-19916#clasificacionporprogramasdegastos>).

Additionally, a cautionary note is necessary regarding the expenditure limits for local entities. Each fiscal year, the local government prepares its budget by considering the revenues obtained in the previous fiscal year, the expected revenue for the upcoming year, and the necessary spending across various expenditure areas. The allocation of resources to different areas is subject to non-financial expenditure limits, or *límites de gasto no financiero*, established by the central government, which are designed to ensure adherence to the principles of budgetary stability and financial sustainability.<sup>6</sup> Specifically, the central government sets three types of fiscal targets each year that act as caps on municipal spending: budgetary stability, the share of public debt, and the expenditure rule.<sup>7</sup> Hence, if municipalities seek to increase their public expenditures on welfare programs such as preschool education or long-term care, they must ensure that such increases do not exceed the fiscal targets set by the central government. In cases where additional spending in these programs is desired, it must be balanced by either reducing expenditure in other areas or increasing the level of revenues to maintain compliance with the fiscal targets.

Therefore, to account for the municipalities that comply with the fiscal targets, data on the outstanding share of public debt for the year 2009 was collected for each municipality in the sample.<sup>8</sup>

## 5.2 Sample Selection

By merging the various datasets, a municipal panel was constructed for the years 2010 to 2014. Based on the concept of *mixed races*, the sample is focused on first-in-the-list young candidates who won (the “treatment group”) and lost (the “control group”) against first-in-the-list old candidates in municipal elections.<sup>9</sup> Consequently, the study’s sample is narrowed towards this specific target population.

First, as highlighted in the previous section, the lack of detailed budgetary data for years outside 2010 to 2014 limited the sample size within the specified time range. This is crucial for selecting data for the 2007 and 2011 municipal elections. Relying solely on these two electoral terms could pose a potential limit capturing the desired effect of the study, as the process of ageing across the municipalities has accelerated in recent years (see Section 2). Nonetheless, there are still notable discrepancies between the average age of the mayors in our sample (47.36 and 48.43 years old for both terms) relative to the average age of population for the selected terms, 40.74 and 41.33, respectively (INE, 2024).

Second, given the complexities across the Spanish political spectrum and regional differences, the sample is restricted to elections between the two main parties in Spain, namely the Spanish Socialist Workers’ Party (PSOE) and the People’s Party (PP). Both moderate-left and moderate-

<sup>6</sup>Article 30, Ley Orgánica 2/2012 de Estabilidad Presupuestaria y Sostenibilidad Financiera (LO 2/2012).

<sup>7</sup>Based on Article 12 of the law LO 2/2012, the expenditure rule limits the growth of public spending to the medium-term growth rate of the national economy’s Gross Domestic Product (GDP).

<sup>8</sup>The year 2009 was chosen given the severity of the financial situation many Spanish municipalities faced in the aftermath of the 2008 global financial crisis.

<sup>9</sup>The concept of mixed races refer to situations where candidates with different characteristics (e.g., gender, ethnicity, age) compete for electoral victory. In this study, mixed elections are defined as those where the first-in-the-list candidate from most voted and second most voted political parties (i.e., PP or PSOE) are either above or below the median from the voting-age population (i.e., 42 years of age).

right parties have historically received the majority of votes and have held power in the majority of the municipalities in Spain. This prominence is also evident in the selected terms, as both parties ruled in almost 70% of the municipalities (see Figures B.1 and B.2). Studying their elected candidates should provide insights into the policies and decisions that affect a larger portion of the population. For instance, this restriction could help to isolate the effect of having a young mayor on spending decisions, as considering only these two major parties can reduce the variability due to party-specific ideologies and policies. Nevertheless, due to the potential risk associated with specific characteristics that each party shares, the policy preferences of both political parties are further analysed in Section 7.

Third, given that the winning electoral candidate may not always be elected as mayor, the electoral data is narrowed to include only those elected candidates who were positioned as “first-in-the-list candidates” by their parties, to increase the chances of identifying elected mayors. The data is restricted to these individuals primarily due to the difficulties in implementing an empirical strategy that studies close elections under a closed-list PR systems (see Section 2).<sup>10</sup> Despite the potential lack of representativeness that comes with reducing the sample to these candidates, the dataset provided by MPT containing information about the already elected candidates ensured that only those who (i) were positioned as first in the list and (ii) ended up elected -either as mayor or as councillor of the municipality- entered the sample. In other words, only the candidates positioned at the top of the list by each party that gained a seat in the local council, either as mayor or councillor, were selected.

Furthermore, due to data protection policies, datasets containing the age of the candidates did not associate this variable to personal information such as their names. This posed a difficulty, as the age could not be linked directly to the selected first-in-the-list candidates. Instead, relevant information other than the candidate’s name, such as the municipality identification code, the political party, role and gender of the elected candidate allowed to link the age to each of the candidate in the sample.<sup>11</sup>

Additionally, besides candidate selection, municipalities with fewer than 250 inhabitants were dropped from the sample due to different electoral system (see Section 2). These small municipalities, representing less than 1% of the observations of the sample, are typically less representative of the overall population distribution. They are characterised by higher proportion of elderly residents and disproportionately low birth rates.<sup>12</sup> Thus, excluding these municipalities should not impact the external validity of the study.

Finally, it should be noted that municipalities approve their budgets for a given year in December of the previous year, hence budgets were linked to the municipalities in year  $t - 1$ . However, a relatively significant portion of the municipalities (552 municipalities in total) failed to report their budgets on a yearly basis. These municipalities were predominantly small in population size and should therefore not impact the external validity of the results. For this reason, they were excluded from the sample.

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<sup>10</sup>As it will be further described in Section 6, close elections are defined as those where young candidates from a winning party won by a small margin of vote shares to the second party.

<sup>11</sup>By concatenating these variables in the linkage process, potential duplicate values that could arise from identical names are avoided.

<sup>12</sup>The paper by Bagues and Campa (2021) illustrate this demographic phenomenon in their Data section.

### 5.3 Descriptives

Finally, in order to gain insight about the policy preferences of the young mayors in the sample, Table 5.1 presents the municipal descriptives by age and mixed races of the candidates. Panel A from the table represent the variables encapsulating the main outcome variable from equation (6.2):  $Policy_{it}$ . Following a similar approach to Carozzi and Gago (2023), these outcome variables are measured either on the extensive margin (i.e., whether the municipality  $i$  allocated public funds to the program in question) or on the intensive margin (i.e., the share of expenditure per program as a fraction of the total municipal expenditures). Notably, municipalities governed by young or old mayors do not differ substantially in their expenditures preferences, which are characterised by fairly small values across the panel.

Next, the figures related to the relevant demographic variables are presented in Panel B. A minor difference can be observed regarding the population size, as municipalities governed by old mayors tend to have relatively larger populations. However, the values for the remaining variables prove to be balanced for both mayor type. For instance, the main male and female percentages, the share of population born outside of the country and the population born in a different region show minimal variation between municipalities with young and old mayors. Panel C, illustrate the share of mayors from PP and PSOE political parties. PP mayors have a slightly larger share in the sample, but the values are quite balanced across each of the columns in the table.<sup>13</sup>

Despite the overall balanced results for both young and old mayors in normal and mixed races, it is worth noting that sample selection resulted in a relatively larger number of observations associated with old mayors. A plausible explanation of this discrepancy might be the fact that the selected cut-off of 42 years is below the average age of the mayors for both terms (see Figure 5.1). Thus, a larger share of observations could potentially be located above this threshold.

Additionally, Table A.7 from Appendix illustrate further descriptives statistics about the individual characteristics of the mayors. Specifically, it provides information about the previous occupation, the level of studies and the gender. Overall, the municipalities in the sample tend to be governed by male mayors with tertiary education and prior experience in white collar occupations. The reported results also show some notable discrepancies between young and old mayors. For instance, young mayors are more likely to have college degrees, with 59.1% of them holding one compared to 17.6% of old mayors. Young mayors are also more likely to have been white-collar workers, with 41.7% having this background compared to 15.6% of old mayors. In terms of gender, there is a higher percentage of young female mayors (22.8%) compare old female mayors (6.5%).

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<sup>13</sup>For further insights regarding the differences between PP and PSOE municipalities see Table A.2 in the Appendix.

Table 5.1: Municipal Descriptive Data by Age

	All	Old Mayors	Young Mayors	Mixed - Old	Mixed - Young
<b>A. Age-related Policies</b>					
Long-Term Care Share	0.002 (0.007)	0.002 (0.006)	0.005 (0.010)	0.002 (0.007)	0.002 (0.008)
Long-Term Care Dummy	0.609 (0.488)	0.573 (0.495)	0.792 (0.406)	0.443 (0.497)	0.444 (0.497)
Preschool Share	0.003 (0.006)	0.003 (0.005)	0.005 (0.008)	0.003 (0.005)	0.003 (0.005)
Preschool Dummy	0.609 (0.488)	0.572 (0.495)	0.798 (0.402)	0.437 (0.496)	0.434 (0.496)
<b>B. Local Characteristics</b>					
Population	10566.956 (67592.465)	11183.861 (71728.020)	7408.773 (40103.259)	7576.520 (24077.499)	7421.090 (23246.072)
Mean Age Municipality	36.752 (18.445)	36.530 (18.791)	38.090 (16.140)	40.384 (15.296)	39.182 (15.465)
Male (%)	51.129 (2.078)	51.106 (2.072)	51.246 (2.105)	51.228 (2.071)	51.043 (2.083)
Female (%)	48.858 (2.084)	48.880 (2.078)	48.743 (2.109)	48.752 (2.078)	48.938 (2.091)
Debt 2009 (%)	0.027 (0.173)	0.028 (0.172)	0.022 (0.178)	0.020 (0.088)	0.021 (0.103)
Pop. Born Abroad (%)	9.017 (8.163)	9.009 (8.174)	9.055 (8.104)	9.311 (8.319)	8.998 (7.683)
Pop. Born in Different Region (%)	10.092 (8.503)	10.042 (8.488)	10.344 (8.574)	9.948 (8.362)	10.000 (8.117)
Pop. Under 4 (%)	2.598 (1.874)	2.547 (1.876)	2.905 (1.835)	2.816 (1.727)	2.865 (1.717)
Pop. Over 80 (%)	8.413 (4.554)	8.510 (4.630)	7.827 (4.014)	8.761 (4.553)	8.201 (4.106)
<b>C. Parties</b>					
PP Mayor (%)	52.241 (49.954)	52.653 (49.935)	51.343 (49.994)	50.073 (50.036)	55.918 (49.699)
PSOE Mayor (%)	47.759 (49.954)	47.347 (49.935)	48.657 (49.994)	49.927 (50.036)	44.082 (49.699)
Observations	12,301	10,290	2,010	1,398	980

*Notes:* Table illustrate the sample mean and standard deviations in parentheses of each variable. In Panel A, values are obtained from the sampled municipal budgets from the years 2010-2014. Panel B, Population variable (row 6) contains the averages of both 2007 and 2011 years. Demographic values related to the population born outside the municipality and group of age (rows 9-14) are obtained from the 2011 Population Census. Columns 5 and 6 show the results for mixed races, with column 5 indicating values when an old candidate won and column 6 when a young candidate won. *Sources:* Ministry of Finance, Ministry of Interior, INE, and MPT. Table created by the author.



## 6 Methodology

The aim of this study is to verify whether elected mayors who are below the median of age of the voting population have stronger preferences to allocate public funds towards policy programs affecting their age cohort compared to older mayors. Clearly, age alone is not the sole determinant of mayor's policy preferences. Therefore, this section will explore the potential confounding factors that may impact the relation of interest, the suitable identification strategy capable of mitigating potential endogeneity issues, and the validity of this strategy.

### 6.1 Identification and Endogeneity Concerns

One identification problem associated with understanding whether municipalities governed by younger mayors have higher expenditure preferences toward age-related programs, such as preschool or long-term care programs, is the presence of unobserved local traits that may influence their decisions. For instance, municipalities with a larger proportion of young or old inhabitants may encourage mayors to invest more funds in policies that benefit citizens at both ends of the population distribution.<sup>1</sup> Moreover, to capture the vote of the electorate, candidates may announce attractive political programs during their campaigns that may encourage citizens to migrate to those municipalities that better suit their preferences.<sup>2</sup>

These examples may impede the identification of the relation of interest, as the presence of these factors may be both the cause and the effect of the young mayor's policy preferences. Therefore, the existence of observed and unobserved factors that may correlate with a mayor's age and subsequently influence their allocation of public funds increases the chances of suffering biased estimates if we were to implement an OLS model to estimate the desired effect.

This scenario raises several questions related to the election of the mayor: Is the vote share obtained by the mayor's political party purely dependent on the underlying characteristics of the municipality? If so, do these characteristics allow the candidates to modify their policy preferences in order to *precisely* control their election as mayors, or could there be any *uncertainty* on the voting count that could avoid this potential manipulation of the final result?

To answer to these questions and address the aforementioned potential endogeneity concerns, Regression Discontinuity Design (RDD) is employed as the preferred empirical methodology to exploit the relation of interest. Particularly, given that we focus on a context where preferences of politicians are determined by their potential election as future mayors of the local councils, a close-election RDD is implemented following the identifying assumptions described by Lee (2008).

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<sup>1</sup>An extensive body of literature have focused on studying the potential unobservable influence that the age of the electorate may have on the public spending decisions of the politicians (e.g., Poterba, 1997; Harris et al., 2001; Brunner and Johnson, 2016).

<sup>2</sup>This phenomenon, known as Tiebout bias, explores the possibility that people choose to move to jurisdictions that best satisfy their demands for public goods and services (Tiebout, 1956).

## 6.2 Close-election RDD

Considering the differences in local traits, can we argue that young candidates who narrowly win elections are equally comparable to older candidates who win these elections? Intuitively, if we hold constant all potential observables and unobservables factors surrounding the election of these candidates, the existence of a random chance element in the final vote shares of closely contested elections between young and older candidates, where the party of the young candidate wins by a small vote share margin, can be considered “as good as randomly assigned” (Lee, 2008).

In other words, examining municipalities where young candidates barely won the elections against municipalities where young candidates barely lost (and older candidate won) by a close-to-zero vote share margin, provides quasi-random variation in the winner’s election. Thus, the winning candidate in these close elections is likely to be determined by pure chance, assuming some unpredictable random component of the vote (Ferreira and Gyourko, 2009).

Hence, in close elections the probability that a young candidate ( $i$ ) becomes mayor ( $M_i = 1$ ) is determined by the randomness derived from the ultimate vote share ( $V_i$ ), where the probability changes discontinuously at the threshold ( $c$ ):

$$\lim_{v \rightarrow c^-} \Pr(M_i = 1 | V_i = v) \neq \lim_{v \rightarrow c^+} \Pr(M_i = 1 | V_i = v).$$

However, unlike standard RD designs, where assignment to treatment is determined by falling below or above a specific threshold, assignment to treatment in this type of elections is defined by the age of the municipal candidate, *conditional on narrowly winning the municipal election* (Marshall, 2024). Importantly, since the probability of an electoral candidate from the winning party being elected as mayor is neither zero nor one due to the specifics to the electoral system, implementing a *fuzzy* RDD becomes the ideal identification strategy (Imbens and Lemieux, 2008).

Therefore, given the challenges derived from the institutional setting of this study -where (i) PR system that follows the D’Hondt method for seat allocation poses difficulties for implementing an RDD,<sup>3</sup> and (ii) the first-in-the-list candidate from the winning party does not always become elected as mayor (see Section 2)- the most suitable identification strategy implemented is the close-election RDD focusing on mixed races.<sup>4</sup>

## 6.3 Estimation

The fact that the probability of winning a municipal election is neither zero below nor one above the threshold indicates that the relationship between becoming a mayor and their policy expenditure preferences cannot identify an average treatment effect (Lee, 2008; Lee and Lemieux, 2010). Indeed, as the winning young candidate does not become directly elected as mayor precludes the application of a sharp RDD. Therefore, in a setting with imperfect compliance, the

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<sup>3</sup>As described by Solé-Ollé and Viladecans-Marsal (2013), under this electoral system, each party and each seat has a specific vote threshold which increases the difficulty to establish a straight relationship between the number of seats held by a party and their control of the local government.

<sup>4</sup>In essence, this methodology ensures that the young candidate who won a mixed race against an older candidate is equally comparable to the winning older candidate, with age being the only differential factor.

potential discontinuity that follows from the probability of being assigned to treatment identifies a Local Average Treatment Effect (LATE). Additionally, because the *fuzzy* RDD identification strategy has a similar analogy to using Instrumental Variables, the treatment effect will be estimated using a two-stage least-squares (TSLS) estimation procedure (Hahn et al., 2001).

### 6.3.1 First-stage Specification

To explore the plausible local random assignment, the first-stage estimates the relation between becoming a young mayor and the vote margin of the young candidate (i.e., the assignment rule).

The first-stage specification (6.1) begins with the definition of  $YoungMayor_{it}$  as the outcome variable. This is a binary variable that takes values of one if the municipality  $i$  is ruled by a mayor with less than 42 years of age during year  $t$ . The running (or forcing) variable,  $YoungVoteMargin_{it}$ , is the difference in vote share between the young and old candidates from the two most voted political parties in municipality  $i$  and election year  $t$ .<sup>5</sup> Hence, the variable  $1(YoungVoteMargin_{it} > 0)$  is a dummy for the running variable, taking value of 1 if the party led by a young candidate received the most votes in the 2007 or 2011 municipal election, thereby identifying the municipalities with a young mayor.<sup>6</sup> Next, the term  $f(YoungVoteMargin_{it})$  refers to the polynomials used to adjust the sides of the thresholds, with first-order polynomials chosen as the preferred functional form, following the recommendations from the literature (see Gelman and Imbens, 2019). The vector  $X_{it}$  contains municipality level control variables, including the municipality population, the share of female and male population, the share of population older than 80 and the share of population younger than four, and the share of debt for each municipality for the year 2009 (see Table A.1). Lastly,  $\alpha_0$  is the constant and  $u_{it}$  is the stochastic error term clustered at the municipal term level to account the potential heteroskedasticity and serial correlation.<sup>7</sup>

$$YoungMayor_{it} = \alpha_0 + \alpha_1 1(YoungVoteMargin_{it} > 0) + f(YoungVoteMargin_{it}) + \delta X_{it} + u_{it} \quad (6.1)$$

### 6.3.2 Second-stage Specification

The second-stage estimates the relationship between the elected young mayor and the expenditures on the two policy programs of interest for this study, namely preschool and long-term care (LTC). The second-stage specification (6.2), begins with the main outcome variable of the study:  $Policy_{it}$ . This variable is defined using (i) positive spending dummies to estimate extensive margin expenditures and (ii) the share of expenditures in these programs to estimate the intensive margin expenditures in municipality  $i$  and year  $t$ . Next,  $\gamma$  is the parameter of interest which estimates the effect of having a young mayor on the policy programs in question. The terms  $f(YoungVoteMargin_{it})$ , and  $\delta X_{it}$  are specified as in equation (6.1),  $\beta$  is the intercept, and  $\epsilon_{it}$

<sup>5</sup> $YoungVoteMargin_{it} = VS_{it}^y - VS_{it}^o$ , where  $VS_{it}^y$  is the vote share of the young candidate's party and  $VS_{it}^o$  is the vote share of the old candidate's party. Candidates under 42 year of age are classified as 'young' and vice versa.

<sup>6</sup>Imperfect compliance arises because a positive  $YoungVoteMargin_{it}$  does not guarantee that the young candidate becomes a mayor; they may instead be elected as councillors (Section 2).

<sup>7</sup>Note that error term  $u_{it}$  is clustered at municipal term level as municipalities usually change mayors at the end of their ruling term.

is the error term also clustered at the municipal term level.

$$Policy_{it} = \beta + f(YoungVoteMargin_{it}) + \gamma YoungMayor_{it} + \delta X_{it} + \epsilon_{it} \quad (6.2)$$

As it will be further explored in the subsequent section, four regressions are calculated to estimate the desired effect. Intuitively, this specification captures the intensive and extensive margin expenditures for both programs (i.e., two regressions for each program).

## 6.4 Validity of RDD

Finally, before exploring the results on young local incumbent’s policy preferences, it is essential to validate the *fuzzy* RDD design by assessing its key assumptions.

### 6.4.1 Discontinuity of the Treatment Variable

The first assumption is the discontinuity in the treatment probability at the cut-off. Specifically, the probability of having a young mayor should change discontinuously at the threshold of the running variable (i.e., when *YoungVoteMargin* is equal to zero). Figure 6.1 depicts the discontinuity in the treatment variable and the assignment rule at the threshold upon running the first-stage (6.1). As illustrated, there is a genuine discontinuity in the probability of having a young mayor of approximately 34 percentage points when the running variable crosses the zero threshold.<sup>8</sup>

A closed-list PR system does not ensure that first-in-the-list young candidates with more votes than old candidates will become elected as mayors, as they could potentially become elected as councillors (see Section 2). Despite this imperfect compliance, there is still a discontinuity at the threshold which ensures that the probability of becoming a young mayor jumps 34% when the vote share of young candidates is above zero. Therefore, the result suggest that the victory of young candidates in mixed races is a strong predictor of becoming a mayor.<sup>9</sup>

### 6.4.2 Selection of Optimal Bandwidths

When selecting the optimal size of the bandwidth, there is a fundamental trade-off between the bias and the variance of the estimates that should be considered: sample observations that are close to the cut-off tend to report less biased and more imprecise estimates, whereas widening the size of estimated sample leads to the opposite effect (Lee and Lemieux, 2010).

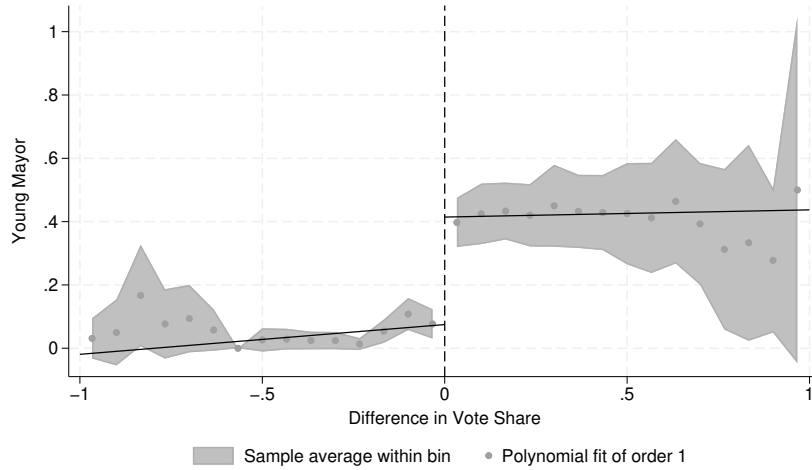
Taking into account this trade-off, I deviate from the conventional balancing of squared-bias and variance to minimise the mean-square error. Instead, I follow the robust methodology used by Calonico et al. (2014) for selecting optimal bandwidths on each side of the cut-off. Specifically, I choose a range varying from 22% to 28% of the young vote margin, based on the optimal bandwidths reported by each of the second-stage regressions, following the recommended practices from Calonico et al. (2017) on the use of *rdrobust* package on Stata software program.

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<sup>8</sup>Graphical results obtained following the recommendations outlined by Calonico et al. (2014).

<sup>9</sup>The specifics of the electoral system prevent perfect compliance. The winning young candidate may not be elected mayor by the council if their party does not obtain the majority of votes during the municipal elections.

Figure 6.1: Discontinuity of becoming a young mayor in close mixed elections



*Note:* The vertical axis denotes the fraction of young mayors, whereas the horizontal axis represents young vote margin, where positive values indicates the victory of a young candidate over the old candidate and vice versa. The fitted lines represent first-order polynomial fit at each side of the cut-off and the scatter points are the averages within the bins of the victory margin of the young candidate. A total of 15 bins are selected and evenly spaced at each side of the cut-off. *Sources:* Ministry of Interior and MPT.

Each of these bandwidths ensure high inference power in each of the first-stage estimates, as it will be further explored in Section 7.

### 6.4.3 Manipulation Tests

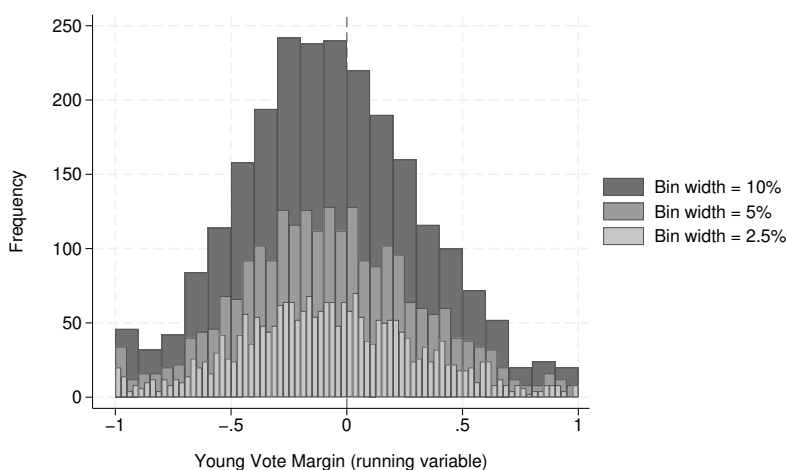
Another crucial assumption is the continuity of the forcing variable around the threshold. If candidates have precise control over their vote shares we would expect self-selection or sorting around the cut-off. To test this, an histogram is analysed based on the frequency of the variable. As shown in Figure 6.2, the running variable displays high frequency levels close to the threshold, indicating the absence of sorting around the threshold. Furthermore, a McCrary (2008) test was performed to assess the potential manipulation of the variable around the cutoff. The test reports a p-value of 0.240, supporting the absence significant discontinuity in the density of the running variable at the cut-off and thus not rejecting the null hypothesis of no manipulation.

### 6.4.4 Balancing Tests

The final assumption required for the validity of the design focuses on the continuity of both observed and unobserved factors around the cutoff, ensuring that only the age of the mayor shows a discontinuity. Given the implausibility of testing the unobserved factors affecting the relation of interest, we focus on the continuity of the observed baseline controls variables included in both models. To run this test, the running variable ( $YoungVoteMargin_{it}$ ) is regressed on each of the control variables ( $X_{it}$ ). As illustrated in Figure B.3 from the Appendix, there is no evidence of potential sorting of the assignment variable that could reflect discontinuity for each of the baseline observed covariates, supporting therefore the validity of the strategy.

As a final note, although individual-level characteristics of the mayors are not controlled for in the main models to account for differences in the characteristics of young mayors, balance checks

Figure 6.2: Continuity of the Forcing Variable - Frequency Histogram.



*Note:* Frequency distribution of the young candidate vote shares for both 2007 and 2011 close municipal elections. *Sources:* Ministry of Interior and MPT.

were performed for each of the analysed variables indicated in Table A.7. As illustrated in Table A.8 in the Appendix, none of the estimates prove to be statistically significant, with p-values above conventional significance levels and point estimates generally close to zero, indicating no substantial discontinuity in these variables at the threshold.

## 7 Results

Do young mayors “care” about social spending? The following section will aim to shed light on this question by analysing the results obtained from the described models. First, an analysis will be conducted on the main results reported from the first-stage and second-stage specifications. Subsequently, additional analyses derived from the main results will be discussed.

### 7.1 Main Results

As briefly mentioned in the preceding section, the probability of having a young mayor once the running variable has surpassed the threshold proved to show a notable jump (see Figure 6.1). To further illustrate this result, Table 7.1 reports the coefficient estimates for each of the first-stage models from equation (6.1) implementing the manually inputted optimal bandwidths obtained from the second-stage and using first-order polynomials following the practices from Calonico et al. (2014) and Calonico et al. (2017).

All four coefficients demonstrate that there is an approximate 34% likelihood of a young candidate becoming the mayor of the municipality when they win narrow contested elections. The estimates prove to be statistically significant at the one percent level, and the F-statistics reported are relatively close to ten in each of the columns. Given the significant impact on the treatment variable, we can conclude validity of the instrument.

Next, we evaluate whether having a young incumbent impacts the amount social spending

Table 7.1: First-stage - Young Mayor

	Young Mayor	Young Mayor	Young Mayor	Young Mayor
Young Winner	0.350*** (0.040)	0.347*** (0.038)	0.345*** (0.036)	0.344*** (0.035)
F-stat	8.759	9.174	9.550	9.904
Bandwidth	0.220	0.240	0.260	0.280
Mean Dep. Var.	0.207	0.207	0.207	0.207
Clusters	202	222	244	261
Observations	1592	1592	1592	1592

*Note:* Sample is limited to mixed close elections. The dependent variable is a binary variable taking values above zero when the young candidate have a higher vote share compared to the old candidate. Local linear regressions are estimated using first-order polynomials and 95% confidence intervals. Control variables are included and standard errors are clustered at the municipal level. *Sources:* Ministry of Interior and MPT.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

for the two welfare programs of interest. Table 7.2 reports the results for the second-stage specification. On the one hand, columns 1 and 2 show the estimates when equation (6.2) is calculated using as outcome variable the dummy indicating whether or not the governor allocated funds to the age-related policies (i.e., the extensive margin expenditures for preschool and long-term care programs). On the other hand, columns 3 and 4 calculate this outcome focusing on the proportion of expenditures in such programs as a fraction of the total local expenditures (i.e., intensive margin expenditures).

Notably, both extensive and intensive margin coefficients show statistically insignificant and close to zero estimates in all four models. The estimate in column 1 suggests that young mayors elected in close races are reluctant to place public funds in the long-term care (LTC) program. This negative estimate has an associated p-value of 0.210 which precludes the statistical significance of this result. On the contrary, column 2 coefficient indicates that electing these mayors is positively associated with a higher allocation of funds in preschool programs. However, this positive estimate also reports statistical insignificance (p-value equals 0.620) at all conventional levels. Therefore, we cannot reject the null hypothesis of no effect of young mayors on their willingness to place funds in long-term care and preschool programs.

Furthermore, the absence of a plausible effect is even more tangible when the outcome variable is analysed on the intensive margin. The reported coefficient in column 3, for instance, suggest that probability of having a young mayor is associated with a decrease of 0.3 percent of expenditures in long-term care programs as a fraction of the total local expenditures. Similarly, the estimate from column 4 implies that the probability of electing a young mayor under close elections is associated with a (almost) negligible decrease of 0.01 percent of expenditures in preschool programs. Given that the p-values for each of the estimates are above all conventional levels, we cannot reject the null hypothesis of no effect of having a young mayor on the amount of public funds allocated towards age-related programs.

Additionally, to further corroborate these results, reduce-forms regressions are estimated to examine the impact of a young candidate's victory in the elections with both extensive and intensive outcome variables (see Table A.3 from Appendix). Despite the absence of the treatment in these models (i.e., the probability of having a young mayor at the threshold), the results align closely with those illustrated for the second-stage analysis. This consistency in the results allow

Table 7.2: Second-stage - Young Mayor

	LTC dummy	Preschool dummy	% LTC	% Preschool
Young Mayor	-0.156 (0.124)	0.067 (0.137)	-0.003 (0.003)	-0.0001 (0.0018)
p-value	0.210	0.620	0.284	0.944
F-stat	11.776	10.358	10.719	11.413
Bandwidth	0.296	0.228	0.245	0.276
Mean Dep. Var.	0.207	0.207	0.207	0.207
Clusters	408	340	352	392
Observations	1592	1592	1592	1592

*Note:* Columns 1 and 2, use as outcome variable the binary variables taking value of 1 if spending in long-term care (LTC) and preschool programs are positive. Columns 3 and 4, use as outcome variable the proportion of spending in LTC and preschool programs as a fraction of total municipal expenditures. Local linear regressions are estimated using first-order polynomials, 95% confidence intervals and uniform kernels. Controls are included and standard errors clustered at the municipal level. *Sources:* Ministry of Finance, Ministry of Interior and MPT.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

us to rule out the possibility that young mayors may have a differential engagement towards preschool and long-term care programs.

## 7.2 Additional Analyses

To conclude this section, two additional analyses are explored aiming to consolidate the main findings from this study. First, I examine whether the previous results can be extrapolated at the party level. Then, I explore whether young mayors have stronger taste for other type of policy programs.

### Political Parties

One limitation of the identification strategy used in this study is the challenge of linking it directly to closed-list proportional representation (PR) system that characterises Spanish municipal elections. As discussed earlier, this electoral system complicates the clear implementation of a close-election RDD focusing on single candidates. The existing literature exploiting this methodology adjusted to this electoral system is limited and complex (e.g., Solé-Ollé and Viladecans-Marsal, 2013; Folke, 2014; Curto-Grau et al., 2018).

Given the difficulty of applying close-election RDD to PR closed-list electoral systems, I attempt to corroborate the main results of the study using a broader approach by focusing on the elected mayors from political parties. Specifically, the analysis now adjusts the treatment variable to the elected mayor from PSOE's political party. The rationale for choosing this political party is that left-wing parties might allocate a higher share of public expenditures towards social spending compared to right-wing parties.<sup>1</sup>

A similar analysis to that for young mayors is conducted. The validity tests for the *fuzzy* RDD and identification strategy again show the strength of the instrument at the first-stage (see Figure B.6 and B.7 from Appendix). However, an additional discontinuity test is conducted to

<sup>1</sup>A substantial body of literature has studied whether party ideology is a determinant for welfare redistribution (e.g., Herwartz and Theilen, 2017).



examine whether age jumps with the identity of the party once the sample is narrowed to close elections. This is plausible given that the sample of young mayors is disproportionately smaller compared to old mayors (see Table A.2). Therefore, a balance check is exploited on the two treatment variables (i.e., Young Mayor and PSOE Mayor) in a similar fashion as Carozzi and Gago (2023). The statistical insignificance of each coefficient at all conventional levels indicates that the effect of PSOE mayors on age-related policies is not endogenous to the change in the age of the mayor (see Table A.4 from Appendix).

Table 7.3 reports the second-stage estimates from the effect of having a PSOE mayor on the extensive and intensive margin outcomes for the two main policy programs. Overall, the coefficients align with the main results of the study. The outcomes variables show p-values above all conventional levels, indicating the statistical insignificance of all four coefficients. However, a minor discrepancy results from the reported estimate in column 1 (i.e., extensive margin expenditures in long-term care programs (LTC)). The positive value suggest that mayors from this political party may engage more in this type of programs. Nonetheless, due to the lack of significance in the estimates, we cannot reject the hypothesis of no effect of these majors on age-related policies.

Table 7.3: Second-stage - PSOE Mayor

	LTC dummy	Preschool dummy	% LTC	% Preschool
PSOE Mayor	0.031 (0.104)	0.045 (0.101)	-0.001 (0.002)	-0.0007 (0.0013)
p-value	0.765	0.652	0.353	0.563
F-stat	11.127	11.106	11.430	11.562
Bandwidth	0.185	0.186	0.199	0.202
Mean Dep. Var.	0.207	0.207	0.207	0.207
Clusters	713	713	760	775
Observations	3949	3949	3949	3949

*Note:* Columns 1 and 2, are binary variables taking value of 1 if spending in long-term care and preschool budget expenditures are positive. Columns 3 and 4, report the proportion of spending in Long-Term Care and Preschool programs as a fraction of total municipal expenditures. Local linear regressions are estimated using first-order polynomials, 95% coefficient intervals and uniform kernels. Standard errors clustered at the municipal level. *Sources:* Ministry of Finance, Ministry of Interior and MPT.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## Other Policies

This last section explores whether young mayors advocate for policy programs beyond long-term care and preschool programs. Section 2 described some reasons why these programs are classified as “age-related”. Nonetheless, municipalities have the autonomy to direct public funds to additional policy programs that may be indirectly linked to the characteristics of the governing politician. Here, I study whether policy programs such as increasing environment protection or promoting cultural activities in the municipalities may be linked to the preferences of younger mayors. The choice of these programs is based on the plausible assumption that young leaders may advocate more resources towards progressive and innovative policy areas.<sup>2</sup>

<sup>2</sup>Although empirical evidence exploring this effect is limited, there is existing literature illustrating the impact that political party affiliation or gender of the governor have on this type of policies (Fredriksson et al., 2011;

Results for the effect of young mayors on these specific programs are illustrated in Table 7.4 (see Appendix for additional results). Overall, the results align with the main results of the study (Table 7.2). A minor difference is observed, however. The probability of electing young mayors is associated in 22% likelihood of allocating public expenditures to environmental policies. Although this estimate appears to be economically significant, drawing a conclusion about the potential effect of this relationship is challenging due to its weak statistical significance.

Table 7.4: Second-stage - Young Mayor

	Environment dummy	Culture dummy	% Environment	% Culture
Young Mayor	0.223 (0.153)	0.006 (0.125)	0.001 (0.001)	0.001 (0.001)
p-value	0.144	0.961	0.244	0.408
F-stat	1.463	0.048	1.166	0.828
Bandwidth	0.191	0.247	0.230	0.211
Mean Dep. Var.	0.207	0.207	0.207	0.207
Clusters	275	350	328	343
Observations	1592	1592	1592	1592

*Note:* Columns 1 and 2 are binary variables taking the value of 1 if spending in environmental and cultural policies, respectively, is positive. Columns 3 and 4 report the proportion of spending in environmental and cultural programs as a fraction of total municipal expenditures. Local linear regressions are estimated using first-order polynomials, 95% coefficient intervals, and uniform kernels. Standard errors are clustered at the municipal level. *Sources:* Ministry of Finance, Ministry of Interior, and MPT.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## 8 Sensitivity Analyses

In this section, the sensitivity of the main results of the study is examined through various checks, following Lee and Lemieux (2010)'s recommendations for non-parametric estimations. It is worth noting that some recommended sensitivity analyses, such as the discontinuity test, the test for no manipulation, and the continuity of the baseline covariates, have been already analysed in Section 6, and therefore will not be discussed here.

The primary analyses conducted to validate the main results include (i) removing baseline covariates from the specifications, (ii) using different bandwidths, and (iii) varying the degree in the functional forms. The results from these tests are illustrated in Table 8.1 and are primarily conducted to verify the robustness of the baseline estimates from second-stage (Table 7.2). Additionally, further tests are explored at the end of this section.

### Removal of Covariates

As noted in previous sections, local linear regressions calculated using both discrete and continuous outcome variables have employed several covariates to increase the precision of the estimates at the cut-off.<sup>1</sup> Panel A.1 from Table 8.1 shows the second-stage results when the vector of control variables is excluded from equation (6.2). For comparison, the second-stage baseline results

Ramstetter and Habersack, 2020).

<sup>1</sup>These covariate-adjusted RD estimators have followed from the practices of Calonico et al. (2019).

illustrated in Table 7.2 are included in Panel A.2. Based on the reported results from the local linear regressions, the removal of the control variables do not illustrate magnitude differences when compared to the covariate-adjusted RD estimators in Panel A.2. Thus, the main parameter reported in Table 7.2 prove to be robust when the control variables are removed.

### **Change of Bandwidths**

Next, we test for the trade-off between bias and precision using wider bandwidths for the main local linear regressions. Panels B.1 and B.2 report the second-stage treatment effect using bandwidths outside the optimal range reported by the baseline specification results.

Panel B.1 reports estimates using  $\pm 0.50$  window across all main models (columns 1 to 4). Clearly, the estimates do not differ significantly in magnitude from the baseline results in Table 7.2. Similarly, Panel B.2 test the models with a  $\pm 0.20$  window at each side of the threshold. Although point estimates show higher magnitude and variance when compared to the baseline, the remain relatively similar. Therefore, we can rule out the possibility that capturing a smaller or larger sample of observations may impact the robustness of the main baseline results.

### **Different Polynomials**

So far, the results from this study have used low-order polynomials following the recommendations from the literature (e.g., Lee and Lemieux, 2010; Hahn et al., 2001). However, knowing whether this is a good approximation and lead to less biased estimates is not fully clear. For goodness-of-fit, I test the statistical inference using data points that are both close to and far away from the cut-off by using higher order polynomials at both sides for the thresholds.

First, Panel C.1 examines the changes using second-order polynomials. Clearly, no notable differences are appreciated in terms of variations for both point estimates and standard errors when compared to the baseline results. Second, Panel C.2 conducts a similar analysis with third-order polynomials. A minor sign change in the point estimate of long-term care (column 1) is observed, but its significance remains unaffected given its p-value (0.924) is far from conventional significance levels. Therefore, we can conclude that the main baseline results are consistent across different functional forms.

### **Additional Tests**

The robustness of the results have also been tested in first-stage specification (6.1). Table A.5 in the Appendix displays each of the results for each of the test previously discussed. The consistency of the first-stage baseline estimates reported in Table 7.1 persist when we allow for changes in the specification. Overall, the evidence of discontinuity in the probability of the young candidate's vote share is persistent and statistically significant at the one percent level across all panels. Therefore, it can be concluded that the baseline results for the first-stage are robust to the sensitivity analyses.

Finally, an additional sensitivity test is conducted to analyse the robustness of the results when the sample size is changed. So far, all of the results illustrated in this study have used 42 as the cut-off age for constructing the treatment variable, aligning with the median voting-age

population (VAP) for the study period. This median VAP was obtained from the total national population. However, the median age may vary depending on the municipality. Therefore, I decide to take a different approach and instead use as “cut-off age” the median VAP of the municipalities of the sample. As illustrated in Figure B.12 from the Appendix, the median VAP from the sampled municipalities is approximately 50 which aligned with the median age of the mayors from the sample. Table A.6 and Figure B.11 from Appendix present the results from this alternative approach. Overall, the change in sample size does not significantly impact the results’ magnitude. Despite the minor discrepancy in the sign of one of the point estimates, the magnitude and significance levels in each model remain robust even when the cut-off age is altered. Therefore, we can further establish that the baseline results stay robust across different sample sizes.

Table 8.1: Robustness Checks: Second-stage

	LTC dummy	Preschool dummy	% LTC	% Preschool
<b>Panel A.1: No Controls</b>				
Young Mayor	-0.099 (0.228)	0.272 (0.231)	-0.004 (0.003)	0.000 (0.002)
p-value	0.665	0.239	0.198	0.824
Bandwidth	0.205	0.203	0.260	0.226
<b>Panel A.2: Controls</b>				
Young Mayor	-0.149 (0.125)	0.075 (0.134)	-0.003 (0.003)	0.000 (0.002)
p-value	0.232	0.575	0.281	0.941
Bandwidth	0.294	0.244	0.248	0.235
<b>Panel B.1: <math>h</math>: 0.50</b>				
Young Mayor	-0.047 (0.094)	0.271 (0.230)	-0.004 (0.003)	0.000 (0.001)
p-value	0.620	0.239	0.198	0.862
Bandwidth	0.500	0.500	0.500	0.500
<b>Panel B.2: <math>h</math>: 0.20</b>				
Young Mayor	-0.165 (0.153)	0.143 (0.151)	-0.003 (0.003)	0.002 (0.002)
p-value	0.283	0.343	0.404	0.411
Bandwidth	0.200	0.200	0.200	0.200
<b>Panel C.1: Quadratic Pol.</b>				
Young Mayor	-0.047 (0.193)	0.104 (0.184)	-0.004 (0.004)	0.003 (0.003)
p-value	0.810	0.569	0.428	0.317
Bandwidth	0.279	0.333	0.304	0.337
<b>Panel C.2: Cubic Pol.</b>				
Young Mayor	0.021 (0.224)	0.023 (0.217)	-0.004 (0.004)	0.003 (0.003)
p-value	0.924	0.914	0.589	0.409
Bandwidth	0.288	0.318	0.315	0.326
Observations	1592	1592	1592	1592

*Note:* The binary outcomes reported in columns 1 and 2 take value one if programs of interest have positive values. Columns 3 and 4 illustrate the percentages of expenditures in such programs as a fraction of the total program per municipality. Local linear regressions calculated in Panels A and B use uniform kernels and first-order polynomials. Local linear regressions calculated in Panels C.1 and C.2 use triangular kernels, and second and third-order polynomials. *Sources:* Ministry of Finance, Ministry of Interior, and MPT.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## 9 Conclusion

This study has examined the potential impact of young political leaders on increasing public expenditures for welfare policies that benefit specific age groups. Based on political competition models from Alesina (1988) and Alesina and Passarelli (2019), I hypothesised that the age of leaders influences their policy expenditure decisions, particularly in a context of an ageing society. While much of the existing literature has focused on the consequences that other characteristics of politicians, such as gender or ethnicity, may have on the size and composition of policy expenditures, I aimed to expand on the limited research exploring the impact of *age* on these decisions for political leaders.

To investigate the implications of this demographic variable on public spending, I focused on the expenditures preferences of young mayors in Spanish municipalities regarding two important age-related welfare programs: long-term care and preschool. These preferences are analysed based on whether young mayors allocate funds to these programs and the amount of funds being allocated as a fraction of the total municipality expenditures. By collecting electoral, demographic and budget data from the Spanish government for the years 2007 to 2015, I am able to empirically explore this effect using a Regression Discontinuity Design (RDD). Given the specifics of Spain's closed-list proportional representation (PR) system, where elected first-in-the-list candidates may not become directly elected as mayors of the municipality, I decided to implement a *fuzzy* RDD.

The quasi-random variation derived from elections where a young candidate won by a small margin of vote share against the old candidate enabled the removal of potential confounding factors, relying on the identifying assumptions from Lee (2008). However, despite the tested validity of the design, none of the predicted hypotheses were satisfied. Extensive and intensive margin estimates for both welfare programs proved to be statistically insignificant at all conventional levels, suggesting that age is not a key determinant in allocating public funds to age-related programs. Although this empirical strategy did not fully capture the nuances of the PR electoral system, the main results were further corroborated by various sensitivity analyses.

Despite the significant economic implications of an ageing population, the consequences of elderly electorate and politicians on the development, implementation and funding of welfare policies remains unexplored. Further research should investigate this escalating issue, considering that the shift towards a graying society may overrepresent the interest of the elderly at the expense of younger generations. Sustaining the welfare-state as we conceive it today requires policy reforms capable of adequately balancing the allocation of public good and services that could ultimately redistribute well-being and prosperity to all citizens in society. The naive belief that today's welfare will persist in the future will vanish as long as our leaders remain indifferent towards this demographic phenomenon.

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## A Supplementary Tables

Table A.1: Definitions and sources of control variables

Control Variable	Description	Source
1. Municipality population	Population resulting from the municipal registers as of January 1st of 2007 and 2011. Figures are approved by the Spanish Government.	<a href="https://www.ine.es/dynt3/inebase/es/index.htm?padre=525#">https://www.ine.es/dynt3/inebase/es/index.htm?padre=525#</a>
2. %Male population	Share of male population calculated from the total municipal population.	<a href="https://www.ine.es/dynt3/inebase/es/index.htm?padre=525#">https://www.ine.es/dynt3/inebase/es/index.htm?padre=525#</a>
3. %Female population	Share of female population calculated from the total municipal population.	<a href="https://www.ine.es/dynt3/inebase/es/index.htm?padre=525#">https://www.ine.es/dynt3/inebase/es/index.htm?padre=525#</a>
4. %Debt 2009	Share of public debt as a total of municipality public expenditures in 2009.	<a href="https://www.boe.es/buscar/act.php?id=BOE-A-2014-879">https://www.boe.es/buscar/act.php?id=BOE-A-2014-879</a>
5. %Population born abroad	Share of municipal population born outside Spain. Data from the 2011 Population Census.	<a href="https://www.ine.es/jaxi/Tabla.htm?path=/t20/e244/avance/p02/10/&amp;file=2mun00.px&amp;L=0">https://www.ine.es/jaxi/Tabla.htm?path=/t20/e244/avance/p02/10/&amp;file=2mun00.px&amp;L=0</a>
6. %Population born in different region	Share of municipal population born outside of the Autonomous Community. Data from the 2011 Population Census.	<a href="https://www.ine.es/jaxi/Tabla.htm?path=/t20/e244/avance/p02/10/&amp;file=2mun00.px&amp;L=0">https://www.ine.es/jaxi/Tabla.htm?path=/t20/e244/avance/p02/10/&amp;file=2mun00.px&amp;L=0</a>
7. Mean age municipality	Mean age of municipal population. Data from the 2011 Population Census.	<a href="https://www.ine.es/jaxi/Tabla.htm?path=/t20/e244/avance/p02/10/&amp;file=1mun00.px&amp;L=0">https://www.ine.es/jaxi/Tabla.htm?path=/t20/e244/avance/p02/10/&amp;file=1mun00.px&amp;L=0</a>
8. Population over 80	Share of municipal population over the age of 80. Data from the 2011 Population Census.	<a href="https://www.ine.es/jaxi/Tabla.htm?path=/t20/e244/avance/p02/10/&amp;file=1mun00.px&amp;L=0">https://www.ine.es/jaxi/Tabla.htm?path=/t20/e244/avance/p02/10/&amp;file=1mun00.px&amp;L=0</a>
9. Population under 4	Share of municipal population under the age of 4. Data from the 2011 Population Census.	<a href="https://www.ine.es/jaxi/Tabla.htm?path=/t20/e244/avance/p02/10/&amp;file=1mun00.px&amp;L=0">https://www.ine.es/jaxi/Tabla.htm?path=/t20/e244/avance/p02/10/&amp;file=1mun00.px&amp;L=0</a>

Table A.2: Municipal Data by Age

	All Municipalities	PP Mayors	PSOE Mayors
<b>Age-related Policies</b>			
Young Mayor	0.163 (0.370)	0.109 (0.312)	0.310 (0.462)
Long-Term Care Share	0.002 (0.007)	0.001 (0.005)	0.004 (0.010)
Long-Term Care Dummy	0.609 (0.488)	0.561 (0.496)	0.737 (0.440)
Preschool Share	0.003 (0.006)	0.003 (0.005)	0.004 (0.007)
Preschool Dummy	0.609 (0.488)	0.565 (0.496)	0.727 (0.446)
<b>Municipal Characteristics</b>			
Population	10566.956 (67592.465)	10787.018 (67405.959)	9975.152 (68098.122)
Male Share	51.129 (2.078)	51.073 (2.010)	51.280 (2.243)
Female Share	48.858 (2.084)	48.915 (2.015)	48.705 (2.250)
Share Debt 2009	0.027 (0.173)	0.027 (0.177)	0.026 (0.163)
Born Abroad	9.017 (8.163)	8.836 (8.017)	9.503 (8.525)
Born in Different Region	10.092 (8.503)	9.937 (8.355)	10.508 (8.876)
Mean Age Municipality	36.752 (18.445)	36.001 (18.775)	38.641 (17.450)
Population Under 4	2.598 (1.874)	2.578 (1.881)	2.649 (1.854)
Population Over 80	8.413 (4.554)	8.251 (4.469)	8.821 (4.738)
Observations	12,301	3,334	8,966

*Note:* Table illustrate the sample mean of each variable and standard deviations in parentheses. Column 1 includes values for the municipalities ruled by PP Mayors and Column 2 for municipalities ruled by PSOE Mayors. *Sources:* Ministry of Finance, INE, and MPT. Table created by the author.

Table A.3: Reduced Form - Young Mayor

	LTC dummy	Preschool dummy	% LTC	% Preschool
Young Vote Margin	-0.045 (0.053)	0.055 (0.051)	-0.001 (0.001)	0.001 (0.0008)
p-value	0.397	0.283	0.473	0.417
Bandwidth	0.181	0.187	0.164	0.146
Mean Dep. Var.	0.207	0.207	0.207	0.207
Clusters	294	312	308	268
Observations	1592	1592	1592	1592

*Note:* Columns 1 and 2, use as outcome variable the binary variables taking value of 1 if spending in long-term care and preschool programs are positive. Columns 3 and 4, use as outcome variable the proportion of spending in long-term care and preschool programs as a fraction of total municipal expenditures. Local linear regressions are estimated using first-order polynomials, 95% confidence intervals and uniform kernels. Controls are included and standard errors clustered at the municipal level. *Sources:* Ministry of Finance, Ministry of Interior and MPT.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table A.4: RD Balancing Checks - Party and Mayor Type

	PSOE Mayor	Young Mayor
Treated	0.004 (0.057)	-0.02075 (0.035)
p-value	0.933	0.553
Bandwidth	0.205	0.209
Clusters	292	728
Observations	1590	3955

*Note:* “Treated” estimate in column 1 obtained by replacing the PSOE Mayor dummy as the outcome in the main second-stage specification (equation 6.2). Conversely, estimate in column 2 obtained by replacing the Young Mayor dummy as the outcome in the RD specification for the effect of party. Covariates included and standard errors clustered at the municipal level. Sample size adjusted to mixed races.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table A.5: First-Stage Estimates - Additional Sensitivity Check

<b>Panel A.1: No Controls</b>	
Young Winner	0.298*** (0.038)
Bandwidth	0.208
<b>Panel A.2: Controls</b>	
Young Winner	0.335*** (0.034)
Bandwidth	0.224
<b>Panel B.1: <math>h</math>: 0.50</b>	
Young Winner	0.364*** (0.023)
Bandwidth	0.500
<b>Panel B.2: <math>h</math>: 0.20</b>	
Young Winner	0.335*** (0.036)
Bandwidth	0.200
<b>Panel C.1: Quadratic Pol.</b>	
Young Winner	0.372*** (0.056)
Bandwidth	0.269
<b>Panel C.2: Cubic Pol.</b>	
Young Winner	0.404*** (0.075)
Bandwidth	0.297
Observations	1592

*Note:* The outcome variable is a dummy taking values of one when the young candidate have a higher vote share compared to the old candidate. Local linear regressions are estimated using first-order polynomials and 95% confidence intervals. Control variables are included and standard errors clustered at the municipal level. *Sources:* Ministry of Interior, and MPT.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table A.6: Second-stage - Cut-off Age 50 - Additional Sensitivity Check

	LTC dummy	Preschool dummy	% LTC	% Preschool
Young Mayor	-0.058 (0.169)	-0.027 (0.146)	-0.003 (0.004)	-0.002 (0.002)
F-stat	8.496	9.654	7.647	7.515
Bandwidth	0.137	0.176	0.118	0.117
Mean Dep. Var.	0.207	0.207	0.207	0.207
Clusters	623	563	479	528
Observations	1958	1958	1958	1958

*Note:* Columns 1 and 2, use as outcome variable the binary variables taking value of 1 if spending in long-term care and preschool programs are positive. Columns 3 and 4, use as outcome variable the proportion of spending in long-term care and preschool programs as a fraction of total municipal expenditures. Local linear regressions are estimated using first-order polynomials, 95% confidence intervals and uniform kernels. Controls are included and standard errors clustered at the municipal level. *Sources:* Ministry of Finance, Ministry of Interior and MPT.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table A.7: Mayor Characteristics by Age

	All municipalities	Old Mayors	Young Mayors	Mixed - Old	Mixed - Young
Blue Collar Worker	0.099 (0.299)	0.088 (0.284)	0.175 (0.380)	0.103 (0.304)	0.099 (0.298)
White Collar Worker	0.189 (0.392)	0.156 (0.362)	0.417 (0.493)	0.183 (0.387)	0.217 (0.412)
College Degree	0.229 (0.420)	0.176 (0.381)	0.591 (0.492)	0.200 (0.400)	0.281 (0.450)
High School Diploma	0.209 (0.406)	0.195 (0.396)	0.302 (0.459)	0.230 (0.421)	0.175 (0.380)
Without Studies	0.026 (0.158)	0.029 (0.167)	0.005 (0.071)	0.024 (0.154)	0.007 (0.083)
Female	0.086 (0.281)	0.065 (0.247)	0.228 (0.419)	0.083 (0.276)	0.122 (0.327)
Male	0.433 (0.495)	0.382 (0.486)	0.772 (0.419)	0.415 (0.493)	0.378 (0.485)
Observations	12,301	10,720	1,581	1,243	862

*Notes:* Table illustrate the sample mean and standard deviations in parentheses of the prior occupation, the level of studies and the gender of the mayors classified by age and mixed races. *Sources:* Ministry of Finance, Ministry of Interior, INE, and MPT. Table created by the author.

Table A.8: Balance Check - Young Mayor Characteristics

	B Collar	W Collar	High School	No Studies	Female	Male
Young Mayor	0.196 (0.131)	-0.164 (0.158)	-0.129 (0.158)	-0.068 (0.063)	-0.046 (0.147)	0.026 (0.139)
p-value	0.134	0.297	0.413	0.279	0.754	0.853
F-stat	1.498	-1.044	-0.819	-1.083	-0.313	0.185
Bandwidth	0.234	0.238	0.258	0.300	0.215	0.241
Mean Dep. Var.	0.207	0.207	0.207	0.207	0.207	0.207
Clusters	376	367	379	442	365	365
Observations	2120	2120	2120	2120	2120	2120

*Note:* From left to right columns, the dependent variables indicate the treatment effect estimates for young mayors with respect to (i) blue collar workers, (ii) white collar workers, (iii) high school studies, (iv) no studies, (v) female, and (vi) male. Standard errors are in parentheses.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$



## B Supplementary Figures

Figure B.1: Share of Mayors and Councillors (2007-2011 Term)

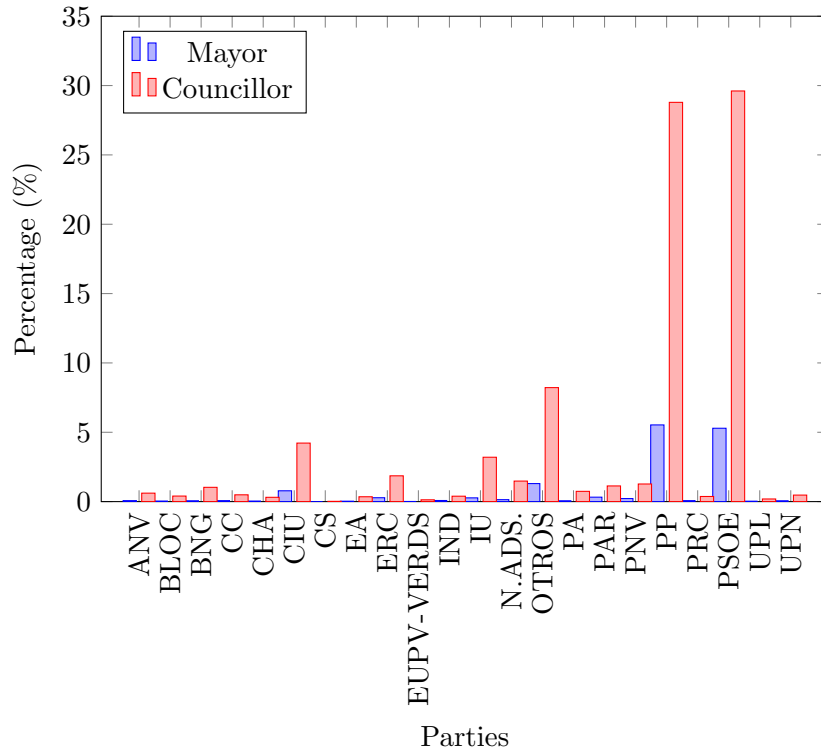
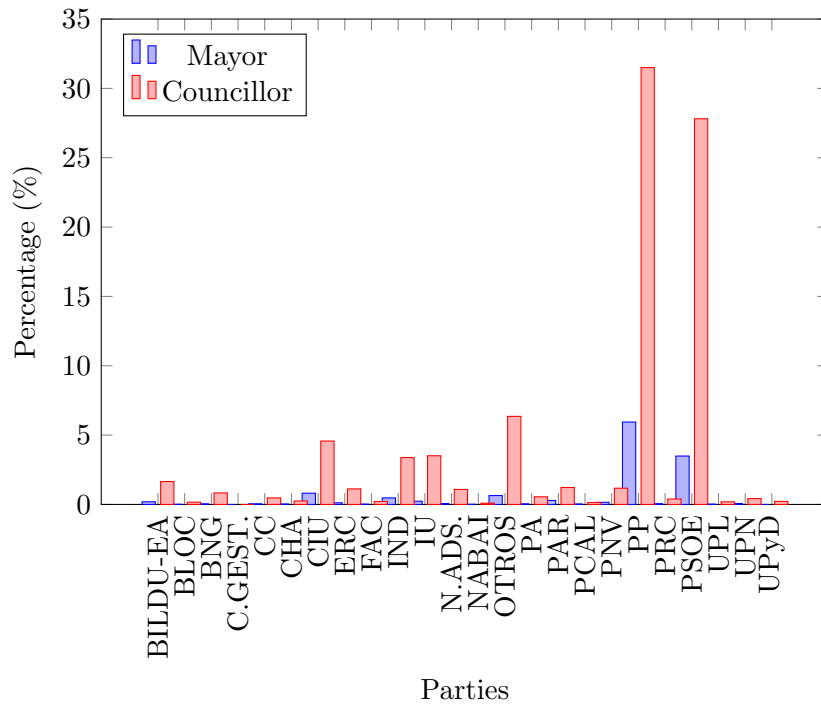
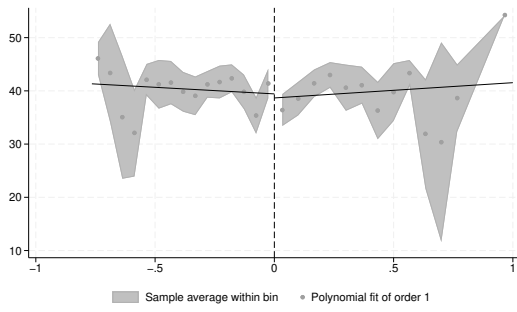


Figure B.2: Share of Mayors and Councillors (2011-2015 Term)

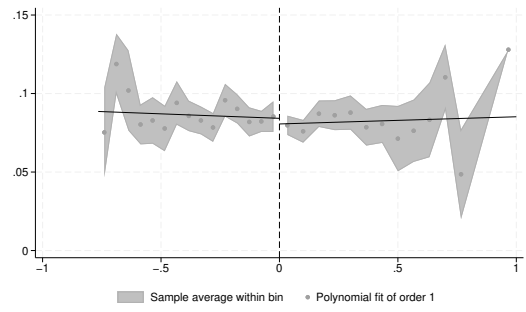


*Note:* Figures display the share of mayors and councillors by political party during the two municipal terms of the study: 2007-2011 and 2011-2015. *Source:* MPT. Charts created by the author.

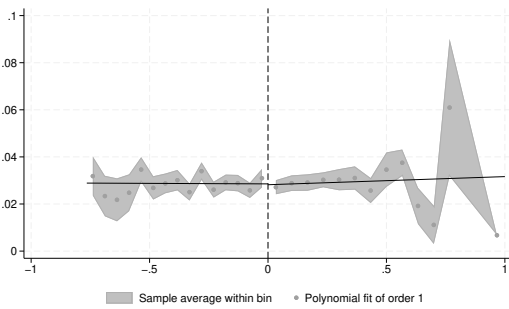
Figure B.3: Balance Checks - Young Candidate Winner



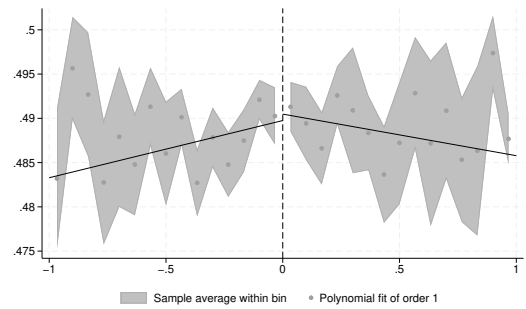
(a) Mean Age



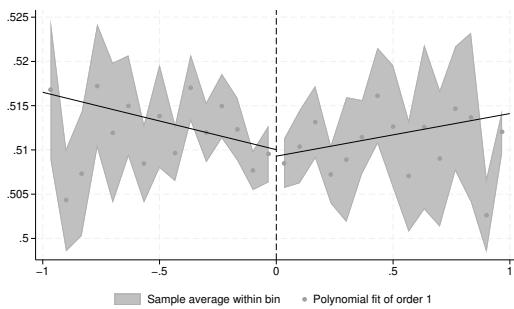
(b) Elderly %



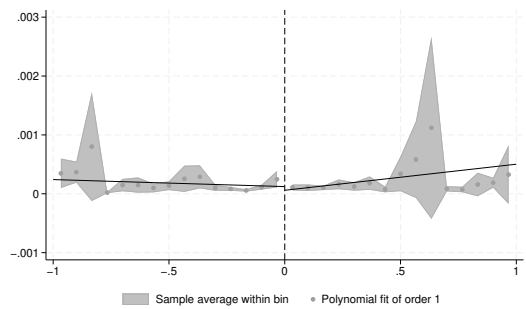
(c) Children %



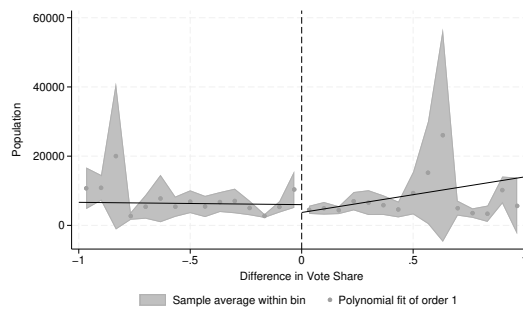
(d) Female %



(e) Male %



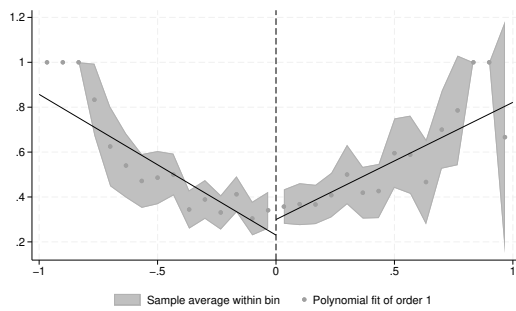
(f) Debt %



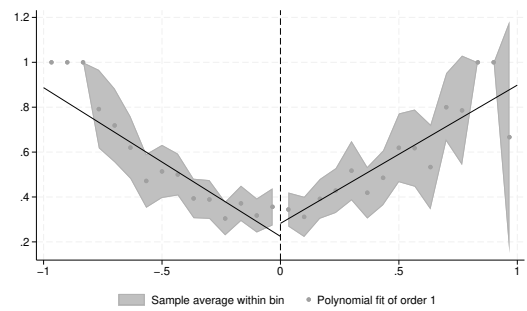
(g) Municipal Population

*Note:* Horizontal axis refers to the vote share difference between old and young candidate, whereas vertical axis contain the controls variables. The fitted lines represent first-order polynomial fit on each side of the cut-off and the scatter points are the averages within the bins of the victory margin of the young candidate. A total of 15 bins are evenly spaced at each side of the threshold. Shaded area displays the 95% confidence interval. *Sources:* Ministry of Interior and MPT.

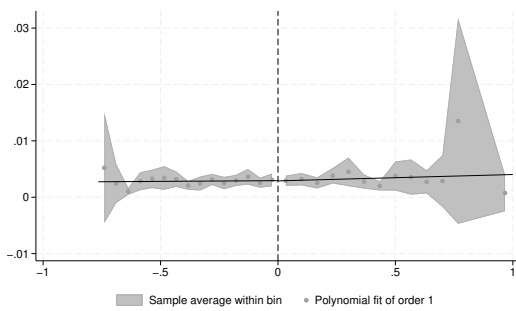
Figure B.4: Reduced Form RD Plots



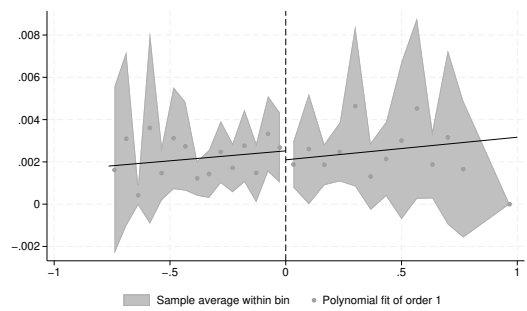
(a) Extensive Margin: Preschool



(b) Extensive Margin: Long-Term Care (LTC)



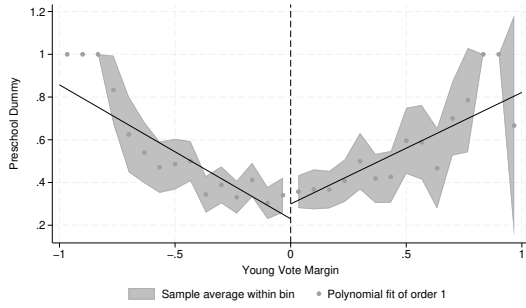
(c) Intensive Margin: Preschool



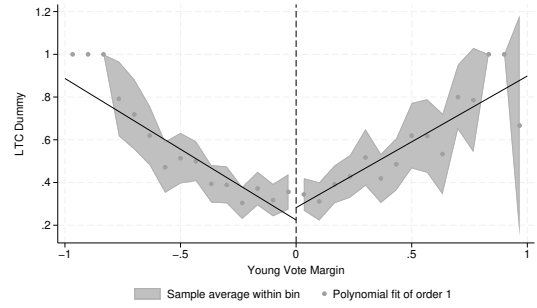
(d) Intensive Margin: Long-Term Care (LTC)

*Note:* Horizontal axis refers to the vote share difference between old and young candidate, whereas vertical axis correspond to the main welfare programs of the paper, long-term care and preschool. The fitted lines represent first-order polynomial fit on each side of the cut-off and the scatter points are the averages within the bins of the victory margin of the young candidate. A total of 15 bins are evenly spaced at each side of the threshold. Shaded area displays the 95% confidence interval. *Sources:* Ministry of Finance, Ministry of Interior and MPT.

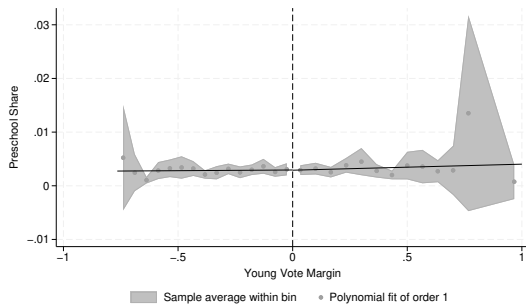
Figure B.5: Second-Stage RD Plots



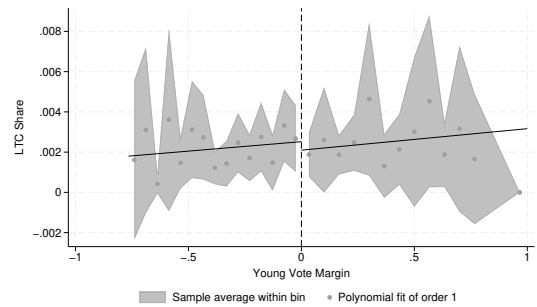
(a) Extensive Margin: Preschool



(b) Extensive Margin: Long-Term Care (LTC)



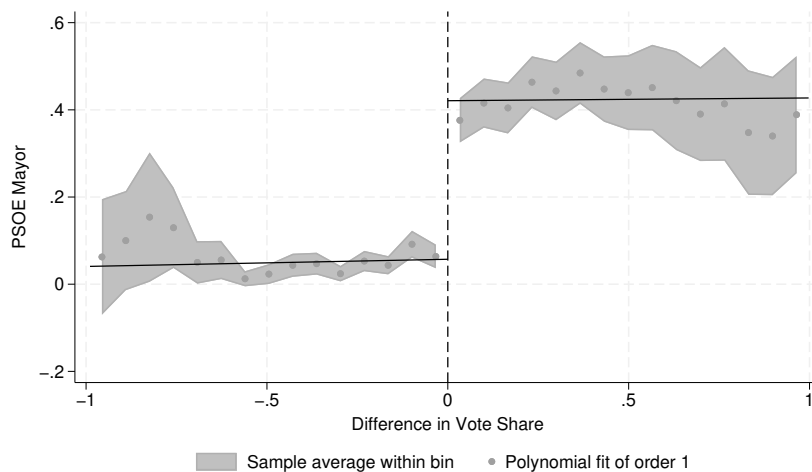
(c) Intensive Margin: Preschool



(d) Intensive Margin: Long-Term Care (LTC)

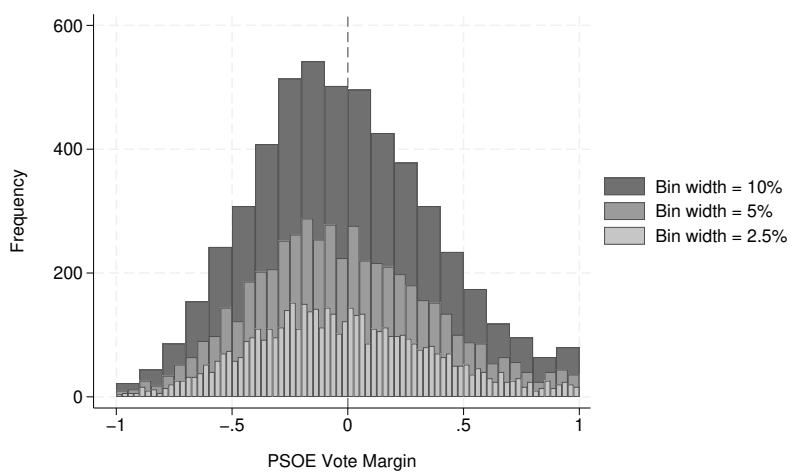
*Note:* From top to bottom and from left to right. Horizontal axis refers to the dummy of young mayor in close elections. Vertical axis correspond to the intensive and extensive outcomes for the main programs of the paper, long-term care and preschool. The fitted lines represent first-order polynomial fit on each side of the cut-off and the scatter points are the averages within the bins of the victory margin of the young candidate. A total of 15 bins are evenly spaced at each side of the threshold. Shaded area displays the 95% confidence interval. *Sources:* Ministry of Finance, Ministry of Interior and MPT.

Figure B.6: First-stage - PSOE Mayor



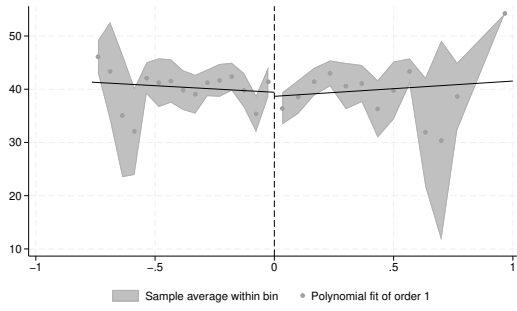
*Note:* The vertical axis denotes the fraction of PSOE mayors, whereas the horizontal axis represents political party vote margin, where positive values indicate the winning of a PSOE candidate and vice versa. The fitted lines represent first-order polynomial fit on each side of the cut-off and the scatter points are the averages within the bins of the victory margin of the young candidate. Shaded area displays the 95% confidence interval. *Sources:* Ministry of Interior and MPT.

Figure B.7: Frequency histogram - PSOE Mayoral Candidate

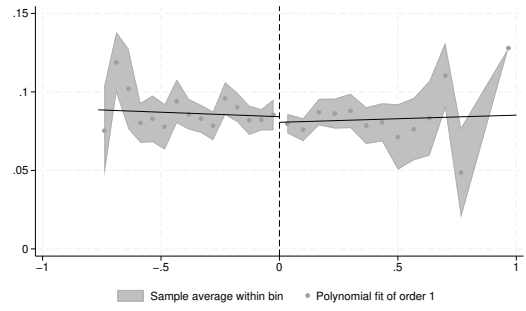


*Note:* Manipulation test illustrating the distribution of PSOE candidate winning vote share margin. McCrary (2008) test reported p-value 0.166 rejecting plausible manipulation at all conventional p-values. *Sources:* Ministry of Interior and MPT.

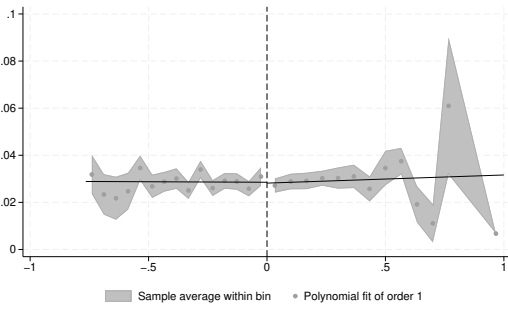
Figure B.8: Balance Checks - PSOE Winner



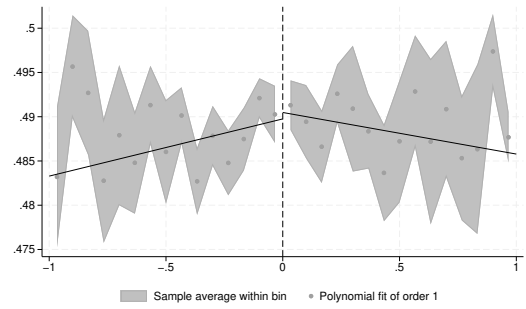
(a) Mean Age



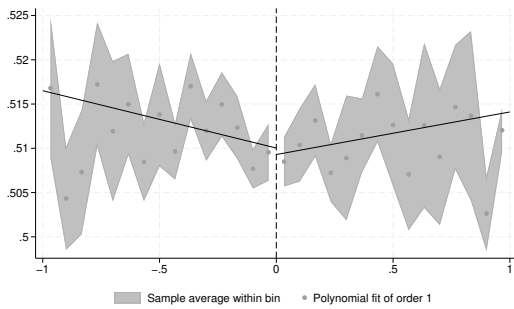
(b) Elderly %



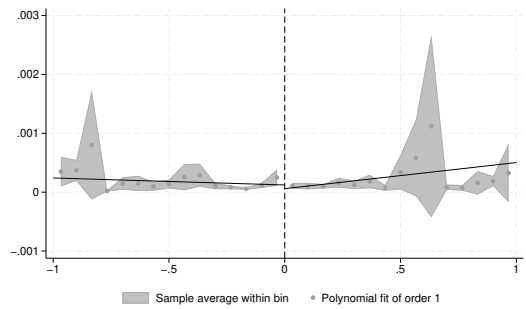
(c) Children %



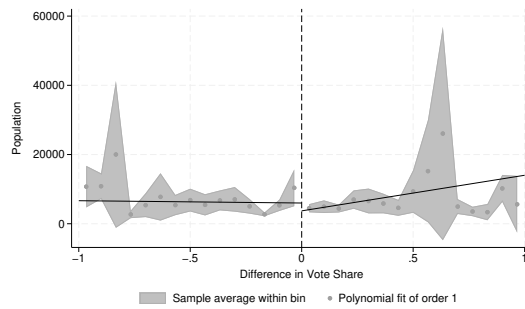
(d) Female %



(e) Male %



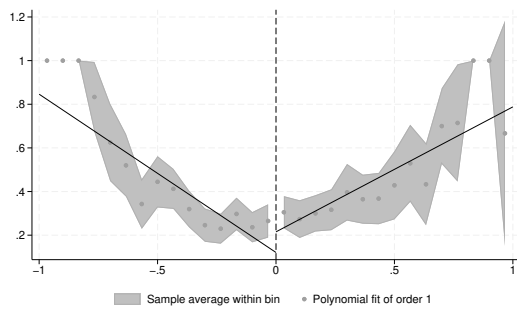
(f) Debt %



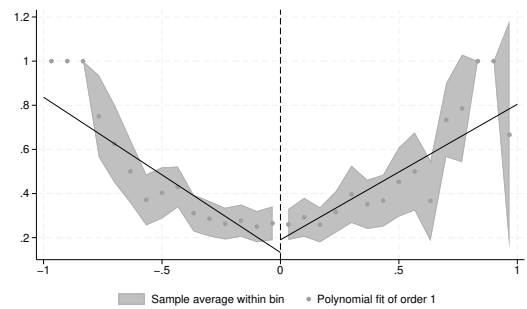
(g) Municipal Population

*Note:* Horizontal axis refers to the vote share difference between PP and PSOE political parties' candidate, whereas vertical axis contain the controls variables. The fitted lines represent first-order polynomial fit on each side of the cut-off and the scatter points are the averages within the bins of the victory margin of the young candidate. A total of 15 bins are evenly spaced at each side of the threshold. Shaded area displays the 95% confidence interval. *Sources:* Ministry of Interior and MPT.

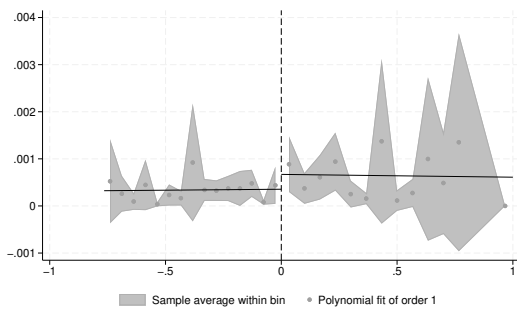
Figure B.9: Reduced Form RD - Plots Alternative Policies



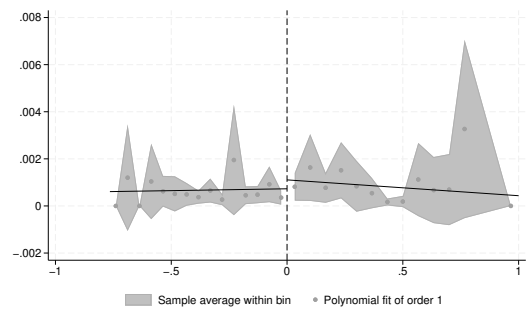
(a) Extensive Margin: Environment



(b) Extensive Margin: Culture



(c) Intensive Margin: Environment

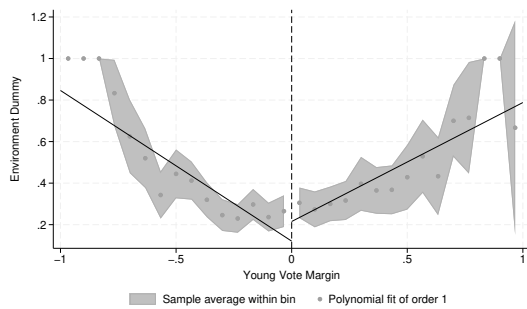


(d) Intensive Margin: Culture

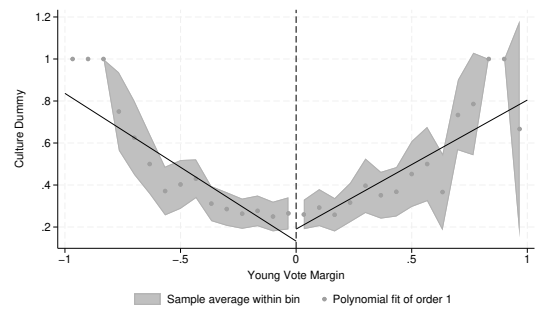
*Note:* Horizontal axis refers to the vote share difference between old and young candidate, whereas vertical axis correspond to the alternative programs of the paper, environmental protection and culture. The fitted lines represent first-order polynomial fit on each side of the cut-off and the scatter points are the averages within the bins of the victory margin of the young candidate. Shaded area displays the 95% confidence interval. *Sources:* Ministry of Finance, Ministry of Interior and MPT.



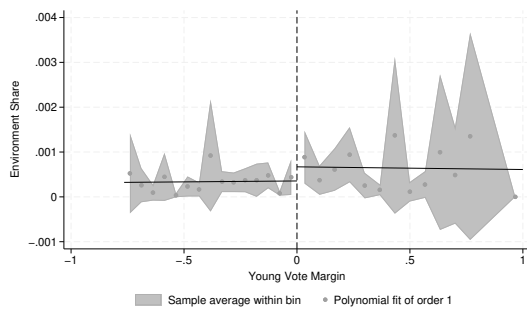
Figure B.10: Second-stage RD Plots - Alternative Policies



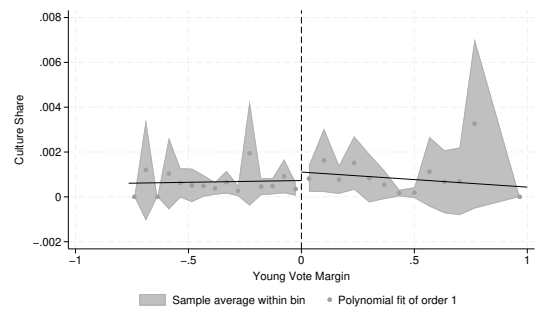
(a) Extensive Margin: Environment



(b) Extensive Margin: Culture



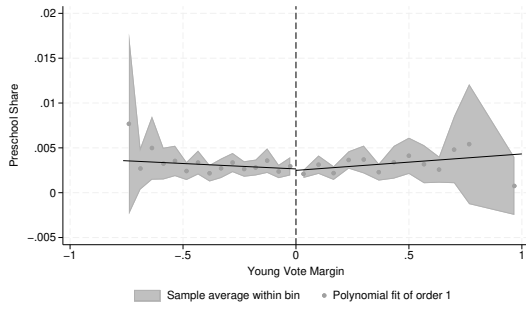
(c) Intensive Margin: Environment



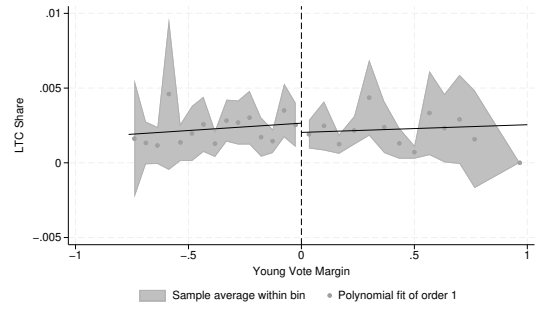
(d) Intensive Margin: Culture

*Note:* Horizontal axis refers to the dummy of young mayor in close elections. Vertical axis correspond to the intensive and extensive outcomes for alternative programs environmental protection and culture. The fitted lines represent first-order polynomial fit on each side of the cut-off and the scatter points are the averages within the bins of the victory margin of the young candidate. A total of 15 bins are evenly spaced at each side of the threshold. Shaded area displays the 95% confidence interval. *Sources:* Ministry of Finance, Ministry of Interior and MPT.

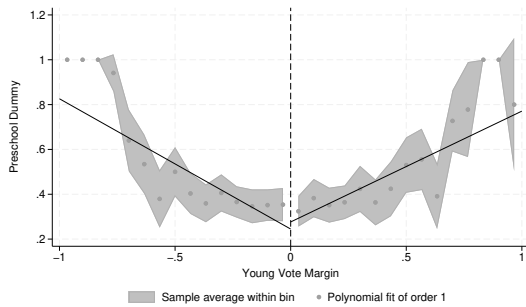
Figure B.11: Second-stage RD Plots - Cut-off Age 50



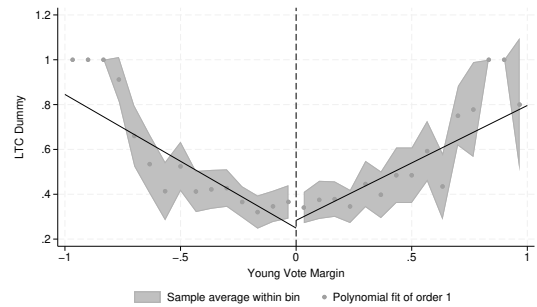
(a) Intensive Margin: Preschool



(b) Intensive Margin: Long-Term Care (LTC)



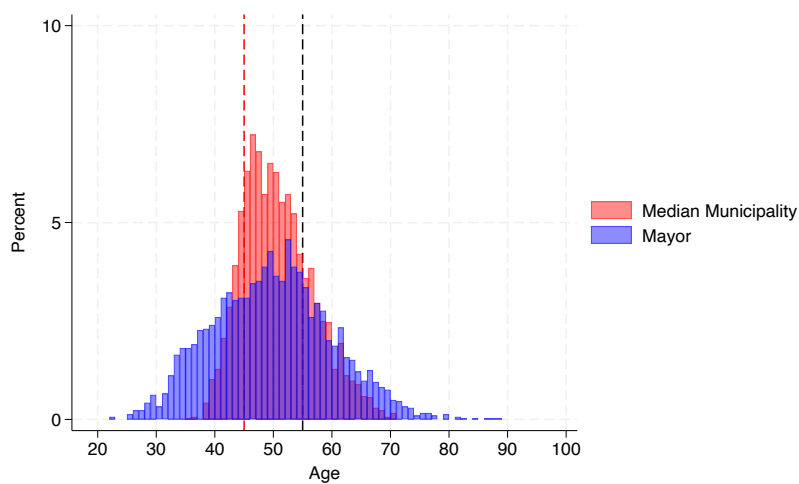
(c) Extensive Margin: Preschool



(d) Extensive Margin: Long-Term Care (LTC)

*Note:* Horizontal axis refers to the dummy of young mayor in close elections. Vertical axis correspond to the intensive and extensive outcomes for long-term care and preschool. Outcomes obtained using age 50 as cut-off for mayoral candidate. The fitted lines represent first-order polynomial fit on each side of the cut-off and the scatter points are the averages within the bins of the victory margin of the young candidate. A total of 15 bins are evenly spaced at each side of the threshold. Shaded area displays the 95% confidence interval. *Sources:* Ministry of Finance, Ministry of Interior and MPT.

Figure B.12: Median Age of Municipalities and Mayors



*Note:* This graph illustrate an overlaying histogram with the distribution of the median age of the municipalities, and the age of the mayors for year 2011. The vertical axis represents the proportion in percentage terms and the horizontal axis represent the age range of the voting population. Dashed lines in color red and black depict the 20th and the 80th percentile of age. The approximate average of the median age of the municipalities is 50 and the median age the mayors is also 50. *Sources:* INE and MPT. Graph created by author.