University of Cologne
Faculty of Management, Economics and Social Sciences
Master of Arts in Political Science, 6th Semester

Master Thesis

Youth representation in Brazilian municipalities: Do the young make a difference in public spending?

Author:
Monja Rinderle
Student-ID: 7385456
E-Mail: monja.rinderle@gmx.de

Supervisor:
Prof. Dr. Sven-Oliver Proksch

Köln, 5 July 2023

Abstract

Young people are underrepresented in political institutions worldwide which could have detrimental consequences for policy outcomes and democracies at large. This thesis investigates whether youth representation in the legislative and executive branch influences the allocation of public spending in Brazilian municipalities. To do so, I create a large panel data set covering more than 32,000 municipal governments from 2002 to 2022 and use a regression discontinuity design as well as mixed-effects models. I show that the young age of mayors and councilors has no coherent effect on the composition of municipal budgets although there are a few interesting patterns in select policy areas. My findings put into question the link between descriptive and substantive representation with regards to youth and underline that youth representation is no panacea for achieving more equitable outcomes across generations.

Content

Figures

Tables

Abbreviations

AD	Age Difference
ARI	Age Representation Index
CER	Coverage Error
FINBRA	Finanças do Brasil
HDI	Human Development Index
IBAM	Instituto Brasileiro de Administração Municipal
IBGE	Instituto Brasileiro de Geografía e Estatística
IPU	Inter-Parliamentary Union
LAPOP	Latin American Public Opinion Project
LATE	Local Average Treatment Effect
MEM	Mixed-Effects Model
MSE	Mean-Squared Error
MP	Member of Parliament
PCRD	Politician Characteristic Regression Discontinuity
RD	Regression Discontinuity
RDD	Regression Discontinuity Design
TSE	Tribunal Superior Eleitoral
UN DESA	United Nations, Department of Economic and Social Affairs

1 Introduction

Young people are underrepresented in political institutions. While about half of the world's voting-age population is 40 years old or younger, only 19.3 percent of national legislators are below that age (IPU 2023a, UN DESA 2022). Numbers are even more drastic when focusing on those 30 years or younger: on average only three percent of national legislators worldwide belong to this group - which means they are underrepresented by a factor of nine relative to the proportion of 18–30-year-olds in the world population.[1,2] If we look at the composition of cabinets, the share of (national) ministers aged 40 years or younger also stands at a mere 9.6 percent (0.3 percent are 30 years or younger)[3] (Nyrup & Bramwell 2020), and only very rarely are heads of governments below the age of 40.[4] Quite pessimistically, one could say that we live de facto in a gerontocracy, meaning "a state or government in which old people rule" (dictionary.com, n.d.).

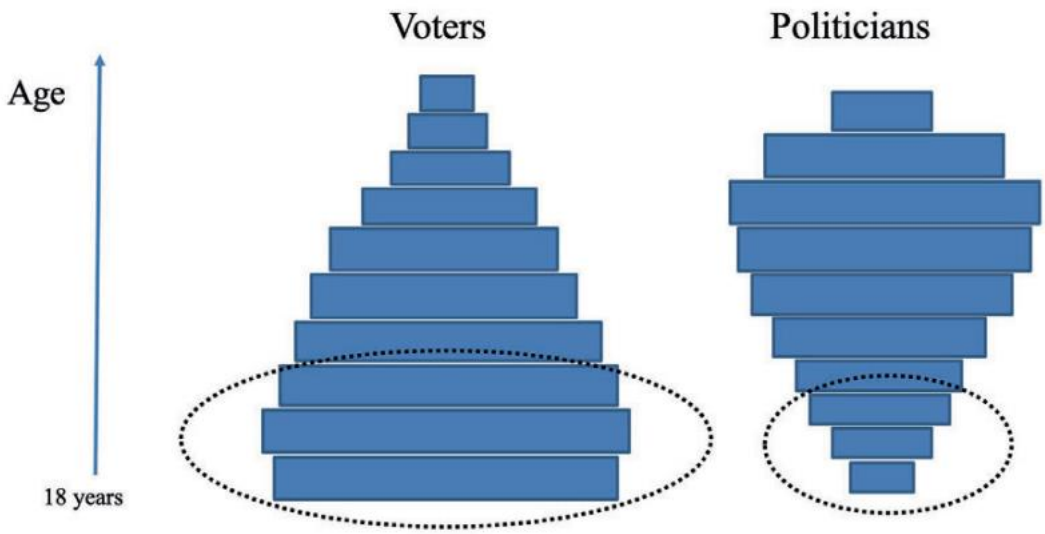


Figure 1: The age distribution in parliaments and the age distribution among voters (Stockemer & Sundström 2022b, p.4).

On a positive side, several initiatives have emerged that recognize the need to achieve better youth representation in political institutions. Most prominently, the United Nations Sustainable Development Goals (SDGs) call in Target 16.7 to "ensure responsive, inclusive, participatory and representative decision-making at all levels" (UN DESA, n.d.). One indicator

[1] The proportion of 18-30-year-olds in the world population is ca. 27.7% (UN DESA 2022). The exact factor of underrepresentation is 9.3.
[2] I consider here only the averages for lower or unicameral chambers as of January 2023, the averages for upper chambers are, however, even lower (6.2% for ≤ 40-year-olds, 0.6% for ≤ 30-year-olds) (IPU 2023a).
[3] The share is calculated based on available data for 1,983 ministers of 145 countries that were in office in July 2021 (*WhoGov* data set).
[4] In July 2021, there were five country leaders younger than 40 years old in office.

specifically aims at youth representation reporting the "proportions of positions in national and local institutions, including (a) the legislatures […], compared to national distributions, by sex, age, persons with disabilities and population groups" (ibid.). In addition, the Inter-Parliamentary Union, the global organization of national parliaments with 179 member countries (IPU 2023c), has adopted the resolution on "Youth Participation in the Democratic Process" in 2010, calling for a "greater inclusion of young people in political decision-making" (IPU 2021, p.9).

In my thesis, I argue that youth representation matters. Young people are the future and crucial for the development of any country. Their participation in political institutions is not only vital for the legitimacy and stability of a country's democracy but also for intergenerational justice as a whole. The aim of this study is to investigate whether youth representation also matters for policy outcomes. More specifically, I examine whether the age of mayors as well as the age composition of local councils has an influence on municipal spendings. To do so, I use a regression discontinuity (RD) design analyzing close elections between young(er) and old(er) candidates for mayor as well as mixed-effects models (MEMs) to examine youth representation in local councils.

I focus on youth representation in Brazil, thereby extending research to a country of the Global South and to a country where youth still make up a significantly larger share of the population compared to countries in the Global North, meaning that youth underrepresentation might be of even greater concern here. Theoretically, the larger proportion of youth should translate into larger amounts of young people represented in political institutions. Looking at the Age Representation Index (ARI) introduced by Stockemer and Sundström (2022a), Brazil belongs to the first quarter of countries in the world with the best youth representation[5], yet still only having an ARI 30 of 0.18 after the 2018 election.[6] In addition, Brazil has been a reasonably well-functioning democracy over the last three decades[7]. Youth in Brazil might therefore be able to make some kind of difference in political institutions in contrast to youth in countries that cannot be considered democracies or where they are virtually not represented at all. Generally, Brazil is an interesting case to study as it is one of the most populous countries in

[5] Irrespective of whether looking at the ARI 30, ARI 35, or ARI 40 of the most recent data available from 171 countries.
[6] Where 0 means no representation and 1 perfect representation of the respective age group relative to their proportion in the voting-age population. ARI 30 means youth ≤ 30 years.
[7] Since 1987, Brazil has been an "Electoral Democracy" according to V-Dem categorization (Papada et al. 2023, p.40).

the world, a newly industrialized country, and home to the largest rainforest on earth, making it a country of great importance for sustainable development in the world.

My thesis contributes to the literature on youth representation and more broadly to the literature examining the consequences of politicians' characteristics on substantive representation as well as the literature on youth and politics more generally. My results must be described as mixed and inconclusive. They suggest that the young age of mayors and councilors has no coherent effect on the allocation of Brazilian municipalities' expenditures although there are a few interesting patterns for some spending categories. Overall, however, young politicians do not seem to spend more (less) on policy areas that are arguably more (less) important to the young, putting into question the link between descriptive and substantive representation with regards to youth. My thesis proceeds as follows. First, I introduce the topic and present a short literature review (chapters 2 and 3). I then explain my theoretical framework and lay out my hypotheses (chapter 4). After that I elaborate the Brazilian case (chapter 5) and present an overview of the data (chapter 6), and then proceed with my RD and MEM analyses (chapters 7 and 8).

2 Why Youth Representation Matters

The relative absence of young politicians in both legislatures and governments is concerning for several reasons. Firstly, descriptive representation is an important factor for the perception of legitimacy of a political system and its policy outcomes, especially among those groups that are underrepresented (Kissau, Lutz & Rosset 2012, pp.64-65). Youth make up a substantial share of the population and it is therefore only fair and just that they are included in representative bodies and political decision-making, even more so considering that the youth have a much higher stake in today's actions or inactions because they still have the bulk of their lives ahead of them (IPU 2020, p.1). For example, Arnesen and Peters (2018) provide evidence that citizens are more willing to accept political decisions when they were made by descriptively similar representatives (including in age) and hence argue that descriptive representation can increase the legitimacy of policy making in democracies. Proponents of descriptive representation posit that representative bodies should be a microcosm of the broader society and "mirror" their populations in a broad spectrum of ascriptive characteristics (e.g. Mansbridge 1999). Yet, today's parliaments are still far from being representative in this regard. Pippa Norris (1997, p.6) noted 25 years ago that "legislatures worldwide include more of the affluent than the less well off, more men than women, more middle-aged than young, and more white-collar professionals than blue-collar workers" – a quote that is still just as true today[8].

Secondly, there is considerable evidence of linkages between descriptive and substantive representation.[9] Given that so few young politicians sit at the decision-making tables, youth interests are likely to be undervalued (Stockemer & Sundström 2022a, p.3). In the words of the Inter-Parliamentary Union (2016, p.2) "without the youth's active participation, the laws and policies passed (…) may be detrimental to their interests, both today and in the future". The interests of young adults might differ from those of older cohorts, for example with regard to welfare spending priorities (e.g. pensions, education and childcare), climate change policies (Stockemer & Sundström 2022a, p.3) or the time horizon of policies. That is, the elderly might prefer policies yielding short-term benefits at the expense of long-term investments (see McClean 2021). Youth underrepresentation is thus particularly worrisome given that young people are disproportionately affected by policy decisions taken on longer-term issues such as

[8] For example, women comprise only about 26.5 percent of all parliamentarians worldwide as of January 2023 although they make up half of the world's population (IPU 2023b).
[9] This link is further elaborated in the theoretical section (chapter 4).

climate change, public debt, social welfare reforms or environmental protection (ibid., p.1).[10] Hence, youth representation is not only assumed to correct inadequacies in substantive representation, but it is also connected to the issue of intergenerational justice (Stockemer & Sundström 2022a, p.5). Many societies in the world are currently facing or are about to face large demographic changes. Ageing populations result in older electorates and go hand in hand with a shift in power between generations (Tremmel et al. 2015, p.1). By constituting an ever-smaller proportion of the population and the electorate, younger generations will have less societal, economic and political power. Berry (2014, p.709) has therefore warned that demographic change may "threaten the practice of representative democracy in a profound sense". Consequently, improving youth representation should be regarded as one step towards dealing with this challenge and as a chance to increase intergenerationally fair policies.

Thirdly, better youth representation could contribute to enhancing young people's feelings of inclusion and motivate them to become more politically involved. Youth are regarded as one of the most disengaged groups in politics (Kitanova 2020, p.820). Scholars and politicians alike have long expressed their concern about their low political participation, pointing to electoral turnout or political party membership where young adults have the lowest participation rates compared to other age groups (e.g. Goerres 2007, Sloam et al. 2021) and compared to young adults of previous generations (Grasso 2014). Similarly, there has been concern about the low political interest and knowledge of youth (e.g. Stockemer & Sundström 2022b, pp.25-26). Many scholars (e.g. Busse, Hashem-Wangler & Tholen 2015; Pickard & Bessant 2018) have, however, emphasized that, although young people seem to turn their back on formal politics, they are neither apathetic nor disengaged. Scholars point instead to the comparatively higher rates of youth in alternative forms of political participation, such as through social media, various organizations, petitions or protests (e.g. Sloam 2016, Kitanova 2020). Cammaerts et al. (2014, p.645) argue that "young people are willing to engage politically but are turned off by the focus and nature of existing mainstream political discourse and practice, which many believe excludes them and ignores their needs and interests". They further report that (European) youth "often believe that those who 'do' politics are neither representing them nor care about them" (ibid., p.650).

This disconnect of youth from formal politics is troublesome. As Stockemer and Sundström (2022b, p.31) maintain, it matters *where* youth participate, as it is in formal politics,

[10] I am aware that those too young to participate in elections and those yet to be born are potentially even more affected than young adults, yet I lay aside the debate on reforms of the democratic system that aim to better represent children and future generations (see for example Van Parijs 1998).

in parliaments and cabinets, where laws are drafted, decided, and implemented. They argue that a more adequate youth representation could reduce the feelings of alienation of youth toward the political system and increase their political participation (ibid., pp.24-34). They embed their argument in a framework which they label "the vicious cycle of political alienation", theorizing that the declining political interest of the young, their lack of conventional political participation and their inadequate representation in political office all reinforce one another. For example, because of youth's low electoral participation, political parties gain relatively little from catering to the interests of youth, something which further entices politicians to ignore issues affecting youth, possibly leading to even more political disengagement, and the continuation of the negative spiral (ibid. 2022a, p.5). An increased presence of youth in parliaments could thus break this vicious cycle and encourage youth to be more engaged in the political process, for example, as it would increase youth visibility, decrease youth alienation and bring more issues relevant to youth on the political agenda, or at least is assumed to do so by voters (see McClean & Ono 2023). Pomante and Schraufnagel (2015) provide suggestive findings in this direction; analyzing both experimental and observational data, they find that youth turn out to vote in greater numbers when candidates are younger.[11]

In the end, it is important to emphasize that this last, third argument to explain why youth representation matters is mainly based on studies on Western democracies and it should be underscored that circumstances can be much different in other regions of the world (e.g. Do youth really have the lowest electoral participation rates? What are the reasons?). Nevertheless, the outlined mechanisms are related to the multidimensional concept of representation where formal, descriptive, substantive and symbolic representation are all closely interconnected (see Schwindt-Bayer & Mishler 2005). Thus, at least theoretically, youth representation could have positive effects on youth satisfaction with the political system and youth political participation, including in countries of the Global South.[12]

Overall, youth representation is vital for intergenerational justice. Youth under-representation in political institutions might contribute to the disillusionment of youth, and their lack of trust in and support for the political system (IPU 2020, p.1). It reduces democratic legitimacy and can be perceived as "democratic deficit with detrimental consequences"

[11] In turn, there is evidence that young voters are more likely to vote for young candidates, or more broadly, voters prefer candidates of their party who are closest to themselves in age (e.g. Webster & Pierce 2019, Sevi 2021). In fact, voters across age groups hold stronger negative biases against older candidates (Eshima & Smith 2022, McClean & Ono 2023). This would imply that an increase in (especially youth) turnout and a higher number of young candidates could lead to an increase in youth representation.

[12] There is also some empirical evidence for the descriptive-symbolic representation link, yet said evidence should be described as mixed (see Poertner 2023).

(Sundström & Stockemer 2021, p.195) with regards to policy outcomes as well as democratic stability at large. Healthy democratic institutions should therefore ensure the inclusion and representation of all relevant groups of society not only to respect and fulfil their rights, but also to bring all people closer to political institutions and to make better policy (IPU 2016, p.2).

3 Literature Review

For a long time, the literature on youth and politics was almost exclusively dedicated to research on the (lack of) political participation of young people. However, in light of demographic change in many countries, political representation of young people has recently become a greater focus of research (Berry 2014). Lowering voting age and introducing youth quotas are controversially discussed to bring about more intergenerational justice in ageing societies (e.g. Tremmel et al. 2015, Bidadanure 2016). Additionally, there are studies that analyze the experiences of young politicians in parliaments (Winsvold, Ødegård & Bergh 2017; Erikson & Josefsson 2019) or examine the role of age in electoral processes (Shen & Shoda 2021, Belschner 2023). With regards to youth representation, several scholars have tried to explain which factors condition higher or lower levels of young people in parliaments (e.g. Joshi 2013, Krook & Nugent 2018, Stockemer & Sundström 2018, 2022b) and governments (Stockemer & Sundström 2022b).[13] Notably, an emerging number of studies also take an explicit intersectional approach and investigate how gender and age intersect with political representation (e.g. Joshi & Och 2021, Stockemer & Sundström 2021, Belschner 2023).

While the literature on youth representation has so far mainly focused on the causes behind the relative absence of youth in political institutions, research on potential consequences has only very recently received more attention. This is surprising given that there is extensive research on how other characteristics of politicians such as gender (e.g. Chattopadhyay & Duflo 2004, Clayton & Zetterberg 2018, or Funk, Paul & Philips 2022), race and ethnicity (e.g. Broockman 2013), LGBT identification (e.g. Reynolds 2013), level or type of education (e.g. Besley, Montalvo & Reynal-Querol 2011) or socioeconomic class (e.g. Carnes & Lupu 2015) can influence their behavior in office or policy outcomes more broadly. Several scholars have also studied the descriptive-substantive representation link in the Brazilian context (Brollo & Troiano 2016; Blaschke 2017; Rocha, Fernandez Orellano & Bugarin 2018; Funk & Philips 2019; Lautenschlage 2022), yet never with regards to age. Part of the reason why there is a lack of studies on youth representation might stem from the fact that youth is temporary and universally experienced - in contrast to other characteristics such as gender or race (Stockemer & Sundström 2022a, p.2). Age discrimination does not come with the same level of domination, exclusion and historical animosity as other social identities and thus may be perceived as less

[13] The papers find that PR (proportional representation) electoral systems and lower eligibility ages for candidates are beneficial for youth representation in parliaments. For cabinets, a higher share of youth in parliaments and a lower age of the head of government are beneficial.

unjust than the exclusion of women or ethnic minorities (McClean 2021, p.5, see Mansbridge 1999). Nevertheless, age discrimination does exist and should not be treated lightly (see for example the Global Report on Ageism by the World Health Organization on the impact of ageism on health and well-being (WHO 2021)).[14] Drawing from all the reasons outlined in the chapter before, I argue that youth representation should receive greater attention in research.

As mentioned previously, there is a vast amount of literature studying the link between descriptive and substantive representation. Drawing from Krcmaric, Nelson and Roberts (2020), who provide a recent review on this so-called "personal biography approach" literature, one must recognize that there is a substantial number of studies that report positive findings. Many studies do find evidence that politicians' biographical factors influence their behavior as well as policy outcomes. Nevertheless, critically assessing the different methods used, evidence should still be described as mixed.

With regards to age, there are only a few studies: Curry and Haydon (2018) provide evidence that older members of the US House of Representatives are more likely to introduce bills on issues that are relevant for the elderly. However, this relationship only holds for low-salience senior issues. For high-salience bills, the determining factor is instead the age demographics of the legislator's constituency. Fiva, Nedregård and Øien (2023) use quantitative text analysis to find that there are substantial differences in the political speech of legislators of different gender, age, geographic region and class in the Norwegian parliament. They show that there are differences even when comparing legislators from the same party bloc and policy committee. The authors report that young legislators talk more about childcare and the environment whereas older legislators appear to be more concerned about healthcare (but not pensions). Furthermore, studying the German national parliament, Debus and Himmelrath (2022) demonstrate that younger MPs participate more in debates on climate change than older MPs and Bailer et al. (2022) show that young German legislators are more likely to ask parliamentary questions related to age topics[15] – at least during their first term in office. The authors argue that the incentive for MPs to engage in policy domains related to their descriptive traits declines over the course of their career.

In addition to these studies that looked at politicians' legislative behavior, there are, to the best of my knowledge, only four studies that examine if there is a link between the age of

[14] Ageism can affect both older and younger people. While I focus in my thesis on younger people, I do want to emphasize that older people are to some degree also underrepresented in political institutions. Further research in this regard is also needed.

[15] The authors define e.g., parental leave, childcare, juvenile crime, age discrimination or social benefits related to children as age topics.

politicians and policy outcomes. Alesina, Cassidy & Troiano (2019) study Italian municipalities and find that young mayors are more likely to increase public spending in election years, which the authors argue is due to their stronger reelection concerns. Nonetheless, they show that municipalities of both younger and older mayors present, on average, a similar level of revenues and expenditures during their mandates. While Alesina et al. (2019) do not focus on specific policy areas of expenditures, McClean (2021) shows, using a regression discontinuity design, that younger mayors in Japan increase their municipality's spending on child welfare, especially with regard to long-term investments in infrastructure. In contrast, he reports that older mayors do not increase the overall spending on elderly welfare but expand short-term benefits for the elderly by decreasing long-term investments. Similarly, Baskaran, Hessami & Schirner (2021) study German (Bavarian) municipalities using an instrumental variable approach. The key difference to McClean's study (2021) is that they focus on local councils instead of mayors. The authors find that municipalities with a higher share of young councilors spend more on childcare and schools. Lastly, Dahis, de las Heras & Saavedra (2023) have only very recently analyzed the effect of politicians' age on long-term policy in the Brazilian context also using an RD approach. Importantly, they only study the municipalities in the Legal Amazon region and not the whole country.[16] They find that electing a young mayor reduces deforestation and greenhouse gas emissions and increases the share of municipal spending on education but not on environmental management. However, the latter three studies have all not been published in academic journals yet.

[16] Note that the working paper was uploaded when I was already in the process of writing this thesis.

4 Theoretical Framework

The question whether and how descriptive representation translates into substantive representation has received a lot of attention both in theoretical and empirical research. Representation is a fundamental concept in democratic theory, and I follow Hanna Pitkin's (1967) definition that understands descriptive representation as representatives "standing for" and substantive representation as "acting for" the citizens they represent. Therefore, descriptive representation means the resemblance or correspondence between the represented and the representative with regard to their personal characteristics such as gender or ethnicity, while substantive representation refers to the behavior of the representative on behalf of and in the interest of the represented. Pitkin (1967, p.142) points to the pitfall of solely focusing on descriptive representation since the parliament's resemblance of the general public would not automatically guarantee good representation in terms of its activity. She suggests that it does not matter so much who represents, as long as the ideas and preferences are represented (Arnesen & Peters 2018, p.870). Mansbridge (1999, p.628), however, argues that "descriptive representation enhances the substantive representation of interests by improving the quality of deliberation". In the words of John Stuart Mill: "in the absence of its natural defenders, the interest of the omitted is always in danger of being overlooked; and when looked at, is seen with very different eyes from those of the persons whom it directly concerns" (as cited in Schwindt-Bayer & Mishler 2005, p.413). With regards to youth, Furlong and Cartmel (2012, p.17) point out that issues with a core relevance for young people might be "tackled from a paternalistic and condescending 'we know what's best for you' perspective or (…) addressed in ways that prioritize the interests of older generations". In the following, I outline the potential causal mechanisms that link descriptive and substantive representation.

A first basic prerequisite is that young people have distinct policy preferences from older people because, as Svaleryd (2009, p.187) maintains, without differences in preferences, there is no reason to expect that there are differences in policy outcomes. Generally, public opinion polls from various countries show that age groups have distinctive preferences. Young people in the United States, for example, express more liberal attitudes than older citizens on issues such as immigration, same-sex marriage or racial discrimination (Pew Research Center 2018). Likewise, young Europeans are more supportive of same-sex marriage than older Europeans (Dotti Sani & Quaranta 2020). Moreover, age was a clear dividing line in the Brexit vote in 2016, where young people were much more likely to vote that the United Kingdom remains

within the European Union compared to older people (Bell & Gardiner 2019). Carrying out an age-period-cohort analysis for European countries, Norris and Inglehart (2019) further find that younger generations tend to have more liberal, multicultural, and egalitarian beliefs, whereas older generations are generally more likely to hold conservative values.

Furthermore, there is a vast literature examining if there are age differences in preferences with regards to welfare spending. In a recent systematic literature review, Vlandas, McArthur and Ganslmeier (2021, p.15) come to the conclusion that the elderly are more supportive of pension spending, yet acknowledging that this can also be popular with younger people. They also conclude that "older people are notably less supportive of spending on childcare and education than the young, albeit with substantial heterogeneity across countries" (ibid.). In addition, De Mello et al. (2017) provide evidence that, in countries of Europe and the former Soviet Union, the elderly have stronger preferences for allocating additional government spending to healthcare and pensions, while the young are more likely to consider education, protecting the environment and assisting the poor as priorities for additional government spending. Younger people have also been found to attach a higher priority to environment protection (Poortinga et al. 2019; Ahlfeldt, Maennig & Mueller 2022; Parth & Vlandas 2022) and to support more government spending to tackle climate change (Arpad 2018; Andor, Schmidt & Sommer 2018; Johnson & Schwadel 2019).

Lastly, scholars theorize that the interests of age groups might differ with regards to the time horizon of policies, that is, the elderly might have fewer incentives to care about long-term oriented policies since they entail short-term costs and few benefits for them (McClean 2021, pp.8-9). By contrast, the young might be more willing to support such policies and bear the short-term costs since they have a longer horizon over which they can benefit from them. More broadly, Alesina and Passarelli (2019) connect this to the higher (lower) willingness of the young (old) for policy changes and reforms.

Overall, this short overview demonstrates that the youth indeed have interests and hold views that differ from those of older individuals. The differences observed in research have been explained both with life-cycle effects (due to being at a certain stage in life, e.g. in education, labor or retirement) or with cohort effects (due to different socialization experiences during young adulthood, i.e. the belonging to a specific generation) (Kissau et al. 2012, pp.67-68). While the underlying reasons do not really matter for the representation of youth in political institutions at a particular point in time, they do underscore that it is very evident that age groups share at least some age or cohort-related interests, concerns or goals (Bidadanure 2015, p.40), without essentializing the interests of youth and keeping in mind their heterogeneity as a group.

Given this prerequisite, one can assume that these differences in preferences have at least some impact on politicians' behavior. A basic assumption is that, on average, young politicians have the same preferences than the general young population. Yet, this is debatable as politicians are usually wealthier and better educated and as the individual career plans of politicians might influence their behavior and contradict their preferences (Alesina et al. 2019, p.691; Bailer et al. 2022). Nevertheless, one can expect that since young politicians have a personal connection to the interests, preferences, and challenges faced by youth, they can more easily relate to their needs and act in their interest compared to others (Curry & Haydon 2018, p.572). For example, younger politicians are more likely to be raising children than older ones (McClean 2021, p.7). They have therefore not only an informational advantage with regards to childcare or education issues but can also more easily relate with people in this situation. Likewise, older politicians are more likely to be confronting financial and health challenges related to ageing and retirement. Even when politicians do not directly have these personal experiences, they are more likely to have similarly aged friends and peers that do. In sum, it is assumed that young politicians (can) act as stronger advocates for the young population than others.

Moreover, there is some evidence that legislators understand it as their role to represent their descriptive groups' interests (e.g. Dittmar, Sanbonmatsu & Carroll (2018) for female legislators in the United States; Karlsson & Gilljam (2014)[17] for young legislators in Norway). On the one hand, this can be due to similar preferences and/or better understanding of the descriptive group as mentioned above. For example, Broockman (2013) shows through a field experiment that black US state legislators are more intrinsically motivated to advance black people's interests than their counterparts, even if it offers little political reward for them. On the other hand, it can also be a strategic choice of the politician to represent the interests of the respective descriptive group (McClean 2021, Bailer et al. 2022). Having a comparative advantage in making credible appeals to the young, they may expect to attract more votes from similarly aged constituents when acting on age-salient issues. Young politicians may even feel pressure to represent their age group in order to please voter and media expectations and age stereotypes[18] (Winsvold et al. 2017, Krcmaric et al. 2020, McClean 2021).

[17] As cited in Stockemer and Sundström (2022b, p.36).
[18] McClean and Ono (2023) show in an experiment that Japanese voters expect candidates to focus more on issues important to similarly aged voters. That is, young candidates were associated with policy issues such as education, childcare, or climate change, whereas older candidates were associated with elderly care and healthcare.

When studying the link between descriptive and substantive representation, one must take into account the institutional constraints legislators and governors face. For example, legislative action is limited or structured by committee assignments, party discipline or agenda setting (Curry & Haydon 2018, p.575). Legislators may not be free to vote according to their preference but need to follow the party line. Also, they may not be able to raise awareness for a topic if they are not members of the specific committee or if they are not given the opportunity to mention it in parliamentary debate. In addition, depending on the electoral system, they may have stronger electoral incentives to act according to the interest of the electorate rather than according to their own interest (Svaleryd 2009, p.186). The degree to which descriptive representation can translate into substantive representation may therefore depend very much on the constraints politicians face. Scholars, however, usually assume that politicians have some level of discretion (Krcmaric et al. 2020, p.135). That is, if they were entirely constrained by institutional structures their personal preferences and characteristics would be irrelevant.[19]

A large body of research has investigated whether politicians of a certain descriptive characteristic behave differently in office than their counterparts examining all sorts of different legislative actions (see Krcmaric et al. 2020 for an overview). For example, Lowande, Ritchie and Lauterbach (2019) study communication between legislators and federal agencies and find that women, veterans and ethnic minorities are more likely to work on behalf of constituents with whom they share identities. On balance, one can say that there is considerable evidence that descriptive characteristics affect politicians' individual behavior.

Lastly, it is still unclear how descriptive representation influences policy outcomes. Generally, one can expect that executives, especially heads of government, have a relatively higher level of autonomy, and thus their individual identity and preferences may have a stronger influence on policymaking. With regards to legislators, the "politics of presence" model by Anne Phillips (1998) theorizes that the enhanced presence of MPs belonging to the disadvantaged group will contribute towards a transformation in the institutional culture, political discourse, the policy agenda and ultimately, the policy outcomes (Lovenduski & Norris 2003, p.89). An increased presence of the so far underrepresented group should cause

[19] This also relates to two competing theoretical models of electoral competition. On the one hand, the "Downsian" model (Downs 1957) that suggests that personal characteristics and preferences should not matter for policies since all politicians will eventually support the policy preferred by the median voter in an attempt to maximize their vote-shares (Blaschke 2017, p.3). On the other hand, the "citizen-candidate" models (Osborne & Slivinski 1996, Besley & Coate 1997) that assume that candidates only run for office if their expected benefit from winning outweighs the costs of running (Blaschke 2017, p.3). Since these costs are expected to be different for each candidate, politicians will not implement the same policies as predicted in the median voter model.

an aggregate preference shift in the legislature and consequently affect collective legislative decision-making outcomes (Clayton & Zetterberg 2018, p.920). In addition, it should increase the group's ability to shape political discourse and policy content, broaden the political agenda (see Devlin & Elgie 2008), and lead to the group's increased presence in committees. Moreover, it should also increase the group's bargaining power in formal and informal negotiations with other legislators or members of the executive. Overall, one should expect that the "politics of presence" means that the preferences of the specific descriptive group trickle through each and every legislative process and, even if it may take some time, eventually make a difference in policy outcomes.

In this thesis, I investigate the descriptive-substantive representation link by examining young politicians and their effect on municipal spending. I use government expenditures as a form of substantive representation because they are very likely to impact other policy outcomes. In addition, since budgetary allocations represent the distribution of somewhat finite resources, they represent trade-offs that should, at least to some degree, reflect politicians' policy priorities (Clayton & Zetterberg 2018, p.917). As governments do not have unlimited funds to distribute, increasing expenditures in one area often requires a decrease in another (at least as a proportion of the budget) (Funk & Philips 2019, p.21). Thus, if youth representation significantly increases the spending on certain policy issues, this indicates that the young also change the priority that governments place on these issues. Moreover, since budgets are set every year, they reflect politicians' priorities every year anew and can be traced directly to the politicians of the current legislative term, in contrast to other policy outcomes.

Based on the presented theoretical framework, my hypotheses are as follows:[20]

H1: The share of municipal spending on a youth policy issue is significantly higher for municipalities of young mayors compared to others.

H2: The higher the share of young councilors in the local council, the higher the share of municipal spending on a youth policy issue.

H3: The share of municipal spending on a youth policy issue is significantly higher if there is both a high(er) share of young councilors and a young mayor in a municipality.

[20] The spending categories I define as being youth or non-youth policy issues are further elaborated in chapter 6.2. Hypotheses are of course the opposite for non-youth policy issues.

Although the mayor has significant control over expenditures (as discussed in greater detail in chapter 5.2), the local council is responsible for approving the mayor's proposed budget and may directly or indirectly influence the mayor's decisions (Funk & Philips 2019, p.22). Hence, I first test if a young mayor and the share of young councilors have an independent or unconditional effect on the share of municipal spending on certain categories and then test if there is an interaction effect in the third hypothesis. Since the budget is a combined outcome of the mayor and the council, the share of young councilors and a young mayor may reinforce or be conditional on one another (see Funk & Philips 2019, Park & Liang 2019, Baskaran et al. 2021). Intuitively, the young might only be able to make a difference if they are present with sufficient numbers. This also relates to the theory of "critical mass" which has been debated for decades in the literature of women's representation and which assumes that women first need to reach a certain numeric threshold – a critical mass – in the legislature before they are able to effectively influence legislative outcomes (Funk et al. 2022, pp.372-374).

5 The Case of Brazil

5.1 Youth in Brazil

Brazil is the largest country in Latin America and with 216 million inhabitants the seventh most populous country in the world (UN DESA 2022). It ranks 87th on the United Nations Human Development Index (HDI = 0.754 indicating "high human development") and has the same HDI value as the average in the Latin America and Caribbean region (UNDP 2022). Brazil is considered an upper-middle-income country by the World Bank (2023b) and yet is extremely affected by income inequality: the Gini index is 52.9 percent in 2021 (10th highest in the world) (World Bank 2023a).

The Brazilian population is comparatively young. The median age of the population is 34 years, which is above the regional average of 31 years but still considerably lower than the average median age in Europe (42 years) (UN DESA 2022). In Latin America, Brazil has one of the oldest populations just after Costa Rica, Uruguay and Chile. In 2023, 21 percent of the Brazilian population are 15 years or younger and only 10 percent are 65 years or older. In comparison: 15 percent of the population in Germany are 15 years or younger and 23 percent are 65 years or older. While population ageing is expected to accelerate rapidly in Brazil and in the whole Latin American region[21], the demographic structure of today (and of the last two decades) is very different to the ones in the ageing societies of the Global North.

Still until the year 2014 half of the Brazilian population was younger than 30 years (UN DESA 2022). Today, there are around 49 million young people (15-29 years) in Brazil constituting almost one quarter of the country's population (23%). Youth in Brazil are diverse and face various difficulties. In 2017, 8.3 percent of young people lived in extreme poverty and 30.1 percent in poverty, which is equivalent to living on US$1.90 and US$5.5 per day respectively (Atlas das Juventudes 2021, p.21). In addition, the majority of young Brazilians is black (10%) or of color (51%), yet these groups are more vulnerable, and their living conditions subjected to structural racism (ibid., p.16). Inequalities of race manifest themselves in areas, such as education, work and income, and public security. For example, in 2018, the homicide rate among black men was nearly three times higher than that among white men. Generally, Brazilian youth face significant safety and security risks with especially high levels of youth violence and road accidents (IYF 2017, p.118). In the Youth Development Index from 2020,

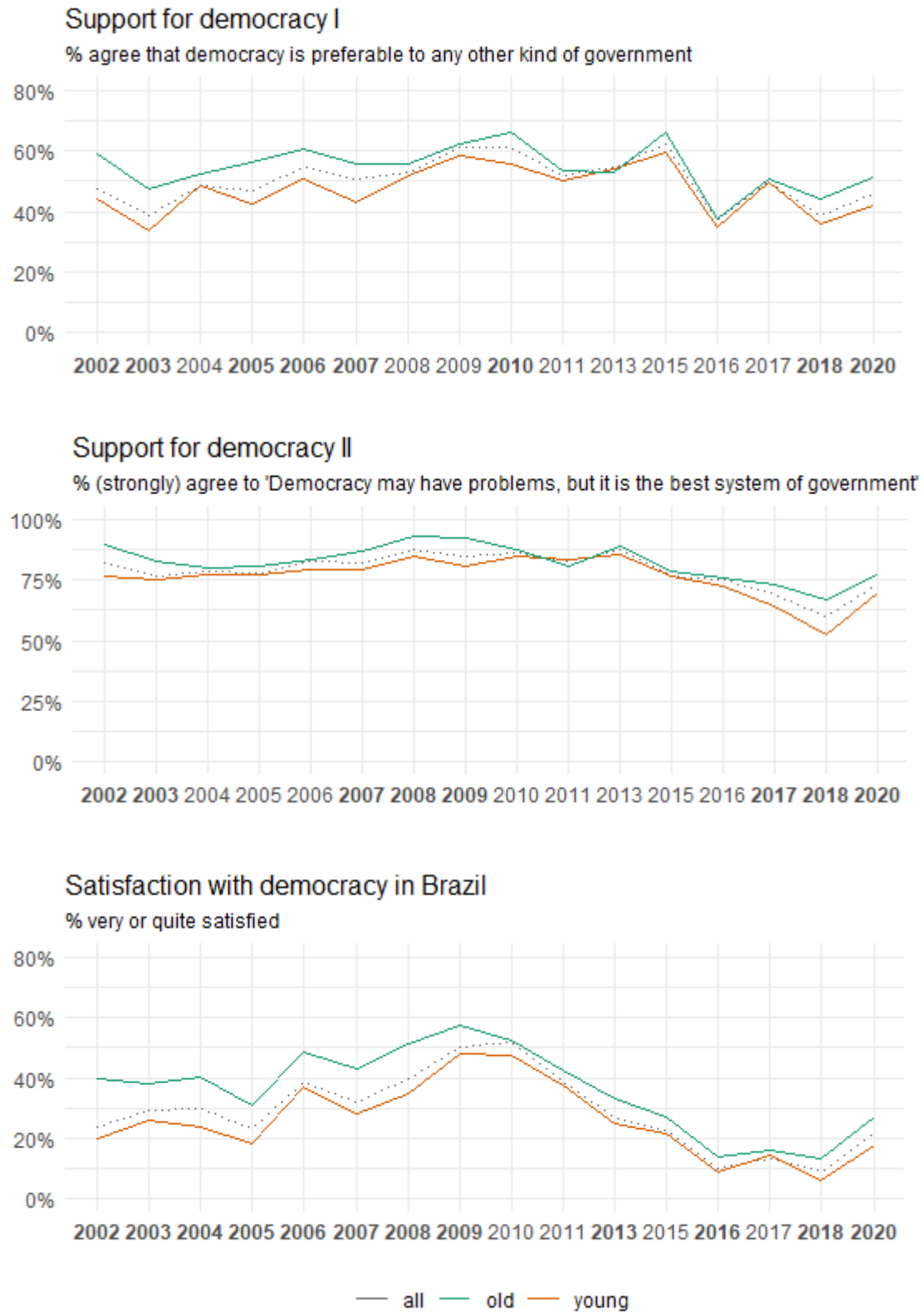
[21] In Brazil, the share of the population 65 years or older is expected to more than double by 2050, reaching over 22%, while the share of the population 15 years or younger is expected to steadily decline and approach the average of Europe and Northern America (around 15%) (UN DESA 2022).

Brazil has a particular low rank in the Peace & Security domain - both compared to other South American countries, with only Colombia and Venezuela faring worse, and the world overall, at 140 out of 181 countries (The Commonwealth 2020). In total, Brazil has a medium youth development according to the index, ranking 116 out of 181, is second last in South America (just before Venezuela) and scores particularly poorly in the domains Peace & Security, Health & Wellbeing and Employment & Opportunity. In the beginning of 2020, about 27 percent of young Brazilians (18-24 years) face unemployment, which is well above the country's overall average of 12 percent in that period (Atlas das Juventudes 2021, p.107). In addition, 20 percent of young Brazilians (14-29 years) did not complete basic education (ibid., p.49).

Turning to political participation, young Brazilians are less likely to vote compared to older Brazilians, yet more likely to engage in protests or demonstrations.[22] They are even more politically interested than their older counterparts – or at least they were in the first decade of the century. However, young Brazilians seem to have an extremely low level of political efficacy. According to the Global Millennial Viewpoints Survey of 2016, 93 percent of the youth (16-24 years) in Brazil feel that their government does not care about their wants and needs (IYF 2017, p.65). In addition, a majority of young people (57%) disagree with the following statement: "Those who run the country are interested in what people like you think" in the Latin American Public Opinion Project (LAPOP) surveys (2014 & 2016/17). The young generally express less support for democracy than the old and are less satisfied with democracy (see the figures below). In 2020, 73 percent of Brazilians (70% of youth) say that democracy is the best system of government, yet only about 22 percent (18% of youth) are satisfied with the functioning of democracy in Brazil.

Fortunately, there have been various approaches in Brazil to strengthen adolescent and youth rights and to include youth in political processes. For example, the National Youth Secretariat *(Secretaria Nacional de Juventude – SNJ)* was created in 2005 being responsible for the development and implementation of youth policies (Youth Policy Labs 2014). It further facilitates the Interministerial Committee for Youth Policy, which is the "permanent body for management and monitoring of public policies of the Federal Government for youth" (ibid.) as well as the National Youth Council *(Conselho Nacional de Juventude – CONJUVE)* which is responsible for creating and proposing youth policy guidelines, commissioning studies and research on the socio-economic reality of the youth and promoting exchanges between national and international youth organizations (UNICEF 2014, p.30; Youth Policy Labs 2014).

[22] The statements from this paragraph are based on my own analyses with LAPOP and Latinobarómetro survey data. See Appendix A for all details and results.



Figures 2, 3 and 4: Comparing attitudes towards democracy between young (16-29 years) and old (55+ years) Brazilians based on Latinobarómetro data. Years in bold indicate significant ($p < .05$) differences based on chi-square tests of independence (see Appendix A for more details).

Moreover, the National Youth Policy was formulated in 2005 (Atlas das Juventudes 2021, p.26) and since 2004, there is an annual youth parliament *(Parlamento Jovem Brasileiro – PJB)*, organized by the national lower house (Câmera dos Deputados, n.d.). At the state and local levels, institutions such as youth secretariats, sub-secretariats, coordinating committees, boards of directors or councils were created (UNICEF 2014, p.30). Such institutions existed in around one thousand municipalities in 2014. Furthermore, in 2010, the Constitution of Brazil was amended to include the term "youth" in the chapter of fundamental rights and guarantees, alongside the family, child, adolescent, and elderly (Constitutional Amendment No. 65, Youth Policy Labs 2014). Subsequently, in 2013, the Youth Statute was adopted by the Brazilian government, which provides for youth rights and details principles and guidelines for public policies directed at young people (UNICEF 2014, p.39). It further encourages broad youth participation in the design, implementation and evaluation of public policies and promotes youth creativity and participation in the development of the country.

Overall, Brazil is a populous and emerging country with huge disparities within the (young) population. Youth development is particularly low compared to other countries of the region and a majority of young Brazilians are dissatisfied with democracy in their country and have low levels of political efficacy. Yet, a variety of measures have been taken to improve youth political participation in the last two decades. It is against this background that I will examine youth representation in the following.

5.2 Institutional Background

Brazil is a presidential democracy and organized as a republican federation (Klein & Sakurai 2015, p.24). The federalist structure of Brazil comprises the union, 26 states and a federal district (holding the capital Brasília), and more than 5500 municipalities as the lowest layer of administrative division. While some municipalities have large populations (such as São Paulo with over 12 million inhabitants), the vast majority (94% in 2022) have less than 100,000 residents, and around 50 percent have less than 11,000 (IBGE 2022). The executive power in municipalities rests on the mayor *(prefeito)*, the deputy mayor, and the secretaries (Lautenschlage 2022, p.24). While the mayor and the deputy mayor are directly elected every four years, the secretaries are appointed by the mayor. Municipal governments may stay in office for a maximum of two four-year consecutive terms. The legislative body is called the city council *(câmara municipal)* and is formed by councilors *(vereadores)* that are also directly elected by voters every four years (Silva 2022). Councilors do not face any term limits.

Municipal elections for mayors and councilors take place at the same time all over the country in 4-year intervals and are staggered by 2 years relative to state and federal elections (Brollo & Nannicini 2012, p.748). Elections are usually held in October and oath of office takes place in January of the following year (Constitution of Brazil Art. 29, Item III). The minimum age to run for mayorship is 21, for councilorship, 18 (ibid. Art. 14 §3, Item VI). Voting in Brazil is compulsory for all citizens over 18 and under 70 and optional for citizens aged 16 and 17, older than 70, or illiterate (Rocha et al. 2018, p.152). Voter turnout thus tends to be very high (Funk & Philips 2019, p.25). The mayor of each municipality is elected jointly with the deputy mayor through plurality rule (Rocha et al. 2018, p.152). For municipalities with less than 200,000 inhabitants, accounting for approximately 97 percent of municipalities, the election uses a single-ballot plurality vote, meaning a first-past-the-post system where the candidate with the most votes wins. In contrast, for municipalities with more than 200,000 inhabitants, the election uses a dual-ballot plurality rule (second-round "runoff") where the two most voted candidates from the first round face a second round if an absolute majority is not achieved in the first round. Councilors, on the other hand, are elected through an open list, proportional representation system (Correa & Madeira 2014, p.5). Here each voter has one vote and can cast it either for a party or an individual candidate in a party's list. The number of councilors in a city council is determined by the population size of the municipality and ranges between 9 to 55 councilors (Constitution of Brazil Art. 29, Item IV).

The 1988 Federal Constitution delegated a considerable degree of legislative and fiscal autonomy to municipalities (Rocha et al. 2018, p.151). It establishes the local governments' responsibilities in the areas of infant and elementary education, health services, urban development, local transportation and preservation of local historic and cultural heritage (Constitution of Brazil Art. 30). Generally, municipalities have the power to legislate on matters of "local interest" and to supplement federal and state legislation where applicable. In addition, all levels of government are jointly responsible for (amongst others) public health and assistance; environment protection; agriculture and food supply; housing and sanitation; providing the means for access to culture, education, science, technology, research and innovation; and the combat of poverty (ibid. Art. 23).

As in other decentralized systems, municipal governments are not able to finance their public policy responsibilities alone (Rocha et al. 2018, p.152). Their own tax revenues usually make up only a small portion of total revenues (Klein & Sakurai 2015, p.24). State and federal transfers are the main source of income for most Brazilian municipalities, with federal transfers accounting on average for 65 percent of the municipal budget (Brollo & Troiano 2016, p.31).

Nevertheless, the Brazilian Institute of Municipal Administration reports that municipalities are very free to use the resources transferred by the states or the union (IBAM 2020, p.163). The main exceptions are the mandatory spending floors for education and health set forth in the constitution, which require municipalities to spend at least 25 percent on education and 15 percent on health (ibid.; Funk & Philips 2019, p.25). Overall, scholars agree that municipalities have a considerable level of discretion over expenditure allocation (Klein & Sakurai 2015, Funk & Philips 2019, Britto & Fiorin 2020).

Moreover, reflecting the presidential system in Brazil, the mayor is the chief executive of the municipality enjoying a relatively high level of autonomy (IBAM 2020, p.40). Funk and Philips (2019, p.25) state that Brazilian "municipalities have a 'strong mayor, weak council' form of government, known as *executivismo*, which is common throughout Latin America". The mayor thus has significant policymaking powers and discretion although the checks-and-balances system at municipal level provides councilors with a few institutional checks to limit the mayor's authority (ibid.; Wampler 2007, p.51). Generally, the mayor holds the main responsibility for municipal performance (Klein & Sakurai 2015, p.24). With regards to finance, the mayor is in firm control of the budgetary process (Wampler 2007, p.46). She or he proposes each year the budget plan to the local council for approval, yet according to Wampler (2007, pp.50-51), the council is limited in its ability to alter the proposed budget. Councilors, for example, cannot increase or decrease the budget's size and hence cannot introduce legislation that would require spending additional funds. They can pass budgetary amendments (with majority support), but those must transfer a spending allocation from one budget line to another and can still be vetoed by the mayor. Furthermore, the mayor can increase spending between 5 and 40 percent on any item in the budget without prior council approval. Finally, the council needs to approve the proposed budget by a two-thirds majority (Constitution of Brazil Art. 30 §2), yet if it fails to do so, the budget from the previous year is reinstated, which - to some extent - diminishes councilors' negotiating power (Wampler 2007, p.51). Altogether, the local council seems to have little direct influence over the municipal budget, Funk and Philips (2019, p.25) therefore conclude that "if a mayor prioritizes a particular issue, she or he should be able to allocate expenditures to reflect this prioritization, so long as the constitutional and legal requirements are met".

6 Data and Main Variables

6.1 Defining Youth

There is no universal definition of "youth" or "young people" (The Commonwealth, p.5). In fact, international and regional organizations use varying age ranges to categorize young people, and the same is true of national governments. As Stockemer and Sundström (2022b, p.9) outline, age is a malleable and fluid concept since being of a certain age can have a different meaning across various settings and in different times. For example, being 30 might already be quite old in some countries with low life expectancy, while in countries with life expectancies of 80 years or more, people at the age of 30 might still be rather young. Different ages of majority and ages for the right to vote and stand for election make a universal definition additionally difficult. Generally, "there is no objective threshold that separates young people from people who are not young anymore" (Hainz 2015, p.24).

For the purpose of this paper, I follow the definition of the Youth Statute *(Estatuto da Juventude*) of Brazil that considers young people to be those between the ages of 15 and 29 (UNICEF 2014, p.11). While I use this definition for my main analyses, I conduct additional analyses setting the upper limit to all ages between 26 and 40 years. This is reasonable in the context of youth representation in political institutions considering that young people can generally only stand for election when they are 18, for governmental positions the minimum age is usually even higher. For example, the minimum age for local councilors in Brazil is 18, and the one for mayors 21. The Inter-Parliamentary Union, the global organization of national parliaments, defines in their statutes that a young parliamentarian is one who is under the age of 45 (IPU 2021, p.9). I thus make sure in my additional analyses that both young councilors and young mayors are maximum 40 years old when they are elected, so that they remain under this threshold throughout their term in office.[23]

[23] The two papers that address a similar research question to my own used higher age thresholds: McClean (2021) defined young to be those below the age of 50 in his analyses for Japan; Baskaran et al. (2021) defined young to be those 40 years or younger in his analyses for Bavaria, Germany.

6.2 Youth Policy Issues – Dependent Variables

As outlined in the theory section, I choose municipal spendings on youth policy issues to quantify youth substantive representation. In this chapter, I explain what I define as youth policy issues in the Brazilian context and how I operationalize them for my empirical analyses. As mentioned before, it is only logical that youth have interests and hold views that differ from those of older individuals because they are at a specific point in their life or because they belong to a specific generation with different socialization experiences. However, this does not mean that every young individual has the same policy preferences. Brazilian youth are extremely heterogeneous, e.g. with respect to income, social class, education level, race, ethnicity or religious orientation. I thus refrain from essentializing youth interests and want to emphasize that youth interests might also vary across time and space (Funk & Philips 2019, p.23).

I analyze public opinion survey data from both Latinobarómetro and the Latin American Public Opinion Project (LAPOP) in order to see if there are systematic differences in interests and concerns between young and old Brazilians (see Appendix A for all details and results). The main question I look at is nearly identical in both surveys and appears in all survey rounds. It asks participants what they consider to be the most important (or serious) problem the country is facing. It is an open question with no response options offered and only one problem allowed to be mentioned. The most prevalent concerns of Brazilians are quite consistent over time and independent of the survey. They include unemployment, health problems (lack of service), corruption, violence/gangs, crime/public security and education problems. Crisis of the economy/economic problems, poverty/social inequality and political situation/crisis are also among the most mentioned concerns in certain years. While these concerns are very similarly raised by the young and old, there are some significant age differences (see Tables 1 and 2). Young Brazilians are more likely to mention education problems, unemployment, poverty/social inequality and economic crisis/problems compared to their older counterparts, whereas old(er) Brazilians are more likely to mention problems with regards to health and public security.

Most important problem - LAPOP data 2007-2021

	Young vs. Old			Young vs. Not-Young		
Problem	Old	Young	p-value	Not-Young	Young	p-value
Health, lack of service	16.74	10.34	0.000	16.12	10.34	0.000
Violence	12.20	11.47	0.346	10.35	11.47	0.050
Corruption	11.06	11.67	0.423	11.08	11.67	0.307
Unemployment	8.88	12.37	0.000	11.86	12.37	0.388
Security, lack of	5.95	3.66	0.000	4.72	3.66	0.003
Politics, politicians	4.57	3.23	0.003	4.01	3.23	0.023
Economy, problems with, crisis of	3.35	5.49	0.000	4.31	5.49	0.001
Delinquency, crime, violence	2.48	3.07	0.158	2.16	3.07	0.000
Drug use	2.25	2.10	0.725	2.03	2.10	0.791
Education, lack of, poor quality	2.25	4.22	0.000	2.87	4.22	0.000
Poverty	2.02	2.64	0.106	1.88	2.64	0.003
Inequality	1.72	2.89	0.001	2.16	2.89	0.006
Inflation, high prices	1.22	0.52	0.000	0.91	0.52	0.012
Water, lack of	0.61	0.74	0.536	0.43	0.74	0.011
Roads, poor condition	0.46	0.56	0.612	0.31	0.56	0.028
Environment	0.27	1.08	0.000	0.29	1.08	0.000
Discrimination, stereotypes	0.23	0.59	0.042	0.25	0.59	0.001
N (Observations)	2623	4430		9620	4430	

Table 1: Most important problem – LAPOP. Percentage of respondents from each group who identify the issue as the most important problem the country is facing. Young: 16-29 years, old: 55+ years, not-young: 30+ years. Pooled analysis, analysis by year in Appendix A.

Most important problem - Latinobarómetro data 2004-2020

	Young vs. Old			Young vs. Not-Young		
Problem	Old	Young	p-value	Not-Young	Young	p-value
Health issues	22.72	11.69	0.000	20.66	11.69	0.000
Corruption	12.10	11.44	0.333	11.78	11.44	0.497
Unemployment	10.81	17.23	0.000	13.45	17.23	0.000
Crime/Public Security	9.18	5.74	0.000	8.02	5.74	0.000
Violence/gangs	5.51	4.39	0.018	4.74	4.39	0.305
Education problems	5.27	7.94	0.000	6.40	7.94	0.001
Political situation/crisis	4.87	4.96	0.833	4.96	4.96	1.000
Poverty/Social Inequality	2.62	5.38	0.000	2.70	5.38	0.000
Economy/economic/financial problems	1.90	3.55	0.000	2.73	3.55	0.003
Low salaries	1.15	0.63	0.013	1.09	0.63	0.004
Environment problems	0.21	0.63	0.005	0.21	0.63	0.000
N (Observations)	3737	6007		12127	6007	

Table 2: Most important problem – Latinobarómetro. Percentage of respondents from each group who identify the issue as the most important problem the country is facing. Young: 16-29 years, old: 55+ years, not-young: 30+ years. Pooled analysis, analysis by year in Appendix A.

Similarly, another study cited by the Atlas das Juventudes (2021, p.41) shows that, compared to all other adults, youth are more preoccupied about getting quality education and better job opportunities and less about improvements of health services. Lastly, there was a specific question only asked to youth (16-25 years) in the LAPOP 2010 survey: “What issues

or problems concern you frequently?". A majority of 57 percent mentioned "work, job, income, stability of job or economy" as their biggest concern, trailing a wide margin to the next category "security, crime, gangs" (12%). Nevertheless, the numbers below illustrate that the young and old have very similar priorities with regards to government investments. In fact, it seems the only striking difference is for pensions.

LAPOP 2021:

Questions: Governments have limited resources. In your opinion, in which of the following areas should the Brazilian government invest more money first? And second?[24]

Young: Health (42.5%), Education (37.9%), Environment (8.2%), Social assistance (6.4%), Transportation and roads (2.3%), Water (1.4%), Electricity (1.3%)

Old: Health (42.6%), Education (34%), Social assistance (7.2%), Environment (5%), Water (4.6%), Transportation and roads (4.5%), Electricity (2.2%)

LAPOP 2012:

Questions: Please tell me what is the main area where the government should invest more money? And second?[24]

Young: Health (36.5%), Education (35.7%), Security (11.8%), Aid for the poor (5.6%), Infrastructure (4.3%), Habitation (3.3%), Environment (2.2%), Pensions (0.6%)

Old: Health (36%), Education (29.2%), Pensions (11.4%), Security (9.6%), Aid for the poor (5.8%), Infrastructure (4%), Habitation (3.3%), Environment (0.7%)

The data for my dependent variables come from the Brazilian National Treasury *(Tesouro Nacional)* website which is linked to the Brazilian Ministry of Economics. It provides a data set called FINBRA *(Finanças do Brasil)* which gathers expenditure information reported by the municipalities detailed by category.[25] Data are available for the years 2002-2022.[26] There are 28 main expenditure categories (but also several subcategories for each):

- Social assistance
- Pensions
- Health
- Labor
- Education
- Public security
- Rights & Citizenship
- Culture
- Sports & Leisure
- Energy
- Communication
- Environmental management
- Agriculture
- Agrarian organization
- Science & Technology
- Industry
- Trade & Services
- Transport
- Urbanism
- Sanitation
- Housing
- Legislative
- Judiciary
- Essentials to justice
- Administration
- National defence
- International relations
- Special charges

[24] I combined the two questions so that the numbers indicate the percentage of respondents who mentioned an area either first or second. Young: 16-29 years, Old: 55+ years.
[25] The data reflect only the expenditure committed and not the money effectively disbursed.
[26] A distinction of expenditures by subcategories is available only as of 2005.

In order to decide which categories to define as youth, neutral and non-youth policy issues, in my analysis, I draw from the evidence from other countries as elaborated in the theory and literature sections as well as my analyses with public opinion data above. All categories not mentioned in the following are defined as neutral being too broad to label them as youth or non-youth issue. Importantly, even the non-neutral categories should not be regarded as being exclusively (un-)important to youth, rather I theorize they should matter more (or less) for them.

Without a doubt, I define *Education* as a youth issue. Young people clearly place a higher priority on this issue in Brazil and elsewhere and it is age specific as it is mostly relevant during a particular life-cycle-phase. In addition, Baskaran et al. (2021) found a positive effect of youth representation on municipal education spending in Germany. Furthermore, I identify the subcategories *Assistance to Children and Adolescents, Assistance to the Elderly,* and the main category *Pensions* as age specific (the first as youth issue, the other two as non-youth issues). Possible positive or negative effects on these welfare spendings would be consistent with findings of McClean (2021) and Baskaran et al. (2021). In addition, there is general evidence of age differences in preferences on welfare spending (see Vlandas et al. 2021). Also, at least on pensions, there is some initial indication from the public opinion analysis that young Brazilians are giving less priority to respective spending.

Lastly, I define the category *Environmental Management* as a youth issue. Young people are disproportionately affected by policy decisions or political inaction today with regards to the climate crisis and international climate movements such as Fridays For Future protests are especially driven by young people (Stockemer & Sundström 2022b, pp.14-15). Evidence from other countries also prove that there is a generational dimension to the environment issue (see theory section). Yet, the level of environmental concern varies between countries (Baiardi 2022) and in countries like Brazil, everyday life is often determined more by personal survival. Social issues, such as access to school and university education, the labor market and the security situation therefore have much more priority. This is corroborated by the analyses of public opinion data above, which also show that environment protection has no priority for Brazilians. Although the wish to spend more on the environment has increased from 2012 to 2021, it is neither a government spending priority for Brazilians, young or old, nor is it often mentioned as the most important problem of the country. Nevertheless, a large majority state that climate change will be a very serious problem for Brazil if nothing is done against it (80% in 2017, 78% in 2019 (LAPOP)), there is an active Fridays For Future movement in the country (FFF 2023) and young Brazilians are generally more likely to choose the protection of the environment over the promotion of economic growth (LAPOP 2014 & 2016/17). In addition,

Dahis et al. (2023) found that electing a young mayor in the Amazon region of Brazil reduces deforestation and greenhouse gas emissions[27] and generally, there are debates in literature on a possible positive effect of youth representation on the environment and climate (see Karnein & Roser 2015 or Stockemer & Sundström 2022b) – although admittedly, these are formulated around a Eurocentric worldview.

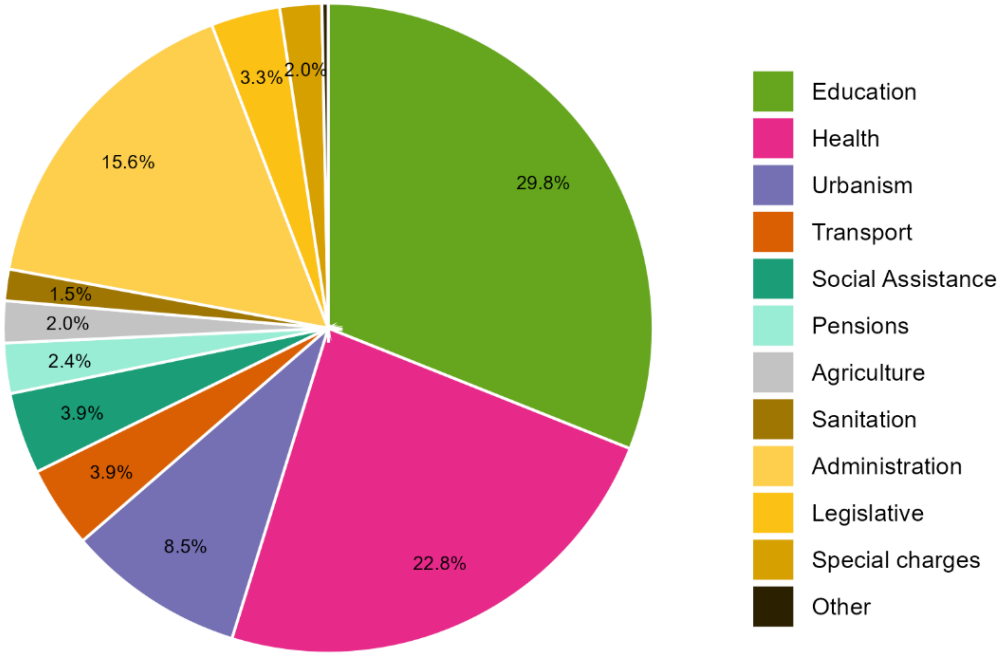


Figure 5: Average spendings of municipalities by category, 2002-2022. Source: FINBRA

For operationalization I compute my dependent variables as the share of expenditures on the total spendings of a municipality. They thus range between 0 and 100 percent. I believe this approach best captures the spending priorities within municipalities and makes them more comparable across municipalities with different levels of expenditures. Municipalities spend on average 127.6 million Brazilian Reais per year, which is about 4,000 Brazilian Reais per capita.[28] The pie chart above (Figure 5) shows the distribution of average municipal spending by category. As can be seen, municipalities spend on average the most on education, health and administration. Yet, there can also be considerable variation in the amount municipalities spend on certain categories (see Table 3).[29] Unfortunately, several of the 28 categories account for

[27] Mavisakalyan and Tarverdi (2019) also find a positive effect of female representation on the stringency of climate change policies.
[28] I deflated the spendings using the National Consumer Price Index (INPC) as of January 2023 applying the *deflateBR* R package (Meireles 2018). 1 Brazilian Real equals to about 0.18 Euro at that time (https://www.oanda.com/currency-converter/de/).
[29] This is also true for spendings on health and education although there are mandatory spending floors for these categories as mentioned before (at least 25% on education and at least 15% on health). In fact, municipalities do not always seem to comply with these requirements according to the data.

only a vanishingly small portion (less than 1 percent) of total expenditures, such as public security, labor or environmental management. Table 3 further indicates that there are some categories on which municipalities usually do not spend any money during a term, e.g. National Defence or International Relations, which is not very surprising for these cases as it is out of their mandate. Yet, there are also several other categories on which municipalities do not as frequently spend money.

Summary statistics of municipal spendings (in %)

Category	Mean	SD	Min	Max	Zero
Education	29.7	8.3	0.0	67.7	0.0
Health	22.8	5.0	0.0	57.5	0.0
Administration	15.5	6.3	1.5	73.9	0.0
Urbanism	8.6	4.8	0.0	45.8	0.8
Transport	3.9	4.6	0.0	38.3	11.5
Social Assistance	3.9	1.8	0.0	21.8	0.1
Legislative	3.3	1.4	0.0	26.2	4.8
Pensions	2.4	3.4	0.0	24.5	39.5
Special Charges	2.0	2.0	0.0	37.3	17.6
Agriculture	2.0	2.3	0.0	39.1	5.0
Sanitation	1.5	2.4	0.0	48.0	23.2
Culture	1.0	1.0	0.0	20.6	5.7
Sports & Leisure	0.9	0.9	0.0	50.3	3.8
Assistance to Children & Adolescents	0.6	0.6	0.0	8.6	4.8
Environmental Management	0.5	1.0	0.0	14.4	29.4
Energy	0.4	0.9	0.0	36.8	55.9
Housing	0.4	1.0	0.0	24.1	49.1
Trade & Services	0.3	0.8	0.0	19.1	51.2
Public Security	0.2	0.6	0.0	12.2	49.7
Judiciary	0.2	0.6	0.0	32.2	68.8
Labor	0.2	0.7	0.0	23.7	74.6
Industry	0.1	0.5	0.0	13.3	73.7
Assistance to the Elderly	0.1	0.3	0.0	9.2	31.7
Essentials to Justice	0.1	0.4	0.0	20.5	88.2
Communication	0.1	0.2	0.0	6.9	71.5
Rights & Citizenship	0.0	0.3	0.0	13.8	85.4
National Defence	0.0	0.1	0.0	12.0	91.5
Science & Technology	0.0	0.1	0.0	5.0	94.4
Agrarian Organization	0.0	0.1	0.0	5.9	97.9
International Relations	0.0	0.1	0.0	13.1	99.4

Table 3: Summary statistics of municipal spendings averaged by term. Zero refers to the percentage of municipal governments that do not spend anything on that category. 2002-2022. Source: FINBRA

6.3 Youth Representation in Brazil – Independent Variables

On the national level, young people (18-29 years) make up only 3.1 percent of the legislators in the lower chamber today[30], while they constitute about one fifth of the country's population (18.5%) (UN DESA 2022). They are thus underrepresented by a factor of six. Youth representation in the national parliament is negligibly small today and has not been much higher in the preceding four legislative terms[31] (Stockemer & Sundström 2022a). Turning to youth representation in government, the current president of Brazil, Luiz Inácio Lula da Silva, is 77 years old and all of his predecessors except one since 1985 have been 55 years old or older when starting their term (Nyrup & Bramwell 2020). Furthermore, over the last twenty-two years (2000-2021), national ministers have been on average 57 years old and only a handful of ministers (9 out of 231) have been younger than 40 upon assumption of office, the youngest being 33 years old.

For my study, I will focus on youth representation on the municipal level in Brazil. For this, I use candidate-level data from six municipal elections in Brazil: 2000, 2004, 2008, 2012, 2016 and 2020. It comes from the Superior Electoral Court *(Tribunal Superior Eleitoral - TSE)* and contains information about all the candidates running in the elections under study, allowing me to analyze both the pool of candidates and the pool of politicians elected. It gives detailed information on the candidates' gender, date of birth, party affiliation, marital status and level of education, as well as the number of votes each candidate has received. I thus know the age of the candidates and can define young mayors, councilors and candidates as those younger than 30 years at the time of election[32] in the main analyses[33] and create a dummy variable. In addition, I can calculate the share of young councilors in the municipal councils. Both variables are my main independent variables.

A first basic descriptive analysis of the data shows that young mayors were drastically underrepresented in Brazil since the year 2000, while middle-aged and older mayors (40 to 69 years old) much overrepresented (see Figure 6). There were on average just 2.2 percent mayors younger than 30 years old at the time of election, thus underrepresented by a factor of seven, and approximately eight percent of mayors were younger than 35 years old, still

[30] I web scraped the birth years of the current MPs from https://www.camara.leg.br/deputados/quem-sao on 12 May 2023.
[31] The previous term (2019-2022) had actually the best youth representation among those five legislative terms of which I have data available. 27.1% of legislators were ≤ 40 years compared to 21.9% in the current term and even less in the other three (Stockemer & Sundström 2022a).
[32] I use the age at the time of election as in the original data, but it is important to keep in mind that the politicians can become one to four years older during their time in office.
[33] Or younger than any age up to the threshold of ≤ 40 years for additional analyses.

underrepresented by a factor of three. The average age of mayoral candidates and mayors was 48. The youngest mayor was 21 and the oldest 95 years old.

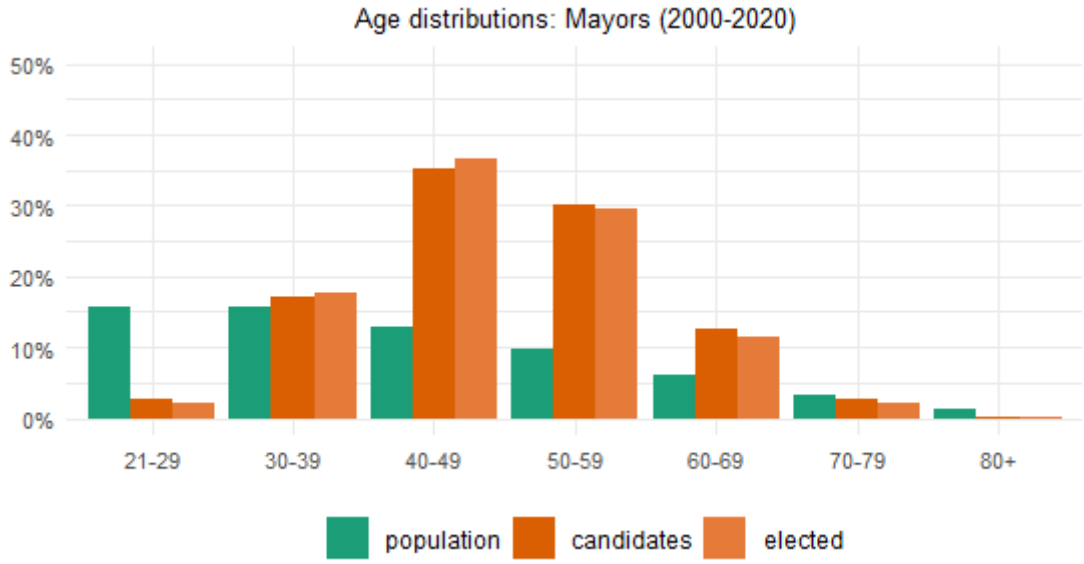


Figure 6: Age distributions of the general population, mayoral candidates and mayors elected in Brazil averaged over the years 2000-2020. Sources: UN DESA (2022), TSE

Moreover, Figure 7 shows that the underrepresentation of youth is not as drastic for local councilors. There were on average eight percent of councilors younger than 30 at the time of election (underrepresented by a factor of 2.6). About 20 percent were younger than 35, thereby representing their age group quite well. Yet, as can be seen, this is mostly due to councilors in their early 30s. The average age of councilor candidates was 44, that of councilors elected 43.

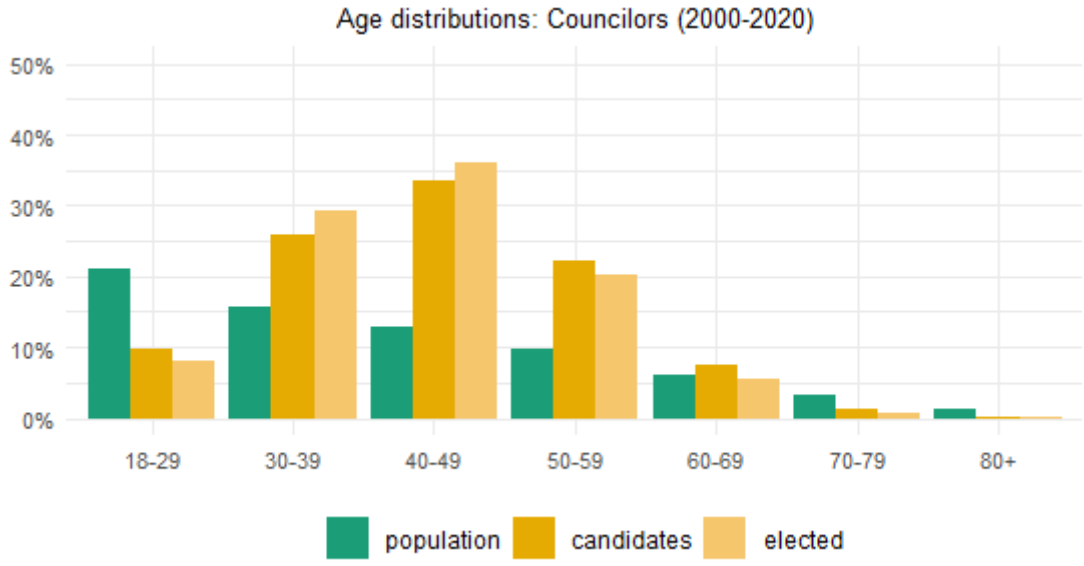


Figure 7: Age distributions of the general population, councilor candidates and councilors elected in Brazil averaged over the years 2000-2020. Sources: UN DESA (2022), TSE

Overall, the share of mayoralties in Brazil held by young people was negligibly small. The average percentage of youth in local councils was just about eight percent and almost half (44%) of the councils had not a single young member. Over the twenty years of 2000 to 2020, youth (under)representation has remained quite stable for both mayors and councilors.[34] Interestingly, however, there was some regional variation. The North and North-East regions of Brazil had somewhat younger mayors compared to the other three regions (Central-West, South and South-East) as well as higher youth shares in local councils.

6.4 Panel Data Set

Overall, I created a large and detailed panel data set covering all 5568 Brazilian municipalities[35]. It contains public spending data from 2002 to 2022[36] and 32,059 municipal elections[37] of the years 2000, 2004, 2008, 2012, 2016 and 2020. The outcome variables are calculated as an average over the four years of a legislative term.[38] Fortunately, since the mandate of all mayors starts in January, the beginning of the mayoral administration and the beginning of the calendar year are the same, and therefore municipalities' fiscal indicators can be associated with a specific mayoral administration. Also note that the data set needs to be further reduced for my RD analysis, which I explain in the following chapter.

The data set contains characteristics of the mayor and the respective local councils from TSE. As I have information to which party the mayor belongs, I create a few dummy variables for the largest parties and also create a dummy indicating whether the mayor belongs to a left-leaning party (see Appendix B for categorization). In addition, I compute a variable indicating

[34] Generally, in addition to the drastic underrepresentation of youth mentioned in this section, it might be important to point out that the few young politicians in Brazilian politics are more likely to be dynastic politicians, meaning politicians who have had or have relatives in office (Bragança, Ferraz & Rios 2015; Belschner 2023).

[35] In total, there are 5570 municipalities in Brazil today. Yet Brasília, the federal capital, and Fernando de Noronha, a state district of Pernambuco, are only counted as "equivalent municipalities" and do not have elected mayors or councilors (IBGE n.d.). Also note that the number of municipalities has increased slightly over time: for the term after the election in 2000 there were 5560 municipalities, for the one after 2004 there were 5564, for the one after 2008 there were 5565, and since the 2012 election there are 5570 municipalities.

[36] Data for the year 2022 was downloaded from FINBRA on 27 May 2023 and does only include information of 5197 out of 5568 municipalities (93%). Coverage in the years 2004 or 2012 has, however, been similarly reduced. See also Table B.3 in Appendix B.

[37] I had to drop some observations (about 1335 elections, 4% of the total) because of missing data either on the dependent or independent variables. Almost 600 of the dropped observations are due to supplementary elections in municipalities, thus there was a change in mayor during a term. In addition, I chose to drop another 506 observations as there would be public spending information for just 1 year of the 4-year term.

[38] This means that the outcome variables of the first term are averages of only three years (2002, 2003, 2004) and the ones of the last term of only two years (2021, 2022). Variables that had information of just 1 year were dropped (see footnote above).

whether it is the second term of a mayor or the first.[39] In line with findings from Brollo and Nannicini (2012), I also include variables specifying whether a mayor is aligned with upper levels of government; that is, whether the mayor's political party is the same as the one of the state governor or the president. The authors found that alignment with the president affects the allocation of federal transfers (also see Kleider, Röth and Garritzmann (2018) for further cross-country evidence).

Furthermore, I add various demographic and socioeconomic characteristics of municipalities to the data set: total population size (logged), human development index, population living in rural areas, in extreme poverty and in poverty, GINI coefficient, average income per capita (in R$), area size (logged), child mortality, illiteracy rate and life expectancy. They may influence the level of expenditures as they give rise to different kinds of demands towards public institutions. I further control for the proportion of elderly (people 65 years and older) and the proportion of children (people younger than 15 years) living in the municipality to account for variations in demands for government services. For example, Vlandas et al. (2021) report in their systematic literature review that "population ageing appears to be associated with reduced education spending and increased healthcare spending, both within and between countries". Due to lack of adequate data, I am not able to include a variable capturing the extent of corruption in a municipality although it very clearly influences the allocation of public spendings. All mentioned data come from the national statistics office IBGE, the Brazilian Institute of Geography and Statistics *(Instituto Brasileiro de Geografía e Estatística)*, and with the exception of total population and area size, all variables are only available for the years 2000 and 2010, which is when the census was conducted.[40] Table B.1 in Appendix B provides an overview over all variables in my data set and respective sources and Table B.2 reports respective summary statistics.

Below I present descriptive statistics of the characteristics of mayors, local councils and municipalities, for the whole country of Brazil as well as for the subset of municipalities where a young mayor, a not-young mayor or an old mayor is in office (Table 4). As can be seen, young mayors are more likely to be female than older ones and more likely to have completed basic and secondary education. Quite unsurprisingly, young mayors are much less likely to be

[39] Note that there is an available variable in the TSE data where a candidate self-declared whether or not they are a candidate for reelection (*Second term (TSE)*). Yet, because of inconsistencies in that variable, I decided to compute my own variable using the information available in the data set as reference (*Second term (own)*). Both variables have no information for the first term (election year 2000).

[40] I assign the values of the 2000 census to the first three legislative terms (elections in 2000, 2004 and 2008) and the values of the 2010 census to the last three legislative terms (elections in 2012, 2016 and 2020).

married or in their second term. With regards to council composition, young mayors have on average younger and more female councils. The municipalities in which young mayors govern are generally less developed. Life expectancy and average per capita income is lower and child mortality, illiteracy and (extreme) poverty is higher compared to municipalities of old(er) mayors. Moreover, young mayors govern on average in smaller municipalities both by area and population size. Lastly, I want to point out the poor representation of women in Brazilian local politics: only about 10 percent of mayors and 13 percent of councilors are female.

Descriptive Statistics

	Brazil	Young (≤29)	Not Young (30+)	Old (55+)
Mayor				
Age	48.26	26.79	48.75	61.21
Female	9.54	12.32	9.47	8.00
Married	77.69	31.07	78.75	81.06
Basic Education	89.94	97.75	89.77	82.62
Secondary Education	79.19	92.11	78.90	69.66
University Education	47.08	47.89	47.06	45.04
Second Term (own)	29.27	9.79	29.74	32.17
Second Round	0.82	0.42	0.83	1.04
PT	6.79	5.88	6.81	4.41
PSDB	14.12	12.18	14.16	14.96
PMDB/MDB	19.09	18.49	19.11	20.54
PP	8.29	9.38	8.27	9.28
PFL/DEM	10.03	7.70	10.09	10.59
PL/PR	5.73	6.30	5.72	5.21
PDT	5.76	5.32	5.76	5.65
PTB	5.98	5.32	5.99	6.29
Left Party	23.73	23.53	23.73	20.27
Aligned President 1	12.07	10.78	12.10	10.33
Aligned President 2	5.57	5.04	5.58	3.15
Aligned Governor 1	21.33	17.51	21.42	20.95
Aligned Governor 2	14.23	10.08	14.33	12.87
Local Council				
N. Councilors	10.12	10.01	10.12	10.44
Share Female	13.38	14.66	13.35	13.49
Share Young (≤ 29)	8.29	10.36	8.25	7.62
Mean Age	43.14	42.37	43.16	43.81
Share Mayor's Party	26.34	26.60	26.34	25.64
Share Left Party	25.93	26.90	25.90	25.65
N. Parties	5.69	5.76	5.69	5.92
Municipality				
Life Expectancy	70.75	69.36	70.78	71.35
Child Mortality	30.39	36.08	30.26	28.44
Illiteracy Rate	20.43	27.30	20.28	18.89
GINI	0.52	0.53	0.52	0.52
Extreme Poverty	15.95	22.70	15.80	13.99
Poverty	32.07	41.13	31.87	28.97
Income	416.46	330.51	418.42	452.47
HDI	0.59	0.55	0.59	0.61
Population 65+ years	7.44	7.27	7.44	7.66
Population < 15 years	28.93	30.32	28.90	28.02
Population Rural	38.82	43.47	38.72	35.46
Area Size	1,513.90	1,314.18	1,518.47	1,481.00
Population	34,522.41	24,729.76	34,745.48	44,897.32

Table 4: Descriptive statistics of panel data set. Characteristics of mayors, local councils, and municipalities, for the whole country of Brazil as well as for different subsets of mayors.

7 Regression Discontinuity Analysis

7.1 Identification

Identifying the effect of young mayors on municipal spending is a challenging task. Municipalities governed by young mayors may differ from municipalities governed by old(er) mayors because of many unobservable characteristics. If some of these characteristics correlate with or affect municipal spendings, a simple comparison of the two types of municipalities would be misleading (Cattaneo, Idrobo & Titiunik 2019, p.10). For instance, decisions on public spendings might be correlated with municipality-specific characteristics such as quality of education or previous experience with young people in politics, all of which could also influence the age of the elected mayor. One possible way to deal with these endogeneity issues is using a regression discontinuity design (RDD). I use a close-election sharp RDD which "is a common method for estimating the effect of winning candidates' characteristics on downstream outcomes" (Bellodi, Morelli & Vannoni 2023, p.8). The idea here is that municipalities where young candidates won the elections by very thin margins can be compared to municipalities where young candidates lost by similarly thin margins. Cattaneo et al. (2019) further distinguish two different frameworks in RDDs: the continuity-based framework, that assumes continuity in potential outcomes near the cutoff and relies on extrapolation to the cutoff in order to compare the two groups, and the local randomization framework, that assumes treatment (i.e. winning the election) to be as-if randomly assigned in a small window around the cutoff, assuming conditions that mimic a randomized experiment. As the latter framework requires stronger assumptions, I will focus on the continuity-based approach.

Generally, RDDs have a high internal validity and are considered to be one of the most credible nonexperimental strategies (Calonico et al. 2019, p.442). Yet it is important to point out that RDD effects have only a limited external validity. The quantity estimated in RDDs is the local average treatment effect (LATE). RDD effects are thus only valid for observations close to the cutoff (in my case for government terms when municipal elections were won or lost by narrow margins). This means that they are not representative of the treatment effects that would occur for units with scores further away from the cutoff. It is very likely that both candidate- and municipality-level characteristics are systematically different in close and not-close elections. Results can therefore not be easily generalized.

In my analysis, the estimand is the LATE of electing a young candidate on public spending. I intentionally define it as the LATE of electing a young candidate, instead of the LATE of youth or young age alone following recent recommendations in the methodological

literature (Marshall 2022). In fact, politician characteristic regression discontinuity (PCRD) designs cannot isolate the effect of a specific characteristic as it requires researchers to invoke two strong additional assumptions: i) the candidate characteristic does not affect vote shares and ii) no compensating differential affects the outcome of interest. As Marshall (2022) outlines, neither condition is plausible and both conflict with theory and empirical evidence. He thus suggests redefining the estimand as a compound treatment including the characteristic of interest plus all compensating differentials. In my case this means that the RD estimator captures the effect of the mayor being young plus all other individual-level characteristics that distinguish young from not-young candidates and that allow the former to remain in close elections. In the validity section, I describe how balance tests for mayor-level characteristics can help me interpret my PCRD estimates.

7.2 Estimation

To conduct my RD analysis, I focus on those municipal elections where the two mayoral candidates with the highest vote shares were exactly one young and one not-young candidate. The actual number of observations in the different analyses depends on the age threshold I use to define a young person as well as on the chosen age difference (AD) the two mayoral candidates should at least have. For example, if I do not set an age difference, some of the elections included in the RD analysis might be between two candidates very close in age, that is perhaps between a 29-year-old "young" candidate and a 30-year-old "not-young" candidate, which does not seem to be very sensible. Hence, I choose to set a minimum candidate age difference of 5 years. In general, I run 15x3 different age specifications: 15 specifications for different upper thresholds of "young" (all ages between 26 to 40 years); and 3 different specifications for ADs of at least 5 years, 10 years and 20 years. I decide that for my main analysis "young" means being 29 years or younger like in the official definition of youth in Brazil and the age difference to the opponent is of at least 5 years mainly due to power reasons. For this main specification, I have 1381 elections in 1115 unique municipalities where the young candidate could win 48.3 percent.[41] For all 45 specifications, the number of observations varies between 339 (young ≤ 26, AD ≥ 20) and 9782 (young ≤ 40, AD ≥ 5).

Each RDD has a so-called running variable that characterizes the assignment rule. In close-election RDDs this variable is the margin of victory (M) of an election. In my case, I

[41] A map of the municipalities included in the analysis can be found in the Appendix, Figure B.1.

calculate the margin of victory as the difference in the vote shares of the young candidate and the not-young candidate.[42] Hence, a positive margin of victory (M > 0) means that the young candidate won the election and otherwise, (M < 0) the not-young candidate became mayor. Zero is thus the cutoff point (M=0) after which the candidate is assigned the treatment (i.e. wins the election).

For estimation, I follow the methodological recommendations by Cattaneo et al. (2019). This means my RD analyses are based on the continuity-based approach using nonparametric local linear polynomial methods. I fit local weighted least squares (WLS) models where weights are determined by the triangular kernel function. I further use the automatic bandwidth selector proposed by Calonico, Cattaneo and Titiunik (2014), optimizing the mean-squared error (MSE) of the RD point estimator, and report robust bias-corrected confidence intervals and p-values as recommended by Cattaneo et al. (2019) allowing for valid statistical inference. Moreover, I include a set of pre-treatment covariates as well as election year, municipality and state dummies to boost efficiency. Analyses are implemented with the *rdrobust* (Calonico et al. 2022) and *rddensity* (Cattaneo, Jansson & Ma 2023) packages in R. The RD estimator captures the average yearly effect of electing a young mayor within a government term.

7.3 Validity

Before proceeding with the analysis of the public spending outcomes, I assess the validity of my RD design. First, I document that there is absence of sorting around the cutoff, meaning young and not-young candidates are similarly likely to win or lose elections by a close margin and cannot determine on which side of the cutoff they will fall. By conducting density tests as proposed by Cattaneo, Jansson & Ma (2020), I find no statistical evidence of manipulation at the cutoff. With a p-value of 0.58 I cannot reject the null hypothesis of continuity of the density functions for control and treatment units at the cutoff. Figure 8 shows that density estimates at the cutoff are very near each other and the confidence intervals (shaded areas) overlap. In addition, for all 45 specifications the null hypothesis cannot be rejected (p-values range between 0.17-0.99), which offers evidence supporting the validity of the RD design.

[42] In case there was a second-round election (no candidate got more than 50 percent of the total votes in the first round in a municipality of more than 200,000 inhabitants), the margin of victory reflects the result from the second round. In total, this was the case in less than 1 percent of the cases in the entire data set.

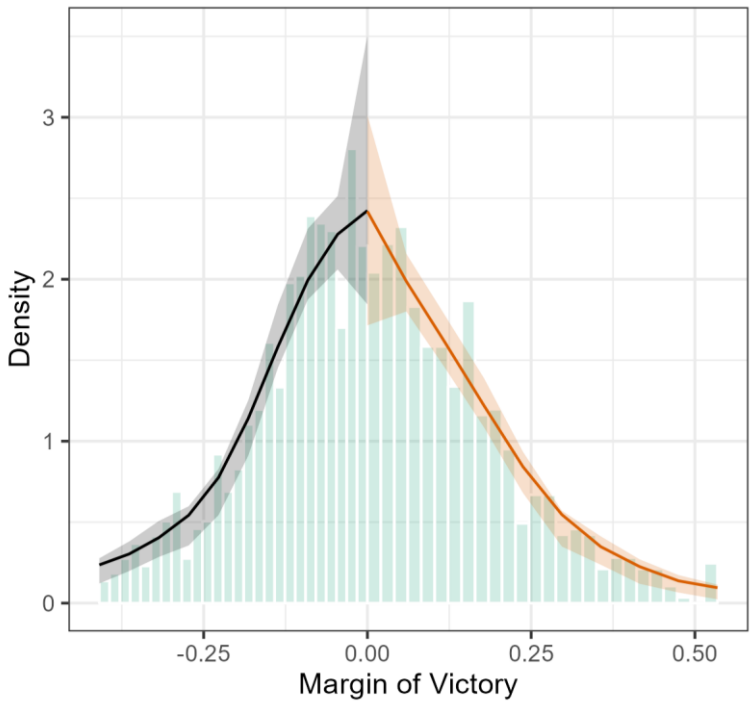


Figure 8: Manipulation test using the local polynomial density estimator proposed by Cattaneo et al. (2020). Main specification young ≤ 29 years, AD ≥ 5 years.

Next, I conduct balance tests for 31 pre-treatment covariates. Near the cutoff, treated units should be similar to control units in terms of observable characteristics (Cattaneo et al. 2019, pp.79-80). The reasoning is that if covariates that are known to correlate strongly with the outcome of interest are discontinuous at the cutoff, the main assumption of RD designs of continuity in potential outcomes is unlikely to hold. However, in my case, as I use a PCRD design, focusing on the effect of a candidate characteristic, candidate-level covariates do not have to be continuous at the cutoff, only municipality-level covariates do (Marshall 2022). Instead, rather than validating the PCRD design, candidate-level covariate tests help me characterize the compound nature of my treatment. The figure below shows the results of balance tests of a large set of pre-treatment covariates (variables that are determined before the treatment is assigned) for my main age specification.[43]

[43] Since covariates have to be predetermined, I only include alignment with the state governor and president at time of election, i.e., alignment during the first two years of the mayoral term.

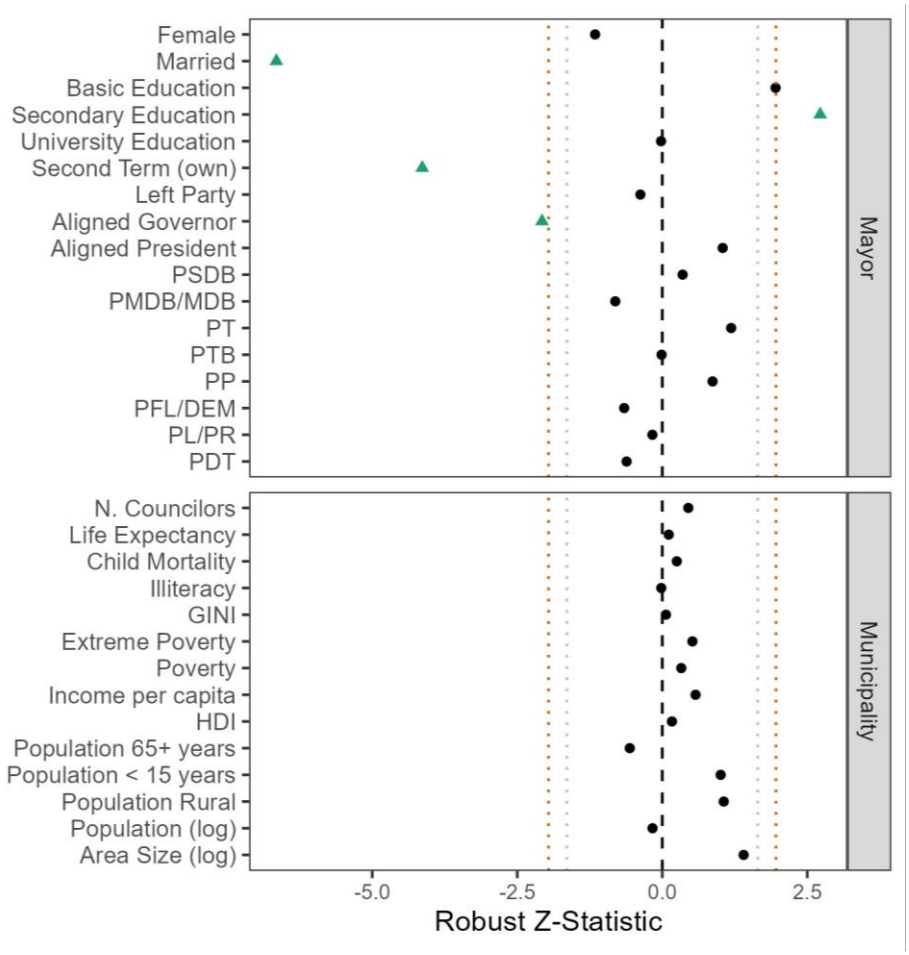


Figure 9: Balance tests for pre-treatment covariates. RD robust Z-statistics of the effect of electing a young mayor on pre-treatment covariates with vertical lines at the 95% and 90% robust confidence intervals. Estimation using local polynomial estimators with triangular kernel and CER-optimal bandwidth (as suggested by Cattaneo et al. 2019). Robust p-values and confidence intervals using bias-correction with cluster-robust standard errors at municipality level. Covariates include municipality, state and election year dummies. Main specification young ≤ 29 years, AD ≥ 5 years.

As can be seen, there are no significant discontinuities at the 5 or even 10 percent level for municipality-level covariates. P-values range from 0.16 to 0.99 (see Table B.4 in Appendix B). This increases the internal validity of my PCRD design. Young and not-young mayors are also similar with respect to individual characteristics (e.g. gender or party membership). However, young candidates are more likely to be new entrants compared to their not-young counterparts. I find that the probability of young mayors being incumbents is 24 percentage points lower, being married even 54 percentage points lower. Both is not particularly surprising. Furthermore, young mayors have generally a higher probability of having completed basic and secondary education and are somewhat less aligned with the respective state governor at time of election. Taking account of all 45 different specifications, young mayors are also more likely to be member of a left-leaning party. Overall, Table 5 below provides evidence that my RD estimates remain valid independent of my age specifications. The only exceptions are a few

specifications with AD ≥ 20 years where area size is discontinuous at the cutoff which might bias these estimates. Generally, however, it should not affect the reliability of my conclusion greatly. In the following, I only include covariates in my analyses that are balanced at the cutoff as recommended by Cattaneo et al. (2019).

Balance Tests for Pre-Treatment Covariates - Percent of significant estimates

Covariate	p < 0.05	p < 0.1	Covariate	p < 0.05	p < 0.1
Aligned President	0.00	0.00	Poverty	0.00	0.00
Child Mortality	0.00	0.00	PP	0.00	0.00
Extreme Poverty	0.00	0.00	PSDB	0.00	0.00
Female	0.00	0.00	PTB	0.00	0.00
GINI	0.00	0.00	Population Rural	0.00	2.22
HDI	0.00	0.00	PT	0.00	8.89
Illiteracy	0.00	0.00	Aligned Governor	6.67	11.11
Income per capita	0.00	0.00	Area Size (log)	2.22	11.11
Life Expectancy	0.00	0.00	PFL/DEM	0.00	11.11
N. Councilors	0.00	0.00	University Education	6.67	11.11
PDT	0.00	0.00	Left Party	15.56	20.00
PL/PR	0.00	0.00	Basic Education	26.67	42.22
PMDB/MDB	0.00	0.00	Secondary Education	51.11	66.67
Population (log)	0.00	0.00	Second Term (own)	84.44	93.33
Population < 15 years	0.00	0.00	Married	97.78	100.00
Population 65+ years	0.00	0.00			

Table 5: Balance tests for pre-treatment covariates for all 45 specifications (young ≤ 26 years to young ≤ 40 years, AD ≥ 5 years, AD ≥ 10 years, AD ≥ 20 years). Estimation is the same as in Figure 9. Multiple-testing adjustment for p-values performed with Benjamini & Hochberg (1995) procedure to control for the false discovery rate.

As mentioned before, the estimated effect in my RD analyses is the effect of electing a young mayor. This is not an isolated effect of the "young" attribute, but rather a compound effect that includes all correlated characteristics that come with being a young candidate in close elections. As I have shown, electing young mayors comes with a higher probability of them being unmarried, not incumbent, better educated and belonging to a left-leaning party. There might even be more unobservable characteristics that distinguish young from not-young candidates, such as political or general life experience or other generational differences. But from a theoretical point of view, this is no issue, because it is exactly this combined package of characteristics that come with young mayors (or young politicians in general) that I argue should be represented in the political sphere.

7.4 Results

Table 6 presents RD results for my main age specification. I provide estimates both with and without including pre-treatment covariates (that are balanced at the cutoff). The results suggest that there is generally no effect of electing a young mayor on most public spending categories. There might be a positive effect on social assistance and transport, and a negative effect on education, communication and sanitation. Yet, I regard these only as first indications that need to be further analyzed.

RD results - Main specification

	No Covariates	With Covariates		No Covariates	With Covariates
Agriculture	0.749*	0.348	Trade & Services	0.105	0.079
	(0.367)	(0.267)		(0.120)	(0.113)
Bandwidth (h)	0.144	0.144	Bandwidth (h)	0.169	0.174
Observations	789	788	Observations	899	916
Social Assistance	0.428†	0.397†	Science & Technology	-0.010	-0.011
	(0.275)	(0.244)		(0.016)	(0.016)
Bandwidth (h)	0.158	0.150	Bandwidth (h)	0.229	0.234
Observations	850	810	Observations	1061	1068
Assistance to the Elderly	0.033	0.034	Rights & Citizenship	-0.025	-0.024
	(0.047)	(0.040)		(0.019)	(0.019)
Bandwidth (h)	0.169	0.203	Bandwidth (h)	0.156	0.145
Observations	824	912	Observations	845	788
Assistance to Children and Adolescents	0.022	-0.028	Sports & Leisure	0.064	-0.021
	(0.132)	(0.120)		(0.144)	(0.124)
Bandwidth (h)	0.157	0.160	Bandwidth (h)	0.135	0.150
Observations	778	785	Observations	751	815
Education	-1.673	-1.753†	Energy	-0.129	-0.115
	(1.355)	(1.020)		(0.105)	(0.103)
Bandwidth (h)	0.213	0.151	Bandwidth (h)	0.167	0.164
Observations	1021	816	Observations	890	879
Health	0.100	0.424	Housing	-0.092	-0.119
	(0.741)	(0.605)		(0.152)	(0.142)
Bandwidth (h)	0.175	0.184	Bandwidth (h)	0.140	0.147
Observations	919	940	Observations	772	799
Public Security	0.098†	0.067	Industry	0.007	0.002
	(0.062)	(0.061)		(0.034)	(0.033)
Bandwidth (h)	0.167	0.147	Bandwidth (h)	0.204	0.166
Observations	889	799	Observations	1005	886
Labor	-0.070	-0.065	Pensions	0.445	0.597
	(0.093)	(0.091)		(0.525)	(0.516)
Bandwidth (h)	0.166	0.175	Bandwidth (h)	0.167	0.153
Observations	886	916	Observations	889	830
Environmental M.	0.127	0.070	Sanitation	-0.639*	-0.680*
	(0.174)	(0.169)		(0.359)	(0.349)
Bandwidth (h)	0.149	0.145	Bandwidth (h)	0.148	0.141
Observations	806	793	Observations	805	772
Culture	0.124	0.182	Transport	1.440*	0.911*
	(0.177)	(0.166)		(0.649)	(0.457)
Bandwidth (h)	0.162	0.163	Bandwidth (h)	0.146	0.144
Observations	877	878	Observations	798	788
Communication	-0.088*	-0.112*	Urbanism	-0.323	-0.264
	(0.040)	(0.042)		(0.700)	(0.689)
Bandwidth (h)	0.167	0.121	Bandwidth (h)	0.197	0.171
Observations	888	694	Observations	987	900

p-values: † p < 0.1 , * p < 0.05, ** p < 0.01

Table 6: RD results, main specification. The effect of electing a young mayor on public spending by category. Estimates are constructed using local polynomial estimators with triangular kernel. Robust p-values using bias-correction with cluster-robust standard errors at municipality level. h is the MSE-optimal bandwidth. Covariates include the gender of the mayor and their alignment with the president, population (log) of the municipality, life expectancy, child mortality, literacy, extreme poverty, income per capita, Human Development Index, GINI index, rural population, population < 15 years, population ≥ 65 years, number of municipal councilors as well as municipality, state and election year dummies. Main specification young ≤ 29 years, AD ≥ 5 years.

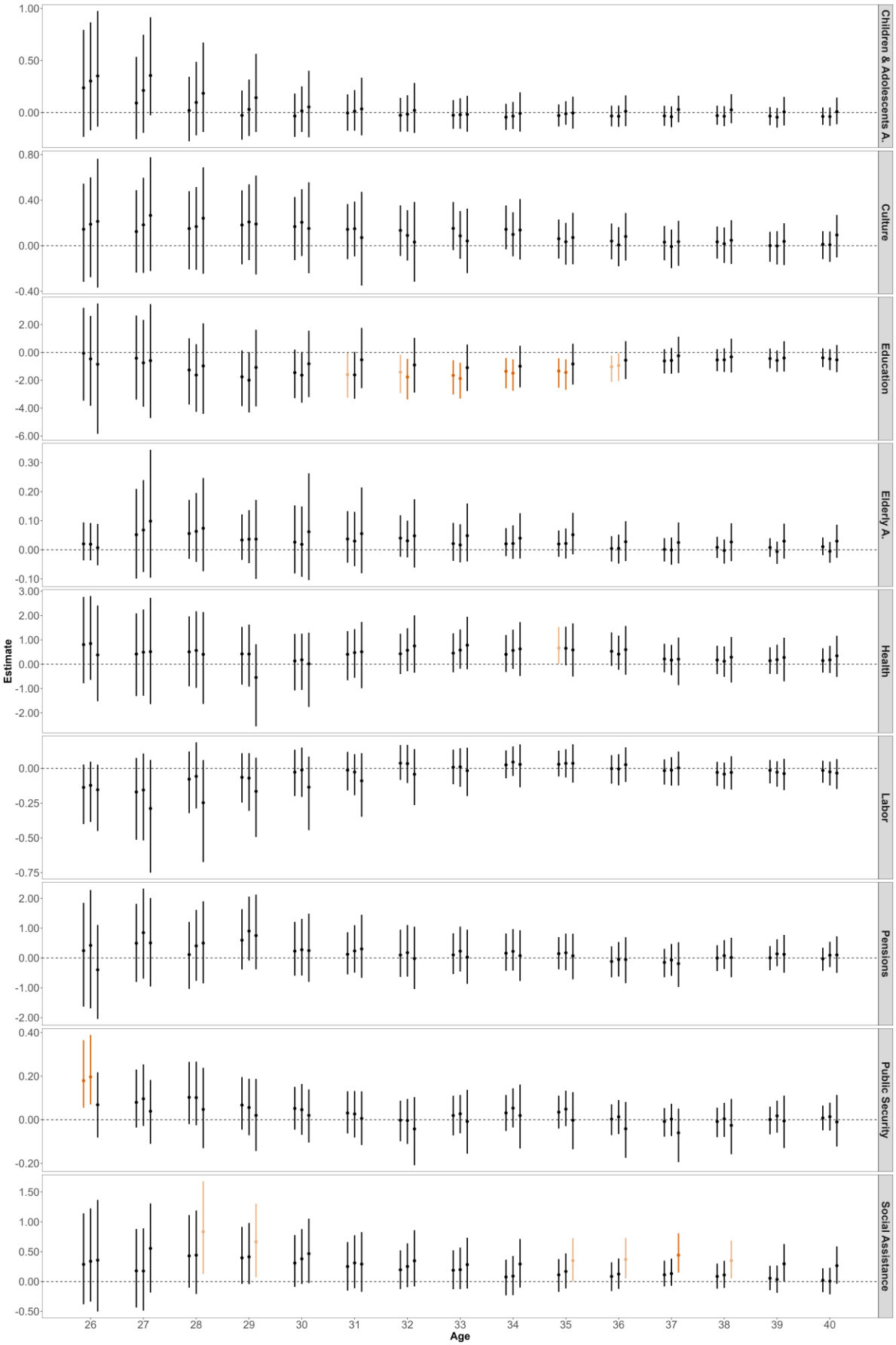
To further investigate my first hypothesis, I run analyses for different age thresholds and age differences to the competitor. The rationale is that if there is indeed an effect of electing a young mayor on public spending, there should be similar results over a range of ages. That is, it should not make a huge difference if I define young as younger than 30 or 31 years for example.

The graphical results in Figure 10 show null effects across almost all public spending categories. Communication and sanitation are the only ones with some kind of discernible pattern indicating that young mayors, when they are 30 years or younger, spend between 0.07 and 0.18 percentage points less on communication, which translates to 78,000 to 199,000 Brazilian Reais less per year, and on average 0.96 percentage points less on sanitation. However, the effect for sanitation is not as explicit as the one for communication and for the latter, one still needs to take into account that only about a third of mayoralties spend anything at all on communication. Lastly, there are some negative estimates suggesting electing a young mayor has a negative effect on education spending, yet the effect disappears once the age difference to the competitor is 20 years or more. This might be a sign that the effect is rather driven by candidates close(r) to each other in age and since the estimates for younger age thresholds are insignificant, the significant estimates might be driven by some other factor(s) not necessarily related to the youth of the mayor.

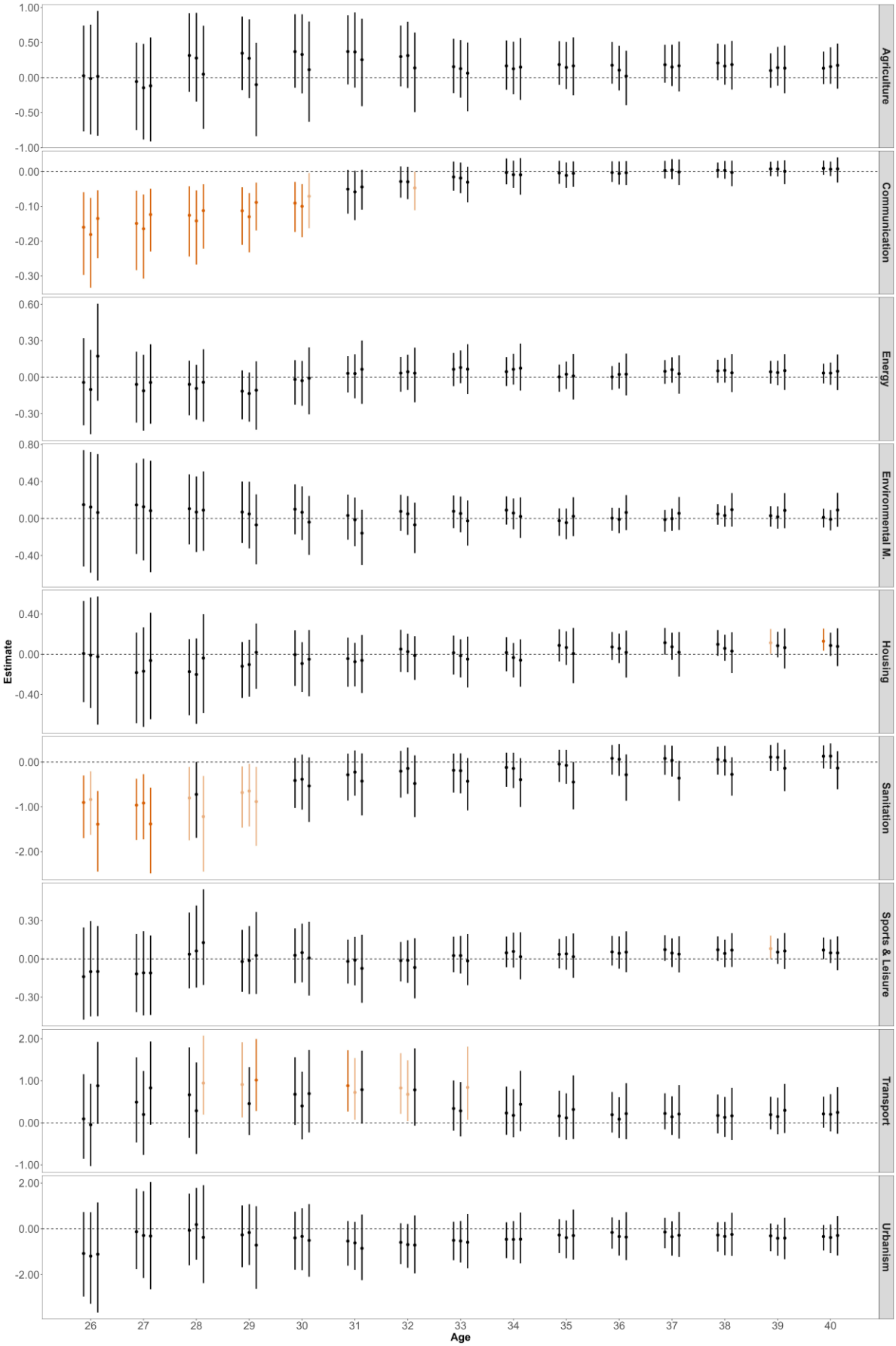
In Appendix B I further show the results for all other spending categories not presented in Figure 10 (Figure B.2). It is reassuring that there is (also) no discernible effect for those theoretically rather implausible categories such as, for example, Administration or Judiciary. In addition, the results are generally the same also if I do not include covariates in the calculation.[44] To further assess the robustness of my (null) results, I run two additional age specifications where the competitors of young mayors are older than a fixed age: i) 45 years or older and ii) 55 years or older (some results are presented in Figure B.3 in Appendix B). Null results remain prominent here and there is also no effect for education anymore. However, the already described negative patterns for communication and sanitation persist. In addition, there is a less ambiguous pattern for transport spending suggesting that young mayors ($\leq$ 32 years) spend on average 1.37 percentage points more compared to mayors of older generations. Yet, due to lack of complete consistency, I do not attach importance to it.

[44] All further results are available in the replication material.

RD results - All specifications – Part 1



RD results - All specifications – Part 2



RD results - All specifications – Part 3

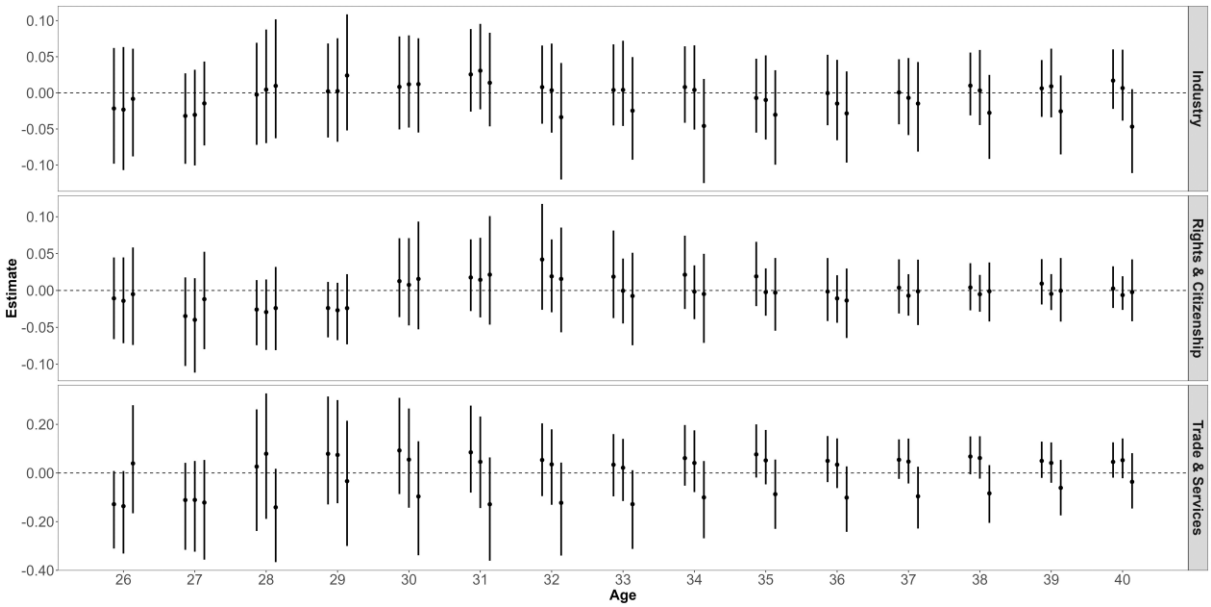


Figure 10: RD results, all specifications. RD estimates with 95% robust confidence intervals are shown of the effect of electing a young mayor on public spending by category. Young ≤ 26 years to young ≤ 40 years. The left estimates have a candidate AD ≥ 5 years, the middle estimates an AD ≥ 10 years and the right estimates an AD ≥ 20 years. Robust p-values and confidence intervals using bias-correction with cluster-robust standard errors at municipality level. Orange coefficients if p-value is smaller than 0.01, light orange coefficients if p-value is smaller than 0.05. Estimation performed using local polynomial estimators with triangular kernel and MSE-optimal bandwidth. Covariates used are the same as in Table 6.

One concern in my analysis is that it may lack the statistical power to detect effects. Table 7 below shows that the probability to detect larger effects (of 50% of a standard deviation) is above the conventional 80 percent for most of my outcomes under the main specification. Yet, the probability to detect moderate effects is only between 27 to 79 percent depending on the outcome, and to detect smaller effects even lower, at 7 to 15 percent. In addition, the table reports on the right side the youngest upper age threshold for young mayors at which power remains consistently over 80 percent[45]. Generally, I can quite safely exclude that there is any effect of electing a young mayor on education spending and I can also exclude any large effect for most of the other categories. Yet, I do not have enough power to detect large or even moderate effects for three of the categories I am mainly interested in, Environmental Management, Assistance to the Elderly and to Children and Adolescents, especially, if I want to define young as younger than 30. Lastly, there is not enough power to detect small effects (of 10% of a standard deviation) for almost all spending categories even when defining young as ≤ 40 years.

[45] The power is calculated for AD ≥ 5 years. Power is typically even lower when I set greater age differences between competitors.

Power Analysis

	Main specification				AD ≥ 5 years		
	SD	50%	30%	10%	50%	30%	10%
Education	8.94	1.00	0.79	0.15	26	30	39
Public Security	0.53	1.00	0.78	0.15	27	30	-
Rights & Citizenship	0.16	0.99	0.76	0.14	26	34	-
Transport	3.84	0.99	0.76	0.14	26	30	40
Industry	0.27	0.99	0.74	0.14	26	31	-
Science & Technology	0.11	0.97	0.64	0.12	26	33	-
Health	4.37	0.97	0.62	0.12	28	31	-
Agriculture	1.90	0.96	0.61	0.12	28	32	-
Labor	0.64	0.96	0.60	0.11	28	31	-
Social Assistance	1.67	0.95	0.58	0.11	29	32	-
Urbanism	4.56	0.94	0.55	0.11	28	31	-
Communication	0.28	0.94	0.55	0.11	29	32	-
Pensions	3.32	0.92	0.53	0.10	28	31	-
Sports & Leisure	0.79	0.91	0.51	0.10	29	31	-
Energy	0.62	0.89	0.48	0.10	29	32	-
Sanitation	2.09	0.88	0.47	0.10	29	33	-
Trade & Services	0.64	0.84	0.43	0.09	29	32	-
Culture	0.91	0.82	0.41	0.09	29	32	-
Housing	0.77	0.81	0.40	0.09	31	34	-
Environmental M.	0.90	0.80	0.39	0.09	30	33	-
Elderly A.	0.20	0.74	0.35	0.08	32	35	-
Children & Adolescents A.	0.52	0.61	0.27	0.07	31	33	-

Table 7: RD power calculations of different public spending outcomes. For the main specification (young ≤ 29 years, AD ≥ 5 years), the table reports the standard deviation of each outcome for untreated units, i.e. municipalities run by not-young mayors. Columns 3 to 5 report power calculations using as benchmark effect sizes 50, 30 or 10 percent of the standard deviation reported in column 2. Calculations include the same covariates as in the main analysis and otherwise use the default settings of the R package (significance level of the power function is 5 percent). On the right side, the table reports the youngest upper age threshold for young mayors at which power remains consistently over 80 percent for large, moderate and small effects, calculated using AD ≥ 5 years and ages between 26 and 40.

7.5 Interim Conclusion

Overall, my RD results show quite clearly that the election of a young mayor has no effect on the allocation of public spending in Brazilian municipalities. Young mayors do not increase education spending as theorized, in fact there are even a few negative estimates suggesting the opposite. In addition, there is no effect on pension spending or spending on Environmental Management, Assistance to the Elderly or Assistance to Children and Adolescents. Yet, for the latter three, power issues restrict me from making a final conclusion. My results further indicate that the election of young mayors negatively influences municipal spending on communication and sanitation issues, though it is unclear why they would have any interest in reducing these spendings.

In the end, I want to point out the difficulty in isolating the effect of a characteristic of interest in PCRD designs. Politicians come with many characteristics that tend to be correlated which is why I defined a compound treatment effect. This means, however, as Marshall (2022, pp.10-11) points out, that the failure to reject the null hypothesis in PCRD estimation is relatively uninformative. While it could mean that there is indeed no effect of the "young" attribute on the outcome, it could also mean that the positive effect of "young" cancels out with a negative effect of possessing relatively less of one or more compensating differentials (in my case maybe being an experienced or incumbent politician). In real-world politics, however, as characteristics come in bundles and age does not stand on its own, having a young mayor in office seems to make no difference for the composition of the municipal budget.

8 Mixed-Effects Model

8.1 Method

As outlined in my theory section, I am not only interested in the effect of young mayors on public spending (H1), but also if there is an effect of young councilors on public spending (H2) and whether the two interact (H3). Since including interaction terms in RDDs is not recommended (Calonico et al. 2019) and the share of young councilors is not a pre-treatment variable, but rather it is also decided at the time of the election[46], I decide to use mixed-effects models (MEMs) to test these hypotheses. While this modeling strategy comes with some reduced internal validity compared to an RDD, it has higher external validity as the estimated effects apply to all Brazilian municipalities and not just to those where a young candidate won or lost by narrow margins against a not-young candidate.[47] Moreover, I can control for potentially correlated covariates such as incumbency or educational level of the mayor, which I could not before, making it easier to trace an effect to age itself. Nevertheless, this method is only conditionally suitable for drawing causal conclusions.

Methodologically, I follow recent recommendations by Garritzmann and Seng (2020), who analyze partisan effects on welfare spending using mixed-effects models (also known as multilevel models). They argue that since governments do not change on a yearly basis, using standard time-series-cross-section regressions with municipality-year as unit of analysis would artificially inflate the number of observations and thus lead to incorrect, overconfident estimates.[48] The authors maintain that when interested in the effects of governments on expenditure or other policy outputs, MEMs are the better choice as they model more accurately the nested structure of the data. In my case, annual spending observations are nested within governments, which are in turn nested in municipalities, which are nested in the 26 Brazilian states. I thus opt to run two different model specifications. The first uses government-terms as a unit of analysis to ensure comparability with my RD results[49], hence only including

[46] Calonico et al. (2019) and Cattaneo et al. (2019) recommend to only include covariates that are pre-treatment in RDDs. This is also why I decide against analyzing heterogeneity in treatment effects based on councilor age.
[47] Since I focused in my RD analyses on elections where the two mayoral candidates with the highest vote shares were a young and a not-young candidate, I excluded a lot of other elections. It is thus possible that my (null) results of chapter 7 are not valid for the rest of Brazilian municipalities. In Appendix Table B.5, I provide evidence that council and municipality characteristics of mixed (young- not-young) elections are indeed systematically different to others.
[48] This is also the reason why I did not use municipality-year as a unit of analysis in my RDD in contrast to Bellodi et al. (2023).
[49] The outcome variables are actually the only yearly variables in my data set and where I, as a consequence, need to "sacrifice" information for the model.

municipality and state as random effects and election year as fixed effect. The other uses municipality-year as a unit of analysis as recommended by Garritzmann and Seng (2020) and similarly, including cubic splines to account for non-linear dynamics in the time dimension. It includes government, municipality and state random effects and additionally year of term fixed effects to account for potential budget cycles. For example, mayors might increase expenditure (on specific areas) in the year of election or alternatively in the year before election (see Alesina et al. 2019).

The control variables included in all models are the same and are similar to the ones in the RD analyses. They are supplemented with variables that were not continuous at the cutoff before or that were not pre-treatment: population (log) of the municipality, child mortality, literacy, extreme poverty, income per capita, GINI index, rural population, population < 15 years, population ≥ 65 years, area size (log), as well as gender, incumbency, university education and left party membership of the mayor. Moreover, the total size, or number of seats, of the council, the number of parties sitting in the council, the share of female councilors, the share of councilors belonging to a left party and belonging to the same party as the mayor could also affect the decision-making process.[50]

In order to answer my hypotheses, I run both models twice: once including an interaction term, *young mayor x share of young councilors*, and once without. This is because in H1 and H2, I theorize that young councilors and young mayors have an unconditional or average effect on public spending, while in H3 I assume a conditional relationship. I am aware that it is not necessarily feasible to examine both a conditional and an unconditional relationship at the same time (Brambor, Clark & Golder 2006, p.73). As Brambor et al. (ibid.) point out, estimates in the unconditional model would not only reflect the underlying relationship between X and Y but also the distribution of the conditioning variable Z. Conscious of this limitation, my results of the unconditional model must be interpreted with caution.

As before, I run the models for 15 different specifications of upper thresholds of "young", meaning all ages between 26 to 40 years. Analyses are implemented with the *lme4* (Bates et al. 2015) package in R. Importantly, I can only include the years 2005-2022 in my MEMs, excluding the data of the first term (of election year 2000) because there is no information on the incumbency status of the mayor available. As a consequence, I have 26,618 observations for the government-term model and 95,104 observations for the municipality-year model.

[50] Note that I did not include life expectancy in the municipality and the Human Development Index because of multicollinearity issues.

8.2 Results

Fortunately, the results of both government-term and municipality-year models are practically identical. Thus, I will only present the results of the first in the following. All further results are, however, available in the replication material.[51]

First, I present empirical findings for my unconditional hypotheses in Figure 11. Like in the RD analysis before, there are mostly null results. With regards to young councilors, the only really consistent patterns across different age thresholds are for education and transport spendings (for all young definitions of ≤ 31 years up until 40 years). The results suggest that if a local council was occupied by 50 percent young people, the average yearly education spending would increase by on average 0.32 percentage points[52], which would translate to an increase of about 394,000 Brazilian Reais (R$) per year (R$12.20 per capita). Likewise, it would mean a decrease of the average yearly transport spending by 0.16 percentage points, that is about R$6.00 per capita per year. Lastly, contrary to expectations, there might be a positive effect of young councilors on pension spending (average increase by 0.19 percentage points), particularly if there were more young councilors 30 years or younger. The pattern is, however, not completely consistent over age thresholds.[53]

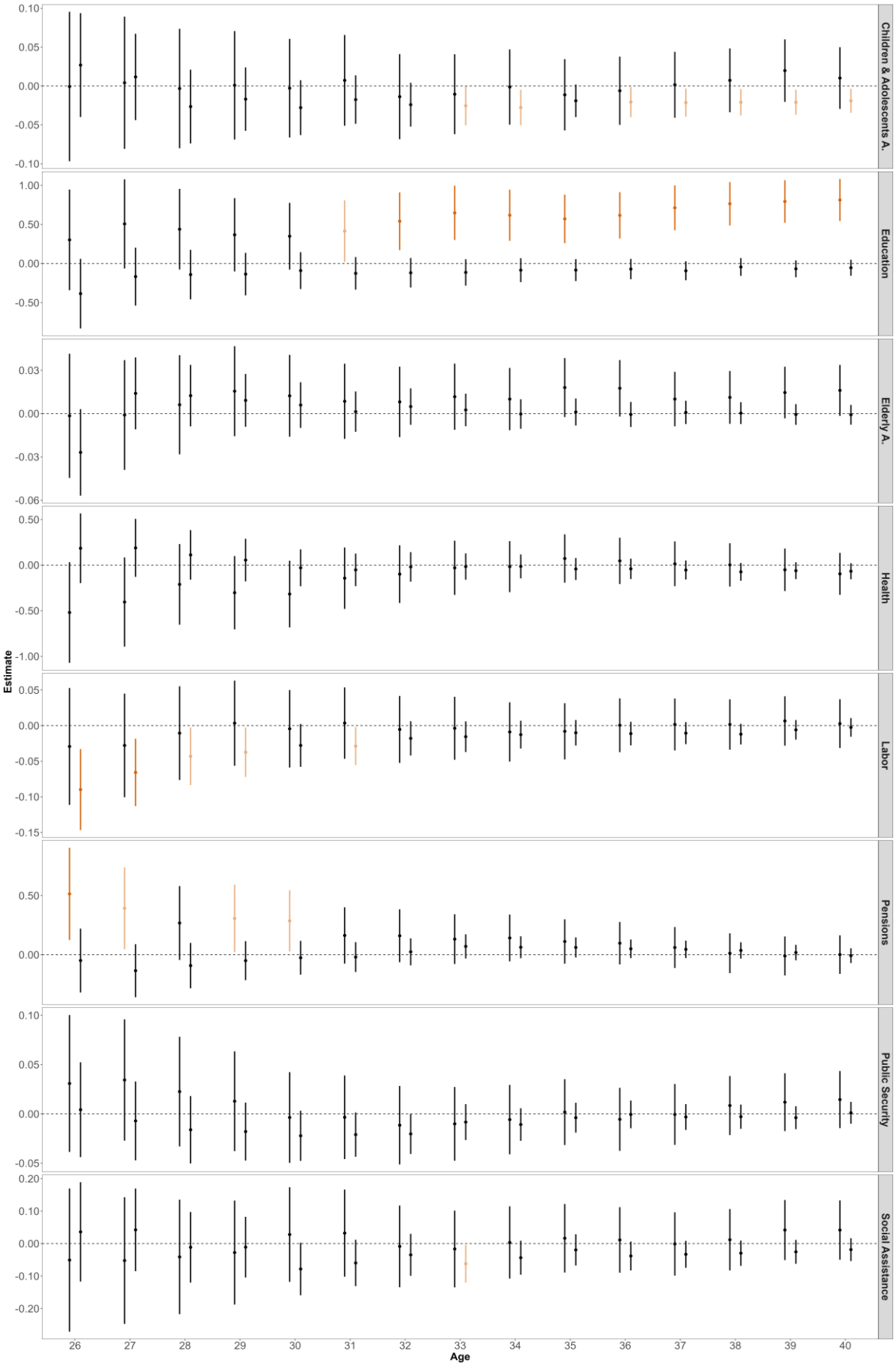
Turning to mayors, a young mayor seems to have a statistically significant effect on the municipal spending on culture (for all young definitions used except young ≤ 28 years). Their presence would increase respective yearly spending by 0.06 to 0.14 percentage points depending on the age threshold, which would mean an increase by 7.6 percent and of R$94,000 per year on average. Furthermore, the results suggest that young mayors have a positive effect on urbanism spending (average effect size of 0.36 percentage points, R$440,000 per year) and a negative effect on labor spending (average effect size of 0.05 percentage points, R$64,000 per year). For the latter, this would mean a decrease of respective spending by 37.8 percent. I regard all other statistically significant estimates as too inconsistent across age thresholds (e.g. Trade & Services) and/or too negligible in effect size (e.g. Children & Adolescents).

[51] As robustness check, I also run the model with some additional covariates (marital status of the mayor and alignment with the president or state governor), or with the incumbency variable from the TSE data, which generally does not make a difference in my findings. Moreover, I included data of the first term in an additional test excluding incumbency as control variable. While those results are comparable to the ones of my main models, there are more often significant estimates, which I believe comes from the fact that incumbency of the mayor does have an influence on public spending and thus biases the estimates.

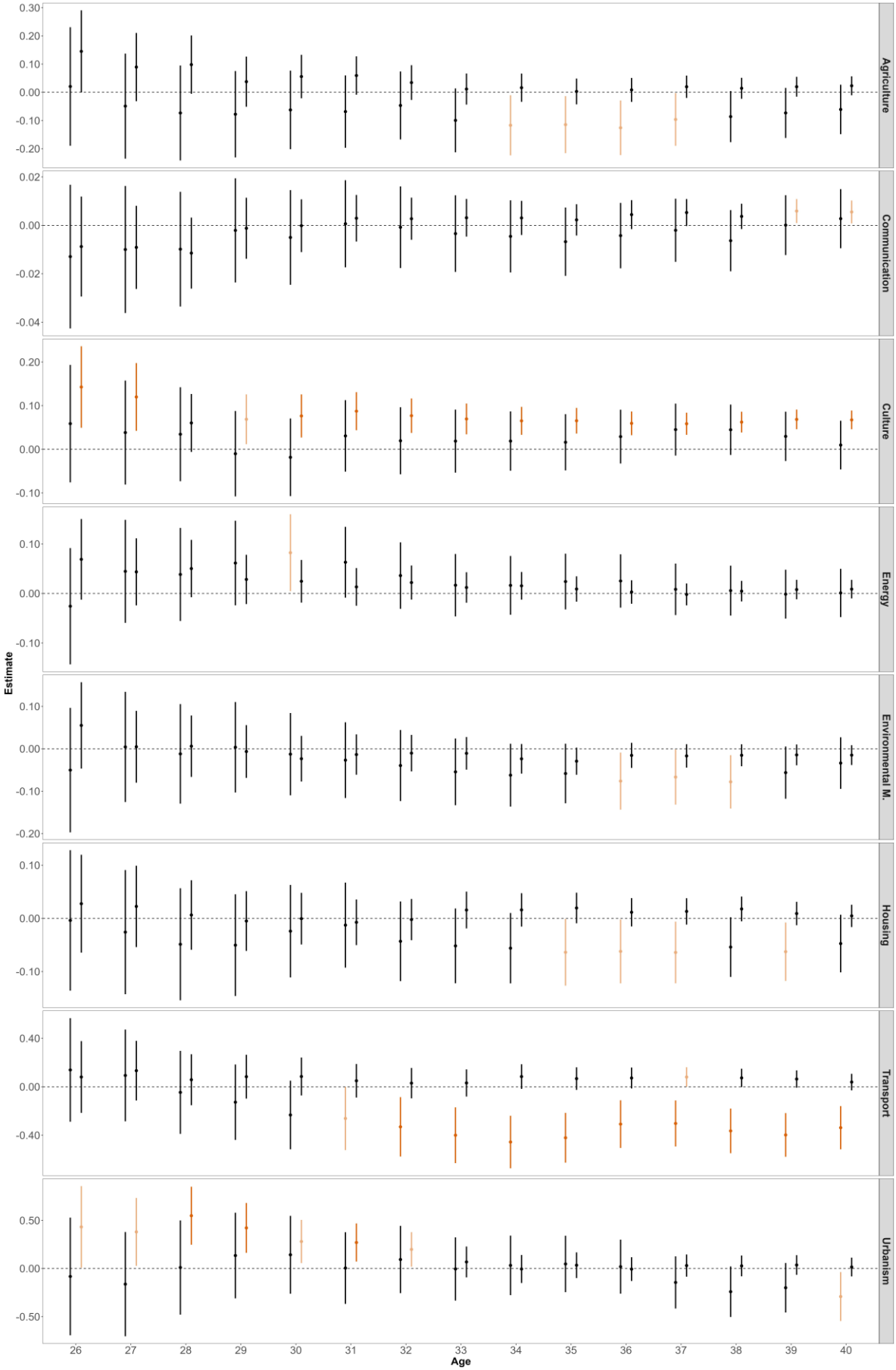
[52] Note that I divide the effect sizes by two because 100% young councilors are neither realistic nor desirable.

[53] Statistically significant estimates for agriculture, environmental management and housing are few and seem to be driven by councilors in their mid-thirties rather than young councilors in general. In addition, average effect sizes for 50 percent young councilors are quite small: agriculture (0.06 pp), environmental management (0.04 pp) and housing (0.03 pp).

Unconditional Model - MEM – Part 1



Unconditional Model -MEM – Part 2



Unconditional Model - MEM – Part 3

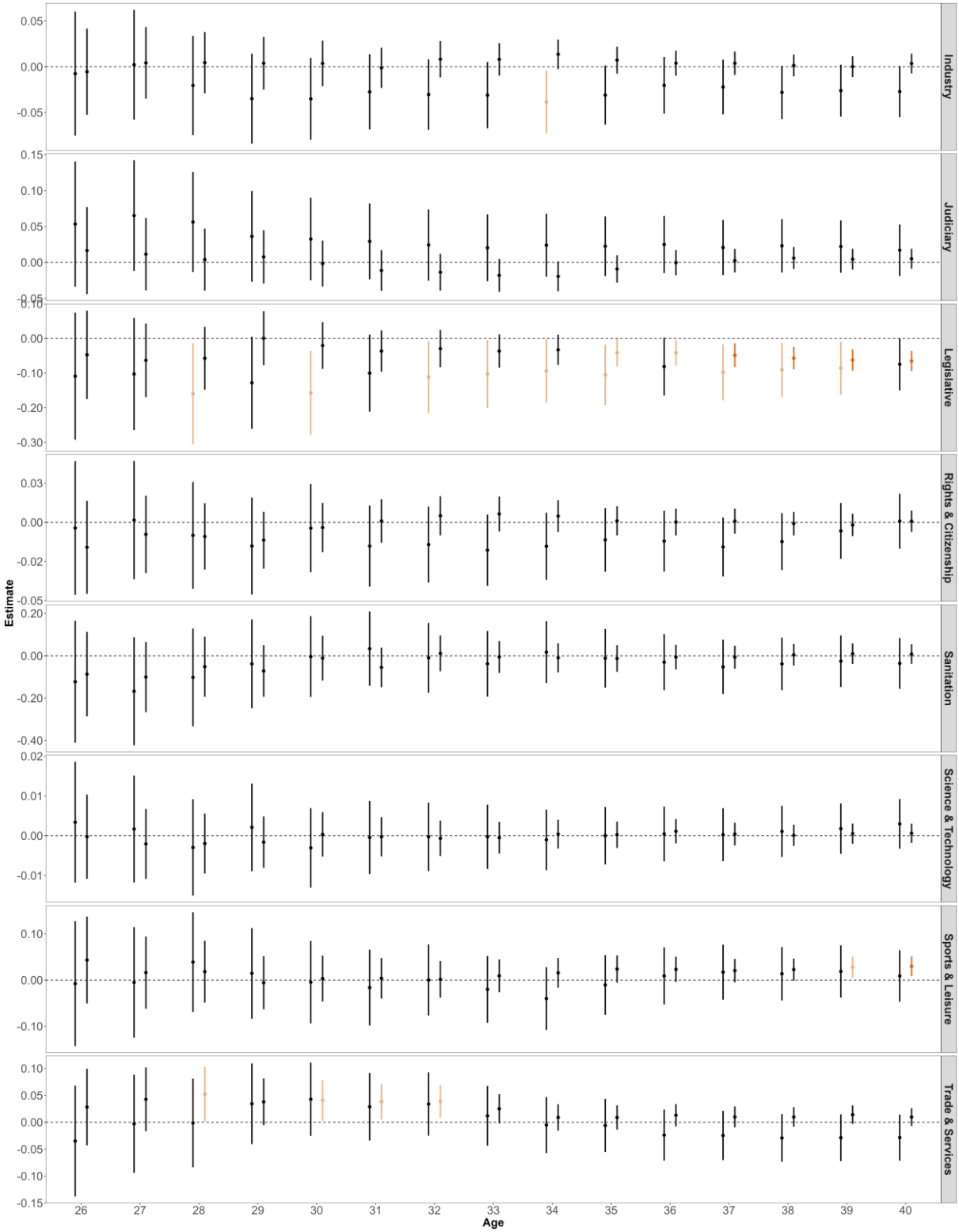
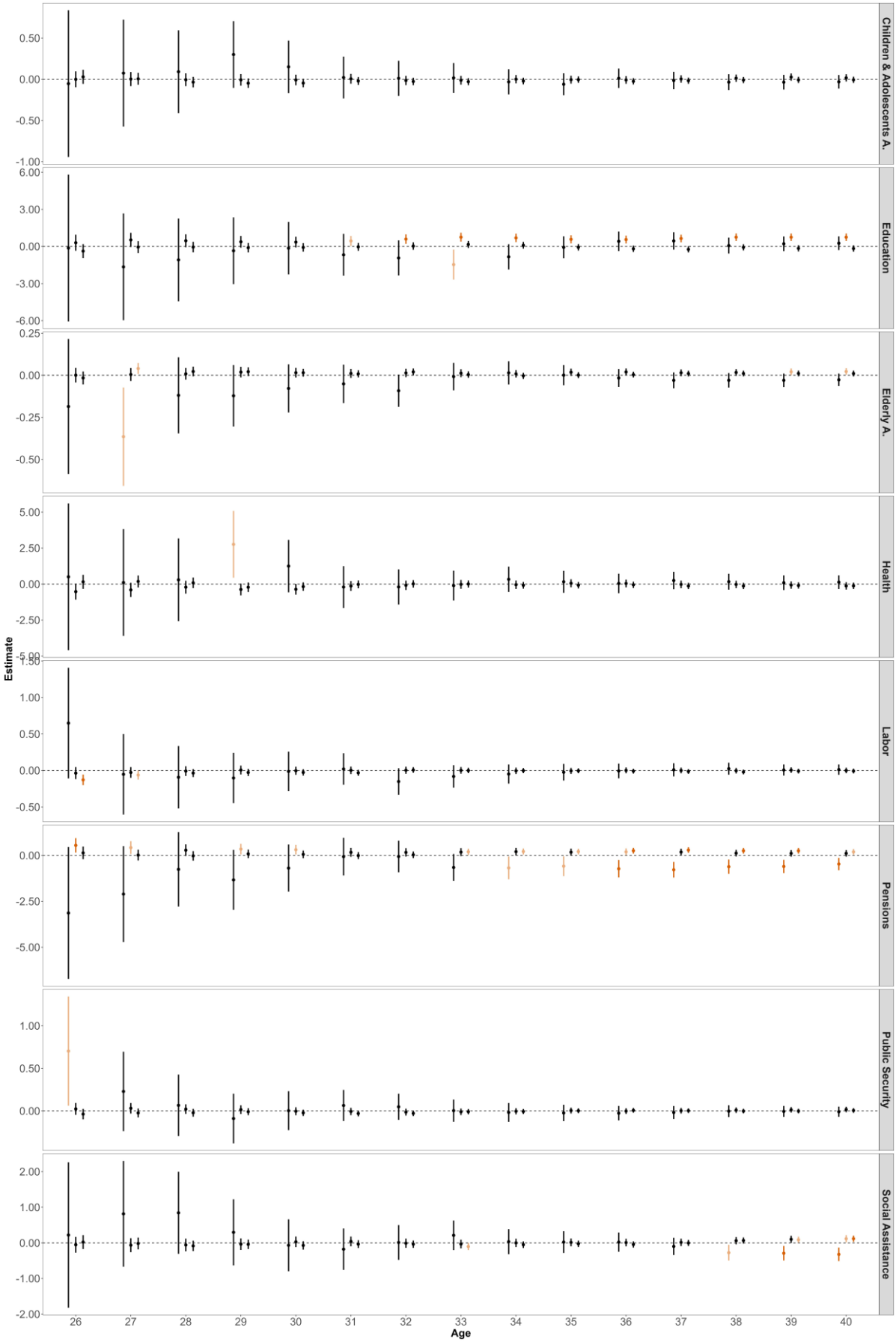
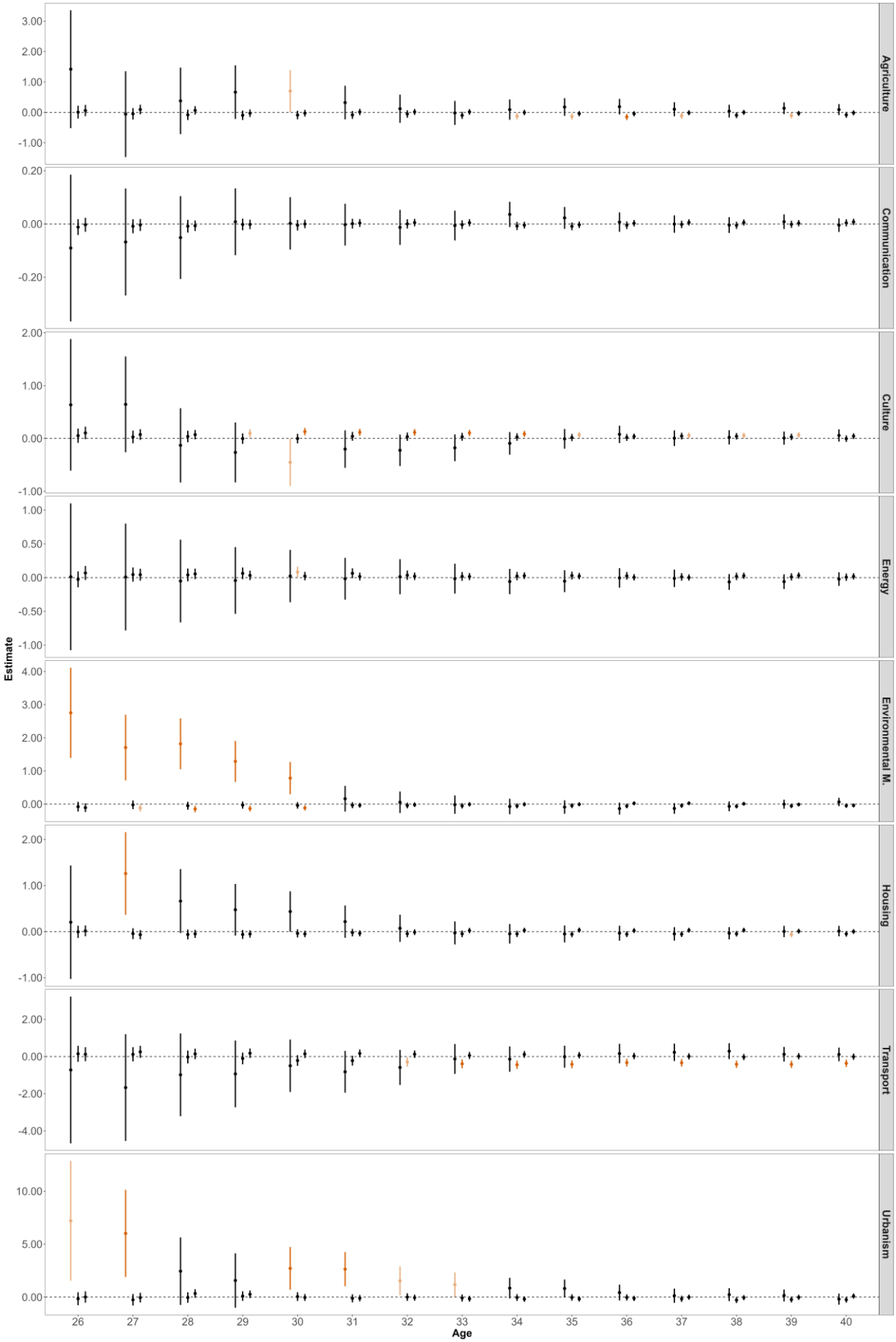


Figure 11: Results of linear mixed-effects model – Unconditional model. Displayed are the estimated main effects with 95% confidence intervals of a young council (100% young councilors) (left) and a young mayor (right) on the share of public spending by category. Orange when $p < 0.01$, light orange when $p < 0.05$. Young ≤ 26 years to young ≤ 40 years. 2005-2022.

Interaction Model - MEM – Part 1



Interaction Model - MEM – Part 2



Interaction Model - MEM – Part 3

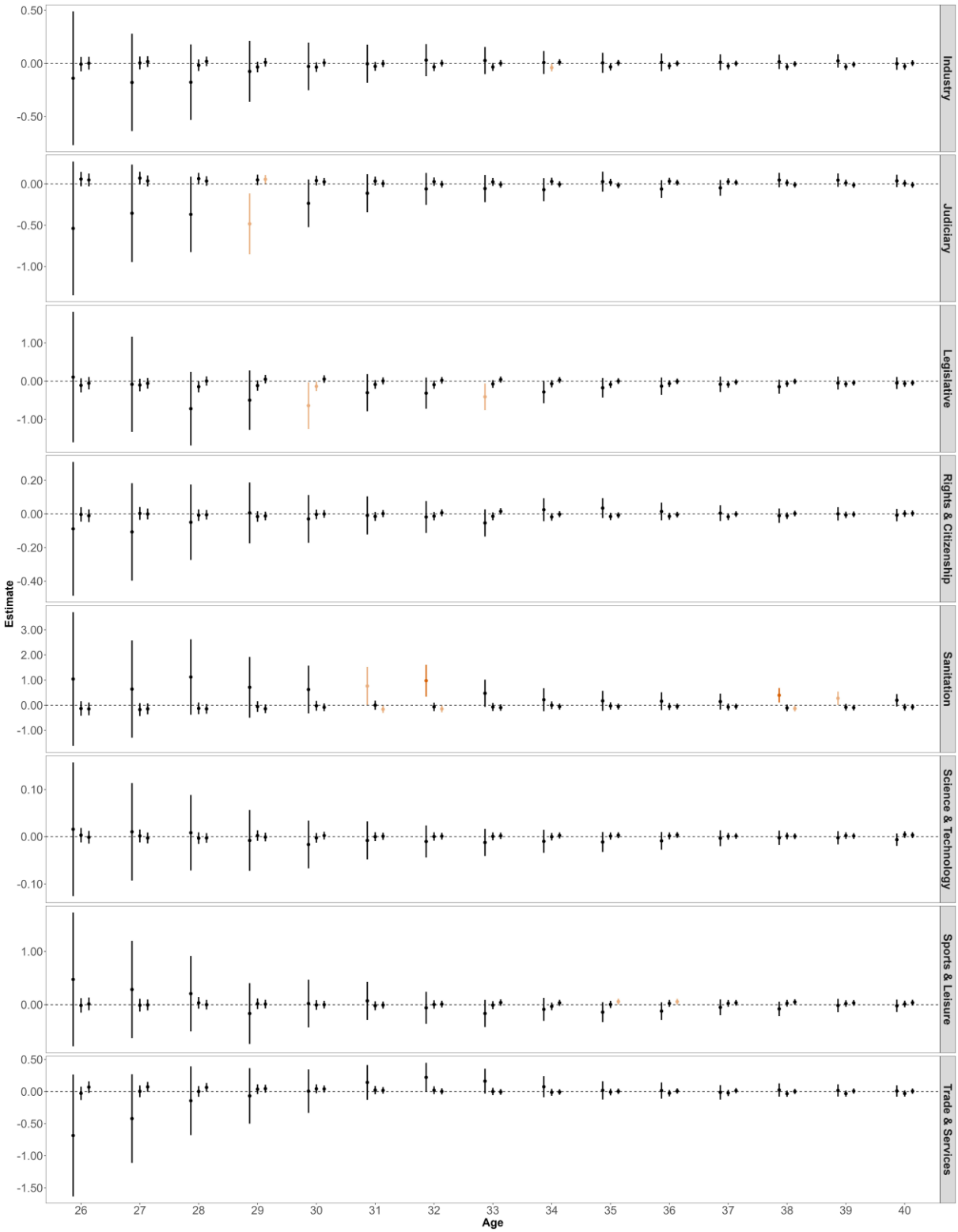


Figure 12: Results of linear mixed-effects model –Interaction (conditional) model. Displayed are the estimated interaction effects (left) and simple effects of a young council (100% young councilors) (middle) and a young mayor (right) with 95% confidence intervals on the share of public spending by category. Orange when $p < 0.01$, light orange when $p < 0.05$. Young ≤ 26 years to young ≤ 40 years. 2005-2022.

Next, I analyze my interaction models (see Figure 12) in order to answer my conditional hypothesis (H3): The share of municipal spending on a youth policy issue is significantly higher if there is both a high(er) share of young councilors and a young mayor in a municipality. Starting with education spending,[54] there is a positive simple effect of young councilors with magnitudes similar to the ones estimated for the main effects. Yet, contrary to expectations, a young mayor does not reinforce this effect, but rather, the results suggest that the initial effect of young councilors disappears once there is also a young mayor in office. Similarly, young councilors are associated with lower spending on transport issues, yet only if there is no young mayor in office. Importantly, there is no young mayor in office in 76 to 96 percent of the cases (depending again on the young definition), which would mean that more young people in municipal councils actually have an influence on education and transport spendings.

Furthermore, there is an apparent positive and significant interaction effect with regards to spending on environmental issues when defining young as 30 years or younger. Accordingly, if there is a young mayor and also 10 percent more young councilors this would lead to an average increase of 0.08 to 0.27 percentage points, which is considerable if we take into account that the average environmental spending of a municipality in a year is just 0.55 percent of the total budget. It would be an increase by 14 to 50 percent and would mean spending R$95,000 to R$334,000 more for environmental issues per year. However, young mayors seem to have a negative marginal effect if there are no young councilors at all (-0.13 percentage points), meaning in 37 to 68 percent of all cases (see Figure 13).

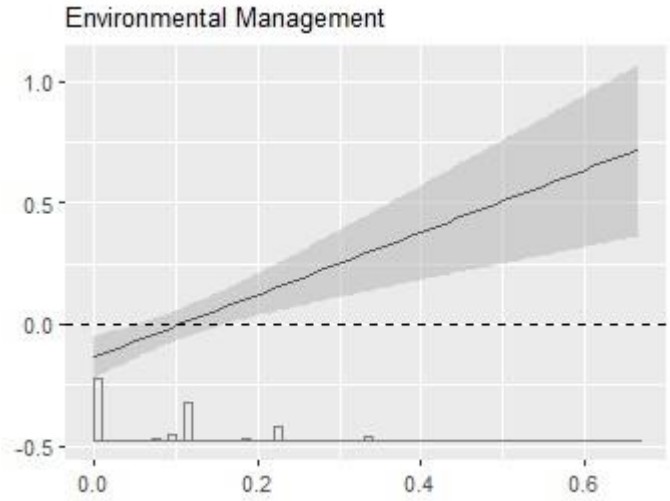


Figure 13: Marginal effect of a young mayor on Environmental Management spending depending on the share of young councilors. Young ≤ 29 years.

[54] I do not elaborate some spending categories, although they have some statistically significant estimates, because it would be difficult to infer from them a general effect of young councilors or mayors.

Similarly, there might be a positive interaction effect of young councilors and a young mayor with regards to urbanism spending (0.12 to 0.72 percentage points with 10 percent more young councilors, R$143,000 to R$875,000 more per year). This effect replaces the positive effect of a young mayor found in the unconditional model. The results further suggest that the effect only materializes once both a young mayor and a sufficient number of young councilors are present (see Figure 14). However, the effect is not completely consistent over young definitions and thus only indicative. Moreover, there is a positive simple effect of young mayors on spending on culture (on average +0.09 pp), yet only if there are no or barely any young councilors. As Figure 15 illustrates, the effect decreases with higher shares of young councilors and disappears at one point.

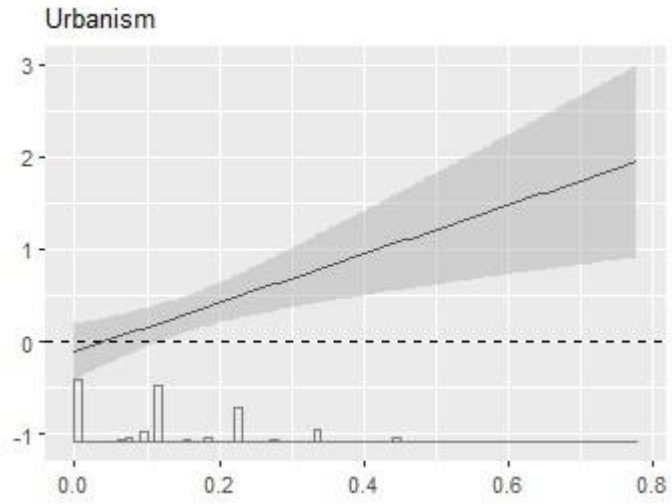


Figure 14: Marginal effect of a young mayor on Urbanism spending depending on the share of young councilors. Young ≤ 31 years.

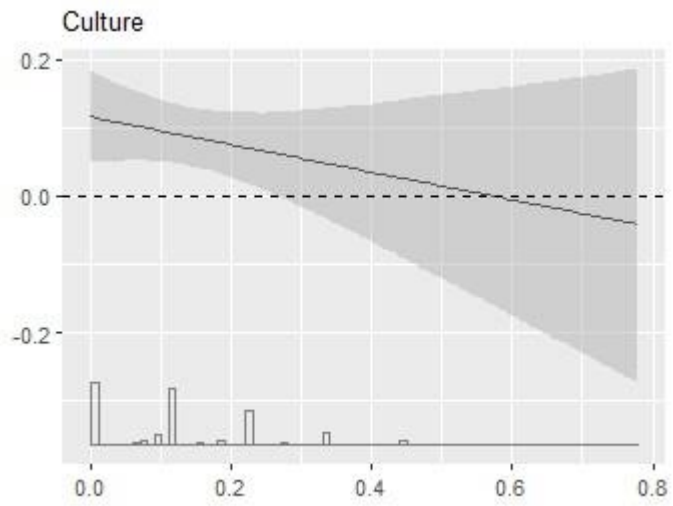


Figure 15: Marginal effect of a young mayor on Culture spending depending on the share of young councilors. Young ≤ 31 years.

Lastly, the pattern for pension spending is noisy. The estimates suggest that there might be a negative interaction effect, but a positive simple effect for young mayors. Figure 16 shows the marginal effect of a young mayor on pension spending, illustrating that the negative

interaction effect actually only would start materializing with rather high and generally unobservable shares of young councilors. In addition, the positive simple effects of young councilors and young mayors are significant for different young definitions making drawing a coherent conclusion difficult.

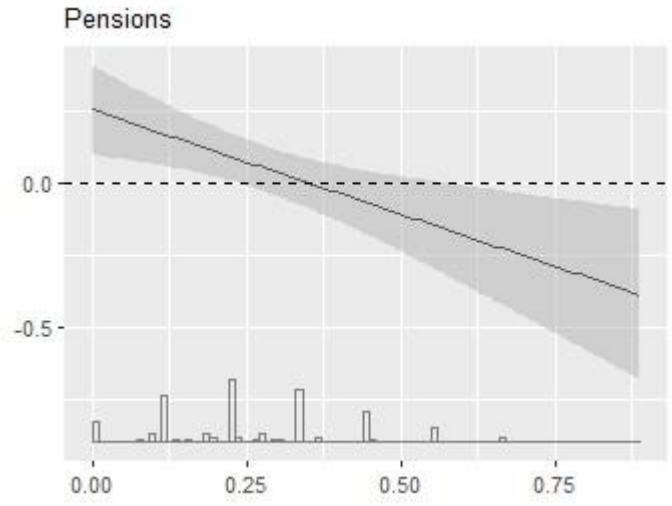


Figure 16: Marginal effect of a young mayor on Pension spending depending on the share of young councilors. Young ≤ 36 years.

8.3 Interim Conclusion

In sum, the statistical analyses of this chapter show that there are no clear, straightforward effects of young mayors and/or young councilors on public spending that would warrant a simple conclusion.

First, the empirical evidence suggests that there is no general reinforcing effect of young mayors and young councilors, although there are some interesting patterns with regards to environment, urbanism and pension spending. I have argued the first to be a youth issue and it seems that young politicians, when being present in both the legislative and executive branch, would indeed increase spending on environmental issues such as environmental preservation or water resources. A young mayor and one more young councilor[55] would thus be associated with, on average, R$6.30 per capita per year more toward the environment. Similarly, they seem to jointly allocate more money towards urban infrastructure or services, although findings are not completely consistent across age thresholds and it is unclear why youth would make a difference here. Lastly, as expected, there seems to be a negative interaction effect on pensions. The effect is, however, only discernible starting young ≤ 34 years and once there is a relatively high share of young councilors in office (more than 50 percent). While these are first insightful

[55] The figure is calculated for 10 percent of young councilors, but since the majority of Brazilian city councils consists of nine seats (75%), this equates to more or less one seat.

findings in support of H3, one must not forget the null results for the other spending categories, in particular those for Education, Assistance to Children and Adolescents and Assistance to the Elderly.

Interestingly, in contrast to a reinforcing effect, some of the presented results suggest that the young age of a mayor has only an effect if there are no or barely any young councilors represented, at least for spendings on culture, and young councilors only have an effect if there is no young mayor in office, at least for spendings on transport and education. While it is unclear why there would be such kind of conditionality and only for these particular spending categories, the results indicate that a 10 percent increase in the share of young councilors would lead to, on average, R$2.40 per capita more on education and R$1.30 per capita less on transport per year. In addition, a young mayor in office would lead to an increase of R$2.90 per capita per year towards cultural issues.[56] Notably, these changes could lead to large differences over time given that they add up incrementally from year to year.

Overall, however, one must admit that the MEM results are sparse and inconclusive. Why would only young councilors prioritize education spending but not young mayors? Why would it be the other way around for culture spending? Why would young politicians decrease transport and increase urbanism spending? Why would there be an interaction effect for environmental management but not for education spending? In the absence of convincing answers, I must question my proposed hypotheses and conclude that there might not be such a clear mechanism after all between youth representation and public spending in Brazilian municipalities.

[56] These per capita figures are calculated based on the estimates from the unconditional model. Figures of the conditional model are, however, similar or even higher in magnitude.

9 Conclusion

Young people are underrepresented in political institutions worldwide. This is not different in Brazil whether at national or local level. Today, there are only about two percent of mayors and seven percent of councilors younger than 30 years in Brazilian local politics. Generally, I have argued youth underrepresentation to be a democratic deficit that risks alienating youth from politics and neglecting their interests in decision-making processes. While there are strong normative arguments for a better representation of young people, I have examined in this thesis whether youth descriptive representation in Brazilian municipalities also influences policy outcomes or, more specifically, the allocation of public spendings. My results reveal that the young age of mayors and councilors has no coherent and straightforward effect on the composition of the municipal budget. The found evidence must be described as mixed and inconclusive.

My RD analysis shows null results across all spending categories with the exception of communication and sanitation implying that the election of young mayors significantly decreases respective spendings. However, my MEM analysis does not replicate these findings, only suggesting a higher share of municipal spending towards culture in municipalities of young mayors compared to others. Considering the fact that I have not posited these topics to be age specific, I treat these findings with caution and leave room for other researchers to show if these are indeed meaningful relationships. Furthermore, in line with findings by Baskaran et al. (2021), I find that municipalities with a higher share of young councilors spend more on education. This effect disappears, however, and is not reinforced when a young mayor is in office. Importantly, my results do not confirm the findings by Dahis et al. (2023) who reported that young mayors in Brazil would allocate more spending to education. Still it remains an open question why there would be a different effect for young councilors and young mayors. In fact, I find a similar pattern with regards to transport spending, although it is unclear why the young would have an interest in decreasing respective spending in the first place. Lastly, there seems to be a reinforcing effect of young mayors and young councilors with regards to environmental spending and, less clearly, with regards to urbanism and pension spending. The former corroborates the findings from Dahis et al. (2023) who showed that there are positive effects of youth representation on environmental outcomes. It thus gives additional support to the idea that more young people in politics could be beneficial for the environment and climate.

Overall, although there are some interesting patterns, the results are admittedly rather incoherent and thus do not provide convincing evidence in support of a link between descriptive

and substantive representation with regards to youth. For example, it is important to mention that I did not find any evidence that youth representation positively affects child welfare (Assistance to Children and Adolescents) or negatively affects elderly welfare (Assistance to the Elderly) quite in contrast to McClean (2021). In addition to prevalent null results across spending categories, some results also contradict each other or are without any theoretical foundation. Therefore, although it is theoretically plausible and likely that youth have distinct preferences compared to their old(er) counterparts and although there is some empirical evidence that they do indeed have differently weighted interests in Brazil, I must conclude that the mere presence of youth in Brazilian political institutions, neither in the legislative nor executive branch, does not necessarily translate into a better substantive representation of those interests. At least the relationship is not clearly detectable when analyzing public spending.

A limitation in my analyses may be that the spending categories are too broad and the data generally too uninformative to capture youth substantive representation. For example, an increase in labor spending would not tell us if money was directed to specific youth employment programmes or to any other employment measures, an increase in education spending would not tell us if it was directed to public or private schools. Future research could thus extend analyses to less abstract outcomes and perhaps to outcomes closer in the causal chain, for example on the behavior of young politicians in political institutions (political speech, committee assignments, etc.) as institutional constraints might inhibit a more direct effect of politicians' characteristics on substantive policy outcomes. Further research could also look into aspects of ideological and policy congruence in relation to young adults to examine how well policy preferences of different age groups are represented in political institutions (see Kissau et al. 2012). In addition, there is still little research analyzing how young politicians perceive their role while in office (see Winsvold et al. 2017, Erikson & Josefsson 2019) and how youth feel about their descriptive and substantive (under)representation in political institutions. Importantly, all of this research should look at a wide range of countries, including in particular countries of the Global South in order to provide a more comprehensive picture of youth, representation and politics. Studies on youth representation should also always be cautious to not discriminate against the elderly.

My thesis contributes to the literature on youth representation and more broadly to the literature examining the consequences of politicians' characteristics on substantive representation as well as the literature on youth and politics more generally. Although my findings predominantly show that there is no effect of youth representation on public spending in Brazil, it does not mean that youth cannot make a difference in political institutions and

processes. Young politicians may be role models for children and youth and generally increase the acceptability of democratic systems. I argue that better youth representation is an end in itself that can contribute to a more inclusive and just social framework. Even though there is no guarantee and no clear evidence that young politicians will better promote youth interests than others, youth representation is a matter of intergenerational justice. Nevertheless, it should not be regarded as the only solution to bring about intergenerationally fairer outcomes.

References

Ahlfeldt, G. M., Maennig, W. & Mueller, S. Q. (2022). The generation gap in direct democracy: Age vs. cohort effects. *European Journal of Political Economy, 72*, 102120. https://doi.org/10.1016/j.ejpoleco.2021.102120

Alesina, A., Cassidy, T. & Troiano, U. (2019). Old and young politicians. *Economica, 86*(344), 689-727. https://doi.org/10.1111/ecca.12287

Alesina, A. & Passarelli, F. (2019). Loss aversion in politics. *American Journal of Political Science, 63*(4), 936-947. https://doi.org/10.1111/ajps.12440

Andor, M. A., Schmidt, C. M. & Sommer, S. (2018). Climate change, population ageing and public spending: Evidence on individual preferences. *Ecological Economics, 151*, 173-183. https://doi.org/10.1016/j.ecolecon.2018.05.003

Arnesen, S. & Peters, Y. (2018). The legitimacy of representation: How descriptive, formal, and responsiveness representation affect the acceptability of political decisions. *Comparative Political Studies, 51*(7), 868-899. https://doi.org/10.1177/0010414017720702

Arpad, T. (2018). Willing to pay to save the planet? Evaluating support for increased spending on sustainable development and environmentally friendly policies in five countries. *PLoS ONE, 13*(11), e0207862. https://doi.org/10.1371/journal.pone.0207862

Atlas das Juventudes (2021). *Atlas das Juventudes: Evidências para a transformação das juventudes*. Retrieved on 02/03/2023 from https://atlasdasjuventudes.com.br

Baiardi, D. (2022). What do you think of climate change? *Journal of Economic Surveys* [Early View], 1-59. https://doi.org/10.1111/joes.12535

Bailer, S., Breunig, C., Giger, N. & Wüst, A. M. (2022). The diminishing value of representing the disadvantaged: Between group representation and individual career paths. *British Journal of Political Science, 52*(2), 535-552. https://doi.org/10.1017/S0007123420000642

Baskaran, T., Hessami, Z. & Schirner, S. (2021). *Can young politicians influence policy in a gerontocracy?* Working paper, University of Siegen & Ruhr-University Bochum. Retrieved on 28/10/2022 from https://www.cesifo.org/sites/default/files/ events/2021/ngs21_Hessami.pdf

Bell, T. & Gardiner, L. (2019). My generation, baby: The politics of age in Brexit Britain. *The Political Quarterly, 90*(S2), 128-141. https://doi.org/10.1111/1467-923X.12623

Bellodi, L., Morelli, M. & Vannoni, M. (2023). A costly commitment: Populism, economic performance, and the quality of bureaucracy. *American Journal of Political Science* [Early View], 1-17. https://doi.org/10.1111/ajps.12782

Belschner, J. (2023). Youth advantage versus gender penalty: Selecting and electing young candidates. *Political Research Quarterly, 76*(1), 90-106. https://doi.org/10.1177/10659129211072559

Benjamini, Y., & Hochberg, Y. (1995). Controlling the false discovery rate: A practical and powerful approach to multiple testing. *Journal of the Royal Statistical Society Series, Series B,* 57(1), 289-300. http://www.jstor.org/stable/2346101.

Berry, C. (2014). Young people and the ageing electorate: Breaking the unwritten rule of representative democracy. *Parliamentary Affairs*, 67(3), 708–725. https://doi.org/10.1093/pa/gss056

Besley, T. & Coate, S. (1997). An economic model of representative democracy. *The Quarterly Journal of Economics, 112*(1), 85–114. https://www.jstor.org/stable/2951277

Besley, T., Montalvo, J. G. & Reynal-Querol, M. (2011). Do educated leaders matter? *The Economic Journal, 121*(554), F205-227. https://doi.org/10.1111/j.1468-0297.2011.02448.x

Bidadanure, J. (2015). Better procedures for fairer outcomes: Can youth quotas increase our chances of meeting the demands of intergenerational justice? In J. Tremmel, A. Mason, P. H. Godli & I. Dimitrijoski (Eds.), *Youth quotas and other efficient forms of youth participation in ageing societies* (pp. 37-56). Springer. https://doi.org/10.1007/978-3-319-13431-4

Bidadanure, J. (2016). Youth quotas, diversity, and long-termism: Can young people act as proxies for future generations? In I. González-Ricoy & A. Gosseries (Eds.), *Institutions for future generations* (pp. 266-281). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780198746959.001.0001

Blaschke, J. (2017). *Are mayors with business experience better politicians? Evidence from close races in Brazil* [Master's thesis, University of Barcelona]. http://hdl.handle.net/2445/113753

Bragança, A., Ferraz C. & Rios, J. (2015). *Political dynasties and the quality of government.* Working paper, Universidade Federal de Minas Gerais, Pontifícia Universidade Católica do Rio de Janeiro & Stanford University. Retrieved on 21/06/2023 from https://web.stanford.edu/~juanfrr/bragancaferrazrios2015.pdf

Brambor, T., Clark, W. R. & Golder, M. (2006). Understanding interaction models: Improving empirical analyses. *Political Analysis, 14*(1), 63-82. https://doi.org/10.1093/pan/mpi014

Britto, D. G. C. & Fiorin, S. (2020). Corruption and legislature size: Evidence from Brazil. *European Journal of Political Economy, 65*, 101940. https://doi.org/10.1016/j.ejpoleco.2020.101940

Brollo, F. & Nannicini, T. (2012). Tying your enemy's hands in close races: The politics of federal transfers in Brazil. *American Political Science Review, 106*(4), 742-761. https://doi.org/10.1017/S0003055412000433

Brollo, F. & Troiano, U. (2016). What happens when a woman wins an election? Evidence from close races in Brazil. *Journal of Development Economics, 122,* 28–45. https://doi.org/10.1016/j.jdeveco.2016.04.003

Broockman, D. E. (2013). Black politicians are more intrinsically motivated to advance black's interests: A field experiment manipulating political incentives. *American Journal of Political Science, 57*(3), 521-536. https://doi.org/10.1111/ajps.12018

Busse, B., Hashem-Wangler, A. & Tholen, J. (2015). Two worlds of participation: Young people and politics in Germany. *The Sociological Review 63*(S2), 118–140. https://doi.org/10.1111/1467-954X.12265

Calonico, S., Cattaneo, M. D., Farrell, M. H. & Titiunik, R. (2019). Regression discontinuity designs using covariates. *The Review of Economics and Statistics, 101*(3), 442–451. https://doi.org/10.1162/rest_a_00760

Calonico, S., Cattaneo, M. D. & Titiunik, R. (2014). Robust nonparametric confidence intervals for regression-discontinuity designs. *Econometrica, 82*(6), 2295–2326. https://doi.org/10.3982/ecta11757

Câmera dos Deputados (n.d.). *Parlamento Jovem Brasileiro*. Retrieved on 01/03/2023 from https://www2.camara.leg.br/a-camara/programas-institucionais/experiencias-presenciais/parlamentojovem

Cammaerts, B., Bruter, M., Banaji, S., Harrison, S. & Anstead, N. (2014). The myth of youth apathy: Young Europeans' critical attitude toward democratic life. *American Behavioral Scientist, 58*(5), 645-664. https://doi.org/10.1177/0002764213515992

Carnes, N. & Lupu, N. (2015). Rethinking the comparative perspective on class and representation: Evidence from Latin America. *American Journal of Political Science, 59*(1), 1-18. https://www.jstor.org/stable/24363593

Cattaneo, M. D., Idrobo, N. & Titiunik, R. (2019). *A practical introduction to regression discontinuity designs: Foundations* (Cambridge elements: Quantitative and computational methods for the social sciences). Cambridge University Press. https://doi.org/10.1017/9781108684606

Cattaneo, M. D., Idrobo, N. & Titiunik, R. (2023). *A practical introduction to regression discontinuity designs: Extensions* (Cambridge elements: Quantitative and computational methods for the social sciences). Cambridge University Press. https://arxiv.org/abs/2301.08958

Cattaneo, M. D., Jansson, M. & Ma, X. (2020). Simple local polynomial density estimators. *Journal of the American Statistical Association, 115*(531), 1449-1455. https://doi.org/10.1080/01621459.2019.1635480

Chattopadhyay, R. & Duflo, E. (2004). Women as Policy Makers: Evidence from a Randomized Policy Experiment in India. *Econometrica, 71*(5), 1409-1443. https://www.jstor.org/stable/3598894

Clayton, A. & Zetterberg, P. (2018). Quota shocks: Electoral gender quotas and government spending priorities worldwide. *The Journal of Politics, 80*(3), 916-932. https://doi.org/10.1086/697251

Correa, G. & Madeira, R. A. (2014). *The size of local legislatures and women's political representation: Evidence from Brazil.* Working Paper, University of São Paulo (FEA-USP). Retrieved on 13/11/2022 from https://ideas.repec.org/p/spa/wpaper/2014wpecon4.html

Curry, J. M. & Haydon, M. R. (2018). Lawmaker age, issue salience, and senior representation in congress. *American Politics Research, 46*(4), 567-595. https://doi.org/10.1177/ 1532673X18754557

Dahis, R., de las Heras, I. & Saavedra, S. (2023). *Young politicians and long-term policy.* Working paper, PUC-Rio & Universidad del Rosario. Retrieved on 25/04/2023 from https://ideas.repec.org/p/rie/riecdt/102.html

Debus, M. & Himmelrath, N. (2022). Advocates of climate action? The age of members of parliament and their activity in legislative debates on climate change. *Climate Action, 1*(16), 1:16. https://doi.org/10.1007/s44168-022-00017-2

De Mello, L., Schotte, S., Tiongson, E. R. & Winkler, H. (2017). Greying the budget: Ageing and preferences over public policies. *Kyklos, 70*(1), 70– 96. https://doi.org/10.1111/kykl.12131

Devlin, C. & Elgie, R. (2008). The effect of increased women's representation in parliament: The case of Rwanda. *Parliamentary Affairs, 61*(2), 237-254. https://doi.org/10.1093/pa/gsn007

Dittmar, K., Sanbonmatsu, K. & Carroll, S. J. (2018). *A seat at the table: Congresswomen's perspectives on why their presence matters.* Oxford University Press

Dotti Sani, G. M. & Quaranta, M. (2020). Let them be, not adopt: General attitudes towards gays and lesbians and specific attitudes towards adoption by same-sex couples in 22 European countries. *Social Indicators Research, 150,* 351–373. https://doi.org/10.1007/s11205-020-02291-1

Downs, A. (1957). An economic theory of political action in a democracy. *Journal of Political Economy, 65*(2), 135–150. https://www.jstor.org/stable/1827369

Erikson, J. & Josefsson, C. (2019). Equal playing field? On the intersection between gender and being young in the Swedish Parliament, *Politics, Groups, and Identities, 9*(1), 81-100. https://doi.org/10.1080/21565503.2018.1564055

Eshima, S. & Smith, D. M. (2022). Just a number? Voter evaluations of age in candidate-choice experiments. *The Journal of Politics, 84*(3), 1856-1861. https://doi.org/10.1086/719005

Fiva, J. H., Nedregård, O & Øien, H. (2023). *Group identities and parliamentary debates.* Working Paper, BI Norwegian Business School & University of Oslo. Retrieved on 13/05/2023 from https://jon.fiva.no/docs/FivaNedregardOien.pdf

Fridays For Future (FFF) (2023). *Strike statistics.* Retrieved on 12/06/2023 from https://fridaysforfuture.org/what-we-do/strike-statistics/

Funk, K. D., Paul, H. L. & Philips, A. Q. (2022). Point break: Using machine learning to uncover a critical mass in women's representation. *Political Science Research and Methods, 10*(2), 372-390. https://doi.org/10.1017/psrm.2021.51

Funk, K. D. & Philips, A. Q. (2019). Representative budgeting: Women mayors and the composition of spending in local governments. *Political Research Quarterly, 72*(1), 19-33. https://doi.org/10.1177/1065912918775237

Furlong, A. & Cartmel, F. (2012). Social change and political engagement among young people: Generation and the 2009/2010 British election survey. *Parliamentary Affairs*, 65(1), 13-28. https://doi.org/10.1093/pa/gsr045

Garritzmann, J. L & Seng, K. (2020). Party effects on total and disaggregated welfare spending: A mixed-effects approach. *European Journal of Political Research*, *59*(3), 624-645. https://doi.org/10.1111/1475-6765.12371

Goerres, A. (2007). Why are Older People More Likely to Vote? The Impact of Ageing on Electoral Turnout in Europe. *The British Journal of Politics and International Relations, 9*(1), 90-121. https://doi.org/10.1111/j.1467-856x.2006.00243

Grasso, M. T. (2014). Age, period and cohort analysis in a comparative context: Political generations and political participation repertoires in Western Europe. *Electoral Studies*, *33*(1), 63-76. https://doi.org/10.1016/j.electstud.2013.06.003

Hainz, T. (2015). Are youth quotas a form of ageism? In J. Tremmel, A. Mason, P. H. Godli & I. Dimitrijoski (Eds.), *Youth quotas and other efficient forms of youth participation in ageing societies* (pp. 21-36). Springer. https://doi.org/10.1007/978-3-319-13431-4

Instituto Brasileiro de Administração Municipal (IBAM) (2020). *Manual do prefeito – 16ª edição*. Coordinated by Marcos Flávio R. Gonçalves. Retrieved on 07/11/2022 from https://www.ibam.org.br/media/arquivos/estudos/Manual_Prefeito_16edicao_2020.pdf

Instituto Brasileiro de Geografia e Estatística (IBGE) (n.d). *MUNIC – Pesquisa de informações básicas municipais* [Publications of *Perfil dos municípios brasileiros*]. Retrieved on 17/01/2023 from https://www.ibge.gov.br/estatisticas/sociais/saude/10586-pesquisa-de-informacoes-basicas-municipais.html?edicao=18195

International Youth Foundation (IYF) (2017). *Global Youth Wellbeing Index*. Retrieved on 02/03/2023 from https://iyfglobal.org/sites/default/files/2017YouthWellbeingIndex_6.pdf

Inter-Parliamentary Union (IPU) (2023c). *About us*. Retrieved on 13/05/2023 from https://www.ipu.org/about-us

Inter-Parliamentary Union (IPU) (2021). *Youth participation in national parliaments*. Retrieved on 28/10/2022 from https://www.ipu.org/file/10711/download

Inter-Parliamentary Union (IPU) (2020, August 19-20). *Stepping up youth participation in politics and parliaments: From words to action* [Conference report]. Fifth World Conference of Speakers of Parliament, virtual meeting. Retrieved on 28/10/2022 from https://www.ipu.org/file/9230/download

Inter-Parliamentary Union (IPU) (2016, March 19-23). *Outcome document of the General Debate on Rejuvenating democracy, giving voice to youth* [Outcome document]. 134th IPU Assembly, Lusaka, Zambia. Retrieved on 02/11/2022 from http://archive.ipu.org/conf-e/134/Rpt-gendebate.pdf

Johnson, E. W. & Schwadel, P. (2019). It is not a cohort thing: Interrogating the relationship between age, cohort, and support for the environment. *Environment and Behavior, 51*(7), 879-901. https://doi.org/10.1177/0013916518780483

Joshi, D. K. (2013). The representation of younger age cohorts in Asian parliaments: Do electoral systems make a difference? *Representation, 49*(1), 1–16. https://doi.org/10.1080/00344893.2013.775960

Joshi, D. K. & Och, M. (2021). Early birds, short tenures, and the double squeeze: how gender and age intersect with parliamentary representation. *Politics, Groups, and Identities, 9*(3), 629-645. https://doi.org/10.1080/21565503.2019.1629319

Karnein, A. & Roser, D. (2015). Saving the planet by empowering the young? In J. Tremmel, A. Mason, P. H. Godli & I. Dimitrijoski (Eds.), *Youth quotas and other efficient forms of youth participation in ageing societies* (pp. 77-92). Springer. https://doi.org/10.1007/978-3-319-13431-4

Kissau, K., Lutz, G. & Rosset, J. (2012). Unequal Representation of Age Group in Switzerland. *Representation, 48*(1), 63-81. https://doi.org/10.1080/00344893.2012.653241

Kitanova, M. (2020). Youth political participation in the EU: Evidence from a cross-national analysis. *Journal of Youth Studies, 23*(7), 819-836. https://doi.org/10.1080/13676261.2019.1636951

Kleider, H., Röth, L. & Garritzmann, J. L. (2018). Ideological alignment and the distribution of public expenditures. *West European Politics, 41*(3), 779-802. https://doi.org/10.1080/01402382.2017.1395634

Klein, F. A. & Sakurai, S. N. (2015). Term limits and political budget cycles at the local level: evidence from a young democracy. *European Journal of Political Economy, 37,* 21-36. https://doi.org/10.1016/j.ejpoleco.2014.10.008

Krcmaric, D., Nelson, S. C. & Roberts, A. (2020). Studying leaders and elites: The personal biography approach. *Annual Review of Political Science, 23,* 133-151. https://doi.org/10.1146/annurev-polisci-050718-032801

Krook, M. L. & Nugent, M. K. (2018). Not too young to run? Age requirements and young people in elected office. *Intergenerational Justice Review, 4*(2), 60-67. https://doi.org/10.24357/igjr.4.2.702

Lautenschlage, J. (2022). The Influence of Mayor's Characteristics and Elections on the Composition of Brazilian Municipalities' Expenditures. *International Journal of Economics and Finance, 14*(10), 23-36. https://doi.org/10.5539/ijef.v14n10p23

Lovenduski, J. & Norris, P. (2003). Westminster women: The politics of presence. *Political Studies, 51*(1), 84-102. https://doi.org/10.1111/1467-9248.00414

Lowande, K., Ritchie, M. & Lauterbach, E. (2019). Descriptive and substantive representation in congress: Evidence from 80,000 congressional inquiries. *American Journal of Political Science, 63*(3), 644-659. https://doi.org/10.1111/ajps.12443

Mansbridge, J. (1999). Should blacks represent blacks and women represent women? A contingent "Yes". *The Journal of Politics, 61*(3), 628-657. https://www.jstor.org/stable/2647821

Marshall, J. (2022). Can close election regression discontinuity designs identify effects of winning politician characteristics? *American Journal of Political Science* [Early View], 1-17. https://doi.org/10.1111/ajps.12741

Mavisakalyan, A. & Tarverdi, Y. (2019). Gender and climate change: Do female parliamentarians make difference? European *Journal of Political Economy, 56,* 151-164. https://doi.org/10.1016/j.ejpoleco.2018.08.001

McClean, C. T. (2021). *Does the underrepresentation of young people in political institutions matter for social spending?* Harvard Program on U.S.-Japan Relations Occasional Paper Series. Retrieved on 28/10/2022 from https://programs.wcfia.harvard.edu/files/us-japan/files/21-04_mcclean.pdf

McClean, C. T. & Ono, Y. (2023). *Too young to run? Voter evaluations of the age of candidates.* Working paper, University of Michigan & Waseda University and the Research Institute of Economy, Trade and Industry. Retrieved on 04/02/2023 from https://static1.squarespace.com/static/5c69ae919d4149419f647fce/t/642ef8a2222f1d48dc943b27/1680799911848/How+Do+Voters+Evaluate+the+Age+of+Politicians%3F.pdf

Norris, P. (1997). *Passages to Power: Legislative Recruitment in Advanced Democracies*. Cambridge University Press

Norris, P. & Inglehart, R. (2019). *Cultural Backlash: Trump, Brexit, and authoritarian populism.* Cambridge University Press. https://doi.org/10.1017/9781108595841

Osborne, M. J. & Slivinski, A. (1996). A model of political competition with citizen-candidates. *The Quarterly Journal of Economics, 111*(1), 65–96. https://www.jstor.org/stable/2946658

Papada, P., Altman, D., Angiolillo, F., Gastaldi, L., Köhler, T., Lundstedt, M., Natsika, N., Nord, M., Sato, Y., Wiebrecht, F. & Lindberg, S. I. (2023). *Defiance in the face of autocratization. Democracy report 2023.* University of Gothenburg: Varieties of Democracy Institute (V-Dem Institute). Retrieved on 20/05/2023 from https://www.v-dem.net/publications/democracy-reports/

Park, S. & Liang, J. (2019). A comparative study of gender representation and social outcomes: The effect of political and bureaucratic representation. *Public Administration Review, 81*(2), 321-332. https://doi.org/10.1111/puar.13092

Parth, A. & Vlandas, T. (2022). The welfare state and support for environmental action in Europe. *Journal of European Social Policy, 32*(5), 531-547. https://doi.org/10.1177/09589287221115657

Pew Research Center (2018). *The generation gap in American politics*. Retrieved on 07/02/2023 from http://www.people-press.org/2018/03/01/the-generation-gap-in-american-politics/

Phillips, A. (1998). *The politics of presence* (revised edition). Oxford University Press. https://doi.org/10.1093/0198294158.001.0001

Pickard, S. & Bessant, J. (2018). *Young people re-generating politics in times of crises*. Palgrave Macmillan Cham. https://doi.org/10.1007/978-3-319-58250-4

Pitkin, H. F. (1967). *The Concept of Representation*. University of California Press

Poertner, M. (2023). Does political representation increase participation? Evidence from party candidate lotteries in Mexico. *American Political Science Review, 117*(2), 537-556. https://doi.org/10.1017/S0003055422000533

Pomante, M. J. & Schraufnagel, S. (2015). Candidate age and youth voter turnout. *American Politics Research, 43*(3), 479-503. https://doi.org/10.1177/1532673X14554829

Poortinga, W., Whitmarsh, L., Steg, L., Böhm, G. & Fisher, S. (2019). Climate change perceptions and their individual-level determinants: A cross-European analysis. *Global Environmental Change, 55,* 25-35. https://doi.org/10.1016/j.gloenvcha.2019.01.007

Presidência da República (n.d). *A constituição federal.* Retrieved on 01/03/2023 from http://www.planalto.gov.br/ccivil_03/Constituicao/Constituicao.htm

Presidência da República (2010, 13 July). *Emenda constitucional Nº 65.* Retrieved on 01/03/2023 from http://www.planalto.gov.br/ccivil_03/constituicao/Emendas/Emc/emc65.htm

Reynolds, A. (2013). Representation and Rights: The impact of LGBT legislators in comparative perspective. *The American Political Science Review, 107*(2), 259-274. https://www.jstor.org/stable/43654014

Rocha, F., Fernandez Orellano, V. I. & Bugarin, K. (2018). Elected in a close race: Mayor's characteristics and local public finances. *EconomiA, 19*(2), 149-163. https://doi.org/10.1016/j.econ.2017.10.005

Schwindt-Bayer, L. A. & Mishler, W. (2005). An integrated Model of Women's Representation. *The Journal of Politics, 67*(2), 407-428. https://www.jstor.org/stable/10.1111/j.1468-2508.2005.00323.x

Sevi, S. (2021). Do young voters vote for young leaders? *Electoral Studies, 69,* 102200. https://doi.org/10.1016/j.electstud.2020.102200

Shen, Y. A. & Shoda, Y. (2021). How candidates' age and gender predict voter preference in a hypothetical election. *Psychological Science, 32*(6), 934-943. https://doi.org/10.1177/0956797620977518

Silva, D. N. (2022). Vereador. *Brasil Escola.* Retrieved on 07/02/2023 from https://brasilescola.uol.com.br/politica/vereador.htm

Sloam, J. (2016). Diversity and voice: The political participation of young people in the European Union. *The British Journal of Politics and International Relations, 18*(3), 521-537. https://doi.org/10.1177/1369148116647176

Sloam, J., Kisby, B., Henn, M. & Oldfield, B. (2021). Voice, equality and education: the role of higher education in defning the political participation of young Europeans. *Comparative European Politics, 19*(3), 296-322. https://doi.org/10.1057/s41295-020-00228-z

Stockemer, D. & Sundström, A. (2022b). *Youth without representation: The absence of young adults in parliaments, cabinets, and candidacies.* University of Michigan Press. https://doi.org/10.3998/mpub.11459940

Stockemer, D. & Sundström, A. (2021). Quotas, the electoral system type and the election of young women. *Social Politics: International Studies in Gender, State & Society, 28*(4), 1025-1045. https://doi.org/10.1093/sp/jxaa006

Stockemer, D. & Sundström, A. (2018). Age representation in parliaments: Can institutions pave the way for the young? *European Political Science Review, 10*(3), 467-490. https://doi.org/10.1017/S1755773918000048

Sundström, A. & Stockemer, D. (2021). Conceptualizing, Measuring, and Explaining Youths' Relative Absence in Legislatures. *Political Science & Politics, 54*(2), 195-201. https://doi.org/10.1017/S1049096520000906

Svaleryd, H. (2009). Women's representation and public spending. *European Journal of Political Economy, 25*(2), 186-198. https://doi.org/10.1016/j.ejpoleco.2008.12.004

The Commonwealth (2020). *The Global Youth Development Report*. Retrieved on 02/03/2023 from https://youth-development-index.thecommonwealth.org/assets/pdf/global-youth-development-report-2020.pdf

Tremmel, J., Mason, A., Godli, P. H. & Dimitrijoski, I. (2015). *Youth quotas and other efficient forms of youth participation in ageing societies*. Springer. https://doi.org/10.1007/978-3-319-13431-4

United Nations Children's Fund (UNICEF) (2014). *Brazil: Civic participation of adolescents and youth.* Retrieved on 13/11/2022 from https://www.unicef.org/brazil/media/2486/file/Civic%20Participation%20of%20Adolescents%20and%20Youth.pdf

United Nations, Department of Economic and Social Affairs (UN DESA), Sustainable Development (n.d.). *Goal 16.* Retrieved on 29/10/2022 from https://sdgs.un.org/goals/goal16

United Nations Development Programme (UNDP) (2022). *Human Development Index (HDI)*. Retrieved on 27/02/2023 from https://hdr.undp.org/data-center/human-development-index#/indicies/HDI

Van Parijs, P. (1998). The disenfranchisement of the elderly, and other attempts to secure intergenerational justice. *Philosophy & Public Affairs, 27*(4), 292-333. https://doi.org/10.1111/j.1088-4963.1998.tb00072.x

Vlandas, T., McArthur, D. & Ganslmeier, M. (2021). Ageing and the economy: a literature review of political and policy mechanisms. *Political Research Exchange, 3*(1), 1932532. https://doi.org/10.1080/2474736X.2021.1932532

Wampler, B. (2007). *Participatory budgeting in Brazil: Contestation, cooperation, and accountability.* Penn State Press.

Webster, S. W. & Pierce, A. W. (2019). Older, younger, or more similar? The use of age as a voting heuristic. *Social Science Quarterly, 100*(3), 635-652. https://doi.org/10.1111/ssqu.12604

Winsvold, M., Ødegård, G. & Bergh, J. (2017). Young councillors - Influential politicians or youth alibi? *Representation, 53*(3-4), 297-311. https://doi.org/10.1080/00344893.2018.1434232

World Bank (2023a). *Gini index*. Retrieved on 19/05/2023 from https://data.worldbank.org/indicator/SI.POV.GINI

World Bank (2023b). *The world by income and region*. Retrieved on 19/05/2023 from https://datatopics.worldbank.org/world-development-indicators/the-world-by-income-and-region.html

World Health Organization (WHO) (2021). *Global report on ageism.* Retrieved on 14/02/2023 from https://apps.who.int/iris/rest/bitstreams/1336324/retrieve

Youth Policy Labs (2014). *Factsheet Brazil.* Retrieved on 01/03/2023 from https://www.youthpolicy.org/factsheets/country/brazil/

Zucco. C. & Power, T. J. (2021). Fragmentation without cleavages? Endogenous fractionalization in the Brazilian party system. *Comparative Politics, 53*(3), 477-500. https://www.jstor.org/stable/27090037

Data:

Atlas do Desenvolvimento Humano no Brasil. *Censo Demográfrico (1991,2000 e 2010).* Data downloaded on 12/04/2023 from http://www.atlasbrasil.org.br/acervo/biblioteca

Instituto Brasileiro de Geografia e Estatística (IBGE). *Tabela 6579 - População residente estimada.* Data downloaded on 21/04/2023 from https://sidra.ibge.gov.br/tabela/6579

Instituto de Pesquisa Econômica Aplicada (IPEA). *Área geográfica – censo.* Data downloaded on 12/04/2023 from http://www.ipeadata.gov.br/Default.aspx

Inter-Parliamentary Union (IPU), Parline Database (2023a). *Data on age: Global and regional averages.* Custom data acquired on 31/01/2023 from https://data.ipu.org/age-brackets-aggregate/

Inter-Parliamentary Union (IPU), Parline Database (2023b). *Data on women: Global and regional averages.* Custom data acquired on 20/02/2023 from https://data.ipu.org/women-averages

Latinobarómetro. English STATA data sets: *2002-2010* (Versions V2014_06_27), *2011* (no version), *2013* (no version), *2015* (no version), *2016* (Version V20170205), *2017* (Version V20180117), *2018* (Version V20190303), *2020* (Version V1_0). Data downloaded on 07/03/2023 from https://www.latinobarometro.org/latContents.jsp

Nyrup, J. & Bramwell, S. (2020). Who Governs? A New Global Dataset on Members of Cabinets. *American Political Science Review, 114*(4), 1366-1374. https://doi.org/10.1017/S0003055420000490. WhoGov data set (Version 2.0) downloaded on 12/10/2022 from https://politicscentre.nuffield.ox.ac.uk/whogov-dataset/

Portal de Dados Abertos do TSE (Tribunal Superior Eleitoral). Data downloaded end of November, beginning of December 2022 and on 25/03/2023 from https://dadosabertos.tse.jus.br/dataset/

Stockemer, D. & Sundström, A. (2022a). Introducing the Worldwide Age Representation in parliaments (WARP) data set. *Social Science Quarterly, 103*(7), 1765-1774. https://doi.org/10.1111/ssqu.13221 Data downloaded on 04/02/2023 from https://www.warpdataset.com/index.php

Tesouro Nacional. *FINBRA (Finanças Municipais).* Data downloaded on 06/12/2022 (2002-2021) and 27/05/2023 (2022) from https://www.gov.br/tesouronacional/pt-br/estados-e-municipios/dados-consolidados/finbra-financas-municipais

The AmericasBarometer by the LAPOP Lab (LAPOP). STATA datasets: *Brazil 2006/7* (Version V5), *Brazil 2008* (Version V10), *Brazil 2010* (Version V4), *Brazil 2012* (Version Rev1_W), *Brazil 2014* (Version V3.0_W), *Brazil 2016/17* (Version V1.0_W), *Brazil 2018/19* (Version V1.0_W), *Brazil 2021* (Version V1.2_W). Data downloaded on 04/03/2023 from www.vanderbilt.edu/lapop

United Nations, Department of Economic and Social Affairs (UN DESA), Population Division (2022). *World Population Prospects: The 2022 Revision*. Custom data acquired on 27/02/2023 from https://population.un.org/dataportal/home

R Packages

Bates, D., Mächler, M., Bolker, B. & Walker, S. (2015). Fitting linear mixed-effects models using lme4. *Journal of Statistical Software, 67*(1), 1–48. https://doi.org/10.18637/jss.v067.i01

Calonico, S., Cattaneo, M. D., Farrell, M. H., Titiunik, R. (2022). *rdrobust: Robust data-driven statistical inference in regression-discontinuity designs.* R package version 2.1.1, https://CRAN.R-project.org/package=rdrobust

Cattaneo, M. D., Jansson, M., Ma, X. (2023). *rddensity: Manipulation testing based on density discontinuity.* R package version 2.4, https://CRAN.R-project.org/package=rddensity

Cattaneo, M. D., Titiunik, R., Vazquez-Bare, G. (2022). *rdpower: Power calculations for RD designs*. R package version 2.2, https://CRAN.R-project.org/package=rdpower

Meireles, F. (2018). *deflateBR: Deflate nominal Brazilian reais*. R package version 1.1.2, https://CRAN.R-project.org/package=deflateBR

Pereira, R. & Gonçalves, C. (2023). *geobr: Download official spatial data sets of Brazil*. R package version 1.7.0999, https://github.com/ipeaGIT/geobr

Appendix

Appendix A – Public Opinion Analysis

I use survey data for Brazil from AmeriasBarometer by the LAPOP Lab, all survey rounds (2007-2021). As well as survey data from Latinobarómetro, survey rounds 2002-2020. Calculations exclude NAs and Don't know's if present. I use weighted estimations when analyzing LAPOP data 2010, 2014, 2017, 2019 and 2021, but not in the pooled analysis. Young are those between 16-29 years; old are those 55 years and older.

Chapter 5.1

I run chi-square tests of independence with simulated p-values. Significant ($p < .05$) differences are marked in bold.

Voted in last presidential elections (LAPOP)

I only include those observations that indicated having a voter's registration card (vote1). Response options are yes or no.

2019: Did you vote in the first round in the last presidential elections of 2018?
X^2 (1, N = 697) = 1.19, p = .31
80.5% of those 55+ years compared to 77.1% of those under the age the 30.

2017: Did you vote in the last presidential elections of 2014?
X^2 (1, N = 681) = 56.92, p < .001
93.3% of those 55+ years compared to 69.2% of those under the age the 30.

2014: Did you vote in the last presidential elections of 2010?
X^2 (1, N = 699) = 87.08, p < .001
89.2% of those 55+ years compared to 56.6% of those under the age the 30.

2012: Did you vote in the last presidential elections of 2010?
X^2 (1, N = 704) = 6.0, p = .014
90.1% of those 55+ years compared to 82.9% of those under the age the 30.

2010: Did you vote in the last presidential elections of 2006?
X^2 (1, N = 1263) = 46.54, p < .001
88.9% of those 55+ years compared to 72.6% of those under the age the 30.

2008: Did you vote in the last presidential elections of 2006?
X^2 (1, N = 788) = 0.18, p = .69
83.4% of those 55+ years compared to 82.2% of those under the age the 30.

2007: Did you vote in the last presidential elections?
X^2 (1, N = 605) = 0.14, p = .72
82.8% of those 55+ years compared to 83.9% of those under the age the 30.

Participation in demonstrations or protest (LAPOP)

Question: In the last twelve months, have you participated in any demonstration or public protest? [Response options are yes or no.]

2019: X^2 (1, N = 798) = 10.77, p = .002
5.5% of those 55+ years compared to 12.7% of those under the age the 30.

2017: X^2 (1, N = 780) = 5.13, p = .023
10.4% of those 55+ years compared to 16.3% of those under the age the 30.

2014: X^2 (1, N = 783) = 25.56, p < .001
2% of those 55+ years compared to 12.2% of those under the age the 30.

2012: X^2 (1, N = 718) = 1.7, p = .21
3.7% of those 55+ years compared to 6.2% of those under the age the 30.

2010: X^2 (1, N = 1312) = 10.2, p = .003
2.4% of those 55+ years compared to 6.3% of those under the age the 30.

Political interest

I combine the first three response options and compare them with "not at all".

LAPOP:

Question: How interested are you in politics: a lot, something, a little or not at all?

2017: X^2 (1, N = 779) = 3.87, p = .044
61.4% of those 55+ years compared to 68.4% of those under the age the 30.

2014: X^2 (1, N = 782) = 0.89, p = .36
60.5% of those 55+ years compared to 63.8% of those under the age the 30.

2012: X^2 (1, N = 718) = 0.48, p = .49
60.7% of those 55+ years compared to 63.5% of those under the age the 30.

2010: X^2 (1, N = 1305) = 9.07, p = .004
58.8% of those 55+ years compared to 67.1% of those under the age the 30.

2008: X^2 (1, N = 822) = 6.66, p = .01
59.1% of those 55+ years compared to 67.8% of those under the age the 30.

2007: X^2 (1, N = 633) = 4.51, p = .03
61.7% of those 55+ years compared to 70% of those under the age the 30.

Latinobarómetro:

Question: How interested are you in politics: very interested, fairly interested, a little interested or not at all interested?

2020: X^2 (1, N = 636) = 3.79, p = .06
59.4% of those 55+ years compared to 66.9% of those under the age the 30.

2010: X^2 (1, N = 666) = 2.32, p = .15
64.8% of those 55+ years compared to 70.4% of those under the age the 30.

2009: X^2 (1, N = 641) = 5.34, p = .023
62.5% of those 55+ years compared to 71.3% of those under the age the 30.

2007: X^2 (1, N = 665) = 15.96, p < .001
48.7% of those 55+ years compared to 64.6% of those under the age the 30.

2005: X^2 (1, N = 673) = 14.04, p < .001
57.1% of those 55+ years compared to 71.5% of those under the age the 30.

2004: X^2 (1, N = 665) = 31.33, p < .001
52.7% of those 55+ years compared to 74.4% of those under the age the 30.

2003: X^2 (1, N = 660) = 17.08, p < .001
61% of those 55+ years compared to 76.5% of those under the age the 30.

See figures on page 19:

Satisfaction with democracy (Latinobarómetro)

Question: In general, would you say you are very satisfied, quite satisfied, not very satisfied or not at all satisfied with the working of the democracy in Brazil?

I combine the first two response options and compare with the other two.

2002: X^2 (1, N = 482) = 19.02, p < .001
2003: X^2 (1, N = 622) = 9.09, p = .004
2004: X^2 (1, N = 616) = 17.59, p < .001
2005: X^2 (1, N = 628) = 11.81, p = .002
2006: X^2 (1, N = 629) = 7.67, p = .008
2007: X^2 (1, N = 626) = 14.85, p < .001
2008: X^2 (1, N = 628) = 15.67, p < .001
2009: X^2 (1, N = 607) = 4.68, p = .031
2010: X^2 (1, N = 618) = 1.35, p = .25
2011: X^2 (1, N = 617) = 1.35, p = .28
2013: X^2 (1, N = 605) = 4.75, p = .031
2015: X^2 (1, N = 600) = 2.55, p = .12
2016: X^2 (1, N = 602) = 3.96, p = .048
2017: X^2 (1, N = 603) = 0.18, p = .71
2018: X^2 (1, N = 606) = 9.46, p = .004
2020: X^2 (1, N = 609) = 8.18, p = .006

Support for democracy I (Latinobarómetro)

Question: With which of the following statements do you agree most?

- Democracy is preferable to any other kind of government.
- Under some circumstances, an authoritarian government can be preferable to a democratic one.
- For people like me, it doesn't matter whether we have a democratic or non-democratic regime.

I compare the first response option with the other two.

2002: X^2 (1, N = 434) = 7.19, p = .010
2003: X^2 (1, N = 592) = 10.56, p = .003
2004: X^2 (1, N = 565) = 0.68, p = .45
2005: X^2 (1, N = 537) = 8.03, p = .007
2006: X^2 (1, N = 569) = 4.52, p = .030
2007: X^2 (1, N = 568) = 7.61, p = .008
2008: X^2 (1, N = 574) = 0.86, p = .37
2009: X^2 (1, N = 575) = 0.90, p = .37
2010: X^2 (1, N = 583) = 6.21, p = .013
2011: X^2 (1, N = 566) = 0.47, p = .54
2013: X^2 (1, N = 553) = 0.02, p = .92
2015: X^2 (1, N = 561) = 2.25, p = .15
2016: X^2 (1, N = 532) = 0.40, p = .57
2017: X^2 (1, N = 540) = 0.08, p = .77
2018: X^2 (1, N = 538) = 3.94, p = .048
2020: X^2 (1, N = 537) = 4.94, p = .027

Support for democracy II (Latinobarómetro)

Question: Democracy may have problems, but it is the best system of government. Do you strongly agree, agree, disagree or strongly disagree?

I combine the first two response options and compare with the other two.

2002: X^2 (1, N = 475) = 10.13, p = .002
2003: X^2 (1, N = 605) = 4.35, p = .040
2004: X^2 (1, N = 585) = 0.59, p = .49
2005: X^2 (1, N = 583) = 0.81, p = .38
2006: X^2 (1, N = 596) = 1.44, p = .26
2007: X^2 (1, N = 613) = 5.54, p = .019
2008: X^2 (1, N = 620) = 8.65, p = .005
2009: X^2 (1, N = 602) = 15.22, p < .001
2010: X^2 (1, N = 623) = 0.66, p = .46
2011: X^2 (1, N = 609) = 0.74, p = .43
2013: X^2 (1, N = 588) = 1.75, p = .22
2015: X^2 (1, N = 581) = 0.32, p = .60
2016: X^2 (1, N = 581) = 0.61, p = .44
2017: X^2 (1, N = 579) = 4.44, p = .032
2018: X^2 (1, N = 582) = 12.16, p < .001
2020: X^2 (1, N = 596) = 4.06, p = .049

Chapter 6.2

Most important problem in the country

The tables show the four most mentioned problems for each group. I run chi-square tests of independence with simulated p-values. Significant ($p < .05$) differences are marked in bold.

Latinobarómetro:

Questions:

2004-2006: In your opinion, which would you consider to be the country's most important problem?
2007-2016: In your opinion, what is the most important problem in the country?
2017- 2020: In your opinion, which is the most important problem facing the country today? [write answer as given, only one answer]

	Young (16-29 years)	**Old (55+ years)**
2020	Health issues (23%), unemployment (12.5%), **corruption** (9.8%), **economy/ economic/financial problems** (9.8%)	**Health issues** (37.6%), education problems (8.5%), unemployment (7.8%), other (7.1%)
2018	Corruption (18.1%), **political situation/problems** (16.8%), unemployment (14.4%), education problems (11.7%)	**Health problems** 28.2%), corruption (15%), other (12%), unemployment (11.7%)
2017	Corruption (33.6%), political situation/problems (23.4%), unemployment (14.4%), **economy/ economic/financial problems** (9.3%)	Corruption (29.9%), political situation/problems (27.7%), **health problems** (14.4%), unemployment (11%)
2016	Corruption (23%), unemployment (16.3%), health problems (16.3%), **economy/economic/financial problems** (14.4%)	**Health problems** (26.1%), corruption (20.9%), unemployment (16.8%), other (8.6%)
2015	Corruption (23%), health problems (13%), political crisis (9.2%), **education problems** (8.4%)	Corruption (24.1%), **health problems** (21%), crime/public security (10.1%), political crisis (8.6%)
2013	Health problems (28.1%), **education problems** (14.5%), corruption (12.2%), crime/public security (8.1%)	**Health problems** (44.9%), crime/public security (11.8%), corruption (8.4%), violence/gangs (8.4%)
2011	Health problems (21.5%), **education problems** (13.2%), **unemployment** (11.3%), violence/ gangs (10.7%)	**Health problems** (34.3%), violence/ gangs (12.4%), crime/public security (9.1%), corruption (7.4%)

2010	Health problems (23.5%), **unemployment** (18.9%), **education problems** (15.1%), violence/gangs (10.2%)	**Health problems** (35.2%), violence/gangs (14.8%), crime/public security (9.6%), education problems (8.8%)
2009	**Unemployment** (24.1%), violence/gangs (15.8%), health problems (12.6%), education problems (9.9%)	**Health problems** (21.8%), violence/gangs (15.1%), unemployment (12%), education problems (9.8%)
2008	**Unemployment** (21.8%), **education problems** (15.5%), health problems (14.7%), violence/gangs (13.7%)	Health problems (20.5%), violence/gangs (16%), unemployment (11.9%), education problems (9.6%)
2007	Corruption (22.1%), **unemployment** (17.6%), crime/public security (16.2%), poverty/social inequality (9.3%)	Crime/public security (20.9%), **health problems** (19.6%), corruption (19.1%), unemployment (10.7%)
2006	**Unemployment** (26.7%), **poverty/social inequality** (11.2%), **education problems** (9.8%), corruption (8.8%)	**Health problems** (16.7%), unemployment (15.7%), **terrorism/political violence/guerrilla** (14.2%), corruption (13.7%)
2005	**Unemployment** (34.8%), corruption (19.7%), crime/public security (9.6%), political crisis (8.6%)	Unemployment (23%), corruption (19.6%), **crime/public security** (19.1%), health problems (10.8%)
2004	**Unemployment** (43.1%), **poverty/social inequality** (18%), crime/public security (10.8%), inflation/price rises/economic crisis (7.7%)	Unemployment (32.4%), **crime/public security** (22.9%), **health problems** (12.2%), education problems (5.3%)

Table A.1: Latinobarómetro: Most important problem in the country.

LAPOP:

Question: In your opinion, what is the most serious problem the country is facing? [Do not read the alternatives; check only one option]

	Young (16-29 years)	**Old (55+ years)**
2021	Covid-19, pandemic (53.6%), other (10.8%), unemployment (7%), **economy, problems with, crisis of** (6.8%)	Covid-19, pandemic (52.2%), other (11%), **politics, politicians** (9.5%), unemployment (8.6%)
2019	Other (19.3%), **corruption** (17.9%), **unemployment** (15.3%), health, lack of service (9.1%)	Unemployment (20.9%), **health, lack of service** (19.2%), other (14%), corruption (11%)

2017	**Economy, problems with, crisis of** (22.9%), **unemployment** (18%), corruption (15.9%), other (12.9%)	**Corruption** (22.6%), other (15.1%), **health, lack of service** (13.3%), economy, problems with, crisis of (12.5%)
2014	Health, lack of service (20.9%), violence (18.8%), corruption (14.3%), **education, lack of, poor quality** (7%)	**Health, lack of service** (28.5%), violence (22.3%), corruption (11.7%), **security, lack of** (10.3%)
2012	Health, lack of service (15.6%), corruption (11.3%), violence (11.1%), unemployment (8.3%)	**Health, lack of service** (22.4%), corruption (11.7%), violence (9.8%), unemployment (5.6%)
2010	Violence (16.7%), **unemployment** (14%), health, lack of service (8.1%), corruption (7.7%)	**Health, lack of service** (16.2%), violence (14.9%), **corruption** (13.5%), unemployment (8.2%)
2008	**Unemployment** (16.2%), violence (16.2%), corruption (13.1%), health, lack of service (12.9%)	**Health, lack of service** (20.6%), violence (20.6%), corruption (9.2%), unemployment (7.3%)
2007	**Unemployment** (23.8%), violence (19.2%), corruption (13.5%), other (5.7%)	Violence (21%), unemployment (12.4%), corruption (12.4%), **health, lack of service** (11.2%)

Table A.2: LAPOP: Most important problem in the country.

Youth concerns (LAPOP, 2010)

Question: What issues or problems do you often worry about? [Do not read alternatives, check only one option]

Youth concerns (16-25 years) - LAPOP 2010

Problem	Percent
Work, employment, salary, income, stability of job or economy	57.0
Security, crime, gangs	12.2
Health	8.2
Obtain or finish education, pay for education	6.5
Environment	3.1
Nothing	3.1
Other	2.9
Fun, parties, sports, club, dating, family, girls or boys	2.7
Situation of country	2.4
Material possessions (clothes and shoes, cell phones, ipods, computers)	1.2
Interpersonal relationships (relationship with parents, family, friends and others)	0.8
N (Observations)	570

Table A.3: LAPOP 2010: Youth concerns.

Concern about climate change (LAPOP)

Question: If nothing is done to reduce climate change in the future, how serious do you think the problem would be for Brazil?

2019: Very serious (77.7%), more or less serious (9.7%), not so serious (8.4%), not serious at all (4.1%)

2017: Very serious (79.9%), more or less serious (10%), not so serious (6.3%), not serious at all (3.7%)

Attitudes towards environment protection (LAPOP)

2014:

Question: In your opinion, what should take priority: protecting the environment or promoting economic growth?

	All	**Old (55+ years)**	**Young (16-29 years)**
Protecting the environment	63,8%	57,8%	71.4%
Promoting economic growth	23.0%	23.5%	19.9%
Both	13.2%	18.7%	8.7%

Table A.4: LAPOP: Attitudes towards environment protection 2014.

***2017*:**

Question: Some people believe that the environment should be prioritized over economic growth, while others believe that economic growth should be prioritized over environmental protection. On a scale of 1 to 7 where 1 means that the environment should be the top priority, and where 7 means that economic growth should be the top priority, where would you locate yourself?

Running Welch Two Sample t-tests (two sided). Overall mean is 3.97.

	Mean 1	Mean 2	M_1 - M_2	*t*	*df*	*p*	95% CI
Old vs. Young	4.63	3.53	1.10	6.55	517.2	< .001	[0.77, 1.43]
Not-Young vs. Young	4.19	3.53	0.66	5.65	1048.7	< .001	[0.43, 0.89]

Table A.5: LAPOP: Attitudes towards environment protection 2017.

Appendix B – Main Analysis

Overview of variables and sources

1. Mayor

Age	Age of the mayor in the election year.
Young	Dummy which is 1 if the mayor is young.
Female	Dummy which is 1 if the mayor is female.
Married	Dummy which is 1 if the mayor is married.
Basic Education	Dummy which is 1 if the mayor has completed basic education.
Secondary Education	Dummy which is 1 if the mayor has completed secondary education.
University Education	Dummy which is 1 if the mayor has completed university education.
Second Term (own)	Dummy which is 1 if it is the mayor's second term in office, 0 if it is the first term. Own calculation
Second Term (TSE)	Dummy which is 1 if it is the mayor's second term in office, 0 if it is the first term. TSE data
Second Round	Dummy which is 1 if the mayor won in a second-round election.
PT, PSDB, PMDB/MDB, PP, PFL/DEM, PL/PR, PDT, PTB	Dummy which is 1 if the mayor belongs to respective party.
Left Party	Dummy which is 1 if the mayor belongs to a left-leaning party (see categorization below).
Aligned President 1 or 2	Dummy which is 1 if the mayor's party is the same as the president's party. Since the president changes in the middle of a mayor's term, 1 refers to alignment during the first two years in office and 2 during the last two years in office.
Aligned Governor 1 or 2	Dummy which is 1 if the mayor's party is the same as the state governor's party. Since the state governor changes in the middle of a mayor's term, 1 refers to alignment during the first two years in office and 2 during the last two years in office.
Vote Margin	Vote margin by which the mayor won in the election. It is 1 if there was no opponent.
Age Difference	Age difference to the nearest opponent in the election.

2. Local council

N. Councilors	Number of councilors.
Share Female	Share of female councilors.
Share Young	Share of young councilors.
Mean Age	Mean age of councilors.
Share Mayor's Party	Share of councilors that belong to the same party as the mayor.
Share Left Party	Share of councilors that belong to a left-leaning party (see categorization below).
N. Parties	Number of parties in the council.

3. Municipality

Life Expectancy	Average number of years that people are expected to live at time of birth.
Child Mortality	Probability of a child dying before reaching the age of 5, per 1000 children born alive.
Illiteracy	Share of population aged 18 years and older who cannot read or write.
GINI	Gini Index (measure for income-inequality).
Extreme Poverty	Share of population in extreme poverty (per capita household income ≤ R$70 per month).
Poverty	Share of population in poverty (per capita household income ≤ R$140 per month).
Income	Average household income per capita in R$.
Area Size	Surface area of the municipality in square kilometer.
HDI	Municipal Human Development Index.
Population 65+ years	Share of population 65 years and older.
Population < 15 years	Share of population younger than 15 years.
Population Rural	Share of population in rural areas.
Population	Total population.

Table B.1: Overview of variables and sources. Source for mayor and local council characteristics is the *TSE*. Information about parties of presidents and state governors is based on *Wikipedia* in order to create the Aligned President and Governor variables. Sources for municipality characteristics are from *IBGE*, yet mostly downloaded from *Atlas do Desenvolvimento Humano no Brasil.*

Categorization of left-leaning parties

I code the variable based on Zucco & Power (2021) and for the parties not included there (in italics) based on general information on *Wikipedia.*

Left-leaning:	
PPS / CIDADANIA	*PMN*
PC DO B	*PST*
PDT	*PT DO B / AVANTE*
PSB	*PPL*
PSOL	*PCB*
PT	*PCO*
PV	*PGT*
REDE	*PSTU*

Not left-leaning:	
PFL / DEM	*PAN*
PR / PL	*PHS*
PMDB / MDB	*PPB*
PTN / PODE	*PRN / PTC*
PP	*PRP*
PRB / REPUBLICANOS	*PSDC / DC*
PROS	*PSL*
PSC	*PRONA*
PSD	*PEN / PATRIOTA*
PSDB	*PMB*
PTB	*NOVO*
SOLIDARIEDADE	*PRTB*

Summary statistics of variables

	N	Mean	SD	Min	Max
Mayor					
Age	32,059	48.26	10.08	20.0	95.0
Young (≤ 29)	32,059	0.02	0.15	0.0	1.0
Female	32,052	0.10	0.29	0.0	1.0
Married	31,996	0.78	0.42	0.0	1.0
Basic Education	31,960	0.90	0.30	0.0	1.0
Secondary Education	31,960	0.79	0.41	0.0	1.0
University Education	31,960	0.47	0.50	0.0	1.0
Second Term (own)	26,194	0.29	0.46	0.0	1.0
Second Term (TSE)	26,593	0.24	0.42	0.0	1.0
Second Round	32,059	0.01	0.09	0.0	1.0
PT	32,059	0.07	0.25	0.0	1.0
PSDB	32,059	0.14	0.35	0.0	1.0
PMDB/MDB	32,059	0.19	0.39	0.0	1.0
PP	32,059	0.08	0.28	0.0	1.0
PFL/DEM	32,059	0.10	0.30	0.0	1.0
PL/PR	32,059	0.06	0.23	0.0	1.0
PDT	32,059	0.06	0.23	0.0	1.0
PTB	32,059	0.06	0.24	0.0	1.0
Left Party	32,059	0.24	0.43	0.0	1.0
Aligned President 1	32,059	0.12	0.33	0.0	1.0
Aligned President 2	32,059	0.06	0.23	0.0	1.0
Aligned Governor 1	32,059	0.21	0.41	0.0	1.0
Aligned Governor 2	32,059	0.14	0.35	0.0	1.0
Vote Margin	31,054	0.16	0.15	0.0	1.0
Age Difference	30,962	11.34	8.60	0.0	63.0
Local Council					
N. Councilors	32,018	10.12	2.71	9.0	55.0
Share Female	32,017	0.13	0.11	0.0	0.8
Share Young (≤ 29)	32,015	0.08	0.09	0.0	0.7
Mean Age	32,015	43.14	3.79	29.3	60.0
Share Mayor's Party	32,018	0.26	0.17	0.0	1.0
Share Left Party	32,018	0.26	0.19	0.0	1.0
N. Parties	32,031	5.69	2.10	1.0	23.0
Municipality					
Life Expectancy	32,046	70.75	4.10	57.5	78.6
Child Mortality	32,046	0.30	0.17	0.1	1.1
Illiteracy Rate	32,046	0.20	0.13	0.0	0.6
GINI	32,046	0.52	0.07	0.3	0.9
Extreme Poverty	32,046	0.16	0.15	0.0	0.8
Poverty	32,046	0.32	0.22	0.0	0.9
Income	32,046	416.46	232.21	62.6	2,043.7
HDI	32,046	0.59	0.11	0.2	0.9
Population 65+ years	32,046	0.07	0.02	0.0	0.2
Population < 15 years	32,046	0.29	0.06	0.1	0.7
Population Rural	32,046	0.39	0.23	0.0	1.0
Area Size	31,937	1,513.90	5,621.69	2.9	160,755.0
Population	32,059	34,522.41	205,839.26	776.0	12,325,232.0

Table B.2: Summary statistics of variables of the panel data set.

Coverage

Year	N
2002	5,379
2003	5,383
2004	5,087
2005	5,138
2006	5,419
2007	5,397
2008	5,360
2009	5,340
2010	5,316
2011	5,201
2012	5,000
2013	5,293
2014	5,072
2015	5,303
2016	5,306
2017	5,359
2018	5,352
2019	5,358
2020	5,368
2021	5,425
2022	5,097

Election Year	N
2000	5,441
2004	5,430
2008	5,333
2012	5,403
2016	5,380
2020	5,072

Table B.3: Number of municipalities by year and by term in the panel data set.

Balance tests for covariates

Variable	RD Estimator	p-value	Bandwidth	Confidence Interval	Observations
Mayor					
Female	-0.075	0.247	0.099	[-0.219, 0.056]	587
Married	-0.535	0.000	0.116	[-0.691, -0.376]	670
Basic Education	0.083	0.051	0.118	[0.000, 0.168]	679
Secondary Education	0.163	0.006	0.114	[0.046, 0.280]	660
University Education	0.000	0.983	0.122	[-0.170, 0.166]	695
Second Term (own)	-0.236	0.000	0.111	[-0.358, -0.128]	582
Left Party	-0.041	0.706	0.104	[-0.190, 0.128]	614
Aligned Governor	-0.130	0.038	0.106	[-0.269, -0.008]	622
Aligned President	0.052	0.298	0.116	[-0.049, 0.159]	677
PSDB	0.022	0.726	0.119	[-0.091, 0.130]	685
PMDB/MDB	-0.050	0.418	0.124	[-0.181, 0.075]	711
PT	0.041	0.235	0.091	[-0.030, 0.123]	546
PTB	-0.005	0.990	0.111	[-0.087, 0.086]	646
PP	0.042	0.386	0.167	[-0.050, 0.130]	888
PFL/DEM	-0.025	0.512	0.125	[-0.121, 0.060]	716
PL/PR	-0.003	0.865	0.125	[-0.083, 0.070]	713
PDT	-0.029	0.539	0.123	[-0.117, 0.061]	701
Municipality					
N. Councilors	0.170	0.654	0.112	[-0.601, 0.957]	647
Life Expectancy	0.033	0.911	0.117	[-0.958, 1.073]	680
Child Mortality	0.007	0.802	0.117	[-0.040, 0.051]	679
Illiteracy	0.002	0.986	0.099	[-0.038, 0.037]	588
GINI	0.002	0.950	0.111	[-0.023, 0.024]	645
Extreme Poverty	0.013	0.603	0.133	[-0.029, 0.050]	744
Poverty	0.012	0.743	0.126	[-0.043, 0.061]	721
Income per capita	14.480	0.566	0.123	[-41.006, 75.006]	701
HDI	0.001	0.868	0.116	[-0.025, 0.030]	677
Population 65+ years	-0.002	0.575	0.106	[-0.010, 0.006]	623
Population < 15 years	0.009	0.314	0.118	[-0.008, 0.025]	683
Population Rural	0.040	0.289	0.116	[-0.035, 0.119]	672
Population (log)	-0.020	0.867	0.160	[-0.329, 0.277]	856
Area Size (log)	0.310	0.161	0.096	[-0.134, 0.809]	578

Table B.4: Balance tests for pre-treatment covariates, main specification. RD estimates of the effect of electing a young mayor on pre-treatment covariates with 95% robust confidence interval. Estimation using local polynomial estimators with triangular kernel and CER-optimal bandwidth (as suggested by Cattaneo et al. 2019). Robust p-values and confidence intervals using bias-correction with cluster-robust standard errors at municipality level. h is the MSE-optimal bandwidth. Covariates include municipality, state and election year dummies. Main specification young $\leq$ 29 years, AD $\geq$ 5 years.

Map of Brazil – Main specification - RD analysis

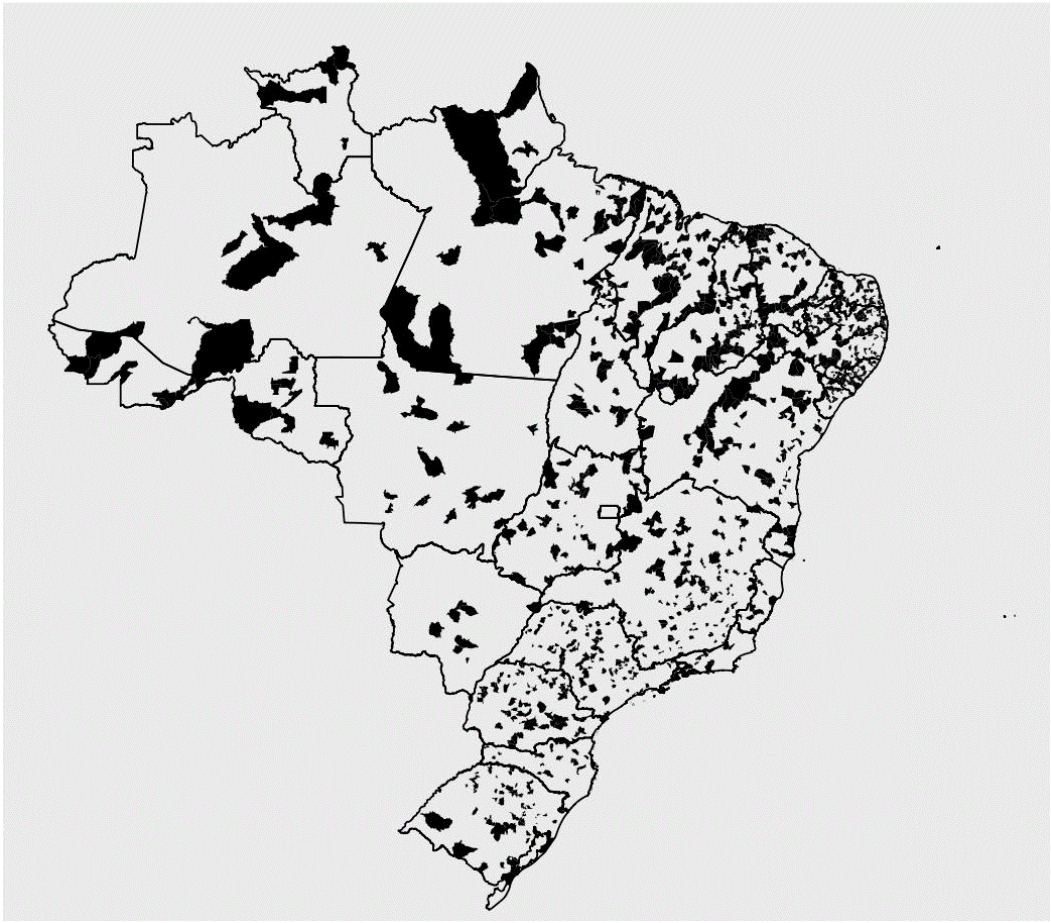


Figure B.1: Municipalities included in the main specification of the RD analysis (1115 out of 5568). Map created with *geobr* R package (Pereira & Gonçalves 2023).

RD results – All specifications – Part 4

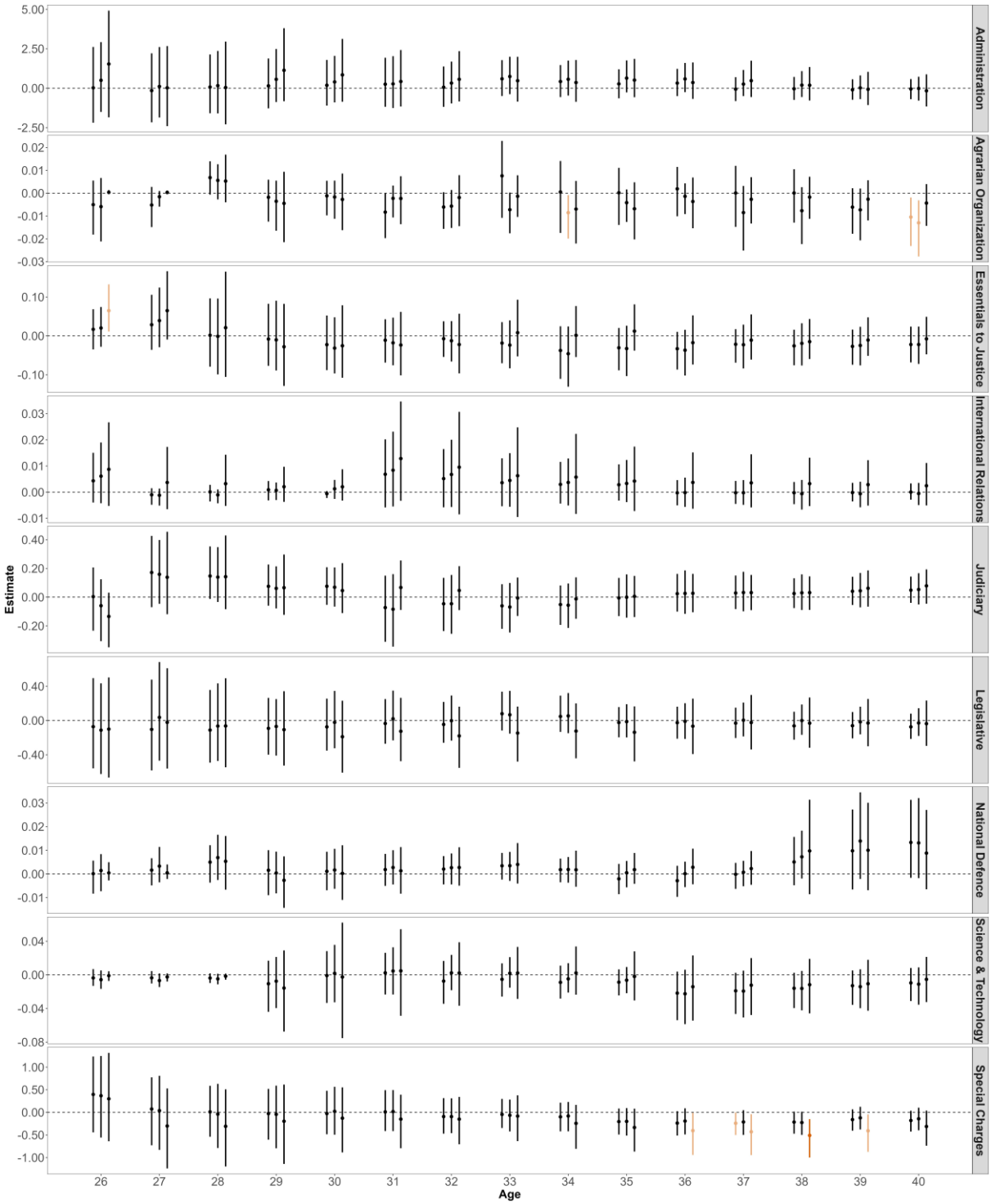


Figure B.2: RD results, all specifications. RD estimates with 95% robust confidence intervals are shown of the effect of electing a young mayor on public spending by category. Young ≤ 26 years to young ≤ 40 years. The left estimates have a candidate AD ≥ 5 years, the middle estimates an AD ≥ 10 years and the right estimates an AD ≥ 20 years. Robust p-values and confidence intervals using bias-correction with cluster-robust standard errors at municipality level. Orange coefficients if p-value is smaller than 0.01, light orange coefficients if p-value is smaller than 0.05. Estimation performed using local polynomial estimators with triangular kernel and MSE-optimal bandwidth. Covariates used are the same as in Table 6.

RD results – Opponent 45+ or 55+ years

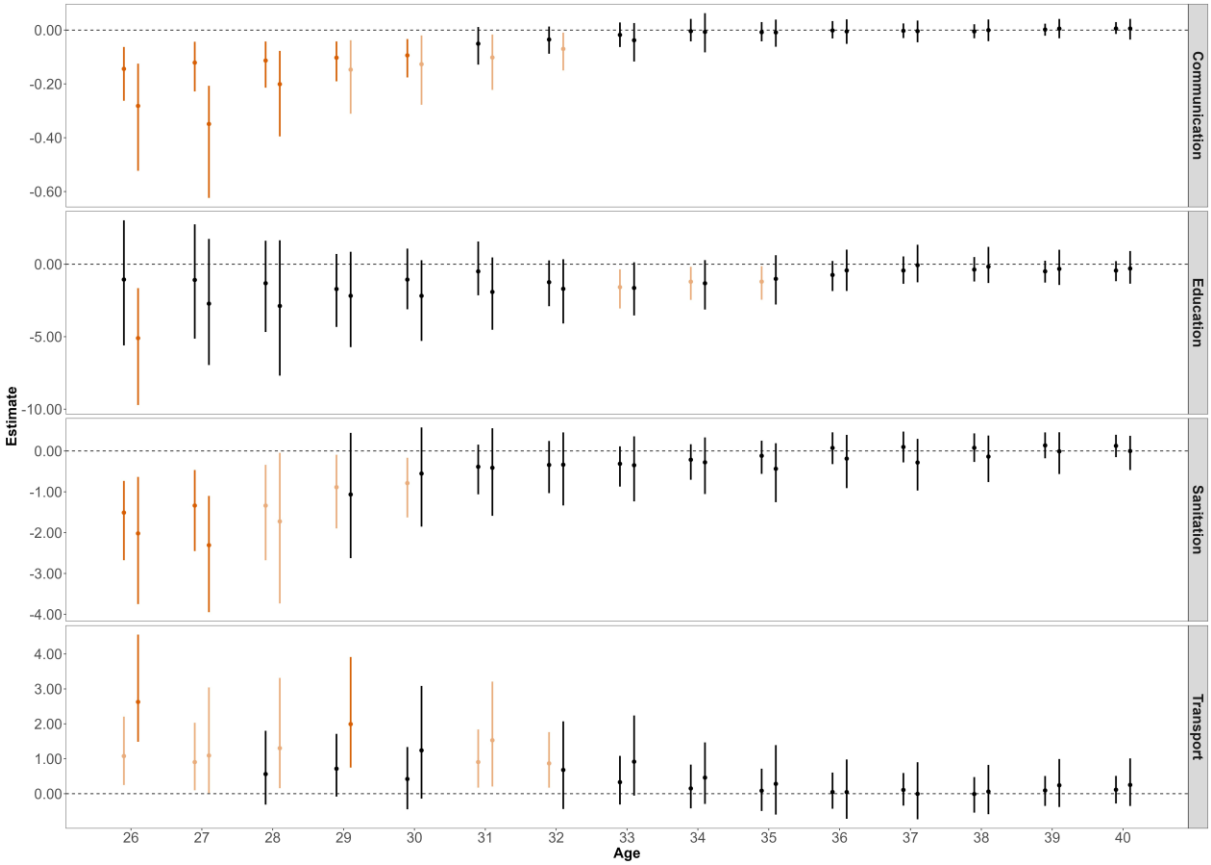


Figure B.3: RD results, additional age specifications. RD estimates with 95% robust confidence intervals are shown of the effect of electing a young mayor on public spending by category. Young ≤ 26 years to young ≤ 40 years. For the left estimates the opponent was 45 years and older, for the right estimates 55 years and older. Robust p-values and confidence intervals using bias-correction with cluster-robust standard errors at municipality level. Orange coefficients if $p < 0.01$, light orange coefficients if $p < 0.05$. Estimation performed using local polynomial estimators with triangular kernel and MSE-optimal bandwidth. Covariates used are the same as in Table 6.

External validity of RDD

	Mixed	Other	p-value
Local Council			
N. Councilors	10.03	10.16	0.064
Share Female	14.65	13.32	0.000
Share Young (≤ 29)	9.95	8.22	0.000
Mean Age	42.52	43.15	0.000
Share Mayor's Party	26.47	26.05	0.409
Share Left Party	26.91	25.94	0.071
N. Parties	5.76	5.72	0.543
Municipality			
Life Expectancy	69.61	70.78	0.000
Child Mortality	34.94	30.29	0.000
Illiteracy Rate	26.13	20.22	0.000
GINI	0.53	0.52	0.006
Extreme Poverty	21.49	15.78	0.000
Poverty	39.60	31.87	0.000
Income	343.63	419.29	0.000
HDI	0.56	0.59	0.000
Population 65+ years	7.36	7.42	0.340
Population < 15 years	29.92	28.93	0.000
Population Rural	42.62	38.46	0.000
Area Size	1,264.37	1,544.45	0.018
Population	25,893.43	35,922.69	0.000

Table B.5: External validity of RDD. Mean characteristics of mixed (young – not-young) elections (using main specification: young ≤ 29 years, AD ≥ 5 years) and all other elections, as well as p-values from a two-tailed t-test.