



Bachelor Thesis

**Mayor's Gender and Resource Allocation: Evidence from
Latvia**

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Abstract

This research builds on the existing public choice literature on how the individual's characteristics affect the political and economic outcomes in different public institutions. Particularly, we look at how the mayor's gender affects budget allocation on different expense categories of local government budgets. To be as close as possible to a randomized experiment, we employ Regression Discontinuity Design (RDD) by using close elections data of Latvian local government elections between 2009 and 2019. In accordance with the academic literature, women mayors tend to spend more on health, public order, and safety and social protection expenses while they spend less on general governance and economic activity expenses. Surprisingly, women spend more on environment protection expenses but the effect on site and housing management and education expenses is inconclusive. Lastly, there are no gender differences in recreation, culture, and religion expense allocation. Our findings are relevant for legislators and academics in developing and researching institutional framework regarding gender representation.

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1. Introduction

In labor economics, individual workers are generally assumed to differ in skills, traits, and experience. Besley (2005) puts forward the notion that this should be so for politics as well. Nevertheless, up until the turn of the century, the prevailing outlook in public choice literature was the one held by J. M. Buchanan – that institutions drive public outcomes as they provide appropriate incentives for the decision-makers (Holcombe, 2012). A major shift to this paradigm was the research by Jones and Olken (2005), who provided strong evidence that individual politicians matter greatly for economic growth. Since these findings, more and more research has entertained the idea that there are individual characteristics that determine how a politician will act in office.

Several characteristics are correlated with policy-making decisions such as professional experience and occupation (Besley et al., 2011; Congleton & Zhang, 2013; Brown, 2019), age (Alesina, Cassidy & Troiano, 2018), socio-economic background (Hayo & Neumeier, 2014), and others. Research by Chattopadhyay and Duflo (2004) is especially notable in the governance literature due to their unique method – exploiting a random experiment in a local council setting in India. The authors conclude that women politicians direct more resources to policies relevant to women. Gender in similar contexts has been researched by other authors (Holman, 2014; Ferreira & Gyourko, 2014; Jochimsen & Thomasius, 2014; Freier & Thomasius, 2015) as well. Building upon the literature on the relationship between decision-maker characteristics and economic policy outcomes, we choose to look at how the gender of local government decision-makers (mayors) affects their budget allocation across expense categories using a quasi-experimental research design.

Moreover, we wish to provide an assessment of the implications of more women leading local governments as the European Union has set a yet-unfulfilled goal for at least 40% representation of each gender in decision-making (Council of Europe, 2003). The high share of woman mayors in Latvia serves as one of the reasons why Latvia is a unique playground for such research. Among the Baltic states, Latvia is leading in terms of women's presence in national and local politics (Centrālā statistikas pārvalde, 2019). In addition, with 23% of mayors being women, Latvia is above the EU average of 15.4% (European Institute for Gender Equality, 2019), granting a more balanced data set compared to previous research on local governments (for instance, Freier & Thomasius, 2015). We focus specifically on local-level governments for two reasons. First, comparing local government leaders' impact

ensures a homogenous institutional framework. Second, we expect the relationship (between gender and resource allocation) to be more pronounced on the local level because mayors have more autonomy compared to national-level politicians (Kažoka & Stafecka, 2017).

Additionally, to our knowledge, there is no research conducted on the role that female politicians could have on resource allocation in post-Soviet countries. This research context could hold valuable insights, as, for instance, Campa and Serafinelli (2019) show that women's attitudes towards work and career vary according to the “politico-economic regimes” (p. 15) in which they have lived. Women from post-communist regimes, compared to historically capitalist regimes, perceive the success of one's career as more important, and we assume that this might be reflected in the resource allocation of local governments as well (Campa and Serafinelli, 2019).

Furthermore, this research is also policy-relevant for Latvia because of the 2021 municipal elections and the upcoming territorial reform, which will reduce the number of municipalities from 119 to 42 (VARAM, 2021). As the reform will increase the authority of the remaining local leadership positions, we find it even more meaningful to evaluate individual power over municipal outcomes. Assuming there are differences between mayors of different genders, our research could help to understand how budgetary priorities will change for the regions affected by the consolidation. To our knowledge, this is the first quantitative assessment of local leader impact on municipal budget allocation in Latvia.

We use panel data on 110 local governments in the period from 2009 to 2019. The dataset includes the results of the municipal elections of 2009, 2013, and 2017 and characteristics of all mayors that took office during this time. We gather the data via personal communication with the municipalities and by using web scraping from secondary sources.

Simply comparing municipalities led by a female mayor to municipalities led by a male mayor would not allow identifying the causal effect of gender on municipal management, as a certain type of municipality might be more likely to elect one gender over the other; this would attribute any observed effects to gender while, in fact, they might arise from the municipality-specific characteristics. To solve this, we employ regression discontinuity design (RDD), which is commonly used in similar public finance and policy research contexts (Brollo & Troiano, 2016). RDD solves this problem by looking at only close election races, where the small margin of victory means that the single winner was determined by chance, i.e., where the gender of the mayor was selected as if randomly. To do

this, we require election result data to find the cases where the victory was narrow. We follow the approach of Freier and Thomasius (2015), and we adjust the RDD using the modifications suggested by Folke (2014) for proportional election systems. To enrich our interpretations, we conduct two interviews with experts familiar with Latvian local politics.

We use annual data on municipal expenses, exploring how the gender of the mayor affects the proportion of budget allocated to each expense category (depicted in Appendix A). Thus, our research question is: **how is fiscal budget expense allocation across categories affected by the mayor's gender in Latvian local governments?**

We conclude that women mayors spend proportionally more on expense categories such as site and housing management and education but less on general governance spending, environment protection, and social protection. However, we do not find consistent mayor gender effects on budget allocation for public order and safety, economic activity, and health expense categories.

We proceed as follows – the following chapter is devoted to a summary of the previous academic work related to the topic, followed by a summary of the institutional background of Latvia. Next, we describe our data set and its construction process before providing an overview of our implementation of RDD and its specification for Latvian municipal elections. Finally, we report the results and give our interpretations of the findings.

2. Literature Review

This chapter provides an overview of the academic work related to (1) individual leaders' role in different institutional settings; (2) the gender differences and (3) their impact on political outcomes. Lastly, we provide (4) a summary of the literature on the municipal leader's gender effects explored using RDD.

2.1. Why and how do individuals matter in politics?

Buchanan (1967, p.11) explains that “in the real world, individuals, as such, do not seem to make fiscal choices. They seem limited to choosing ‘leaders,’ who will, in turn, make fiscal decisions”. Eventually, the voters are the ones deciding on public resource allocation indirectly – they do this by choosing the individual – the set of personal characteristics – that will directly determine the outcomes for them. According to Downs (1957), politicians, irrespective of their gender (or other personal characteristics, e.g., education) should serve the median voter to be re-elected. Additionally, a politician's individual preferences should not determine his/her policy decision-making.

Thus, public choice researchers of the 20th century long considered individual preferences and characteristics insignificant as the outcomes, in their view, are determined by the quality of the institutions, which, in turn, determines the choices of politicians (Holcombe, 2012). At the same time, the labor market has considered individual characteristics as a key mechanic (e.g., Roy, 1951) while empirical research on politician's characteristics affecting public outcomes started only in the early 2000s. The early work by Bertrand and Schoar (2003) looked at how corporate manager's individual characteristics affected the performance of the company. Similar studies were conducted by Wolfers (2006) and Kaplan et al. (2012). Soon, researchers adapted the idea of individuals having an impact on the institutional outcomes to public choice research as well. For instance, Ferreira and Gyourko (p.24, 2014) claim that elected leaders have their preferences and that “they cannot credibly commit to moderate policies”; therefore, the political decisions made by different individuals will deviate and in turn, affect economic outcomes.

National politics

Seeking to understand whether an individual leader matters on a national level, Jones and Olken (2005) find that, when there is a higher degree of autonomy for the leader, he has more influence on economic growth. They conclude that leaders, especially in autocracies, appear to be important for a country's economic development. Besley et al. (2011),

Congleton and Zhang (2013), Brown (2019), and other academics have continued such research by looking at specific characteristics, concluding that career paths and education play a significant role in national leaders' economic judgment.

The effects of individual political leaders' prior experience, political affiliation, and socio-economic status have also been explored for more specific dependent variables, e.g., public debt, deficits, and inflation, and professions, e.g., ministers, central bankers, and judges (Schneider, 2005; Göhlmann & Vaubel, 2007; Hayo and Neumeier, 2014; Moessinger, 2014; Jochimsen and Thomasius, 2014).

Local politics

Jones and Olken (2005) mention that in democratic countries national leaders have almost no effect on economic growth, however, it could be due to the complex bureaucratic hierarchy – a common characteristic of democracies. While national leaders have a lot of resources in theory, their flexibility in allocating these resources in practice is very limited while local government leaders are more autonomous (Kažoka & Stafecka, 2017). Additionally, studying local governments can yield a larger sample as there are many of them in each country, thus, providing more politicians to study compared to national governments. Finally, studying municipalities is a more methodologically sound option as municipalities have a homogenous institutional framework while cross-country comparisons suffer from heterogeneous political backgrounds.

The research for leaders of local governments also spans multiple different characteristics and periods. For instance, the effects that the turnover of local leaders has on performance have been researched by Clinger et al. (2008), Boyne et al. (2011), and Connolly (2018) with contradicting findings. Moreover, similar research has been done by Alesina et al. (2018) and Freier and Thomasius (2015) in exploring the effects of the age and the experience of mayors, concluding that younger mayors are keener on investments and more experienced mayors prefer lower spending.

Having looked at why and how individuals matter in different contexts by reviewing the academic work related to this topic, we further summarize the research on the specific characteristic we study – gender.

2.2. Gender

We intend to look at mayors' gender affecting Latvian municipal budget allocation between expense categories by using RDD as done by Freier and Thomasius (2015). In subchapters one and two, we provide our hypotheses and the academic evidence to support them. Then, we provide the key reasons as to why such research is more viable in Latvia.

2.2.1. Gender and decision making

In this subsection, we aim to explain why we should expect different policy outcomes depending on the gender of the decision-maker.

Gender decision-making differences

Researchers claim that different gender politicians contribute varying points of view to the political process due to their different social experiences and concerns (Hartstock, 1983 as cited in Fox & Schumann, 2000). Although Klenke (2003) states that there is no direct relationship between gender and decision-making, gender has an indirect effect on how leaders perceive their power, conflict management, and trust. As a result, differences in these factors create various decision outcomes in organizations, thus, gender serves as a proxy.

Women are considered to focus more on non-financial or individual objectives, they also value the quality of how decisions are made (Carter, Williams & Reynolds 1997). While men are more objective, confident, and rational (Wood, 1990 as cited in Baquedano, Elawar & Lizárraga, 2007), women seek more proof as they have doubts about the decisions and are sensitive to their environment (Gill, Stockard, Johnson, & Williams, 1987). Female individuals are also more focused on the outcomes and consider the given constraints for their decisions, and focus on their emotions, interpersonal relationships (Kathlene, Carke, Fox, 1991). On the other hand, men fixate on the main aim of their actions, and their decisions are more influenced by work pressure (Baquedano, Elawar & Lizárraga, 2007).

Overall, men and women are considered rather equal in terms of their behavior and intellectual abilities as both genders can work with information, analyze data, set priorities, deal with problems, and predict outcomes. Thus, all mentioned deviations in female or male behavior can be attributed to their role in society (Baquedano, Elawar & Lizárraga, 2007). While throughout history women are viewed as caregivers (Smith, 2014), men are required to be strong, to be leaders in politics or business (Koenig et al., 2011; Vinkenburg et al., 2011).

Decision making in professional environments

Kathlene, Carke, and Fox (1991) claim that male and female professionals may differ due to their “socialization and life experiences” (p.31). However, Arch (1993) believes that deviances in performance are observed because of different motivational aspects – while men enjoy challenges, women are tended to avoid them. Nevertheless, when comparing gender decision-making, particularly at the managerial level, some researchers report no differences (Powell, 1990). For example, mutual fund managers act similarly in managing the fund and its investments (Atkinson, Baird & Frye, 2003).

Johnson and Powell (1994) mention that attitude towards risk is rather similar for both genders in the professional contexts compared to the rest of the population. They argue that irrespective of gender, people that choose a managerial career are more open to risks/challenges. According to the authors, on average, fewer females will prefer such positions, however, women choosing to be managers will have closer preferences to those of men. Secondly, they claim that people get knowledge from their professional environment, which affects their decision-making and perception of different issues.

Overall, professionals from similar professional/educational backgrounds provide a significant opposition to the claim that women and men are different in their decision-making, logical thinking, or perception of risk. Nonetheless, in the case of local governments, there is often no single road to politics, resulting in a large disparity of educational and professional backgrounds (see Appendix B for an illustration of Latvia’s case). Consequently, we hypothesize as follows:

Hypothesis 1: Women and men mayors possess differences in their decision-making, which are reflected in the budget allocation across expense categories¹.

Next, we provide an overview of preferences and decisions made by female and male decision-makers in public office.

2.2.2. Gender and decision-makers in public institutions

Mansbridge (1999) states that a politician who shares their social identity with a group of the society (e.g., gender, age, race) will be able to empathize better with the group

¹ the expense categories we use in this research are depicted in Appendix A.

and, therefore, will ensure better policy implementation. As argued before, the social experience of men and women is different, thus, it should affect their governance preferences.

Generally, women have different political desires than men, who prefer economic/military aspects over social issues (Andersen, 1999, as cited in Holman, 2014; Shapiro & Mahajan, 1986, as cited in Holman, 2014; Thomas, 1994, as cited in Fox & Schumann, 2000; Brollo & Troiano, 2016; Svaleryd, 2009). Kathlene, Carke & Fox (1991) mention that female professionals in the public office prefer “providing direct benefits to targeted groups” or spending “state money directly on people” but men are more concerned about regulating public institutions (p.38.). Chattopadhyay and Duflo (2004) examine the influence that women in public office have on political decision-making, finding that political leaders will allocate more to what is more relevant to their gender. Smith (2014) summarizes the local policy preferences of men and women and concludes – “there may be gender gaps in public perceptions of local issues, especially those issues that concern women’s traditional role as caregivers” (p. 318). Women are prone to support social services to help lower-income and old people societies; they care more about family issues, childcare, healthcare (Schwindt-Bayer, 2006; Thomas, 1994, as cited in Fox & Schumann, 2000; Boles, 1991 as cited in Fox & Schumann, 2000) and unemployment issues (Alozie & McNamara, 2010).

By looking at the U.S. municipalities, Holman (2014) concludes that if a municipality has a female mayor, the chances of entering social welfare programs or spending money on them increase. The author emphasizes that “mayoral position holds significant power in determining spending priorities in cities” (p. 711) and that there may exist governance differences between different gender leaders.

When looking at economic outcomes, women central bankers are more aggressive when controlling inflation parameters (Farvaque et al., 2009). On the other hand, Jochimsen and Thomasius (2014) do not find differences among the size of public deficits as administered by male or female finance ministers. Additionally, Cabaleiro-Casal and Buch-Gómez (2017) report that gender does not affect the changes in total expenses, however, female and male politicians differently divide resources between social and non-social spending.

In contrast, some academics report that public institutions workers/politicians of opposite genders exert no differences in their priorities related to the education system, fiscal questions, city management, infrastructure, or housing issues (Fox & Schumann, 2000;

Schwindt-Bayer, 2006; Tolleson-Rinehart, 2001, as cited in Weikart, Chen, Williams & Hromic, 2006).

To conclude, we see a similar pattern as Freier and Thomasius (2015) and Rocha et al. (2018) - there is no academic unanimity regarding politicians' gender effects on economic performance. Nevertheless, the research of Zāķe (2011) in Latvia shows that voters demand higher performance from female mayors compared to men. So, in case a woman gets elected, she would be more hard-working compared to a similar male candidate. Hence, we predict that when a woman enters the mayoral office, she should be capable of making differences based on her economic beliefs, i.e., affect the resource allocation across budget categories.

According to Latvian legislation, there are ten expense groups for a public budget (Noteikumi par budžetu izdevumu klasifikāciju atbilstoši funkcionālajām kategorijām, 2005). These categories are analogous to the Classification of the Functions of Government (COFOG) (2017) by OECD and have been used in prior research concerning resource allocation (Potrafke, 2020). Like Schwindt-Bayer (2006), we divide the expense categories into two groups – social expenses and economic expenses; a detailed explanation is provided in Appendix A. As Funk and Phillips (2018), we use budget categories with the premise that resource allocation between expense categories demonstrates policy preferences of the mayor since spending more on one category requires reducing resources for other categories. Based on previous literature on how women and men public officials differ in their social and economic preferences, we hypothesize that:

Hypothesis 2: The municipal councils represented by women mayors spend a larger proportion of their budgets on social expenses.

Approving this hypothesis would also imply that women spend a smaller proportion on economic expenses compared to men. Furthermore, such a result can imply a substantive representation of gendered interests (Funk & Phillips, 2018). To explore the viability of such research in Latvia, we continue by looking at the presence of women in Latvian politics.

2.2.3. Gender and public institutions in Latvia

Latvia is the leading Baltic country by women's presence in national political decision making. In 2019, the share of female politicians in the Parliament of Latvia was 21%. This is also the case for local governments: 34% of local politicians in Latvia were female whereas the same metric in Lithuania and Estonia is 29% (Centrālā statistikas pārvalde, 2019). Even

though the average share of local female politicians for the EU is 36%, Latvia is ahead when looking at specifically female mayors: the EU average was 15.4% while in Latvia it was 23% in 2019 (European Institute for Gender Equality, 2019). Freier and Thomasius (2015), on whom we base our research, report that in the case of Bavarian municipal elections, the total share of female candidates was only 3%, and 1.3% of elected mayors were female indicating low statistical power for the tests employed by the authors. As seen from these statistics, Latvia's public sector is better positioned for researching how the mayor's gender affects local fiscal resource allocation. To do so, we further on introduce research that uses the same methodological approach that we employ.

2.3. Research on local governments using regression discontinuity design

When looking at the leader effects on local fiscal outcomes, a methodological challenge might arise when, for instance, focusing on gender. A certain type of municipality might be more likely to elect one gender over the other; this would attribute any observed effects to gender while, in fact, they might arise from the municipality-specific characteristics. For example, a conservative municipality might be more likely to elect a male mayor and to spend more on certain expense categories. A linear regression might attribute this difference in expense allocation to the mayor's gender instead of conservatism among the population. To solve this issue, a good approach is to use Regression Discontinuity Design (RDD) (Lee and Lemieux, 2010). This chapter is devoted to the literature that has been using RDD to study the effects of the mayor's gender in local government settings.

Brollo and Troiano (2016) look at Brazilian municipalities to find out whether the gender of a politician influences corruption. They conclude by saying that male mayors are more likely to take part in corruption while their female counterparts employ fewer temporary workers during the electoral year. RDD is also used in the context of Spain's local elections and imposed gender quotas (Bagues & Campa, 2018). Quotas do not change policy outcomes, yet municipalities that experienced gender quota implementation increase expenditures preferred by women by one pp. Ferreira and Gyourko (2014) conclude that having a female mayor does not affect the city's crime rates, expenditures composition, or the size of the government in US cities. They claim that even though they do not find any gender effects, female mayors are still perceived as more successful due to a five pp higher probability of being re-elected.

Freier and Thomasius (2015) look at municipal politicians' education, experience, and gender to determine their effects on municipal fiscal outcomes and electoral performance among German municipalities. Authors conclude that education level does not affect municipal fiscal performance. However, Freier and Thomasius (2015) state that, because there are too few women mayors in their dataset, they are not able to use RDD to research how the mayor's gender affects fiscal outcomes. Because of this issue, the authors suggest continuing further research on politicians' gender. Rocha et al. (2018) try to address this problem in Brazilian local governments. However, they find that even in close elections, male mayors are less educated compared to their female counterparts. Due to this creating omitted variable bias, authors were not able to provide conclusions for gender effects.

We see a potential for improvements using the Latvian municipal and mayoral data set, thus, we aim to fulfill the existing research gap as around a quarter of Latvia's mayors are female (European Institute for Gender Equality, 2019). Like Rocha et al (2018), we consider a similar methodological approach as Freier and Thomasius (2015). We continue by providing an institutional background for Latvia to gain an understanding of what methodological considerations need to be kept in mind for our research.

3. Political background of Latvia

This chapter summarizes the key attributes of the Latvian political system that are relevant to researching how local government leaders affect resource allocation. We look at the institutional background on a national level, then move on to describe the role of local governments in Latvia; we further explain the municipal election process and examine the power of a local leader in Latvia.

3.1. Institutional background of Latvia

Latvia is an independent, democratic republic that joined the EU in 2004. Since 2014 it is also a member country of the Eurozone but in 2016 Latvia joined the Organisation for Economic Co-operation and Development (OECD) (European Union, n.d.; Ministry of Foreign Affairs of the Republic of Latvia, 2020). Latvia's government is split into the legislature, the executive, and the judiciary branches (The Constitution of the Republic of Latvia, Section 1). Furthermore, the government of the country is divided into two levels – national government and local governments (On Local Governments, Section 3). The national-level government is focused on policy and legislation implementation whereas the local governments oversee territories and autonomously ensure daily social welfare functions.

The administrative division of Latvia's territory appoints 110 municipalities and 9 republic cities, making a total of 119 local governments². The division of the territory changed in 2009 when the number of municipalities was reduced³ from 549 to 119 single-level local governments (Pašvaldības Latvijā, 2020). An upcoming territorial reform in 2021 will further reduce the number of local governments to 42 (VARAM, 2021). Despite the upcoming reform, all local governments still will be organized on a single level without any other intermediaries between them and the national government. In practice, this leaves any single municipality with a lot of autonomy over its territory and decision-making.

3.2. The role of local governments

The functions of each local government are split into two main categories: on the one hand, they have the rights of local authorities and they regulate and manage any activities within the local government. On the other hand, they perform public administration tasks set

² within this thesis, we use the terms “local government” and “municipality” interchangeably

³ because of this, we do not use data prior to 2009 as it is impossible to consolidate it with the current municipalities

by the national government and basic law. Excluding ad-hoc orders from the national government, these include the responsibility to organize utility services, territory improvements, education, and culture. They also provide social assistance/care for the population, ensure public order, promote economic activity, and deal with local unemployment among many other things (On Local Governments, Section 6, Section 15).

The great authority vested in local governments is further illustrated by the immense amount of national budget revenues that end up in local governments – in 2019, consolidated revenues for local governments accounted for 25.6% of total national revenues (Finanšu ministrija, 2020). For comparison, the average for 2019 in the EU was 18.3%, as reported by the Federal Statistical Office (2020). These statistics lead us to a similar conclusion to that of Kažoka and Stafecka (2017) – because of the huge municipal budget fraction of the national budget, municipalities have bargaining power in national policymaking. The authors argue that financing for local governments can be viewed as a tool for maintaining power – local governments whose mayors have better relationships with the national coalition are likely to get greater financial transfers from the government. National parties are also able to ensure that their power will be maintained in the future by supporting their local colleagues.

Local governments have little autonomy regarding their revenues, as nationally regulated taxes accounted for 52% of municipal revenues in 2019 (Valsts kase, 2020). In contrast to this, municipalities are autonomous in their spending, with only 15% of expenses arising from the essential services provided by the municipalities (Valsts kase, 2020).

3.3. Local government elections

Latvian local governments consist of 9 to 19 (or 60 in the case of Riga) elected representatives, dependent on the population of the local government. (Law on Elections of the Republic City Council and Municipality Council, Section 2). The elections for local governments are direct and proportional: the voters cast their ballots for a political party with an ordered list of candidates. The fixed number of seats on the local government Council are allocated to each party proportionally to the votes received with the Webster/Sainte-Laguë method (example calculation can be found in Appendix C). Finally, a candidate's chances of getting elected, depend on “plusses” and “cross-outs” received from voters, which can move the politician up or down on his/her party's candidate list. This mechanism affects the chance

of the politician getting higher on the list and possibly⁴ getting a seat in the Council. Also, there is a 5% vote share threshold under which a party is not considered for seat allocation (Law on Elections of the Republic City Council and Municipality Council, Section 41).

The election of the mayor can be considered indirect as the elected Council members (acting as representatives) vote on the mayor. Any elected council member can candidate for the mayor's seat (On Local Governments, Section 19). However, it is often the case that the first candidate on the winning party's list also gets appointed as the mayor. For example, in the elections of 2017, we found this to be the case in 80% of the 110 local governments in our sample. Even in pre-election campaigning, parties often communicate that the first member on their list is running for mayor, sometimes even building their campaign around their single mayoral candidate (Klūga, 2020). There are also no term limits for mayors in Latvia, so the previous mayor might run for this position indefinitely as long as he is elected on the Council (On Local Governments, Section 19).

To summarize: the mayor of the local government is elected indirectly, and the representatives are elected through a proportional, direct election. Nevertheless, the proportional election results also serve as a strong predictor of who is going to be elected as mayor, thus, we can employ a fuzzy⁵ RDD in our study.

3.4. The role of the mayor

The direct duties of a mayor can be summarized as leadership, agenda-setting, and a representative function of the Council (On Local Governments, Section 62). However, upon being elected, the mayor can also choose to have one or more deputies and, importantly, proposes the next executive director of the local government (On Local Governments, Section 20, Section 68). This is a substantial addition to the mayor's authority since, as explained by Austere et al. (2008), it is possible to shift institutional work to one's individual needs by, for instance, appointing close standing people in important positions.

Even though mayors have autonomy over their decisions, they still must be approved by the council. Nevertheless, due to the small size of the Councils, (in 2019, the median was 15 members), it might not ensure an unbiased and democratic panel of elected politicians to

⁴ but not necessarily; in case the party receives less seats than the politician's adjusted (original number + adjustments by voters) number in the list, he/she will not get elected.

⁵ further explanation provided in the methodology section.

vote for the mayor's decisions. This is amplified by the findings of Kažoka and Stafecka (2017), who state that the power of political opposition is rather low in Latvian local governments. Hence, the coalition, with the mayor as the frontrunner, has almost total control over the local government's decisions. In addition, the mayor oversees drawing up and approving the budget for the year (Noteikumi par budžetu izdevumu klasifikāciju atbilstoši funkcionālajām kategorijām, 2015), thus, directly affecting the resource allocation, which is the focus of this research.

Mayors have autonomous access to the huge municipal budget, whereas members of the Parliament cannot achieve the same effect due to their limited access to resources. Voters, therefore, view mayors as authorities fully dedicated to improving the welfare of the municipality (Kažoka & Stafecka, 2017). Moreover, voters tend to vote for politicians depending on their personalities and irrespective of their political affiliation, again affirming that political individuals in Latvia matter. In practice, we indeed see that in many municipalities the distribution of power has remained unchanged for several elections (Kažoka & Stafecka, 2017). According to our data set, between 2009 and 2020 there have been 73 mayors in office for more than ten years, and 16 of those have been in the office for more than twenty years (Appendix D).

We observe that the upcoming reform might further increase the power of the mayors, as most mayors will be responsible for a larger municipality, while the median number of politicians on the councils will remain at 15 (Centrālā Vēlēšanu Komisija, 2021). Given these conditions, we conclude that Latvia's mayors have a very substantial influence on local government's decision-making processes, thus, looking at mayoral characteristics is of critical importance in the case of Latvia.

4. Data

4.1. Mayoral data

We construct a data set of all those individuals that have held the position of the head of the municipality in one of 119 Latvian municipalities between 2009 and 2019. For each individual we gathered information such as (1) birth year, (2) gender, (3) elections in which they got elected in the position, (4) term start and (5) end dates, (6) education degree and (7) field, (8) previous occupation before being a mayor, (9) political affiliation and (10) annual salary received from the municipality for each year the person was the mayor.

Firstly, we gather information from publicly available sources using web scraping methods in R from the packages *httr* and *rvest*. For instance, term start and end dates, as well as elections were scraped from lists of heads of local governments for 101 municipalities (for instance, Wikipedia, n.d.) while birth year, education, previous occupation, and political affiliation for most mayors were gathered from Central Election Commission data on candidates for municipal elections in 2017 (Centrālā vēlēšanu komisija, n.d.). This data source allowed us to gather information on most mayors who were in office even before the elections of 2017 as many of them were still candidates for the 2017 election. For the information that was still missing, we manually looked up other resources such as municipal newspapers and other online materials.

When the initial data gathering was finished, we used email and phone correspondence to contact each of the 119 municipalities to make sure that the data used in this research is correct and to request missing information; necessary adjustments were made. Overall, 98 of 119 Latvian municipalities have responded and either confirmed or adjusted the data. Next, we gathered the annual salary for each mayor using data from Latvian officials' income declarations (Valsts ieņēmumu dienests, n.d.). Still, minor parts of data are not included as they were not available online and the municipalities could not provide it.

To be able to use education and previous occupation data, we had to summarize the data of each person into bigger classification groups. To do so for education fields, we used the third classification group from the rules about the classification of Latvian education (Noteikumi par Latvijas izglītības klasifikāciju, Annex 2) that divides education programs into nine groups. For previous occupation data, we created classification groups based on the most common experiences that appeared in our data set. Descriptive statistics of mayors of each gender can be viewed in Appendix E. Our data contains 163 male and 49 female mayors

with the average age being 54, tenure – 7.4-8.8 years. Female mayors have a higher level of education on average (96% of women have higher education as compared to 88% for men) and more experienced in the public sector (88% as compared to 80% for men).

4.2. Municipal data

To conclude the effects of mayoral data on municipal performance, we focus on budget allocation for different expense categories (Appendix A). We gather annual budget data for each municipality between 2009 and 2019 from the Regional development indicators module (RAIM, 2019) and combine it with granular budgetary data from the Treasury of Latvia (Valsts Kase, 2020).

To research how mayors consider the tradeoffs across different expense categories, we calculate the total expenses each year and divide each category with the total expenses to get the percentage share of nine expense categories. This approach is employed by other authors researching budget allocation with panel data (Ferreira & Gyourko, 2014; Potrafke, 2020; Sanjuán et al., 2020). While researching Latvian municipalites, the Vilerts, Zutis and Beņkovskis (2019) have found significant effects that population size (among other variables) has on the municipality expense structure – smaller municipalities have higher per capita costs. Because of this, we also seek to include population size as a covariate in our regressions. We use statistics of population in Latvian municipalities between 2009 and 2020 (Centrālā statistikas pārvalde, 2020). As population data is recorded at the beginning of the year, while most of our other data is recorded at the end of the year, we join it with the fiscal data of the previous year.

Descriptive statistics for municipal data are found in Appendix F. Municipalities on average spend the largest fraction (42%) on education but the smallest fraction on health (0.5%); while there are educational institutions in almost every municipality, health centers appear to be only in the largest municipalities. The median municipality total expenses were EUR 7.4 million with a st. dev. of EUR 75 million, indicating a right-skewed distribution of municipal budgets in Latvia.

4.3. Municipal elections data

Within our research period (2009-2019), municipal elections in Latvia have taken place three times – in 2009, 2013, and 2017. With web scraping, we gather election result data, including the votes received by each party, the candidates, and their number on their party's list from the webpage of Centrālā Vēlēšanu Komisija (n.d.). To calculate election

results, we need to know the number of seats for each municipality, and we calculate this using the territory's population at the time of the elections, as described in the Law on Elections of the Republic City Council and Municipality Council (Section 2).

4.4. Data adjustments

To obtain a single data set for the analysis, we must combine the acquired data. We depict the data combining process in Appendix G. One of the most important assumptions in how we combine the data is the selection of a single mayor for each budgetary year. Since the budget of a municipality is typically finalized in January or February (On Local Government Budgets, Section 15), we assign each year to the mayor that was in the office during January and February. In case the municipality experienced mayoral change during this period, we exclude the corresponding year from our data set.

Other minor adjustments were made too. For example, when looking at all ten budget expense categories, we exclude Defense expenses as too few municipalities have planned such categories in their budgets. Lastly, we also exclude the municipality of Roja for the years 2009 and 2010, as the municipality was split into two smaller regions in 2010, meaning previous data would be inconsistent (Eglīte, 2010). Henceforth, we consider them as two separate municipalities starting from 2011.

5. Methodology

We introduce our approach to analyzing the data set we have collected, predominantly relying on a local regression discontinuity design, for which we use the programming language R and the package *rdrobust*. We follow the procedure laid out by Freier and Thomasius (2015). Notably, however, we implement the adjustments suggested by Folke (2014) to account for the specifics of proportional representative elections.

5.1. Preliminary analysis

To establish a baseline for further comparison, we run a simple pooled OLS regression and OLS with fixed effects as done by Freier and Thomasius (2015). We specify the model for each of our dependent variables as depicted in equation (1):

$$Y_{i,t} = \beta_0 + \beta_1 D_{i,t} + \gamma C_{i,t} + \alpha_i + \delta_t + \varepsilon_{i,t} \quad (1)$$

Here, $Y_{i,t}$ represents the category of expenses as a share of total expenses for municipality i at time t . $D_{i,t}$ is the dummy variable indicating the gender of the mayor. $C_{i,t}$ is a vector of control variables we use – the municipality’s population both in actual numbers and in its squared form, as per Freier and Thomasius (2015). For specifying the fixed effects regressions, we use α_i and δ_t for municipality-fixed and year-fixed effects, respectively.

5.2. Regression Discontinuity Design

We use RDD due to its likeness with a randomized experiment and the usefulness in reducing omitted variable bias that comes with it, as pointed out by Lee and Lemieux (2010). For instance, estimates for the effect of a woman being mayor can be biased in the fixed effects regressions if there are municipality characteristics, called baseline covariates, that, first, make it more likely to elect a woman and, second, influence the resource allocation, too. This can be mostly resolved by ensuring that the baseline covariates are distributed continuously across the municipalities where a woman is a mayor, and where a man is a mayor (Lee & Lemieux, 2010).

The intuition behind regression discontinuity designs is grouping the sample into the control group – municipalities with a man as the mayor – and the treatment group – a woman as the mayor. Then, we must ensure that municipalities are as if randomly assigned to the groups to consider the covariates continuously distributed between the groups. The random assignment between the two groups is ensured by observing only municipalities where the election outcomes were close between a man-led party and a woman-led party. If there is a

narrow victory for the mayor of one gender, we can attribute the result – the gender of the mayor – to random chance, because the small number of votes determining who is the final victor might be random. This relies on the assumption that the result cannot be precisely influenced by the parties before it is determined (Lee and Lemieux, 2010). Here, the gender of the mayor should be uncorrelated with municipality-specific factors. As using discontinuity in elections is a well-established method in public policy research, we use this method as well. Figure 1 visually shows the discontinuity that these models try to identify.

To ensure that only close elections are included in our regressions, we must filter observations with a margin of victory (the running variable) sufficiently close to zero, which is the cut-off determining victory of a female mayor. The measure determining the maximum distance from the cut-off is the bandwidth, which can be either selected arbitrarily or by using data-driven methods. In determining the bandwidth, there is a trade-off between bias and precision, as a wider bandwidth includes more observations but strays from the identifying assumption of close races and as-if random outcomes, while a narrow bandwidth might reduce bias but includes fewer observations and, thus, results in larger standard deviations (Lee & Lemieux, 2010). For our specification of RDD, we use the mean squared error (MSE) optimal bandwidth estimators developed by Calonico, Cattaneo and Titiunik (2014).

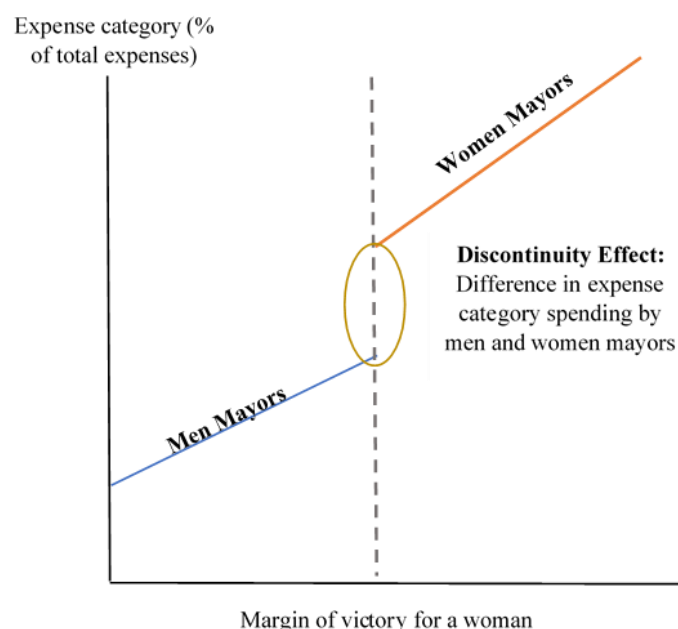


Figure 1. Visual representation of a standard RDD

Folke (2014) explains that in a proportional representative electoral system using RDD is challenging because there is no single threshold determining the winner of an

election, so the margin of victory cannot be easily calculated. Moreover, the number of seats for one party can change independently of its ballot count if the vote shares of the other parties change. Because of this, we use Folke’s approach to calculate the running variable which we use instead of a difference in vote shares, as it would be for majority rule elections.

5.3. Calculation of the running variable

Following Folke’s (2014) method, we create a running variable to indicate how far a woman-led party was from obtaining the most seats. To do this for each election, we first select the elections where a woman-led party either won with a man-led party in the top three parties by vote share, or where a man-led party won with a woman-led party in the top three.

If a woman-led party had the single highest number of seats, we remove a small number of ballots, for instance, ϑ from the party, redistribute those randomly across the other parties 100 times and calculate if the seats changed in at least 50% of the simulations so that the woman-led party would no longer be the single party with most seats. If not, we increase ϑ by small steps and run the simulations again until the seat allocation has changed. Once we reach a value of ϑ that yields this result, we record ϑ divided by the total ballots cast in the election as the index measuring the margin of victory for the party. Similarly, if a woman-led party had the highest number of seats along with another party, or if it was in the top three with a smaller number of seats, we add votes to the woman-led party and subtract them from others until the desired seat allocation is reached.

As a result, we obtain the assignment variable $X = \frac{\vartheta_{max}}{total\ ballots}$ for each election where there was both a woman-led and a man-led party in the top three parties by vote share. X takes on a positive sign if the woman-led party *won* and indicates what share of the votes could the party give up before losing its lead in the council. An X with a negative sign can be interpreted as the opposite – the woman-led party did not *win* and would require approximately $|X|$ more vote share to achieve a lead in the council.

This calculation relies on our assumption that the mayor will be the leader of the party that has the single largest number of seats on the council. Looking at our dataset, we see this is a valid assumption, as 77% of the mayors met this condition, and 78% of the party leaders who met this condition became mayors. However, since the variable X does not fully determine whether a municipality is treated (has a woman as a mayor), we cannot identify a sharp discontinuity and instead continue by describing our implementation of a fuzzy RDD.

5.4. Specifications of the RDD

Using the running variable acquired from Folke's (2014) methodology and following some guidance from Lee and Lemieux (2010), we employ a non-parametric local RDD with a fuzzy discontinuity. We use a fuzzy RDD as a woman-led party having the most seats in the parliament greatly increases the probability of, but does not ensure, the woman becoming mayor. To estimate the coefficient for a fuzzy RDD, we must use two-stage least squares. Equation (2) specifies the first stage:

$$d_{i,t} = \theta_0 + z_{i,t} + f(X_{i,t}) + z_{i,t} * f(X_{i,t}) + \varepsilon_{i,t} \quad (2)$$

Here, $z_{i,t}$ represents the actual gender of the mayor in the municipality, and $f(X_{i,t})$ is a function of the margin of victory. We use two specifications of RDD – (I) one where this function includes a single linear term of $X_{i,t}$ and the bandwidth is determined by the data-driven optimal bandwidth selector, and (II) to test the sensitivity of the results to the bandwidth, we also employ a specification where we manually specify the bandwidth to be double of the previously determined optimal number. We use fitted values of $d_{i,t}$ in the second stage regression (eq. 3) to estimate the effect of treatment τ – mayor being a woman – on the share of expenses allocated to each category. As suggested by Lee and Lemieux (2010), we use clustered standard errors for the municipalities. Finally, as with OLS regressions, we include population size as a covariate in our RDD models.

$$Y_{i,t} = \beta_0 + \tau d_{i,t} + f(X_{i,t}) + d_{i,t} * f(X_{i,t}) + \varepsilon_{i,t} \quad (3)$$

Despite the merits of using RDD, we must note that the coefficients we estimate are local average treatment effects (LATE) (Freier & Thomasius, 2015; Lee & Lemieux, 2010). This means that, as we are using observations where the victory of a mayor's party was narrow, we estimate coefficients valid for this subset of the population. Therefore, the external validity of using local RDD specifications must be carefully assessed, as the effect of a female mayor who barely won might be different from a female mayor who won by a lot.

6. Results and Discussion

Here, we report the results of how the municipality mayor's gender affects its budget allocation to different expense categories. We provide interpretations of the results, relate them to expert opinions (M. Pūķis⁶, L. Metla-Rozentāle⁷), and discuss how they fit into the existing literature. Lastly, we name the limitations and potential future research ideas.

6.1. Preliminary results

For preliminary analysis, we specify two regressions – first, a pooled OLS model for each of the dependent variables and, second, we augment each of these models with municipality and year fixed effects (FE). There are no clear-cut results among the models as significant results in one specification turn insignificant in the other, potentially indicating their incompatibility with the research design. Table 1 summarizes the results:

Results		
Expense category (in % of total expenses)	Pooled	FE
General governance spending	-0.0037 (0.0032)	0.0126*** (0.0033)
Public order and safety	0.00 (0.00)	0.0014*** (0.00)
Economic activity	-0.0007 (0.0059)	-0.0087 (0.0076)
Environment protection	-0.0009 (0.0026)	0.0029 (0.0036)
Site and housing management	0.0094 (0.0069)	0.0063 (0.0086)
Health	0.0019* (0.0009)	0.0006 (0.0006)
Recreation, culture, and religion	-0.0113*** (0.0032)	0.0001 (0.0049)
Education	-0.0036 (0.0067)	-0.0150** (0.0076)
Social protection	0.0088** (0.0022)	-0.0003 (0.0027)
Total expense per capita (EUR)	26.65 (20.53)	-24.72 (22.52)

Table 1. For each regression, we report the coefficients for a woman being mayor and the standard deviation in parentheses. All regressions are estimated on a sample of $n = 1103$. Regressions include control variables for the population and the squared population size. The fixed effects regressions include both time- and municipality-fixed effects. Significance is identified by the asterisks for coefficients. A p-value between 0.1 and 0.05 is identified by *, between 0.05 and 0.01 by **, and under 0.01 by ***.

⁶ Dr. oec., the associated professor at the University of Latvia and senior adviser of the Latvian Association of Local and Regional Governments (LALRG)

⁷ Lecturer at Rīga Stradiņš University Faculty of European Studies, Department of Political Science

Our pooled OLS regressions indicate some significance for the gender of a mayor affecting recreation, culture and religion expenses, health, and social protection expenses. For instance, social protection expenses have a coefficient of 0.9 percentage points (pp) meaning that on average women mayors would spend 0.9 pp more of their municipal total budget on social protection than their male counterparts while they would spend 1.13 pp less on recreation, culture, and religion category expenses. On the other hand, our fixed effects regressions fail to find such effects, instead indicating that women mayors spend more on general governance spending (1.26 pp), public order, and safety (0.14 pp) but less on education (-1.5 pp).

Overall, we do not attempt to make concrete conclusions from these results due to the endogeneity issues these specifications might possess. Although fixed effects mitigate endogeneity issues by allowing to control unobserved time-invariant municipal characteristics, we move on to describe the results from our RDD models, which allow for a cleaner identification of the coefficients of interest – gender effects.

6.2. Results from RDD

We run two specifications of local RDD for each dependent variable – (1) RDD with MSE selector-determined optimal bandwidth and (2) RDD with double the bandwidth of (1), which means that our second RDD specification includes more observations, which are further away from the cut-off. The results are depicted in Table 2.

Our first hypothesis was that, since the decision-making of women and men differs, there would be consequences in terms of budget allocation across different expense categories for different gender mayors. Relying on the results from our RDD models, we find strong evidence that there are highly significant differences for some categories.

However, our second hypothesis concerns more nuanced differences, namely that, according to literature, women mayors will allocate proportionally more of their budgets to social expenses like health, education, social protection, public order and safety, and recreation, culture, and religion. Consequently, we would expect men mayors to focus on economic expenses: general governance spending, site and housing management, economic activity, and environment protection. When looking at RDD results, we find that results are only partially in line with our initial expectations. Our RDD regressions results are depicted graphically in Appendix H.

Results						
Expense category (in % of total expenses)	RDD with data-driven optimal bandwidth			RDD with double the optimal bandwidth		
	Coefficient	Bandwidth (on both sides)	Observations left right	Coefficient	Bandwidth (on both sides)	Observations left right
General governance spending	-0.200*** (0.031)	0.08	15 32	-0.240* (0.128)	0.161	52 50
Economic activity	-0.195*** (0.051)	0.068	13 30	-0.116** (0.059)	0.135	37 40
Public order and safety	0.016*** (0.004)	0.077	15 32	0.020** (0.009)	0.154	52 42
Health	0.077** (0.031)	0.077	15 32	0.055 (0.061)	0.155	52 42
Environment protection	0.202 (0.179)	0.052	8 22	0.028*** (0.007)	0.104	15 40
Social protection	-0.047 (0.042)	0.055	8 22	0.066*** (0.019)	0.111	19 40
Site and housing management	0.160*** (0.001)	0.034	6 16	-0.098*** (0.031)	0.068	13 30
Education	-0.136*** (0.004)	0.037	6 16	0.307*** (0.041)	0.074	15 32
Recreation, culture, and religion	0.012 (0.014)	0.074	15 32	0.033 (0.036)	0.148	49 42
Total expense per capita (EUR)	412.34*** (78.78)	0.086	15 36	289.46 (224.94)	0.171	62 50

Table 2. For each regression, we report the coefficients for a woman being mayor and the standard deviation in parentheses. Regressions include population as a covariate, as per Freier and Thomasius (2015). Significance is identified by the asterisks for coefficients. A p-value between 0.1 and 0.05 is identified by *, between 0.05 and 0.01 by **, and under 0.01 by ***.

Our results indicate that **women mayors spend more on public order and safety, health and environment protection, and social protection expenses.**

We find a highly significant positive effect for women spending more (by 1.6 pp) on *public order and safety*. This is in line with what we hypothesized in chapter 2.2, given that it fits our classification as a social expense. Nevertheless, this is contrary to some of the previous literature: Little, Dunn, and Dean (2001) found that U.S. women political leaders spend less on crime and punishment related expenses whereas Gagliarducci and Paserman (2012) report that there are no mayors' gender differences on budget allocation to the security

expenses in Italy. Finally, Araujo and Tejedó-Romero (2016) find no differences in corruption levels among Spanish municipality leaders of different genders while Brollo and Troiano (2016) look at Brazilian municipalities and conclude that male mayors are more likely to take part in corruption. As our results seem to contradict most Western findings, we hypothesize that the significant effects may arise from the Post-Soviet background and perception of safety for mayors in Latvia.

Our first RDD specification indicates that women mayors spend 7.7 pp more on expenses related to *health*; this was also shown by pooled OLS in our preliminary analysis. While increasing the bandwidth yields an insignificant coefficient, we do not disregard our results due to strong evidence of positive effects. Women spending more on health-related expenses is supported by academia as well. For instance, Chattopadhyay and Duflo (2004) find that female village leaders are more likely to draw attention to health-related matters. Similar conclusions are reported by other authors (Braendle & Colombier, 2016; Funk & Phillips, 2018; Little, Dunn & Deen, 2001; Rehavi, 2007 as cited in Funk & Phillips, 2018).

Like health, *environment protection* produces significant positive effects in only one of the specifications. Namely, the second RDD with double the optimal bandwidth estimates indicates that women mayors spend 2.8 pp more than their men counterparts, providing evidence against our hypothesis. Authors as Little, Dunn & Deen (2001), Funk and Gathmann (2014), and Ramstetter and Habersack (2019) arrive at a similar conclusion finding that women politicians set environment protection as a higher priority in spending and legislature. Seeing academia agree with our results, we consider that the reason for the inconsistency might have been an improper classification of environment protection as an economic expense, which we based on the contents of the expense category. According to the opinion of M. Pūķis⁸ (Appendix I), environmental protection, interpreted as sustainability initiatives and, thus, a social expense, is more of a national-level competency and municipal participation is purely voluntary, making this part of the expenses flexible. Most of the costs included in the category refer to waste management and sewerage, which are inflexible and can be considered economic expenses. M. Pūķis explains our results by women being more influenced by green politics agenda. This implies that women spend more on sustainability

⁸ M. Pūķis states his own opinion and does not represent LALRG

initiatives (which are optional (social) expenses), while men opt for these expenses less often, instead of focusing on just the economic expenses part of environment protection.

Lastly, both pooled OLS and the double bandwidth RDD show that women spend 6.6 pp more on *social protection* expenses. While our first RDD specification yields insignificant results, we still find no reason to consider the significant results invalid. The conclusions of Kathlene, Carke and Fox (1991), Little, Dunn, and Deen (2001), Schwindt-Bayer (2006), Holman (2014), and Funk and Phillips (2018) support our results – women have a strong preference towards allocating resources to socially vulnerable groups and social welfare programs. They also prefer spending state money “directly on people” (Kathlene, Carke and Fox, 1991, p.38). M. Pūķis argues that this could be so due to the social welfare sector including many “feminized professions” to which female mayors can relate to, while men are skeptical of social equality as a priority, and we see this as a viable explanation.

We also find that women mayors have a bigger expense budget than men mayors as there is a significant positive coefficient for expenses per capita in the first RDD specification. Although we cannot evaluate the magnitude of the effect as the coefficients are likely to be exaggerated within the small sample used by the regression, this might imply that women mayors host a bigger budget overall and could be evaluated in further research.

Women mayors spend less on general governance spending and economic activity expenses.

General governance spending has significant negative coefficients in both RDD regressions despite having a positive coefficient in the FE regression. We attribute this to a potential bias in FE regressions that RDD might have excluded and, thus, accept the result. It is also consistent with our hypothesis and, therefore, with the previous academic research. Literature regarding politicians’ gender shows that men are more concerned about regulating public institutions, which might cause them to also allocate more resources to the governance and staff expenses (Kathlene, Carke & Fox, 1991). Another explanation for our result could be women’s intolerance of political corruption (Swamy et al., 2001; Dollar et al., 2011) indicating that they would not tolerate financial inefficiency/waste in the local public institutions as well. Furthermore, Brollo & Troiano (2016) conclude that, during the election periods, women mayors tend to appoint fewer municipal workers whereas men mayors are more likely to engage in such strategic activities, which would explain male politicians spending more on administrative expenses, too.

Regarding *economic activity* – we report highly significant and negative effects in both specifications of RDD, which, again, support our hypothesis. Firstly, researchers (e.g., Brollo & Troiano, 2016) show that women politicians are more inclined to spend on socially relevant expenses like education, health, and welfare payments whereas men typically focus on economic/military issues. Secondly, this is supported by the stereotypical view of gender societal roles as women are considered as caregivers (Smith, 2014) while men should act as economic leaders (Koenig et al., 2011; Vikenburt et al., 2011). Furthermore, Funk and Gathmann (2014) find that women spend less on agriculture, and Funk and Phillips (2018) report women spending less on municipal transportation; both of which are components of the economic activity category.

We cannot conclude whether women spend more/less on education and site and housing management expenses.

RDD regressions for *education* expenses show contradicting and highly significant results. The main difference between the two estimations is the maximum margin of victory/loss for a woman mayor. The RDD using a smaller bandwidth, thus, observations of closer election races, indicates a negative coefficient, which is consistent with the results of our FE regression as well. Nevertheless, the RDD using a larger bandwidth shows a significant positive result, which is persistent even when increasing bandwidth even further. When looking at the existing literature we find no unanimity as well. The research by Chattopadhyay and Duflo (2004) reports that women are less concerned about education-related matters, while other researchers have found evidence for the effect being positive (Funk & Phillips, 2018) or non-existent (Gagliarducci & Paserman, 2011). As we find no common explanation in our sample or the literature, we look for a qualitative assessment of the election and budgeting process (and promises made by the potential mayors). For instance, since education is the largest expense category, it might be used as a trade-off to fulfill close election promises regarding other expense categories. M. Pūķis provides a potential explanation for the conflicting results, stating that the expenses related to education are largely mandatory, and the differences across municipalities are determined by the municipality's ability to obtain investments from the leading national parties.

When looking at *site and housing management* expenses, results are not robust as we see coefficients with p-values below 0.01 indicating opposite effects. The coefficient turns negative when the bandwidth is doubled and stays negative when further increasing the

bandwidth, which would be a result consistent with the previous literature (Funk & Phillips, 2018). According to M. Pūķis territorial improvements is an obligatory duty for each municipality but housing management is a voluntary decision, thus, possibly conclusive results could be obtained by dividing this expense category even further.

There are no differences between genders in recreation, culture, and religion expenses.

The coefficients are insignificant in both RDD regressions despite the initial significant negative coefficient in pooled OLS. Since we cannot rely on the OLS estimations due to potential omitted municipality characteristics, we conclude that the spending fraction on recreation, culture, and religion is similar for both genders. As suggested by M. Pūķis, it would be worth dividing expenses more specifically to explain the tendency as this expense category involves obligatory undertakings and even more voluntary municipal activities.

6.3. Results in the context of Latvia

This subchapter is devoted to a review of our results in the specific context of Latvian local governments. To do so, we have conducted an interview with L. Metla-Rozentāle in search of an opinion by a political expert familiar with Latvian local and gender politics. General governance spending, economic activity, and public order and safety expenses generated highly significant results with both RDD specifications with the magnitude of effects being similar.

We see this as evidence that there are expense categories that close-run elected women mayors prefer more than their male counterparts. Nevertheless, there are categories such as health or education expenses which are not as significantly different as we would expect from prior literature.

L. Metla-Rozentāle notes that the overall lack of differences might be explained by Latvia's political background. Historically, under the Soviet system, there were no distinct gender roles – although men had more “masculine jobs”, the jobs that women did were not necessarily “feminine” (e.g., they drove tractors or were construction workers). This has had effects on the societies of the Post-Soviet democratic countries, such as Latvia. Within these societies, there are no distinct “caretaker” or “provider” roles as it is often common for western cultures, for instance, Germany, Italy, or the U.S, on the likes of which we base our

literature analysis. We conclude that in the western world, the societal background and gender roles might be more differentiated than in post-communist countries.

The magnitude of some of the effects we find is comparatively small (e.g., health, public order and safety expenses). As per L. Metla-Rozentāle, politics, as compared to business, gives less personal freedom to support one's priorities or interests, as politicians are responsible for serving the whole society (i.e., the median voter). She also acknowledges that the mayor does not make budget allocation-related decisions individually, as different committees, and, of course, the coalition is involved. Still, she mentions that this might not be the case in smaller municipalities, where the mayor might have more influence. The discrepancy between large and small municipalities, in essence, stems from the leaders' *de facto* influence in the planning process, which is similar to the findings of Jones and Olken (2005), who compare autocratic and democratic nations. They find little leader effects in complex democratic systems, which increase in magnitude as the institutional structure becomes more authoritative. In the case of small municipalities, the mayor's gender might indeed play a larger role, and this goes in line with our data as most close election races in our sample have happened in smaller municipalities.

Finally, as suggested by L. Metla-Rozentāle, it may be insightful to look at the gender representation across the whole council and evaluate the impact that the share of women politicians in the municipal council has on the budget allocated for different expense categories. Assuming there is some degree of substantive representation, the overall structure of the council might host larger effects in democratic institutions. Nevertheless, this requires additional granular data on the full composition of the municipal council to determine the council composition at any point in time. As we have such granular data only on the mayors, which we collected through personal communication with municipalities, similar research for the whole council should be further conducted with an expanded dataset.

6.4. Robustness tests

To evaluate the robustness of our results, we conduct a density test on the assignment variable to evaluate the assumption that the individual candidates cannot precisely influence the election outcomes. Moreover, as done by Freier and Thomasius (2015), we specify two placebo regressions, changing the threshold for the assignment variable – margin of victory – from 0 to +10% and -10%.

Lee and Lemieux (2010) and McCrary (2008) suggest testing whether there is no manipulation of the outcome among the individuals. In our case, this tests the assumption that close enough to the threshold of being the winning party of the elections, individuals are

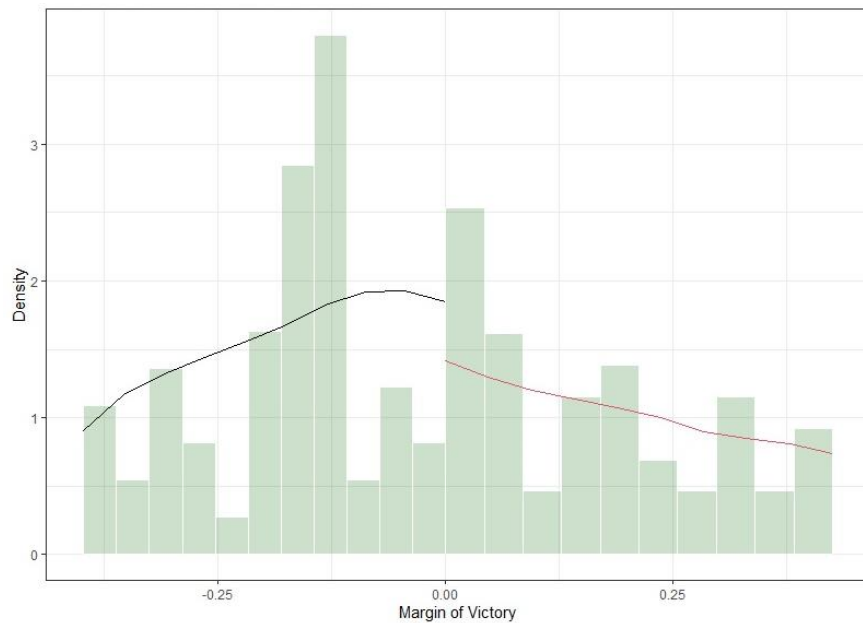


Figure 2. *Density test of the assignment variable*

assigned to the winning or the losing side randomly and are not able to precisely affect the outcome. To do this, we plot a histogram of the running variable and its densities for each side of the cutoff, depicted in Figure 2.

The density test rejects the null hypothesis of no discontinuity of density at the cut-off at the 99% significance level. This casts doubt on the assumption of a continuous distribution around the threshold, as we also observe a consistently lower number of observations in our regressions just left of the threshold. This could potentially be attributable to random chance because of the small sample size on both sides of the threshold, amplifying the proportional differences. Nevertheless, the results of our research should still be interpreted with caution, as it appears that there might be some degree of sorting around the threshold, with female candidates that are close to the threshold also being more likely to cross the threshold.

To test the validity of our results, we run two placebo regressions for each dependent variable, as done by Freier and Thomasius (2015). Finding significant results in the placebo regressions might indicate that our actual results stem from a coincidental difference between the two sides of the sample, not actual mayor gender effects. For the first specification of the two placebo regressions, we set an artificial cut-off point at 10% (meaning the female mayor candidate would need to have a margin of victory of at least 10% for the municipality to be

considered to have a female mayor), and for the second, a threshold of -10% (meaning the female candidate could lose by up to 10% and still be considered mayor). These regressions allow us to test the validity of our identification assumption – that the assignment variable has a discontinuity at value 0 which creates a shift in the municipality mayor's gender. We depict the results from these regressions in Appendix J.

Seeing most of the coefficients turn insignificant allows us to affirm the validity of our assignment variable. Moreover, we gain confidence in the difference being more pronounced at the true threshold, reducing the likelihood of our results stemming from random differences in the samples.

7. Limitations and further research

Looking at our dataset, the issue pointed out by Rocha et al. (2018) – that women in their sample consistently have a higher level of education – does not plague our sample as women and men have approximately the same level of education. Moreover, we see that women and men have roughly the same experience in the mayor's office, age, and experience in the public sector, too (Appendix E). Despite this, we notice that there are some consistent differences in the backgrounds of mayors – a pedagogy or social sciences education background is more common for the women mayors in our dataset, while an engineering and construction background is more prevalent for men (Appendix B). The educational background could be an omitted variable, possibly biasing our results. Moreover, the results from the density test indicate that sorting around the threshold might create bias as well.

Another limitation concerns the way expense categories are accounted for. There is a degree of freedom for the mayor to choose how certain expenses will be classified in the budget. This can create inaccuracies in estimates; however, the effect should not be present given enough observations unless there is a consistent difference between genders in how they record the same expenses. If so, this can bias results and, unfortunately, we cannot test this within the span of our data set. Also, we also cannot make conclusions on the magnitude of any effects, as there are few observations of close elections within our sample. Another drawback we see is that these measurements do not identify the efficiency and productivity of the allocated resources, creating an obstacle in discussing gender priorities, as the results might instead stem from management abilities. In addition, the methodology we use to calculate the margin of victory in proportional elections, as well as the fact that the elections do not directly determine the mayor, might both cause our estimates to be inefficient. This can create potential for future research in an electoral system where the mayor is directly elected and a sharp discontinuity with a reliable margin of victory can be used.

We see a potential to expand this research in several directions. Firstly, the created data set is extensive and there is a possibility to research the effects of other mayoral characteristics as age, tenure, income. Additionally, it would be useful to explore the specifics of the decision-making processes in municipal councils by researching the gender balance (on a council level) effects on budgetary expense categories. Lastly, to gain an even better understanding of the trends that persist in the Post-Soviet political regimes, it would be worth conducting, for instance, a cross-Baltic comparison with a similar research focus.

8. Conclusion

This research contributes to the existing public choice literature that examines the effect of individuals' characteristics (such as age, race, gender, prior professional experience, political affiliation, and others) on the economic and/or political outcomes of public institutions. Specifically, we focus on the local government setting and mayor's gender by examining resource allocation to different budgetary expense categories (Appendix A) in the case of Latvian municipalities between 2009 and 2019.

We find that women mayors spend more on health, environment expenses, and social protection expenses. On the other hand, they spend less on general governance and economic activity expenses. Going against the gathered academic evidence, women mayors spend more on public order and safety but the effect on site and housing management and education expenses is inconclusive, and, thus, further research is needed for these functional categories. Finally, there are no gender differences in recreation, culture, and religion expenses. We interpret our results with caution, as a density test reveals evidence of sorting, with close election races being more likely to turn in favor of women candidates. Despite this, we see that our conclusions are largely in agreement with prior literature, indicating that women do, in fact, opt for spending more on women issues, while men spend more on traditionally masculine issues.

Moreover, we find some evidence that gender effects on policy preferences and/or budget allocation among post-soviet country political leaders slightly differ from other regions, which might be explored further in future research. Our research is further relevant for legislators and academics in developing and researching institutional framework regarding gender representation. Many governments are pursuing gender quotas, long term gender participation rates and other tools for equalizing gender representation in politics. Even though the differences between genders for a single institution may be rather small, the findings we provide are a part of a larger pool of evidence indicating that female representation in politics may well amount to women's interests obtaining more attention in decision-making.

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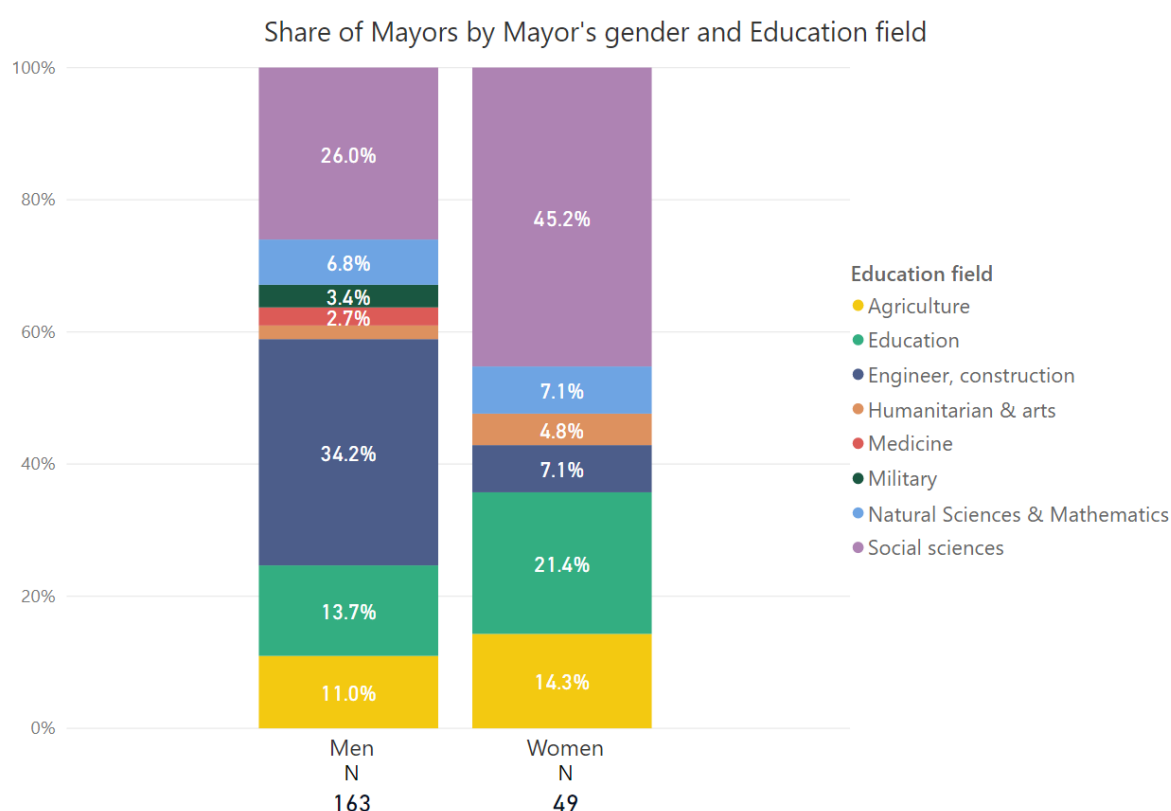
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10. Appendices

Appendix A. Municipal budget expense categories (Noteikumi par budžetu izdevumu klasifikāciju atbilstoši funkcionālajām kategorijām, 2005) and our classification.

Municipal budget expense category	Economic (E) or social (S) expenses	Contents of the category
Health	S	Public health and its institutions
Education	S	Public education and its institutions
Social protection	S	Subsidies and transfers for socially disadvantaged
Public order and safety	S	Safety and lawfulness of all municipality's inhabitants
Recreation, culture, and religion	S	Public sports and culture initiatives
General governance spending	E	General functioning of a municipality and diplomatic relations
Site and housing management	E	Utilities and construction development
Economic activity	E	Business activities, employment, and agriculture
Environment protection	E	Natural resources and sewage
Defense	Excluded because of too few municipalities having such expense category	

Appendix B. Share of mayors by gender and education field.



Appendix C. Vote share calculation example for Latvian municipal elections.

The vote share calculation procedure is described in Law on Elections of the Republic City Council and Municipality Council (Section 41). To illustrate an example, we use election results for the republic city of Valmiera in 2017 (Centrālā vēlēšanu komisija, n.d.). As Valmiera had a population of just under 25,000 in 2017, it elected 13 Council members (Centrālā Statistikas Pārvalde, 2020; Law on Elections of the Republic City Council and Municipality Council, Section 2). A table of the election outcome is shown:

Nr.	Candidate list/party	Valid ballots	Vote share	Registered Candidates
1.	"Valmierai un Vidzemei"	5575	60.9%	16
2.	Zaļo un Zemnieku savienība	1401	15.3%	16
3.	Nacionālā apvienība „Visu Latvijai!” – „Tēvzemei un Brīvībai/LNNK”	904	9.9%	15
4.	Partija "VIENOTĪBA"	642	7.0%	12
5.	Politiskā partija "KPV LV"	336	3.7%	7
6.	"Saskaņa" sociāldemokrātiskā partija	292	3.2%	15

In order to determine the number of seats for each party, we must first exclude the parties which did not cross the vote share threshold of 5% (of all valid ballots), thus leaving us with only parties 1 through 4 to consider.

To calculate the number of seats for each candidate list, the Webster/Sainte-Laguë method is applied: for each party, the party's votes are divided by 1, 3, 5, 7, and so forth, until the number of iterations equals the number of candidates within the party. The result after each division is saved in a list before moving on to the next division. An example of this process for party 1 ("*Valmierai un Vidzemei*") is illustrated:

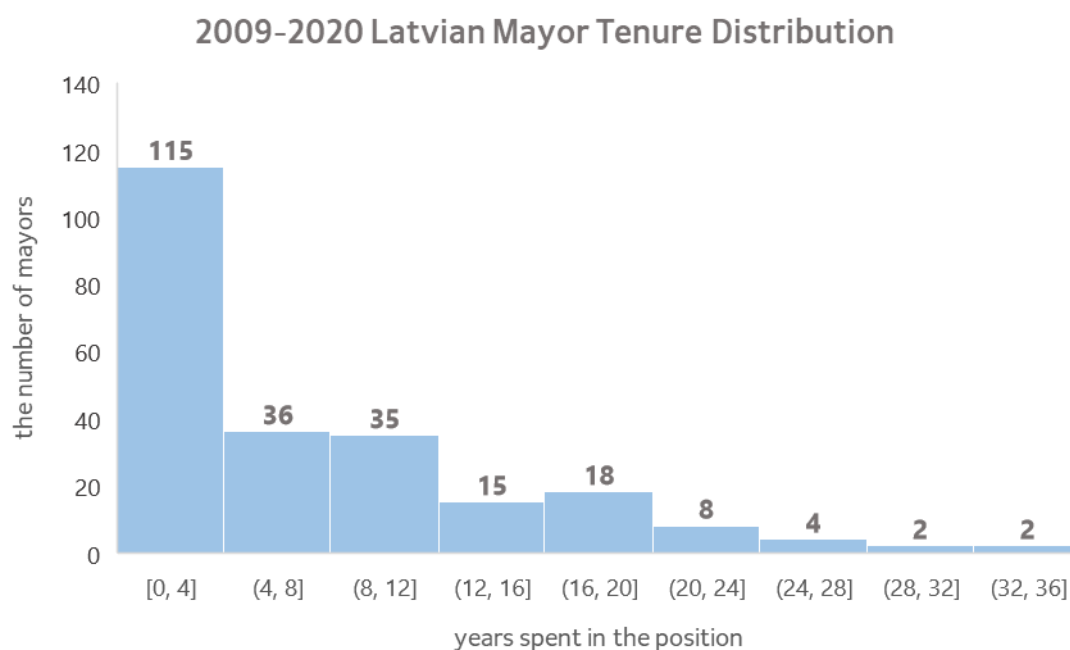
Iteration	Denominator	"Valmierai un Vidzemei" result
1	1	5575.00
2	3	1858.33
3	5	1115.00
...		
15	29	192.24
16	31	179.84

Once this procedure has been done for all parties, all of the division results are sorted in descending order, with the top 13 results indicating the allocation of seats between the parties:

Rank	Division result	Party
1	5,575.00	"Valmierai un Vidzemei"
2	1,858.33	"Valmierai un Vidzemei"
3	1,401.00	Zaļo un Zemnieku savienība
...		
12	371.67	"Valmierai un Vidzemei"
13	327.94	"Valmierai un Vidzemei"
14	301.33	Nacionālā apvienība „Visu Latvijai!” – „Tēvzemei un Brīvībai/LNNK”
15	293.42	"Valmierai un Vidzemei"

In the top 13 results, the party *"Valmierai un Vidzemei"* shows up nine times, thus allocating seats to nine candidates ranked highest on the party's ballot. Similarly, *Zaļo un Zemnieku savienība* receive two seats, while *Nacionālā apvienība „Visu Latvijai!” – „Tēvzemei un Brīvībai/LNNK”* and *Partija "VIENOTĪBA"* receive one seat each.

Appendix D. Histogram of the number of years spent in the mayoral position and the corresponding number of mayors.



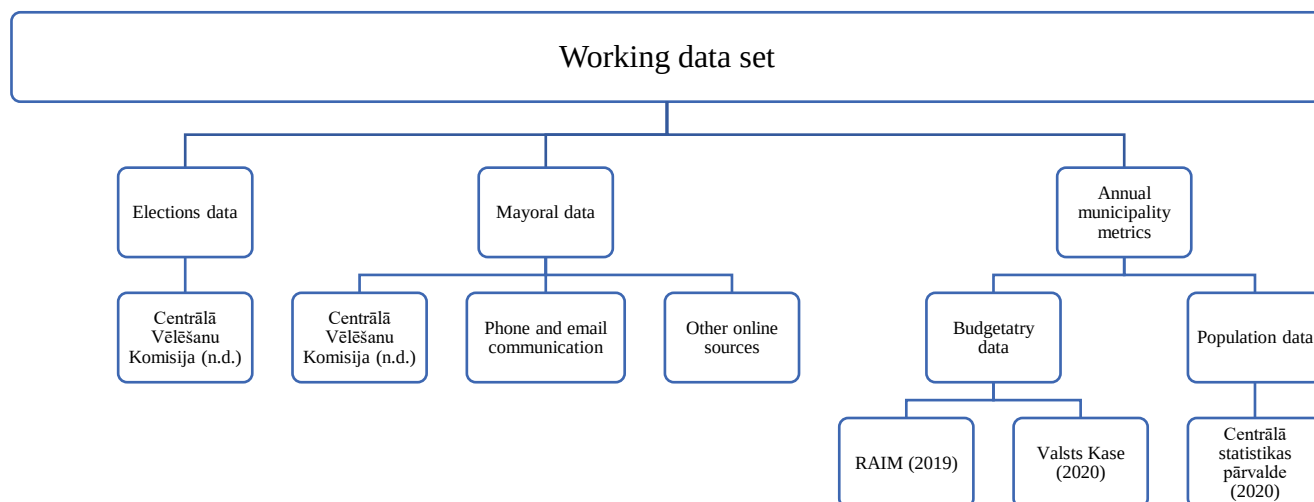
Appendix E. Descriptive statistics of mayors.

Mayoral descriptive statistics		
Statistics/Gender	Male	Female
Number of mayors	163	49
Average age	54.7	54.3
Average tenure	8.8 years	7.4 years
Median tenure	6.5 years	6.5 years
Median annual salary	22,122.3 €	18,708.6 €
Mayors with experience in public sector	80.37%	87.76%
Mayors with higher education	87.73%	95.92%
Summary statistics exclude temporary acting mayors and mayors who do not affect any of the municipal budgetary years according to the classification explained in chapter 4.4.		

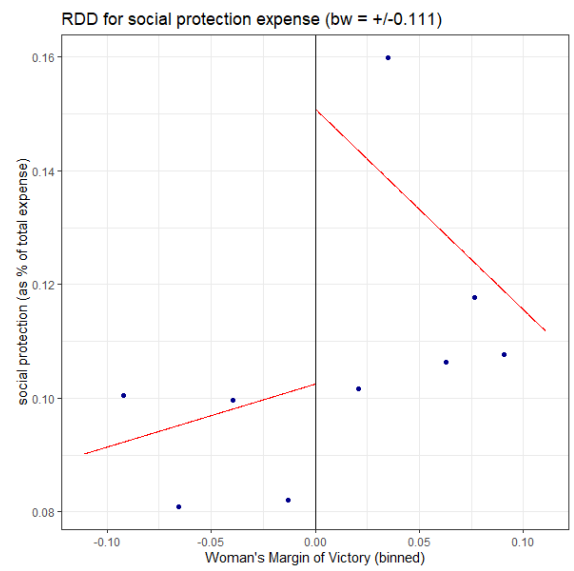
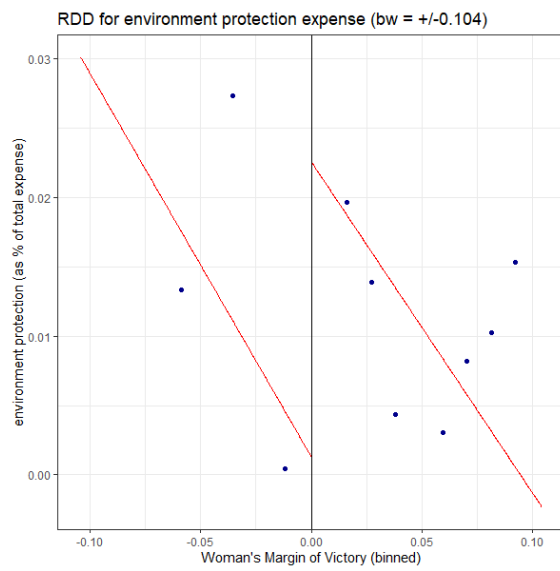
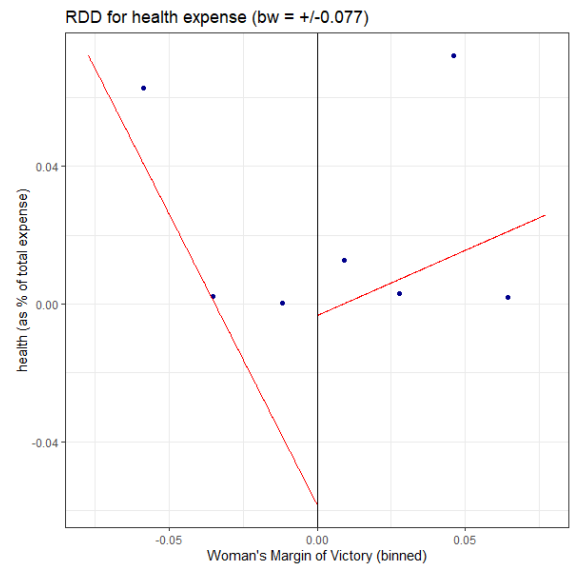
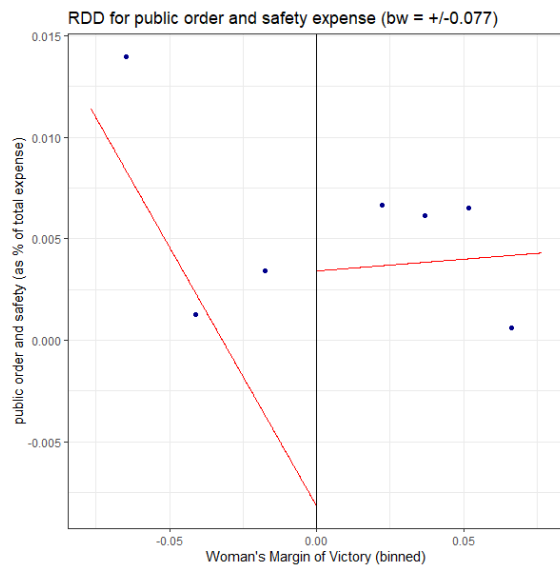
Appendix F. Descriptive statistics of municipal data.

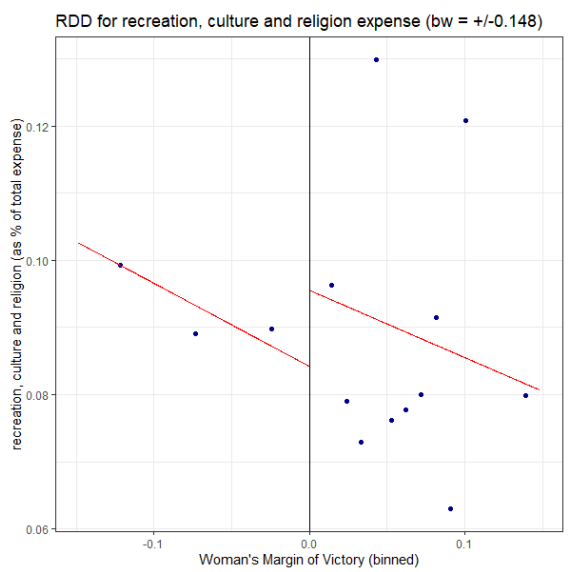
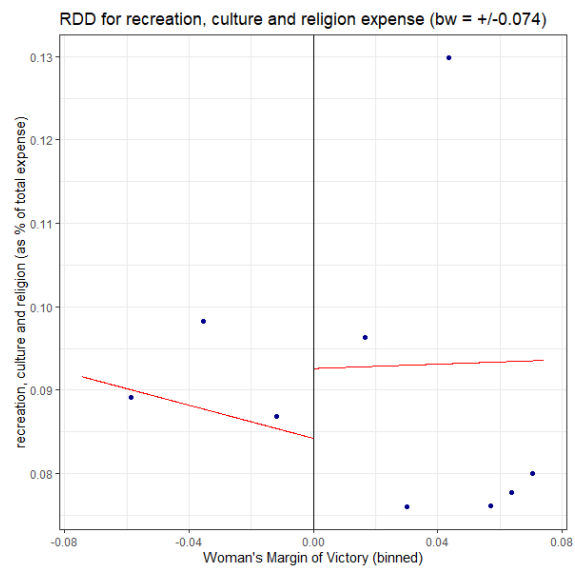
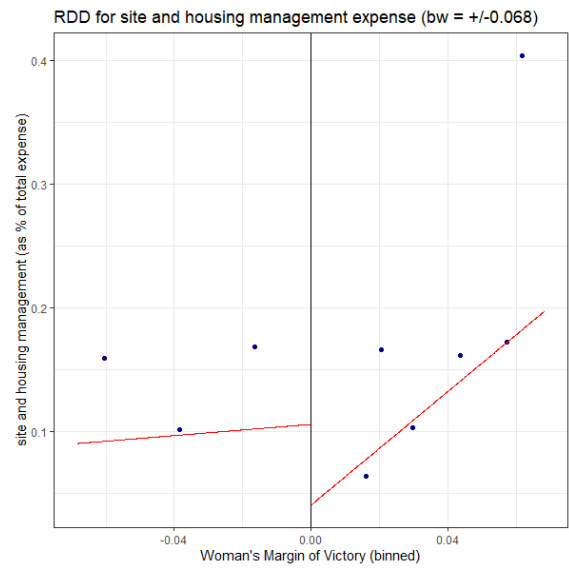
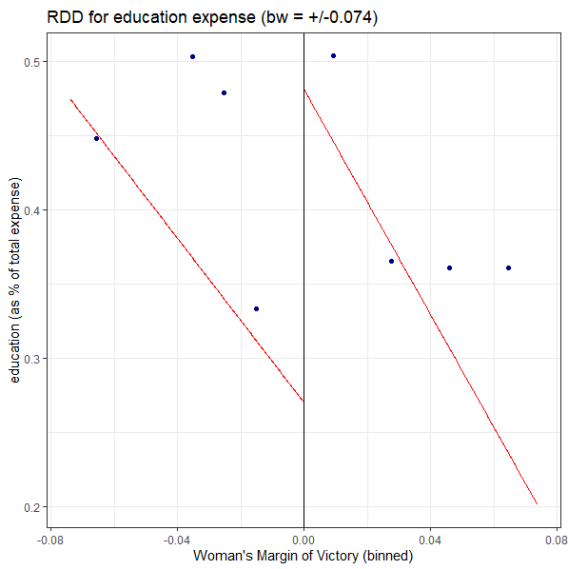
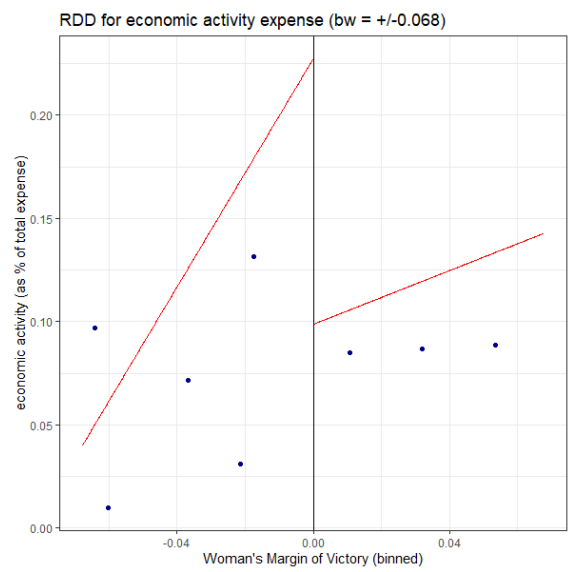
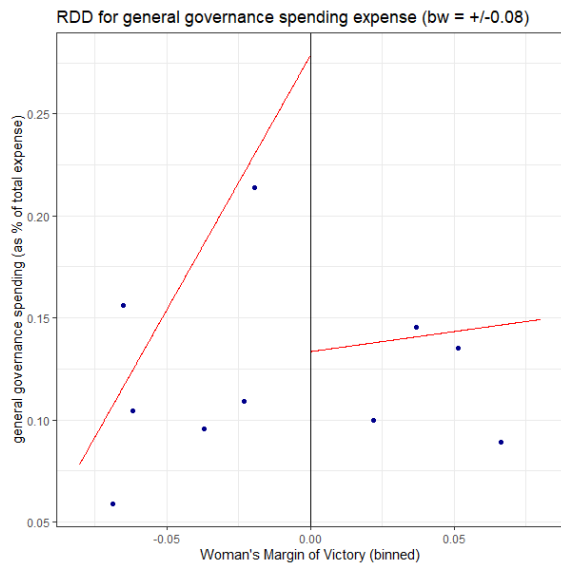
Municipal data descriptive statistics							
Variable	Min	25 th percentile	Median	Mean	75 th percentile	Max	St. dev.
Budget expense categories (in % of total expenses)							
Education	13.85	36.31	42.48	42.27	47.84	72.75	9.17
Site housing management	0.00	8.19	12.95	15.04	20.10	59.31	9.61
General governance spending	2.47	8.49	10.66	11.40	13.51	33.15	4.37
Recreation, culture, and religion	2.01	6.82	8.81	9.61	11.33	47.44	4.39
Social protection	1.79	6.26	8.32	9.34	10.86	31.15	4.84
Economic activity	0.00	2.95	6.62	8.98	12.92	58.77	8.48
Environment Protection	0.00	0.08	0.47	1.74	2.09	37.31	3.58
Public order and safety	0.00	0.41	0.92	1.11	1.56	5.98	0.98
Health	0.00	0.00	0.15	0.50	0.43	11.37	1.25
Defense expense	0.00	0.00	0.00	0.00	0.00	0.14	0.01
Municipal population and total expenses							
Variable	Min	25 th percentile	Median	Mean	75 th percentile	Max	St. dev.
Population	1 038	3 681	6 775	18 427	14 789	704 476	66 824
Total expenses (in EUR)	1 381 098	4 156 813	7 410 600	20 369 120	16 814 963	972 047 672	75 498 130

Appendix G. Working data set visualization.



Appendix H. RDD regression plots.





Appendix I. Possible explanation of our results by M. Pūķis.

Expense Category	Our results	Expert's opinion (M.Pūķis, Dr. oec., the associated professor at the University of Latvia and senior adviser of the Latvian Association of Local and Regional Governments)
General governance spending	Women spend less	-
Public order and safety	Women spend more	-
Economic activity	Women spend less	Men are more tended to focus on technological solutions for a general development
Environment protection	Women spend more	This is more of a national-level competency. There is a high level of freedom of municipal involvement in environmental activities. Possibly, women mayors are more affected by the green politics propaganda.
Site and housing management	Inconclusive differences	Territorial management/development is an obligatory activity for the municipality whereas housing management can be taken up voluntarily. This may explain the inconsistencies in the results.
Health	Women spend more	Ensuring healthcare accessibility is also a voluntary decision. Women might be less critical in this aspect – easily influenced to spend more on health.
Recreation, culture, and religion	Inconclusive relationship	It would be worth dividing expenses more specifically to explain the tendency as this expense category involve obligatory undertakings and even more voluntary municipal activities.
Education	Inconclusive relationship	These expenses are mainly obligatory for every municipality. The main differences in spending across different municipalities might be explained by their ability to attract funds from the national-government parties.
Social protection	Women spend more	The expense category relates to a lot of “feminized professions” and issues (similarly to education). Women mayors might show better understanding for “women professions” and treat it as a priority. It might also show their socialism preferences and the importance of improving the national welfare. Men, on the other hand, are more critical towards social equality as the main goal.
General conclusions: Overall, these explanations are very general. From the results, it seems that women mayors are keener to submit to the views of the national-level politicians/ministries. Nevertheless, we do not see very strong effects that would support such a claim. Additionally, in some cases, it is not possible to argue about certain relationships as some expense categories are very aggregated. Worth emphasizing is the fact that administrative expenses do not explain the quality of the mayor's activity and choices but rather show the accounting approach used. It would be useful to examine the differences when the transfers from the Latvian Municipal Equalization fund are excluded.		

Appendix J. The second robustness test - placebo regression results.

Placebo regression results						
Expense category (in % of total expenses)	RDD with an artificial cut-off at 10 %			RDD with an artificial cut-off at -10 %		
	Coefficient	Bandwidth (on both sides)	Observations left right	Coefficient	Bandwidth (on both sides)	Observations left right
General governance spending	0.012 (0.053)	0.065	24 10	-0.047 (0.067)	0.078	51 9
Economic activity	0.086 (0.103)	0.062	24 10	0.339 (0.400)	0.065	41 9
Public order and safety	-0.034*** (0.006)	0.064	24 10	-0.137 (0.701)	0.055	37 7
Health	-0.002 (0.013)	0.073	32 10	0.231 (0.242)	0.133	65 31
Environment protection	-0.004 (0.007)	0.068	24 10	0.100 (0.099)	0.065	41 9
Social protection	-0.040 (NaN)	0.051	18 2	-0.377 (3.185)	0.047	34 7
Site and housing management	-0.001 (0.140)	0.095	40 18	0.062 (0.166)	0.079	53 11
Education	-0.256*** (0.069)	0.095	40 18	0.148** (0.073)	0.037	22 3
Recreation, culture, and religion	NaN (NaN)	NaN	NaN	0.259 (0.940)	0.057	37 7

For each regression, we report the coefficients for a woman being mayor and the standard deviation in parentheses. Regressions include population as a covariate, as per Freier and Thomasius (2015). Significance is identified by the asterisks for coefficients. A p-value between 0.1 and 0.05 is identified by *, between 0.05 and 0.01 by **, and under 0.01 by ***.