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Abstract

I study some economic and institutional drivers of the quality and behaviour of elected politicians. In the first chapter, using a unique database on local politicians in Italian municipalities between 1985 and 1992, I implement a RD analysis to evaluate the causal effect of a wage increase on the characteristics of politicians in local parliamentary systems. I find that higher expected wages attract more educated member of the local council but this positive selection effect actually results in a less educated council-elected mayor. These results are confirmed by other measure of skills (educational attainment and previous occupations).

In the second chapter, using the same database, I take advantage of a double discontinuity to identify the causal effect of the switch from single-party to coalition governments. I exploit an identification strategy based on the difference in discontinuities and I highlight an increase in the quality of the elected mayor in term of years of schooling and previous job.

Finally, in the third chapter, using Italian MPs micro-data, I study some economic determinants of party discipline. In particular, I study the MPs' behaviour during the XVI, XVII and XVIII legislature focusing on their rebellion rate (i.e. their propensity to vote against their party line) and absenteeism rare by using different estimation methods (OLS, Fractional Logit, Poisson). Our results show that outside income is positive correlated with absences and negative correlated with rebel votes.

Acknowledgment

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Chapter No. 1

Political selection and monetary incentives in local parliamentary systems[1]

> "The identity of the next President of these United States is once again in
> the hands of a bunch of self-serving, money-hungry, boot-licking, power-seeking
> politicians who can be seduced or sucker punched or blackmailed into
> submission. And all I need is just one more vote than the other guy."
> (Frank Underwood, Incumbent President of the United States
> in House of Cards, Chapter 57, 2017)

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[1]This chapter is co-authored with my supervisor, Fabio Cerina, and Marco Nieddu

1.1   Introduction

This paper analyses how an indirect election system might interact with the effect of monetary rewards on politicians' quality. Higher wages for leading positions are typically found to attract better candidates when the election system is direct, i.e. when the voters directly cast ballots for the persons or political party that they desire to see elected (Ferraz and Finan, 2009; Gagliarducci and Nannicini, 2013). However, in a system where the voters elect a body which in turn elects the officeholder in question, whether offering higher wages will translate into a better educated leader is much more debatable. Specifically, we study the impact of a high-wage policy on the relative quality of the elected leader within the body – that is, the quality gap between the leader and the candidate leaders who elected her – and whether this would ultimately result – in absolute terms - into a better or worse body-elected leader.[2]

To investigate these issues, we use a rich database on local politicians in Italian municipalities between 1985 and 1992 and we take advantage of a remuneration policy for local administrators which is a step-function of the municipalities' population. We implement a regression-discontinuity analysis around the 5,000 inhabitants threshold (where the mayor's wage increases by around 30%) to evaluate the causal effect of a wage increase on the characteristics (education, previous occupation, gender and age) of councillors (i.e. elected members of the local parliament), mayors (the council-elected leader) and the (also council-elected) members of the executive committee (the collegial body of Mayor's collaboration).

Our identification strategy relies on the assumption that there are no systematic differences between municipalities barely-above and barely-below the 5,000 thresholds except the ones

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[2]As emphasized by Dal Bó and Finan (2018), quality is a loaded term but in the political economy literature it usually indicates performance-relevant traits like competence or integrity. In this paper we focus on the competence (i.e. skills) aspect of quality and, following the literature, we mainly use educational attainment (years of schooling) to proxy the individual quality of an elected politician. However, we also propose alternative measures of politicians' skills for robustness checks in support of our results such as previous occupations

generated by the policy of interest (the increase in the rewards from office). However, the validity of such an assumption is threatened by the presence of a confounding treatment at the 5,000 cutoff: the electoral rule changes from majoritarian to proportional when crossing the same threshold. Since the main implication of this change is the reduction in the probability to observe a single-party government (as opposed to a coalition one), we restrict our attention to *stronghold* municipalities that is, a sample of municipalities where the leading party has a strong-enough support, and thus is likely to obtain the majority of seats and to form a single-party government regardless of the electoral rule.

We provide three main findings. Consistent with the existing literature on the selection of local politicians, we find that (i) higher expected wages result in more educated member of the local council (+0.8 years of schooling, +6.8% with respect to the mean of the control group). However, we also find that (ii) higher educated councillors elect, among themselves, relatively worse educated mayors: while mayors in control councils are 1.5 years more educated than the mean councillor, this difference almost totally vanishes in the treated group. While this result might be simply explained as a mechanical "ceiling" effect (if councillors' education increases more than for mayors because the education of the latters is already too high) quite surprisingly, we find that this is not the case since (iii) the council-elected mayor turns up being less educated in high-wage councils (-0.9 years of schooling, 6,7% less with respect to their less paid colleagues in less populated municipalities).

These results are strongly significant and their sign is confirmed when we use different measures of quality. Specifically, treated councillors are 17% more likely to have at least a degree and 16% more likely to having been employed as a white-collar worker. By contrast, treated mayors are 40% less likely to be graduated and 16% less likely to be white-collar. Finally, to further investigate the negative impact of higher wages on the relative quality of mayor with respect to the council who elected her, we perform an RD analysis on the change of the

entire skill within the councils at the 5000 threshold. We find a significant reduction in how the mayor ranks with respect to her council as far as years of schooling are concerned: while in municipalities just below the 5000 threshold the elected mayor is on average the 7th more educated councillor out of 20, she becomes the 9th just above the threshold.

Taken together, our results imply that higher wages are effective in attracting better educated councillors, but they do not result in a better educated mayor. However, we find evidence that the members of the executive committee are better educated in higher-pay municipalities (the wage of the executive committee also increases at the cutoff from 0 to 45% of the mayor's pay): better educated councillors elected above the threshold are more likely to become executives.

When exploring the mechanisms underlying our results, we evaluate two potential (and not mutually exclusive) channels. The first one is *preferences-driven*: better educated councillors shy away from better paid but full-time positions (mayors), rather opting for less-paid but more flexible positions (executives) which allow them to enjoy an income outside their public office. The second one is *party-driven:* as argued by several works[3], parties might have an incentive to prevent skilled politicians from reaching top positions and might rather support the appointment of low-quality politicians. According to Cerina and Deidda (2017), low-quality politicians have more re-election concerns because their outside option is lower and are thus more likely to follow the party line and be loyal to the party leadership. Accordingly, some parties, feeling "threatened" by the better pool of candidates for the mayor position, might react by favoring or even imposing the election of a relatively low-quality and hence more loyal mayor. Although disentangling between these two explanations is challenging, suggestive evidence supports the party-driven explanation. As long as the possibility to *moonlight* is not invariant across occupations (being higher in occupations with flexible schedules), the preference-driven mechanism would imply some heterogeneity in the way oc-

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[3]Besley (2005) among the others

cupational shares of executives (who can moonlight) and mayors (who cannot) respond to higher wages at the threshold. Regression-discontinuity estimates on council members' occupations do not support this hypothesis. Moreover, our results are heterogeneous depending on the leading party which controls the stronghold municipalities. Although in both left- (PCI) and center-right-strongholds (DC) higher wages attract better educated politicians, only in the latter subgroups the elected mayor ends up being less-educated. This result can reflect differences in party propensity to control local governments and centralize political decisions, thus further pointing towards a party-driven explanation.

Our work suggests that the effects of monetary incentives are not invariant across different institutional setting. In fact, our results can be directly compared to those of Gagliarducci and Nannicini ([2013]). They perform a similar RD analysis on Italian municipalities at the same 5,000 threshold but, crucially, they focus on a different time span, 1993-2001 when a presidential rather than a parliamentary form of local government was in place. Accordingly, the mayor is directly elected by citizens (who write her name in the ballot) rather than by the council. Under this different institutional scenario, they find a positive and significant effect of the same wage increase for both mayors and candidate mayors. Interestingly, the magnitude of their estimated jump in years of schooling at the 5,000 cutoff is very close to the one we find for councillors, the only directly elected politicians in our framework. These results suggest that that parliamentary stage of the election process has a key role in undoing or even reversing the positive impacts that monetary incentives has on the quality of councillors. This implication is a relevant one because, even if the parliamentary form of government has been replaced by a presidential one in Italy, it is still currently widespread in many European countries.[4]

More generally, our results are related to the literaure on politicians' quality, and its impli-

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[4]Local parliamentary system are in place in Ireland, France, Portugal, Sweden, Czech Republic, Croatia, Denmark, Estonia, Finland, Latvia, Lithuania, Norway and in most UK and Russian municipalities (http://www.citymayors.com/government/europe_mayors.html)

cation on general well-being. Good policies are also the result of good politicians, both at the national (Besley, Montalvo, and Reynal-Querol (2011), Jones and Olken (2005) among others) and the local level (Chattopadhyay and Duflo (2004) and Meyersson (2014) among others). The thriving literature on topics related to political selection seems therefore highly motivated[5]. One of the question that received more attention is whether we can "buy" better politicians. However, the evidence on whether higher rewards from office improve politicians' quality remains inconclusive. On the one hand, some recent works support the case for a positive causal relationship between the wage and quality (commonly proxied with educational attainment and previous occupations) of elected local politicians. Beside the above cited Gagliarducci and Nannicini (2013) (for Italian municipalities), these works include Dal Bó, Finan, and Rossi (2013) (for Mexican municipalities), Ferraz and Finan (2009) (for Brazilian municipalities) and Dal Bó, Finan, Folke, et al. (2017) (for Sweden municipalities). On the other hand, other works focusing on politicians at the national or sovra-national level find no significant evidence of a positive causal relationship between pay and quality (as in Kotakorpi and Poutvaara (2011) and Hoffman and Lyons (2015) focusing respectively on Finnish and U.S. legislators) or even suggest that such a relationship is actually negative (as in Fisman et al. (2015) and Braendle (2015), both focusing on members of the European Parliament). Our paper contributes to and extends this empirical literature by providing new insights on the drivers and features that shape the causal relationship between wage and quality of local politicians. In particular: 1) we focus on local politicians at three different levels (councillors, executives and mayor) and, most importantly, 2) we identify of a novel channel, that of the parliamentary stage of the election process, through which the relationship between wage and quality may interact. We also relate to a number of other recent works dealing with the impacts of electoral and mayors' selection rules. Gulino (2020) also uses micro-level data on

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[5]Recent developments on political selection are recently surveyed and discussed by Dal Bó and Finan (2018).

Italian municipal election focusing on the pre-1993 period to evaluate how the change from majority to proportional rule at the 5,000 threshold affects the probability of re-election of mayors. Hessami (2018) exploits a quasi-experiment at the level of German municipalities to study the effect of the selection rule for mayors on their policy choices finding that directly elected mayors attract significanlty more grants in election years while there is no cycle for council-elected mayors. Finally, Enikolopov (2014) focuses on U.S. local government to study the difference between directly elected vs. council-appointed mayors on politically motivated targeted redistribution finding that appointed bureaucrats are less likely to use targeted redistribution than elected politicians and that this difference is, at least in part, driven by the difference in their career concerns. The rest of the paper is organized as follows. Section 1.2 presents the institutional framework while the identification strategy is described in Section 1.3. In Section 1.4 we presents the data while our main results are examined and discussed in Section 1.5. In Section 1.6 we perform an heterogeneity analysis and discuss candidate mechanisms. Finally, Section 1.7 concludes.

1.2   Institutional setting

1.2.1   Italian municipalities and their form of local government

We focus on the elections of mayors in Italian municipalities (comuni) from 1985 to 1992. Municipalities are the third and least level of administrative divisions in the Italian state. Their extent of administrative autonomy is such that municipal policies have a significant impact on population's welfare. Municipalities are responsible for the provision of public housing, transportation and nursery schools, and for the assistance of elderly people. Moreover they record the acts, the births and deaths, they are responsible of the street, garbage and park management, and the delivery a number of other service to the citizens (from water

supply to waste management, municipal police to infrastructure, and from housing to welfare policies). The government of the municipality is composed by the following bodies:

- **The Elected Council** (*Consiglio Comunale*), represents the local parliament and holds the legislative power with the mayor (it might or might not approve the policies promoted by the local government);

- **The Mayor** (*Sindaco*) is the head of the local government and holds the legislative and executive power;

- **The Executive Committee** (*Giunta*), is the local government of the municipality and represents the collegial body of Mayor's collaboration.

This broad structure has been time-invariant since 1964 up to nowadays but on March 25, 1993, the National Parliament approved the Law no. 81 which represented a radical change in the form of the local government which shifted from a parliamentary to a presidential one. The municipality's electoral system up to 1992 was ruled by the DPR 570/1960 and by the L.663/1964. While some aspects of this electoral system varied across population thresholds, the same form of the local government, a parliamentary one, was shared by all the municipalities, unregarding their population size.

In particular:

1. citizens could only vote for parties and local member of the council;

2. after the election the councillors met to appoint the mayor and the executive committee from *within their own ranks*;

3. the government form was a parliamentary one (i.e. the mayor and the executive commitee had to ask for the "fiducia" to the council).

According to Baldini (2002), all these features responded to a specific need: "to ensure close party control over local governmental activities and - at the same time - to prevent the mayor from consolidating any degree of autonomous leadership" (p. 365). This situation led to "frequent conflicts between mayors who where trying to establish their autonomy and the parties that dominated the administration" (ibid.) and "the life of the executive was indeed permanently dependent on agreements between political parties both inside the council and at the national level." (ibid.).

The 1993 reform introduced the following main changes: 1) citizens can vote directly for the mayor, and not only for the parties and local councillors; 2) the executive committee is chosen by the mayor who can rectruit the members of the executive committee even outside the council; 3) while the survival of the executive is still dependent on the council support (mayors can still be defeated by a no confidence vote by the council), the life of these two institutions is not separate: if the executive committee falls, the council cannot elect another one and new elections are called for for mayor and council[6]. All in all, the 1993 reform entailed a substantial shift of political power from the elected council (which was strongly influenced by national parties' leaderships) to the Mayor and citizens who directly votes for her/him. Voters have now more influence, mayors are more powerful and autonomous from parties but they are also more accountable (ibid.).

1.2.2 Politicians' wage across population thresholds

Since 1963[7], the remuneration of the mayor is an increasing step function of the resident population size in the municipality, as measured by the national Census that takes place every ten years. From 1974 up to 1999, it sharply changes at seven different thresholds while in

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[6]The 1993 introduced other changes in the framework of representation and in the rules converting votes into seats but these aspects are of less interest for our purposes.

[7]The municipality's allowance system then was ruled by the Law n. 148 - 1963 subsequently slightly modified by Law n. 169 - 1974, Law n. 632 - 1979, and finally by the Law n. 816 - 1985

2000 two new thresholds were introduced. Nominal salaries have been adjusted almost every year to account for price inflation, so that real values within each population bracket have remained almost unchanged, in line with the trend in national per capita income. Column 4 to 7 of table 1.1 reports the details of this step function in the period 1985-1992 for the first 4 population thresholds[8].

Table 1.1: Legislative thresholds for Italian Municipalities 1985-1992

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Population	Size Council	Size Ex. comm.	Wage Mayor	Wage Ex. comm.	Wage Council	Fee Council	Electoral Rule
Below 3,000	15	4	1,446	0%	0%	18	Majority
3,000-5,000	**20**	**6**	**2,169**	**0%**	**0%**	**18**	**Majority**
5,000-10,000	**20**	**6**	**2,789**	**45%**	**0%**	**18**	**Proportional**
10,000-30,000	30	6	3,099	45%	0%	22	Proportional

Notes: Population is the number of resident inhabitants as measured by the last available Census. Wage Mayor is the montly gross wage of the mayor and is measured in euros at 2000 prices. Wage Ex. Comm. and Wage Council are the monthly gross wage of the members of the executive committee and the councillors respectively and are expressed as a percentage of the former. Fee Council is the reimbursement per session paid to councillors and is measured in euros. Size Ex. Comm.is the maximum allowed number of executives. Size Councilis the number of seats in the City Council. Electoral rule refers to the way votes are transformed into council seats and can be either Majority or Proportional (a more detailed description of the electoral rule is developed below).

As far as the 5,000 threshold is concerned, the mayor's wage increase sharply from 2,169 to 2,789 euros in terms of 2000 prices, an almost 30% increase[9]. At the same time, the executives' remuneration increased from a fraction of 0% to 45% the mayor's remuneration, meaning that each executive just above the 5,000 inhabitants earns an equivalent to 1,255

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[8]As observed by Gagliarducci and Nannicini (2013), "The average real disposable income remained almost unchanged from the beginning to the end of the 1990s in Italy, decreasing in the first half and returning to the initial level in the second half. Since adjustments were applied uniformly to all municipalities, the relative wage between different population brackets also remained identical across time." (p. 377).

[9]These numbers are based on table 1 by Gagliarducci and Nannicini (ibid.) and table 2 of Grembi, Nannicini, and Troiano (2016).

euros in 2000 prices, compared to a compensation equal to 0 for his colleague in a municipality just below 5,000. By contrast, column 6 and 7 show that the remuneration of councillors is invariant across the 5,000 threshold, being 0 for its fixed part and 18 euros for its variable part (reimboursement per session) both above and below the threshold. However, since both mayors and executives are appointed *by the councillors among themselves*, each councillor has an ex-ante positive expected wage and the latter sharply increases above the 5,000 thresholds[10].

1.2.3 Electoral rules across the 5000 threshold

As we can see from table 1.1, the remuneration of mayors and executives is not the only policy which varies across thresholds. This is the case for the electoral rule, which changes exactly at the 5,000 threshold. Until 1993, the municipality's electoral system was ruled by the DPR 570 del 1960 and by the Legge 663 del 1964. The differences and similarities between these two electoral rules are summarized by table 1.2

Besides all the technicalities, to our purposes the main difference between these two system is the rule transforming votes to seats[11]. Below 5,000 inhabitants, the party obtaining the relative majority of votes is able to gain the absolute majority of seats (i.e. not less than 10) whatever their share of citizens' votes. This is not the case in municipalities above 5,000

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[10]To give an example, assuming that the unconditional probability of being appointed as mayor for the *representative* councillor is equal to $\frac{1}{Council\ size}$ while that of becoming executive is $\frac{Giunta\ size-1}{Council\ size}$, then the expected wage of the representative member of the council in a municipality with population p, $E[w_{c,p}]$, is

$$E[w_{c,p}] = w_{m,p} \left(\frac{1}{Council\ size_p} + f_p \frac{Giunta\ size_p - 1}{Council\ size_p} \right)$$

where $w_{m,p}$ is the mayor's wage in municipalities with population p (column 4) and f_p is the remuneration of executives in municipalities with population p expressed as fraction of the mayor's remuneration (column 5). This expression entails an increase of the expected wage for the representative councillor from around 108 euros below 5,000 inhabitants to around 453 euros above 5,000, more than a fourfold increase.

[11]Another difference, not important for our purposes, is that voters in the party-list proportional system must write in the name of the councillors for whom they want to vote, while in the plurality system the ballot paper contains all the names of running councillors (Gulino 2020).

Table 1.2: Electoral systems

	Below 5,000	**Above 5,000**
Electoral System	Plurality system plurinominal; Majority bonus to the party that obtains the relative majority which allows the latter to obtain the majority of seats in the council	Party-List Proportional (D'hondt method): council seats allocated to lists proportionally to the votes they obtain
Outcome of the vote for the formation of the government majority	Election of the City Council and subsequent agreements between the parties for the formation of the majority and the election of the mayor	Election of the City Council and subsequent agreements between the parties for the formation of the majority and the election of the mayor
Electoral districts	Single	Single
Number of preferences	4/5 of seats in the council	4

Notes: Electoral systems during the 1985-1992 period (adapted from Baldini and Legnante (2000) and Gulino (2020)

inhabitants where council seats are allocated to each party-list proportionally to the share of citizens' votes according to the D'Hondt method. Accordingly, a party-list is able to obtain the absolute majority of seats (i.e. not less than 10) only if the share of votes obtained is large enough (around 45%)[12]. A major implication of this feature, which is key for our identification strategy, is that municipalities below the 5,000 inhabitants are relatively much more likely to display a *single-party government* with respect to municipalities above the 5,000 thresholds where different parties are more likely to negotiate to find a post-election agreement and which are therefore relatively more likely to display a *coalition governments.*

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[12]https://user.eng.umd.edu/~yavuz/electioncalcEE.html

1.3 Identification Strategy

We assess the causal effect of monetary incentives on the characteristics of local politicians in a Regression Discontinuity Design (RDD) framework by exploiting the population thresholds described in Table 1.1. Specifically, we focus on the 5000 population threshold as i) differently from the case of the 3000 and 10000 threshold, the size of both the Council and the Executive Committee do not vary when crossing the 5000 population threshold (thus limiting the number of possible confounders), and ii) there is evidence of manipulation around the 3000 inhabitant threshold[13].

We estimate the following equation

$$X_{itn} = \delta + Above5000_{it}\gamma + f(P_{it}^*)\lambda + \varepsilon_{it} \tag{1.1}$$

where X_{itn} is a vector of characteristics of the Politician n in municipality i in electoral term t, P_{it}^* is the distance, in terms of population[14], of municipality i from the 5000 inhabitants threshold, $Above5000$ is a dummy variable equal to 1 when $P_i \geq P_c$, and $f(\cdot)$ is a function of the distance from the threshold $P_{it}^* = P_{it} - P_c$. Errors ε_{it} are clustered at municipality level. We estimate Equation 1.1 non-parametrically (LLR) within the symmetrical MSE-optimal bandwidth defined following Calonico, M. D. Cattaneo, Farrell, et al. (2017).

Our identification strategy relies on the assumption that municipalities just above and just below the thresholds are (on average) identical except for the wage increase (the treatment) of the local administrators. The validity of this assumption is threatened by two potential issues: 1) the presence of confounding treatments; 2) strategic sorting around the thresholds.[15] In

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[13]Also Gagliarducci and Nannicini (2013) consider the 5000 population threshold to assess the impact of wage increase in the quality of mayor for the period 1993-2001 (when a direct election and a local presidential system was in place). Our analysis can thus be directly compared to their so as to evaluate the impact of different institutional arrangements.

[14]The municipality population is based on the last National Census before the election.

[15]For an extensive review of this RDD based on population threshold see Eggers et al. (2018).

the next two subsections we discuss in details these issues.

1.3.1   Confounding treatments: the stronghold argument

Single-party vs Coalition governments

In Section 3 we highlight that, before 1993, the 5,000 inhabitants threshold also determines the change from a the majority to the proportional rule. This additional treatment might thus undermine the identification of the causal effect of the wage treatment on the selection of local politicians. Below we propose a way to deal with this issue and disentangle the causal effect of wage increase from that of the change in the electoral rule.. Majority and proportional rules differ in the way vote shares translate into seat shares. Municipalities below the 5,000 inhabitants are relatively more likely to display a single-party government (i.e. a seat allocation where a single party obtains at least 50% of seats - 10 over 20) with respect to municipalities above the 5,000 thresholds. The idea according to which, via the party system, majoritarian elections produce single-party governments more often than proportional elections, which instead produce fragmentation of political parties and coalition, or minority, governments, is well consolidated in the literature of political science. See for instance, among the many, Cox (1990) and Lijphart, Aitkin, et al. (1994). Taking advantage of this intuition, Persson, Roland, Tabellini, et al. (2007) proposes a model to study how different electoral rules (majoritarian vs proportional) affects government spending. They argue that the impact of the electoral rule is only indirect: proportional elections induce a more fragmented party system and a larger incidence of coalition governments than do majoritarian elections and electoral competition inside coalition governments induces higher spending than under single party governments.

Consistent with this view, we disentangle the effect of the wage increase by focusing on a subset of municipalities which, both above and below the threshold, do not exhibit any

significant difference in the probability that a municipality display a single-party government. We thus define *strongholds* those municipalities where the vote share of the leading party is large enough that the difference in the likelihood of observing single-party governments between proportional and majority councils is not significantly different from zero. Figure 1.1 below illustrates the main idea behind our identification strategy. In stronghold municipalities (in blue), the change in the electoral rule at the threshold does not generate any relevant impact on the probability that a local government is single-party and thereby on the (ex-post) impact on the selection of local politicians. By restricting the analysis to stronghold municipalities, the observed change in the characteristics of local politicians at the threshold should solely reflect the effect of the increase in mayors' and executives' wages.

Figure 1.1: The stronghold argument
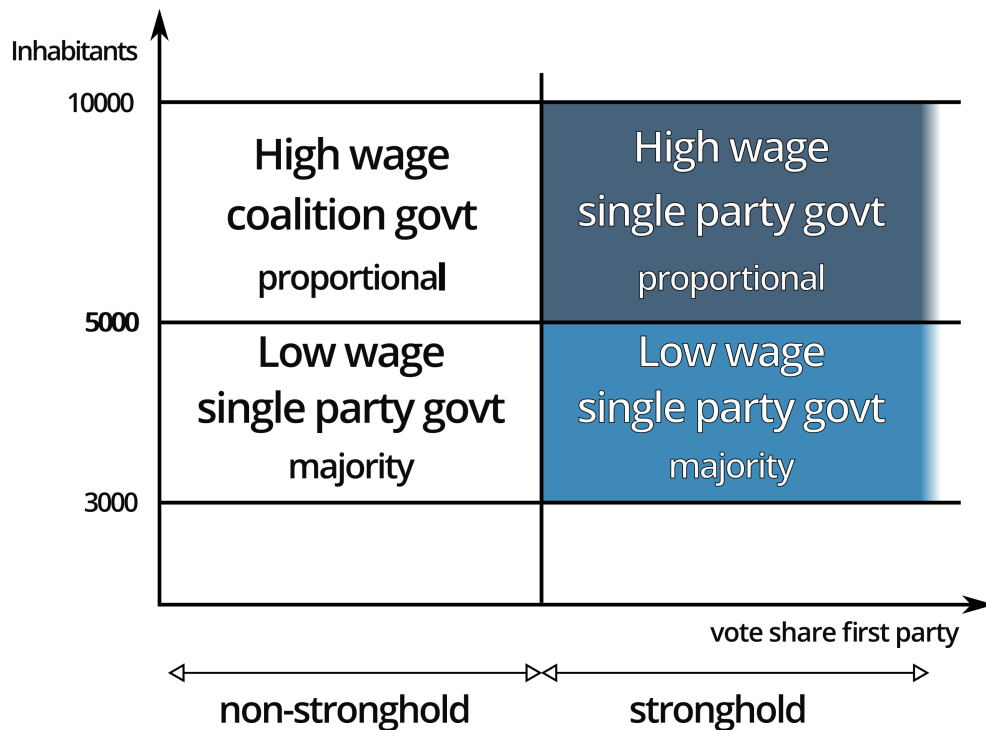
The definition of stronghold municipalities

In our main specification, we define our sample of stronghold municipalities as those where the leading party obtained at least 45% of the votes. This choice comes from the nature of the D'Hondt method applied to local parliament of size equal to 20. Under this rule, single-party governments are more likely to be observed in proportional councils when the vote share obtained by the leading party is larger than a threshold which is somewhere within the interval $40 - 50\%$. Figure 1.2 provides supporting evidence in this direction. It displays the probability of observing a single party government in municipalities where the leading party obtained at least the share of votes reported in the horizontal axis, separately for councils elected with the majority (light blue) and the proportional (dark blue) rule.

Figure 1.2: Single-party governments and votes' share
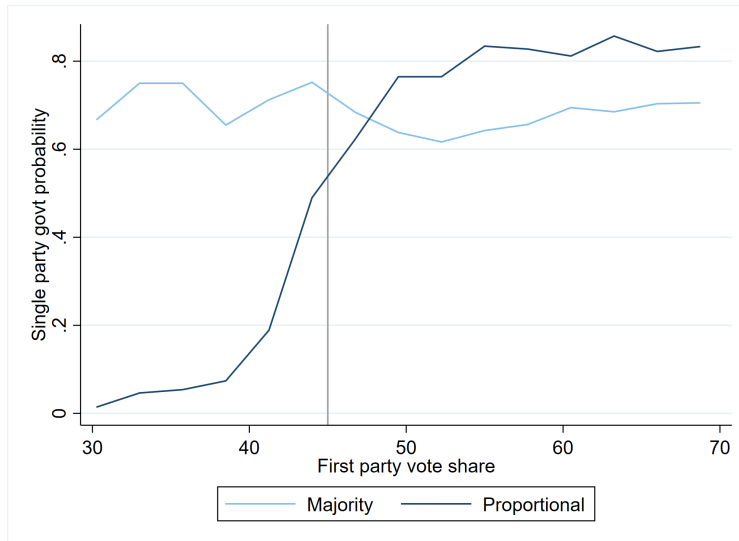
As expected, this probability is constant in the majority council, where the majority premium allows the leading party to obtain the majority of seats in most of the cases (around 70%) and regardless its vote's share. Conversely, for councils elected under the proportional rule the probability that the leading party obtains at least 10/20 seats is very low when its

vote's share is below 40% while it progressively becomes more comparable to the majority municipalities when the vote share approaches 50% of the votes. Above this threshold, this probability remains roughly constant at 80%. While in our main specification we choose the intermediate value of 45% as the relevant threshold for defining stronghold municipalities, in Section 6 we show that our results are robust to the choice of any value within the $40 - 50\%$ vote shares range.

Importantly, we define stronghold municipalities based on the results in the last national elections (at the municipal level), rather than on the results of the municipal elections. We do so to account for the fact that even ex-ante (before election) party fragmentation would be smaller under majority rules. That happens because of two main reasons: 1) small parties are less likely to be represented and therefore their incentive to form a coalition before the election is stronger with respect to municipalities where the proportional rule is in place; 2) according to the well-known Duverger's law (Duverger, 1959) a majority electoral system may produce psychological effects in voters which, by learning the mechanics of the electoral system, are induced not to waste the vote and to express their preference for one of the major parties (strategic voting).

This intuition is confirmed by Figure 1.3 which reports the kernel density of the vote share obtained by the leading party in municipal elections (panel a) and national elections (panel b) for municipalities with population between both 3K and 5K (in red) and for those between 5K and 10K (in blue). Panel (a) shows that the density distribution with majority first-order dominates the one obtained under a proportional rule, thus confirming that votes are on average more dispersed and ex-ante party fragmentation is higher in proportional elections. Hence, defining stronghold based on the results in the municipal election would lead to a potential violation in our identification assumption, as it implies a different sample selection around the threshold. Conversely, the same does not happen when considering the results

Figure 1.3: Probability density of the leading party's vote share

(a) Municipalities elections   (b) National elections
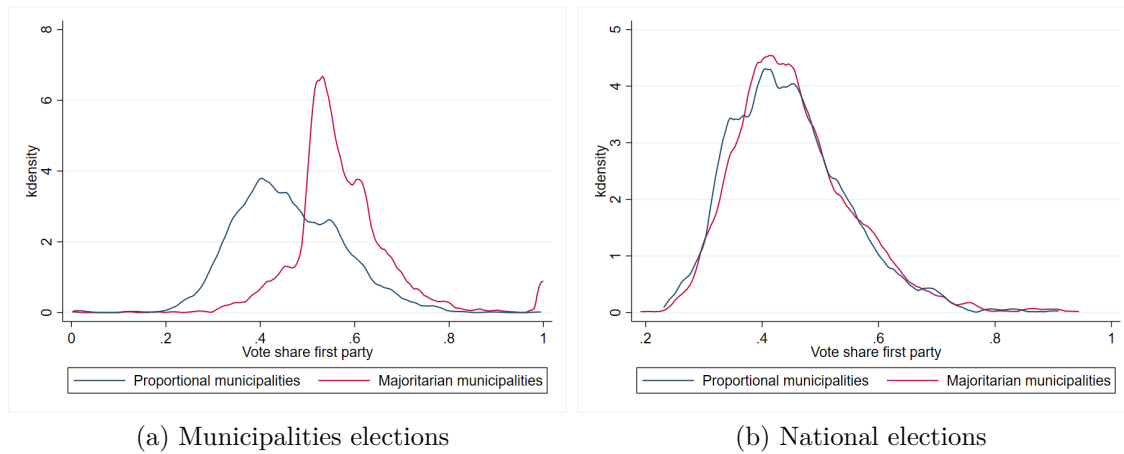
Notes: (a) Kernel density of vote share for the leading party in municipalities elections 1985-1992; (b) kernel density of vote share for the leading party in national elections 1983-1987. In both panels, blu lines refer to proportional municipalities and red lines to majority ones.

in national elections, as the electoral rule is invariant across population thresholds. Panel (b) shows that the densities are almost identical for the two groups.[16,17] Table 1.3 provides further support to the choice of the 45% threshold to identify stronghold municipalities. Shifting from majority to proportional at the 5000 threshold is associated to a statistically significant reduction (-8,6%) in the probability of observing a single party government (a council where the leading party obtains at least 10 seats This result is in line with the above intuitions and it is confirmed when restricting the sample to municipal councils where the

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[16]Notice that since Italian national election took place in 1983, 1987 and 1992, for municipal councils elected between 1985 and 1987 we refer to the 1983 national election while for those elected between 1988 and 1992 we refer to the 1987 national election. Also notice that, since a given municipality is present in our data for at least two election terms, the same municipality might be a stronghold for one election term but not for the other.

[17]In figure A1, in the appendix, we replicate the same exercise but using the cumulative frequency distribution rather than kernel density. We show that, using the results of the national election, the percentage of votes obtained by the first party distributes equivalently, above and below the threshold, while this does not happen if we use the municipal election. In the appendix we also show that our results are robust to changes in how a stronghold is defined. Specifically, our main findings are maintained whether strongholds are defined using regional or provincial elections in t-1 or whether we use national elections in t+1 (rather than t-1 as in the benchmark case).

Table 1.3: Single-party government probability in municipal election

	All	Leading party vote share in nat. elections %			
	(1)	(2)	(3)	(4)	(5)
		<42.5	<45	>45	>47.5
Above 5000	-0.0856*	-0.141*	-0.150**	-0.00551	-0.0157
	(0.0478)	(0.0767)	(0.0673)	(0.0506)	(0.0514)
Mean control group	0.570	0.558	0.561	0.576	0.574
Bandwidth	1491	1235	1337	1614	1532
Observations	2284	1868	2036	2507	2369

Notes: Single-party government is defined as a council with a seat allocation where the leading party obtains at least 50% of seats (10 over 20). The first row (Above 5000) reports the RD estimates of the change above 5000 threshold in the probability of observing a single-party government in the council. The second row reports the value of this probability for the control group (i.e. majority council, below 5000). The third and the fourth rows report the optimal bandwith (computed according to the method by Calonico, M. Cattaneo, and Rocio Titiunik (2014)) and the number of observation respectively. Column 1 reports these values for the overall sample while column (2), (3), (4) and (5) reports the same values when we restrict the sample of municipal councils according the different share of votes obtained by the leading party in the national election. SE clustered at the municipality level.*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

leading party obtained a vote share in the previous national election either below 42,5% (-14,1%) or below 45% (-15%). The difference in the probability of observing a single party government vanishes if we restrict the sample to stronghold municipalities, i.e. those in which the leading party obtained at least 45% in the previous national election (column 4 and 5). In Figure 1.4 we report the geographic allocation of strongholds in the Italian territory using the 1983 and 1987 national elections. The distribution of these do not evidence any particular spatial concentration and seem to change between elections. Hence, strongholds seem to be fairly representative of Italian municipalities and to be evenly distributed across the Italian territory.

Figure 1.4: Stronghold distribution in Italy

| (a) National election 1983 | (b) National election 1987 |
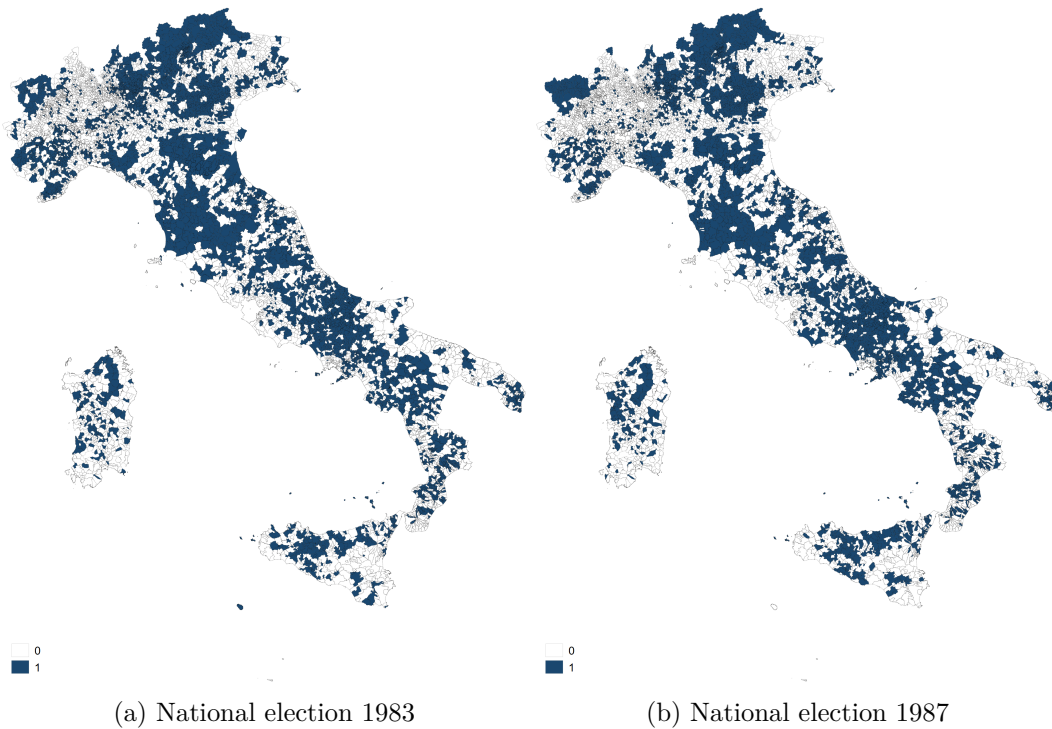
Testing the predictivity of the stronghold vs non-stronghold distinction

Using National rather than municipal elections to define a stronghold, allows us to re-balance the ex-ante party fragmentation. Still, their results represent a good predictor of the municipal ones: considering the subset of stronghold where either is either Democrazia Cristiana (DC) or Partito Comunista (PCI) are the first party (which represents the 97,08% of cases), the first party in national and municipal election coincides with probability 86.85%.[18] To further motivate our identification strategy, we provide two other sets of results related to the composition of the executive committee. It is reasonable to think that the latter is somehow correlated to the seat allocation in the council. More precisely, when the share of

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[18]We focus on this subset because generally the set of parties running in national and municipal election do not perfectly coincide. In particular, smaller lists ("liste civiche" turn out to be over-represented in municipal elections. Nonetheless, the probability that the leading party is the same in both national and municipal election in the overall sample of strongholds is still very high, reaching 71.65%

seats belonging to the leading party is high in the council, it is likely to expect that this should be the case also for the share of seats in the executive committee as the latter is appointed by the former. This intuition is confirmed by table 1.4 which reports the change at the 5000 threshold in the share of executives belonging to the leading party according to 3 different cuts of the data: the overall sample (column 1), non-strongholds and strongholds municipalities (column 2 and 3 respectively). By focusing on the overall sample this value is significantly lower (-9%) when the electoral rule changes from majority to proportional. This result is expected, given the fact that in general proportional government are less likely to generate single-party governments. However, this difference vanishes once we restrict the sample to stronghold municipalities only.

Table 1.4: Share of members of the executive committee from the leading party

	(1) All the sample	(2) Non-Strongholds	(3) Strongholds
Above 5000	-0.0907**	-0.0927*	-0.0322
	(0.0354)	(0.0402)	(0.0396)
Mean control group	0.698	0.702	0.704
Bandwidth	1199	1479	1579
Observations	1817	2260	2455

Notes: The first row (Above 5000) reports the RD estimates of the change above the 5000 threshold in the share of members of the executive commitee belonging to the leading party. The second row (Mean dep. var) reports the value of this share for the control group (i.e. majority council, below 5000). The third and the fourth rows report the optimal bandwidth (computed according to the method by Calonico, M. Cattaneo, and Rocio Titiunik (2014)) and the number of observation respectively. Column 1 reports these values for the overall sample, column (2) reports the values for non-strongholds municipalities (as above defined) while column (3) reports the same values for stronghold municipalities. SE clustered at the municipality level .*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

A similar result is obtained in table 1.5 which reports the change in the probability to observe a municipality whose members of the executive committee only belong to the leading party,

again for different cuts of the data. While this probability is constant across different sample restrictions for the control group (majority councils), this is not the case for proportional councils. In particular, as expected, in the overall sample proportional councils exhibit a significantly lower fraction of single-party executive committee (-22,9%). However, once again, this difference vanishes if we focus on stronghold municipalities only, as reported in column (3).

Table 1.5: Single-party executive commitee

	(1)	(2)	(3)
	All the sample	Non-Strongholds	Strongholds
Above 5000	-0.229***	-0.240***	-0.113
	(0.0671)	(0.0767)	(0.0722)
Mean control group	0.324	0.326	0.342
Bandwidth	1241	1338	2198
Observations	1879	2038	3594

Notes: The first row (Above 5000) reports the change above the 5000 threshold in the probability to observe a municipality whose members of the executive committee only belong to the leading party. The second row (Mean dep. var) reports the value of this share for the control group (i.e. majority council, below 5000). The third and the fourth rows report the optimal bandwidth (computed according to the method by Calonico, M. Cattaneo, and Rocio Titiunik (2014)) and the number of observation respectively. Column 1 reports these values for the overall sample, column (2) reports the values for non-strongholds municipalities (as above defined) while column (3) reports the same values for stronghold municipalities. SE clustered at the municipality level .*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Our results show that strongholds municipalities do not exhibit significant differences in the composition of both the council and the executive committee *regardless* the electoral rule (majority or proportional). All in all, our analysis suggests that results in national elections are a good predictor of the probability of observing single-party governments and provides a motivation behind our idea that by restricting the sample to stronghold municipalities we

are able to clean any potential confounding effect due to the change in the electoral rule at the 5000 threshold.

1.3.2 Validity tests

The validity of our identification strategy relies on the assumption that municipalities cannot sort across the population threshold. A manipulation of the running variable would result in jeopardizing the exogeneity of the treatment and the evaluation of its causal effect.

We test for the validity of this assumption by implementing the manipulation test developed by M. D. Cattaneo, Jansson, and Ma (2018) based on a local-polynomial density estimation technique. In Figure 1.5 we present the result from the manipulation test for the whole sample of municipalities (panels a and b) and for the sample of stronghold municipalities which we consider throughout the rest of the paper (panels c and d). As our sample covers (at least) two electoral cycles, we observe the same municipality and its time-invariant running variable (at least) two times. For this reason, we present the test results separately for two electoral cycles: 1985-1989 and 1990-1992. The estimated densities reported in Figure 1.5 show that no significant discontinuity arises when considering the whole sample (1985-89: p-value 0.19; 1990-92: p-value 0.37) nor when focusing on the stronghold sample (1985-89: p-value 0.14; 1990-92: p-value 0.33). Taken together, these results show that there is no strategic manipulation of the assignment variable, and thus support the validity of our identification assumption.

To provide further support in this direction, we also run a battery of regression to test whether pre-determined covariates are statistically indistinguishable between the two sides of the cutoff. The results of this test are presented in Table 1.6.

Once again, this exercise supports our identification strategy: for any of the characteristics considered, no significant difference arises between municipalities with a population barely-

Table 1.6: Covariates

	Coastal	Area km2	Altitude zone	North-West	
	Geographical characteristics				
Above 5000	-0.294	3.881	-0.142	-0.0292	
	(0.0443)	(4.959)	(0.182)	(0.0574)	
Observations	1231	1627	1184	1190	
	North-East	Centre	South	Islands	
Above 5000	-0.00906	-0.412	0.0855	0.0393	
	(0.0447)	(0.0366)	(0.0611)	(0.0414)	
Observations	1716	1690	843	1581	
	Political characteristics				
	Non-strongholds	N. voters	Share 1st party	1st party is DC	1st party is PCI
Above 5000	0.0277	-33.67	-0.00363	0.0521	-0.0310
	(0.0619)	(33.76)	(0.0121)	(0.0400)	(0.0481)
Observations	1059	1478	1099	1903	1296

Notes: The first row of each panel (Above 5000) reports the change above the 5000 threshold in each of the charchteristics considered in the different columns. The second row reports the standard deviation while the third reports the number of observations. The first two panels report Geographical characteristics: respectively, the probability of being located in a Coastal Area, in an Altitude zone, in the North-West, in the North-East, in the Center, in the South, in an Island. It also reports the Area of the municipality (in km2). The third panel reports some political characteristics: the probability of not being a stronghold municipality (according to the definition above), the number of voters, the share of the 1st party, the probability that the first party is the DC (Democrazia Cristiana) and the probability that the 1st party is the PCI (Partito Comunista Italiano) the probability to observe a municipality whose members of the executive committee only belong to the leading party. Optimal bandwidth are computed according to the method by Calonico, M. Cattaneo, and Rocio Titiunik (2014). SE clustered at the municipality level .*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Figure 1.5: Manipulation

(a) Unrestricted sample 1985-89   (b) Unrestricted sample 1990-92

(c) Strongholds 1985-89   (d) Strongholds 1990-92
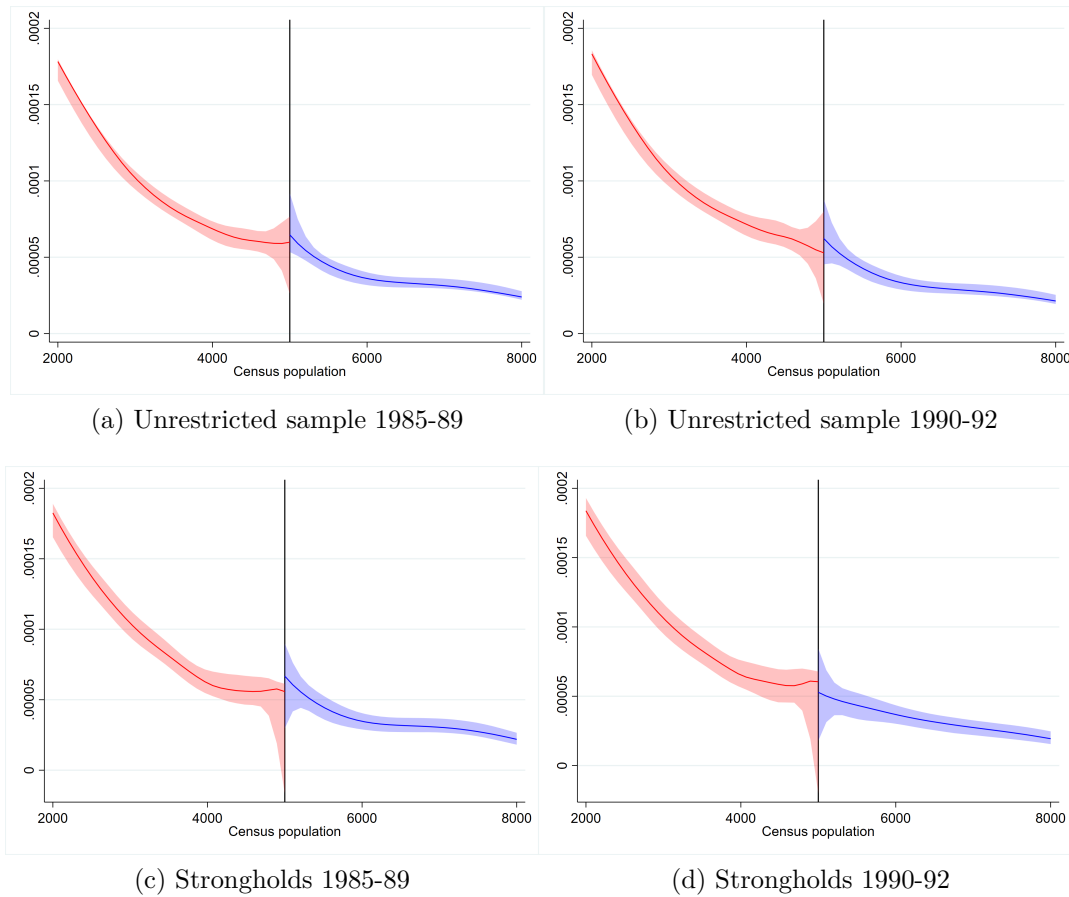
above and barely-below 5,000 inhabitants.

1.4 Data and Summary Statistics

To implement the above-discussed identification strategy, we combine several dataset from different sources related to municipal elections held in Italy from 1985 to 1992. Figure 1.6 report the distribution of electoral term during this period. Most municipal elections are held in 1985 and 1990, although some elections took place in between and in 1991. We collect data on the characteristics of the elected politicians (mayors, councillors and executives) from the

Figure 1.6: Electoral terms
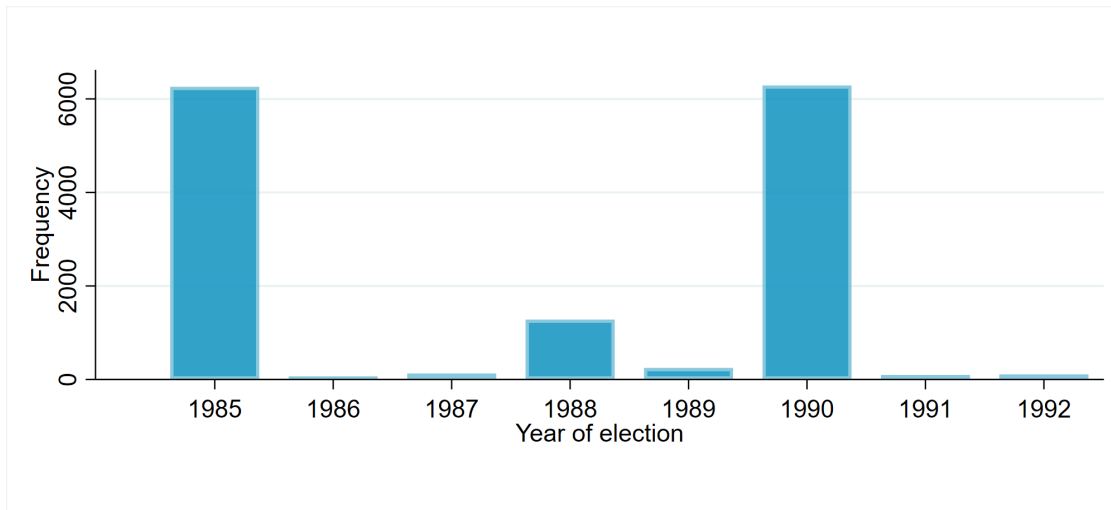
Anagrafe degli amministratori locali e regionali, an online database published and updated annually by the Ministry of Internal Affairs[19]. This database reports, for all members of the elected local government, gender, age, highest educational attainment, party affliation, and (self-declared) previous occupation. We also gather information on the share of votes received by each party in local elections from a series of books labeled "Risultati delle Elezioni Comunali" and "Risultati delle Elezioni Amministrative", which were only available in paper format at the Ministry of Internal Affairs.

Finally, data on national election at the municipal level from 1983 to 1992 come from the website of the Ministry of Internal Affair. We exploit these data to define the sample of stronghold municipalities, as discussed in detail in Section 1.4.

Table 1.7 presents some summary statistics of our main dependent variables for each kind of politicians (councillors, mayors and executives). We report mean and standard deviations for the sample of stronghold municipalities between 3000 and 10000 inhabitants and then we divide this sample below and above the 5000 threshold. Our sample consists of 31579 coun-

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[19]Anagrafe degli Amministratori Locali e Regionali - https://dait.interno.gov.it/elezioni/anagrafe-amministratori

cillors, 1493 mayors and 9922 executives, elected in 1164 municipalities and 1862 electoral terms.

Councillors have on average 11.6 years of schooling, 24% has at least a degree, 68% is a white collar worker (i.e. a lawyer, a professor, a physician or a manager), 8.3% is a woman and they are on average 39.5 years old. Average education increases above 5000 for both measures, the same being true for the share of white collar workers. Both age and the share of females are on average roughly constant above and below the 5000 threshold.

Mayors are on average more educated both in terms of years of schooling (13.7) and share of graduated (40%). They are also on average more likely to work as white collars (68%), they are older (42.8 years old) and less likely to be a woman (3,1%). However, their average education is lower above the 5000 threshold for both measures and they are also slightly younger. Both the share of white collar workers and of females remain roughly constant.

Executives present similar levels with respect to councillors in all the characteristics considered. Also, their trends with respect to population looks very close to that of councillors, with a marked increase in years of schooling, degree rate and white collar workers above the 5000 threshold.

1.5 Results

In this section we report the results of the RDD analysis focusing on the coefficient γ described above for different carachteristics (years of schooling, fraction of politicians with at least a degree, fraction of politicians whose previous job was a white-collar one[20], fraction of female, age) and for different kinds of local politicians (mayors, councillors and executives). In what follows, we restrict the sample only to stronghold municipalities, i.e. those in which the leading party obtained at least a 45% vote's share in the national election just before the

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[20]We refer here to the same classification used in Gagliarducci and Nannicini (2013)

Table 1.7: Summary statistics

	Strongholds		3000-5000		5000-10000	
	Mean	SD	Mean	SD	Mean	SD
Panel a. Councillors						
Years of schooling	11.6	4.10	11.1	4.16	12.3	3.93
Share at least a degree	0.24	0.43	0.20	0.40	0.28	0.45
Share White collar	0.54	0.50	0.49	0.50	0.59	0.49
Age	39.5	10.1	39.6	10.3	39.4	9.73
Share Female	0.083	0.28	0.083	0.28	0.084	0.28
Observations	31579		17061		14527	
Panel b. Mayors						
Years of schooling	13.7	3.33	13.8	3.32	13.6	3.33
Share at least a degree	0.40	0.49	0.42	0.49	0.38	0.49
Share White collar	0.68	0.47	0.67	0.47	0.68	0.47
Age	42.8	9.41	43.3	9.92	42.4	8.82
Share Female	0.031	0.17	0.031	0.17	0.030	0.17
Observations	1493		777		717	
Panel c. Executives						
Years of schooling	11.8	3.99	11.3	4.03	12.3	3.89
Share at least a degree	0.23	0.42	0.19	0.40	0.27	0.45
Share White collar	0.58	0.49	0.55	0.50	0.62	0.49
Age	39.6	9.49	39.8	9.82	39.3	9.12
Share Female	0.083	0.28	0.081	0.27	0.085	0.28
Observations	9922		5200		4723	
Number of municipalities	1164		626		538	
Number of terms	1862		993		869	

Notes: In each of the three panels (respectively Mayors, Executives and Councillors), we report the mean and the standard deviations of the characteristics which we focus on: years of schooling, share of politicians with at least a degree, share of white collars (i.e. lawyers, professors, physicians, and managers) age and share of female. In each panel the last row reports the total number of observations for each kind of politician. Finally the last two columns of the table report the number of municipalities and the number of terms. The first two columns report the mean and the standard deviations for the whole sample of stronghold municipalities (according to the definition above), the third and fourth column reports the respective values for the sample of stronghold municipalities below 5000 inhabitants, while the last two columns reports the respective values for the sample of stronghold municipalities above 5000 inhabitants but below 10000.

municipal ones[21]. Given our discussion of section 1.1 , we interpret γ as the causal effect of an expected wage increase on the above charachteristics.

1.5.1   Councillors and Mayors

Figure 1.7 reports scatters of the observed values around the 5000 threshold of schooling years - our main quality proxy - for Councillors (a), elected Mayor (b) and the difference between the elected Mayor and the *mean* Councillor *within* the same council (c). We also draw a 4th order polynomial fit performed separately on either side of the threshold, and the LLR fit from the estimation described in section 5.3.

By observing this figure, we can draw the following conclusions:

1. **There is a sharp positive jump in years of schooling for councillors at the 5000 threshold**. Our identification strategy allows us to interpret this jump as a positive selection effect due to the increase in the *expected* wage. As described in section 1.2, councillors' direct wage is 0 on both sides of the thresholds, however the wage of executives and mayors sharply increases and since the latters can only be appointed by and among the councillors, the above figure suggests that the higher expected wage for councillors above the 5000 threshold leads to a pool of more educated candidates and ultimately to a more educated council.

2. **More educated councillors appoint relatively less educated mayors:** there is a sharp negative jump in the difference between the years of schooling of mayors and the average years of schooling of the council who appointed her/him. While mayors in control councils are around 1.5 years more educated than the mean councillor, this difference almost totally vanishes in the treated group.

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[21]In section 6.3 we show that our results are reasonably robust to changes in this threshold.

Figure 1.7: Years of schooling
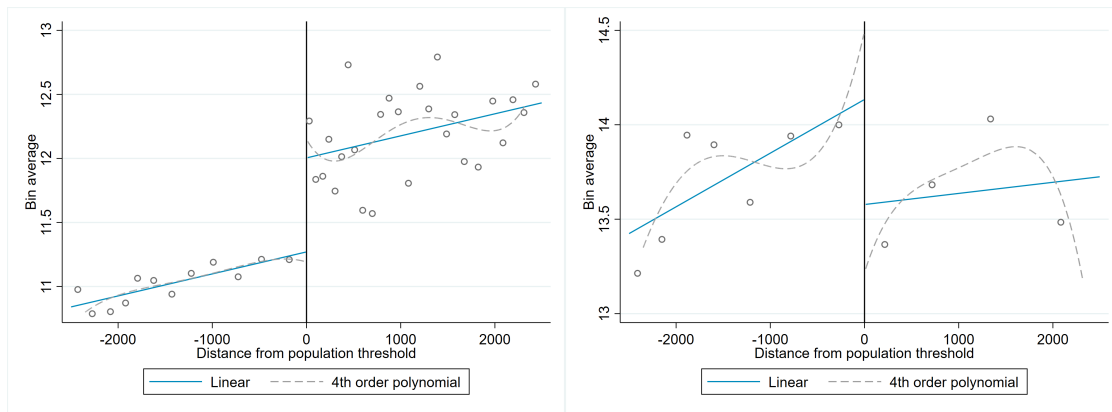
(a) Councillors

(b) Mayors
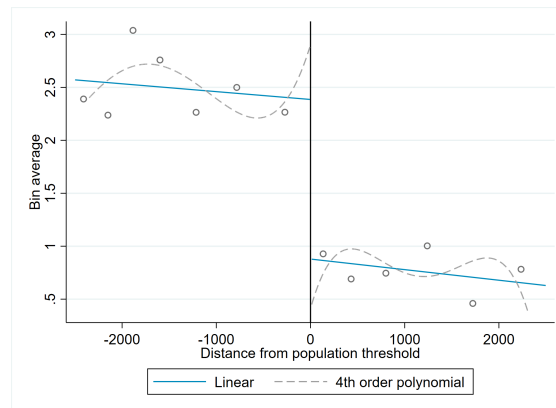
(c) Mayor - mean Councillor

Notes: Years of schooling of Councillors (a), difference between Mayors and the mean Councillor who appointed him (c) and Mayors (b) around the 5000 threshold. Terms from 1985 to 1992. The solid blue lines are local linear regression with optimal symmetric bandwidth and the dashed lines are 4th order polynomial approximation of years of schooling, performed separately on either side of the 5000 threshold. The circles are the observed values aggregated using data-driven RD plot proposed by Calonico, M. D. Cattaneo, and Rocio Titiunik (2015)

3. **There is a negative jump in years of schooling for mayors at the 5000 threshold.** The council-elected mayor turns up being less educated in high-wage councils. The policy of higher remuneration at the threshold has therefore a negative causal effect on the years of schooling for mayors.

Result 3 shows that results 2 is not driven by a simple mechanical "ceiling" effect, i.e. one in which councillors' education increases more than mayors' because the latter is already very high. By contrast, taken together the two results show that more educated councillors elect worse mayor. To further investigate the reduction in the relative education of mayor with respect to councillors at the threshold, we perform an RD analysis on the distribution of years of schooling for councillors at the threshold and of the change in the position of the mayor within the skill distribution of her council. Figure 1.8 reports the jump in the mayor rank (left) and the predicted councillors' rank distribution below and above the threshold (right). The last panel shows that the increase in years of schooling for councillors is mostry concentrated at the mid-top and mid-bottom of the skill distribution and that, most importantly, the mayors' rank jumps from 7 up to 9 out of 20 councillors. This result is also confirmed by the point estimate of the discontinuity regression which delivers a jump of 1.9 ranks at 1% (SE 0.633). Our three main results are well confirmed by Table 1.8 which reports the magnitude of the RDD estimates of the LLR at the 5000 thresholds extending the results to other carachteristics. An higher remuneration has a sizeable and significant positive impact on the quality of councillors (panel 1), measured according to 3 different proxies: 1) years of schooling (0.8 years more, +6.8% with respect to the mean of the control group); 2) fraction of councillors with at least a degree (+0.04, around 17% more than the control group); and, finally 3) fraction of councillors with a white-collar occupation at the time of the election (+0.088, equivalent to a 16% increase with respect to the control group). All these coefficients are strongly significant, at the 1% level. By contrast, the impact on gender composition and

Figure 1.8: Who is the mayor?

(a) Mayor's rank   (b) Education distribution
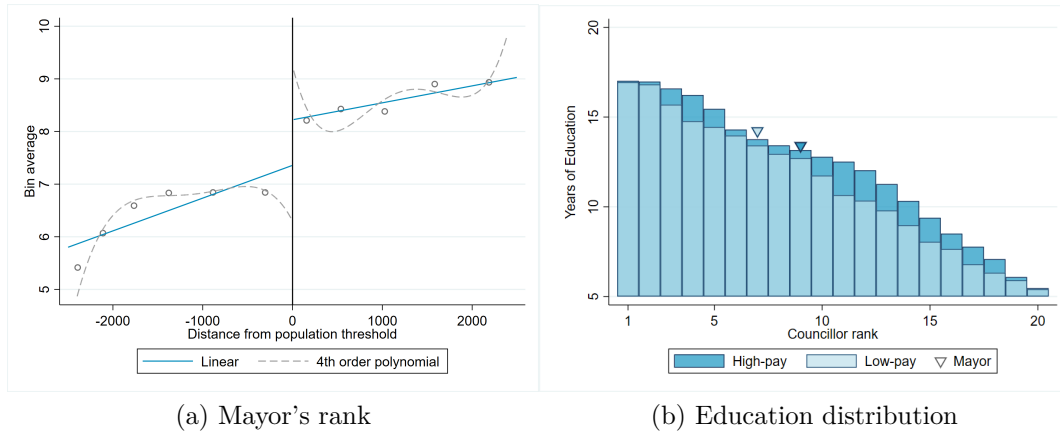
Notes: Mayor's position within the education distribution of her council (left) and councillors' years of schooling predicted distribution (right). Terms from 1985 to 1992. On the left, the solid blue lines are local linear regression with optimal symmetric bandwidth and the dashed lines are 4th order polynomial approximation of the mayor's rank, performed separately on either side of the 5000 threshold. The circles are the observed values aggregated using data-driven RD plot proposed by Calonico, M. D. Cattaneo, and Rocio Titiunik (2015) On the right, light blue histograms are predicted distribution of the councillors below the threshold and dark blue histograms refer to those above the threshold. Triangles are the predicted mayors' position within the council.

age is not statistically different from zero. Panel 2 of table 1.8 reports the difference of each of the previous charachteristics between the mayor and the average councillor who appointed him. The education advantage of mayor with respect to the mean councillor who elected him, which amounts to more than 1 year and a half just below the threshold, totally vanishes in municipalities just above 5000 inhabitants (a 100% reduction). Also, the difference in the probability to be employed in a white collar job is reduced by 31.6% above the threshold, completely reversing the slight advantage that mayors have on the mean councillors below the threshold (only 3%). All these RD estimates are strongly significant, at the 1% level. Finally, while in the control group the mayor is almost 37% more likely to be graduated, this value decreases by 13.6 percentage points in the treated group (a 1/3 reduction). However, the value of this RD coefficient is significantly different from zero only at the 10% level.

Again, the above effect is not purely mechanical but it is driven by an almost specularly

Table 1.8: Councillors and Mayors charachteristics, RDD estimates

	Years Schooling	At least Degree	White Collar	Female	Age
Panel 1: *Councillors*					
Above 5000	0.800***	0.04***	0.088***	0.0075	-0.451
	(0.125)	(0.0096)	(0.0151)	(0.008)	(0.309)
Mean control group	11.75	0.239	0.544	0.0867	40.03
Observations	34150	39354	32035	36064	35086
Bandwidth	1130	1298	1045	1193	1158
Panel 2: *Mayors - Mean Councillor*					
Above 5000	-1.543***	-0.136*	-0.316***	0.0374	-2.148*
	(0.388)	(0.0592)	(0.0735)	(0.0245)	(1.199)
Mean control group	1.572	0.367	0.0254	0.0349	4.415
Observations	3530	3213	3385	3695	2836
Bandwidth	1883	1750	1829	1944	1548
Panel 3: *Mayors*					
Above 5000	-0.919**	-0.148**	-0.102*	0.0374	-2.396*
	(0.467)	(0.0691)	(0.0609)	(0.0246)	(1.385)
Mean control group	13.70	0.402	0.647	0.0351	43.56
Observations	2280	2558	2600	3679	2431
Bandwidth	1258	1410	1437	1938	1343

Notes: Effect of the 30% wage increase at the 5000 threshold on the characteristics of Councillors (panel 1), the difference in the characteristics between Mayors and the mean Councillor (panel 2) and the characteristics of the appointed Mayors (panel 3). Terms from 1985 to 1992. Local linear regression (LLR) with optimal symmetric bandwidth. Age and Years school are measured in years; the other variables are dummies. White collar includes lawyers, professors, physicians, and managers. Standard errors robust to clustering at the municipality$\times$ election level in panel 1 while at the municipality level in panel 2 and 3 .*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

reversed wage impact for mayors with respect to those of the councillors. A mayor of a municipality with population just above 5000 inhabitants is on average almost 1 year (-0.919, equivalent to - 6,7% of the control group mean) less educated than a mayor of a municipality

with population just below 5000 inhabitants. Also, he/she is almost 15% less likely to have a degree with respect to his colleagues in slightly less populated municipalities, 40% of which own a degree. These two effects are significant at 5% level, despite the smaller number of observations. While there is no significant effect on the probability of being a female mayor at the threshold, the fraction of white collar mayors just above the threshold is reduced by 10.2 percentage points (a 16% reduction with respect to the control group) and the age is reduced by 2.4 years (5% less than the control group). However, these latter RD coefficients are significant only at the 10% level.[22]

Our analysis shows that the impact of the higher remuneration policy is not invariant across different categories of local politicians. It has a significant positive effect on the quality of councillors, despite the fact that councillors themselves do not experience an higher remuneration but only an higher *expected* remuneration, associated to their probability of being elected mayors or executives. It is interesting to note that the magnitude of this positive effect (almost one year of schooling, and around 7% more with respect to the control mean) is comparable to the one found by Gagliarducci and Nannicini (2013) for mayors and candidate mayors for the municipal elections between 1993 and 2001, when a direct election was in place. These results for mayors are not confirmed, but actually literally reversed, in our framework with indirectly rather than directly-elected mayors. In other words, better educated councillors elect a significantly less educated mayor, suggesting that the second-stage election process, the parliamentary one, undermines the positive selection effect of higher expected remuneration. An important implication is that the positive effects of higher remuneration policy on mayors is not robust to changes in the form of local government (presidential or

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[22]We provide further evidence of the robustness of these results in section 1.5.3 and in the appendix. In appendix A we report RDD results of the effect of the 30% income increase on the quality of mayors, councillors, and executive committees using different methods for calculating the optimal bandwidth (CERRD, MSESUM, CERSUM) and different functional forms (quadratic, cubic). We also compute the same effect, but with a different definition of stronghold, i.e., municipalities where the first party obtained at least 45% of votes in the previous regional and provincial elections; and in the national elections that took place in 1987 and 1992, thus, those general elections following - rather than anticipating - the municipal elections.

parliamentary) and therefore it must be cautiously implemented.

1.5.2 Executives

We saw that, in accordance to most of the literature on monetary incentives and the selection of local politicians, better educated councilors are attracted by the expectation of a higher remuneration from office. It would be natural to expect that a better pool of candidates running for the mayor office results in a better elected mayor. We just saw that this is not the case, the reverse relation holding instead. These empirical findings, which are strongly significant and robust[23], raise at least two, partly connected, questions: 1) what are the mechanisms behind this counterintuitive effect reversal and; 2) why are better educated councillors attracted by higher wages if they are less likely to become mayors? In what follows we attempt to provide an answer to the latter question, while we will try to propose an answer to the former in section 1.7.

From section 1.2 we know that mayors are not the only office benefiting from a wage increase at the threshold: the wage of each member of the executive committee (the organ of 6 "local ministers" appointed by an among councillors as well - 5 once removed the mayor), increases from 0 to 1255 euros (i.e from 0 to 45% of the mayor's pay) when the 5000 inhabitants threshold is overpassed. Executives are therefore less paid than mayors, but their relative wage increase at the threshold is larger in percentage. It is therefore interesting to check what is the wage effect on executives' quality. If positive, significant, and quantitatively comparable to the one for councillors, we would have a very natural answer to question 2 above: better councillors above the threshold are attracted by the perspective of being appointed in the executive committee. The numbers in Table 1.9 below are consistent with this view.

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[23]As argued in the following subsection

The RD estimates for the executives are remakably similar to those for the councillors, just

Table 1.9: Executives charachteristics, RDD estimates

	Years Schooling	At least Degree	White Collar	Female	Age
Above 5000	0.408**	0.0346**	0.0554**	-0.00157	-0.963*
	(0.163)	(0.0148)	(0.252)	(0.0147)	(0.492)
Mean control group	11.88	0.231	0.575	0.0837	40.20
Observations	12884	13206	12143	10900	10088
Bandwidth	1276	1306	1207	1068	991

Notes: Effect of the wage increase at the 5000 threshold on the characteristics of Executives. Terms from 1985 to 1992. Local linear regression (LLR) with optimal symmetric bandwidth. Age and Years school are measured in years; the other variables are dummies. White collar includes lawyers, professors, physicians, and managers. Standard errors robust to clustering at the municipality× election level in panel 1 and 3 while at the municipality level in panel 2 .*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

slighly smaller in magnitude. This time as expected, better pool of candidates for executive positions (i.e. councillors) results in better appointed executives, suggesting that the better educated councillors attracted by higher expected wages above the threshold end up being members of the executive commitee.

1.5.3   Robustness

In this section we provide evidence that our main results are robust to different choices of the (first party's) vote share identifies the sample of stronghold municipalities. Each point in Figure 1.9 indicates the point estimates – presented with the associated 90 and 95% confidence intervals – from a battery of RD regression where the outcome considered are the years of education of the councillors (left), the difference in years of schooling between the mayor and the mean councillor who elected him (center) and the years of education of the mayors (right). In each regression we define our sample of strongholds as those municipalities

where the leading party obtain at least j % of the votes in the previous national election, where j (reported in the x axis) ranges between 40% to 50% as motivated in section 1.3.

The estimates reported in Figure 1.9 show that our results are stable across different

Figure 1.9: Jumps in years of schooling with different strongholds sample
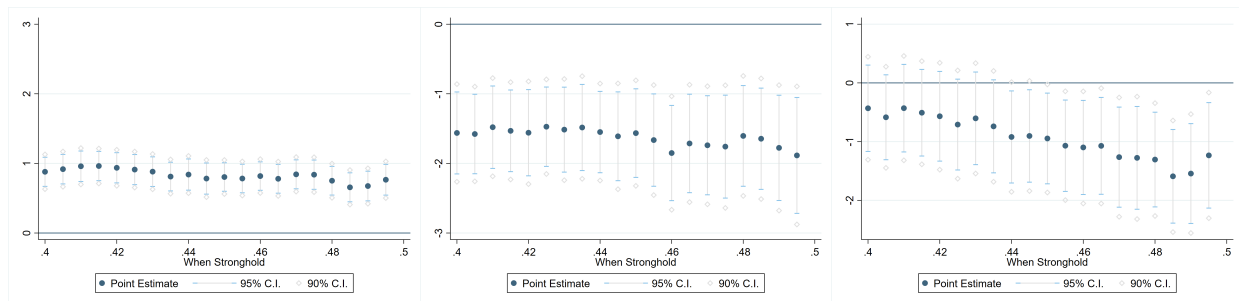
Notes: On the common horizontal axis is reported the minimum share of votes that the leading party should obtain in order for a municipality to be included in the strongholds sample. On the vertical axis we report the point estimates, the 95% and the 90% confidence intervals of the jumps in years of schooling at the 5000 theshold of respectively Councillors (left), difference between Mayors and the mean Councillor who elected him (center) and Mayors (left). Terms from 1985 to 1992.

definitions of stronghold municipalities, and thus provide strong support to the robustness of the results presented in the previous sections.

1.6 Heterogeneity analysis and mechanism

In this section we take advantage of some so far unexplored dimensions of our dataset to seek for heterogeneous effects. The ultimate aim of this analysis is to identify some channels behind the results emphasized in section 1.5. We will explore two main additional dimensions: 1) previous occupation; 2) leading party in national elections at the municipal× term level.

1.6.1   Previous occupation

In table 1.10 we report the RD estimates of the change at the threshold in the share of previous occupations for councillors (column 1), executives (column 2) and mayors (column 3). Tables 1.8 and 1.9 already reported an aggregate occupational variable (white collar jobs), here we disaggregate the analysis to gather some additional information on how the occupational profiles of local politicians change due to wage increase. In particular we seek for occupational groups which - just as in the previous analysis - exhibit jumps at the threshold which are significant and opposite in sign for mayor with respect to councillors/executives.

Table 1.10: Changes in occupation shares, RD estimates

	(1)		(2)		(3)	
	Council		Executives		Mayor	
Government Executives	0.000	(0.002)	0.006**	(0.003)	-0.017	(0.011)
Control group mean	0.007		0.006		0.023	
Observations	32593		17762		3312	
Entrepreneurs/Firms Management	-0.025***	(0.006)	-0.063***	(0.012)	-0.105***	(0.027)
Control group mean	0.067		0.067		0.055	
Observations	26691		5274		1459	
Engineering Professionals	0.010***	(0.002)	0.014***	(0.004)	0.029*	(0.016)
Control group mean	0.016		0.019		0.035	
Observations	58399		17825		3319	
Health professionals	0.009***	(0.003)	-0.009	(0.007)	-0.015	(0.018)
Control group mean	0.034		0.032		0.068	
Observations	46113		9094		2627	
Legal and Social Professionals	0.004	(0.003)	0.008	(0.005)	-0.026	(0.020)
Control group mean	0.023		0.022		0.052	

Continued on next page

Table 1.10 – *Continued from previous page*

	(1) Council		(2) Executives		(3) Mayor	
Observations	36344		13514		2967	
Teaching/Research Professionals	0.008	(0.005)	0.003	(0.008)	0.009	(0.030)
Control group mean	0.059		0.072		0.111	
Observations	32733		11981		2589	
Other Sciences Professionals	-0.001	(0.001)	-0.005*	(0.003)	-0.002	(0.007)
Control group mean	0.010		0.012		0.009	
Observations	69109		18149		3587	
Technicians/Assoc Professionals	0.009	(0.006)	0.016*	(0.009)	0.007	(0.031)
Control group mean	0.089		0.103		0.072	
Observations	36583		14793		2771	
Clerical Support Workers	0.007***	(0.002)	0.011***	(0.003)	0.007	(0.005)
Control group mean	0.004		0.004		0.003	
Observations	25993		9865		1857	
Services and Sales Workers	-0.007**	(0.003)	-0.005	(0.006)	-0.006	(0.011)
Control group mean	0.043		0.044		0.013	
Observations	44939		13051		2431	
Craft and Related Trades Workers	-0.010***	(0.003)	0.004	(0.004)	-0.006	(0.007)
Control group mean	0.028		0.028		0.006	
Observations	35706		16169		2314	
Skilled Agricultural Workers	-0.006**	(0.003)	0.010**	(0.005)	0.016**	(0.007)
Control group mean	0.028		0.021		0.005	
Observations	57365		9364		2351	
Machine Operators and Assemblers	-0.014***	(0.005)	-0.006	(0.005)	-0.001	(0.004)
Control group mean	0.053		0.041		0.007	
Observations	36144		20046		3191	

Continued on next page

Table 1.10 – *Continued from previous page*

	(1) Council		(2) Executives		(3) Mayor	
Elementary Occupations	-0.009***	(0.003)	-0.008***	(0.003)	0.004	(0.004)
Control group mean	0.010		0.010		0.001	
Observations	33072		16251		3473	
Not employed	-0.003	(0.003)	-0.000	(0.006)	0.010	(0.011)
Control group mean	0.041		0.032		0.014	
Observations	63125		13566		2619	
Retired	0.007	(0.006)	0.010	(0.011)	0.045	(0.034)
Control group mean	0.095		0.099		0.175	
Observations	25434		12150		2555	

We do not find any of those: there are 3 occupational groups which exhibit significant and positive jump at the threshold for mayors (Entrepreneurs/Firms Management; Engineering Professionals; Skilled Agricultural workers) but each of them display a similar positive and significant jump for councillors and executives with the exception of Skilled Agricultural workers which is slightly reduced for councillors. However the magnitude of this coefficient and of the control group mean seem to small to draw any meaningful conclusion. All in all, the analysis on occupational shares seems unable to provide any useful information on the mechanism behind the results of section 1.5 and suggests that the effect reversal between mayors and councillors/executives occurs mostly *within* occupations.

1.6.2   Leading party in the municipality

In this section we perform the same analysis of table 1.8 but this time splitting the sample according to the leading party in the national election at the municipal level just before the municipal election. The aim of this analysis is to check whether our main results exhibit

differences across political parties, in which case the analysis would suggest that some of their different characteristics might have a role in driving our findings. We only focus on two main parties, *Democrazia Cristiana* (DC) and *Partito Comunista Italiano* (PCI) since in 97.08% of stronghold municipalities during the 1985-1992 period the leading party is one of these [24]. Results for the year of schooling are reported in table 1.11 and provides some interesting insights. The numbers reported in Panel 1 show that, when we restrict the sample

Table 1.11: Years of schooling, RD estimates by Party

	(1)	(2)	(3)
	Councillors	Mayors	Mayors - Councillor
Panel 1. *Years of Schooling - DC strongholds*			
Above 5000	0.391***	-1.098**	-1.677***
	(0.188)	(0.512)	(0.521)
Control group mean	11.82	14.02	1.775
Observations	19235	2173	2020
Bandwidth	934	1702	1583
Panel 2. *Years of Schooling - PCI strongholds*			
Above 5000	0.913***	0.0489	-0.669
	(0.196)	(1.131)	(1.077)
Control group mean	11.65	12.82	0.674
Observations	9839	722	910
Bandwidth	1115	1447	1809

Notes: Effect of the 30% wage increase at the 5000 threshold on the years of schooling of the politicians elected in DC strongholds (panel 1) and on the years of schooling of the politicians elected in PCI strongholds (panel 2). Terms from 1985 to 1992. Local linear regression (LLR)with optimal symmetric bandwidth. Standard errors robust to clustering at the municipality$\times$ election level in panel 1 while at the municipality level in panel 2 and 3 .*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

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[24]More precisely, 68% are DC strongholds while 28% are PCI strogholds. Notice that, conditional on being a DC stronghold, the probability that a DC affiliated mayor is elected is 90%, while conditional on being a PCI stronghold, the same probability is 74%. So, once again, outcomes in national election results are good predictors of the outcomes in the next closest municipal elections.

to DC strongholds, results are very similar - both in magnitude and in significance level - to the aggregate ones reported in 1.8: a positive jump for councillors (smaller in magnitude but still strongly significant), a negative jump for mayors (slightly larger) and a sharp negative jump for the difference between years of schooling of the mayor and of the average councillor within the same council.

The pattern looks quite different for PCI strongholds: while the positive and significant jump for councillors is preserved (being quantitatively larger than the aggregate one and therefore compensating for the smaller results in DC strongholds), mayors in PCI strongholds do not display a reduction of their years of schooling at the threshold. More importantly, the difference between years of schooling of the mayor and her average councillor - while still preserving a negative sign - is not significantly different from zero, suggesting that on average, when focusing on PCI strongholds, higher remuneration has no statistically significant effect on the relative education of the mayor with respect to the council who elected him.

1.6.3   Discussion

We can think of two main candidate (and not mutually exclusive) mechanisms for the results presented in section 1.6

A first one is *preferences-driven*: better educated councillors are attracted by higher expected wage above the threshold but shy away from top and better paid positions (mayors), rather opting for less-paid positions (executives). There might be several explanations for this behaviour. One of these is that, assuming that the mayor office is a full-time activity while this is not the case for executives, the latter allows local politicians to *moonlight*, i.e. continuing to work on their previous occupation and enjoying its wage[25]. From this perspective, more educated councillors above the threshold might be attracted mostly by the probability to

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[25]See Gagliarducci, Nannicini, and Naticchioni (2010) for an analysis of the causes and consequences of moonlighting in the italian Parliament.

become executives rather than mayors so that they can supplement their income without giving up their previous occupation.

A second mechanism is *party-driven*: as argued theoretically by Cerina and Deidda (2017), parties have an incentive to prevent skilled politicians from reaching top position and might rather support the election of low-quality politicians. In their model, unskilled citizens have a lower opportunity cost of entering politics than do skilled citizens, as the former earn less in the private sector. Accordingly, unskilled citizens engaging in politics are more subject to rent extraction by their party, in the form of service duties, than are skilled citizens[26]. Under this scenario, while increasing the pay of politicians favors the entry of skilled citizens into politics (a positive selection effect), it might also induce (some) political parties to put in place actions that prevents the latter to be elected in apical positions. Under some conditions, the second effect might overcompensate the first leading to a negative relationship between rewards from office and politicians' quality.

This argument seems to be consistent with our main findings of section 1.5 : a positive wage effect for councillors and a negative one for mayors. As for councillors, party leadership can do little to avoid better educated local politicians to run and being elected in the municipal council: in local communities the asymmetric information about the (potential) political qualities of citizens is expected to be low, so that the cost of manipulating information for political parties (in order to make a good candidate look bad in the eye of the voters) might be relatively too large compared to its benefits. By contrast, as anticipated in section 1.2, party leadership (sometimes at the national level), can do more easily affect the behaviour of politicians in the second stage of the mayor's election, i.e. *within the council.* According to Baldini (2002), the parliamentary form of local government was actually functional for parties to keep control over local governmental activities and to prevent the mayor from

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[26]Unskilled citizens have a lower opportunity cost of entering politics than do skilled citizens even in Caselli and Morelli (2004) but they do not consider rent extraction by political parties.

consolidating any degree of autonomous leadership. These goals would be more difficult to reach with a more educated mayor, given her/his lower opportunity cost of leaving politics and therefore her/his lower propensity of being "blackmailed" by national party leadership. This would explain why (some) parties, feeling "threatened" by the better pool of candidates for the mayor position (due to the positive selection of higher remuneration), might react by favoring or even imposing the election of relatively low-quality mayor.

We emphasize that the parliamentary form of local government (like the one in place in Italy up to 1992, but still in place in many other European countries) is key for this mechanism to work. With a presidential form of local government, the direct election of the mayor entails a substantial shift in the political power from parties to citizens and the former are relatively less capable of preventing good candidates to run for mayor and being elected. This view can also easily explain the starking difference in the results we obtained with respect to those of Gagliarducci and Nannicini (2013): the same 30% increase in the mayor's wage leads to an almost 1 year more educated elected mayor in the latter, while in our case it leads to an almost 1 year *less* educated one! To put it in a nutshell, indirect elections and parliamentary form of local goverments, allow party leader to better control the election of the mayor and react to the higher quality of candidates by pushing for the election of low-quality but more loyal profiles.

Does our heterogeneity analysis performed in the previous sections help in identifying the more relevant mechanism? Unfortunately, the features of our dataset do not allow any conclusive answer. However, there are at least two reasons why the analysis leans towards the party-driven explanation. The first is that, as long as the possibility to *moonlight* is not invariant across occupations (being higher in those who are "flexible" enough), then the preference-driven mechanism would imply some heterogeneity in the way occupational shares of executives (who can moonlight) and mayors (who cannot) respond to higher wages at the

threshold. We already saw that this is not the case as the RD estimates of occupational shares do not differ significantly across political offices.

Also, should the preference-driven explanation be the dominant one, there is no particular reason why it would imply heterogeneity in the threshold effects for mayors across political parties. By contrast, it is reasonable to think that such heterogeneity points to the party-driven explanation: different political parties, because of their different internal structure, their different ideology, their different degree of internal democracy, are expected to display different propensity to control local government and to influence the election of local mayors. Should parties have no role in this process, there would be no particular reason to observe any difference in our results between DC and PCI. The heterogenous effects displayed by these two parties can then be thought as a result of their heterogeneity in their propensity to control local governments and centralize political decisions.

1.7 Conclusion

We study how monetary incentives affect the characteristics of local politicians at different levels (councillors, executives, mayors) in a indirect election system where citizens elect the members of a local parliament, who in turns choose their mayor among themselves. The problem is investigated using micro-level data on Italian local election and local politicians between 1985 and 1992.

While most of the literature tends provide evidence of a positive selection effect of monetary incentives, we find that higher expected wages result in more educated member of the local council, but at the same time in relatively worse educated mayors. The negative selection occurring within-council more than offsets the positive selection resulting from the electoral process, up to the pointthatthe council-elected mayor turns up being less educated in high-wage councils. Although data limitations do not allow to unequivocally identify the

mechanisms behind our findings – whether politicians' or parties' preferences can explained them – we provide suggestive evidence supporting the view that the latter play a key role. Our work implies that the positive impacts of monetary incentives can be undone or even reversed in the parliamentary stage of the election process. Such policy implication is particularly relevant as a parliamentary form of local government is currently widespread in many European countries. More generally, a main takeaway of our work is that the effects of monetary incentives are not invariant across different institutional setting and therefore they should be cautiously implemented.

CHAPTER No. 2

PARTY FRAGMENTATION AND POLITICIANS' QUALITY IN ITALIAN MUNICIPALITIES

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2.1   Introduction

Politicians vote and implement policies that highly affect citizens' welfare, both at the national and the local level.[1] In this perspective, the choice of the institutional design that helps selecting the best politicians is a key determinant to ensure higher welfare to society's members. The literature on political selection focused mainly on the role of monetary incentives finding that "increase in legal rewards tend to induce positive self-selection, whereas an increase in illegal rewards can invite negative self-selection" (Dal Bó and Finan, 2018, p. 562). Surprisingly, the role of political or party fragmentation,[2] (i.e. the number of parties within the coalition Le Maux, Rocaboy, and Goodspeed, 2011) has been rather neglected in this literature. Yet, it looks natural to think that it might affect the process of political selection. In fact, it is recognized that political selection is partly controlled and at least strongly mediated by parties who play the role of gatekeepers (Besley, 2005; Galasso and Nannicini, 2011, 2017) and contribute to elect or select their desired candidate in key government positions. The degree of parties fragmentation might, in turn affect the way parties select profiles for key government positions. In parliamentary systems, ceteris paribus, single-party and coalition governments might select different profiles because the degrees of freedom and the incentives associated with their choices are different. While in a single-party government the election of politicians in crucial positions needs not to be negotiated with minority parties, this is not the case in the coalition government where the above decision results from a lengthy bargaining process within the majority coalition.

We attempt at filling this gap by testing whether, in local parliamentary systems, the polit-

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[1] Among the studies that investigate the role of the national politician see D. S. Lee, Moretti, and Butler (2004), Washington (2008) and Clots-Figueras (2012) and among those on local politicians see Chattopadhyay and Duflo (2004), Pande (2003) and Gagliarducci and Nannicini (2013)

[2] Throughout the chapter we use the terms party fragmentation and political fragmentation interchangeably.

ical selection is differently affected by single-party and coalition governments. We measure politicians' quality by their educational attainment but we extend the analysis to other carachteristics like the previous job, age, and gender.[3] We focus on the Italian municipal election held between 1985 and 1992 because of the peculiarities of the electoral rule in place. In fact, during this period, in the electoral system was an indirect one, resulting in a parliamentary system in which citizens vote for the council and then the mayor and the executives are elected by the councillors among themselves.[4]

We take advantage of a natural experiment that allows us to identify the causal effect of the switch from single-party to coalition governments. The electoral rule switches at the 5000 inhabitants threshold, moving from a majoritarian to a proportional. Since the proportional rule induces to a more fragmented allocation of seats and a larger incidence of coalition governments than majoritarian,[5] the electoral rule switch at the threshold allow to identify the differences between high fragmentation and low fragmentation municipalities.

We would be able to identify the effect of the increased fragmentation, within this framework, using an RDD at the 5000 threshold if the electoral rule change is the only policy that changes at the threshold.[6] However, the executives' wage increases at the same threshold; we tackle this issue by using a Difference in discontinuities approach (Grembi, Nannicini, and Troiano, 2016). Our estimation methodology lies on the assumption that stronghold municipalities above and below the threshold have the same degree of fragmentation;[7] thus,

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[3]We use years of schooling as our main proxy for the quality of politicians, they are commonly used in the political economics literature to measure the skills needed for policy-making (Baltrunaite et al., 2014; Braendle, 2015; Brollo et al., 2013; De Paola and Scoppa, 2011; Ferraz and Finan, 2009; Gagliarducci and Nannicini, 2013; Galasso and Nannicini, 2011; Kotakorpi and Poutvaara, 2011).

[4]We look at local politicians which administer Italian municipalities analyzing the city Council, which holds the prerogatives of a national parliament, Mayors, who resembles a national first minister, and the Executive Committee, which exercises the functions of the government.

[5]See among others Lijphart (1984), Lijphart, Aitkin, et al. (1994), Lijphart (2012), Shugart and Taagepera (1989), Cox (1990), Cox (1997), Laver and Schofield (1998) and Funk and Gathmann (2013)

[6]A possible concern using thresholds based on the number of inhabitants is that the threshold of interest might experience other changes in policy (Eggers et al., 2018).

[7]Measured as the fraction of municipalities where a single party government, as opposed to a coalition one, is in place

we can isolate the wage effect at the threshold in these municipalities. On the other hand, if we estimated an RDD, at the threshold, in non-stronghold municipalities, the resulting estimated effect would be composed by the increase in fragmentation and by the increase in executives' wages. We employ a diff-in-disc strategy which allows to causal identify the impact of political fragmentation resulting from the change in electoral law subtracting the jump in quality at the threshold in stronghold municipalities (wage effect) from that in non-stronghold municipalities (wage effect + fragmentation).

The resulting increase in political fragmentation leads to an increase in the elected mayor's quality of about 1.4 years of schooling. This finding is remarked by the difference in quality between mayor and councillors/executive committee in the same council. Higher fragmentation brings the election of mayors with 1.6 additional years of schooling compared to their colleague councillors and a positive jump of 2.1 years of schooling when compared to the appointed executive committee. We also provide further evidence using the probability of being a white collar as a proxy for quality; in fact, the increase in fragmentation leads to an increase of 0.28 in the white collar rate.

These results suggest that the council fragmentation is a crucial determinant of the political selection under the parliamentary system. An explanation consistent with our result is the one according to which when councillors need to build an ex-post coalition to elect the executives (in fragmented municipalities) they find an agreement on high-quality mayors. By contrast, such a driver is missing in the case of stronghold municipalities where the single party has more degree of freedom in the mayor's choice. We would argue that the difference in quality between mayors elected in single-party and coalition government may be induced by differences in the possibility of electing a trusted (more controllable) person to positions of interest. When a compromise has to be made to elect a representative of a coalition, councillors' choices turn to a higher-quality politician that all parties are likely to rely on

The remainder of the chapter is organized as follows. In the next section (2.2), we review the literature. In section 2.3 we outline our institutional background also describing data including some descriptive statistics, in 2.5 we explain our empirical approach. Our empirical analysis results are presented and discussed in Section 2.6, and we conclude with Section 2.7.

2.2 Literature Review

We mainly contribute to the literature on party fragmentation since proportional elections induce a more fragmented party system and a larger incidence of coalition governments than do majoritarian elections (Lijphart, 1984, 2012; Lijphart, Aitkin, et al., 1994, Shugart and Taagepera, 1989, Cox, 1990, 1997, Laver and Schofield, 1998 and Funk and Gathmann, 2013). We exploit this feature of the electoral systems in order to identify the effect of party fragmentation on the quality of local politicians.

Using the Herfindahl index to capture the local council's party fragmentation, Borge (2005), shows that it has the most powerful impact on deficit imbalances. Ricciuti (2004) studying the effects of fragmentation on government spending and surplus, finds relatively low evidence in favour of their relationship with time fragmentation, and good evidence for those with institutional and control fragmentation. Le Maux, Rocaboy, and Goodspeed (2011) indicate that the majority and the fragmentation's electoral margin are key variables that determine the effective political power of parties.

The second strand of literature we refer to is the one on political selection, recently surveyed by Dal Bó and Finan (2018). They identify two main channels that drive the selection of politicians, the positive selection is driven by legal rewards, while increasing illegal rewards can induce negative selection. Using data on Italian Municipalities from 1992 to 2001 and focusing on mayors quality, Gagliarducci and Nannicini, 2013, shows that "a higher wage attracts better-educated candidates and that better-paid politicians reduce the size of the

government bureaucracy by improving efficiency". Exploiting an exogenous variation in the salaries of local legislators across Brazil's municipal governments Ferraz and Finan (2009) investigate whether higher wages attract better quality politicians and improve political performance. They show that higher wages increase competition and improve the politicians' quality, measured as education, previous job and political experience. Dal Bó, Finan, and Rossi (2013) find that higher wages in Mexican municipalities attract better applicants as measured by their IQ and psychological characteristics. The empirical literature gives us not only evidence of positive effect from monetary incentives on selection; indeed Brollo et al. (2013) denote that more massive transfers increase observed corruption and reduce the quality of mayors' candidates measured as educational attainment.

This paper also contributes to the literature on political competition and political selection. (Galasso and Nannicini, 2015) observe that parties optimally allocate their loyal candidates to safe seats, while move expert candidates to uncertain positions. (Galasso and Nannicini, 2011) show that Italian members of parliament with higher ex ante quality, are more likely to run in contestable districts. (De Paola and Scoppa, 2011) highlight that political competition is positive correlated with the quality of local administrators in term of educational attainment and previous job. Finally, some papers highlight the way different electoral system might interact with the quality of elected politicians. Galasso and Nannicini, 2017 argue that the proportional system is more capable than the majoritarian system in selecting better quality politicians. This claim has been confirmed by (Beath et al., 2016) who observe that politicians selected with a single multi-member district (proportional) system are better educated and exhibit less extreme policy preferences. The majoritarian system increases the amount of geographically targeted bills and reduces representatives' shirking (Gagliarducci, Nannicini, and Naticchioni, 2011) while larger voting districts are associated with less corruption (Persson, Tabellini, and Trebbi, 2003).

In addition, our analysis is linked to that of Gulino (2020), using data and identification strategy resembling our own posit that mayors elected under the proportional have a higher probability of being elected to regional offices after their mandate. We contribute to these strands of the literature by providing empirical evidence on the relationship between political fragmentation and the quality of politicians.

2.3 Institutional Framework

Municipalities (Comuni) are the third and last level of administrative divisions in the Italian Democracy.[8] The municipalities are characterized by a certain level of administrative autonomy that allows them to pursue the local population interests. The degree of administrative autonomy of Italian municipalities is high enough to have a significant impact on the local population's welfare. They are responsible for the provision of public housing, transportation, nursery schools, and for the assistance of elderly people. Moreover, they record the acts, the births, and deaths, and they are responsible for the street, garbage and park management, and for the delivery of some service to the citizens.

The government of the municipality is composed of the following elements:

- The Elected Council (Consiglio Comunale), holds the legislative power with the mayor, it appoints the executive bodies and might or not approve their promoted policies.

- The Mayor (Sindaco). The head of the "government", he holds the legislative and executive power, he is elected by the councillors among them. He supervises the functioning of services and offices and the execution of acts, coordinates the timetable of Commercial and Public establishments and that of Public services.

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[8]The institutional framework is closely related to one presented in section 1.2, however, we outline it even in this chapter to simplify the reading of this chapter

- The Executive Committee (Giunta), is the collegial body of mayor's collaboration.

Since 1964 the Italian administrative system has remained unchanged for nearly 30 years and then was reformed by the Law n. 81 of 1993. The new law involves the direct election of the mayor de facto changing the electoral system from a parliamentary to a presidential one (Achilli, 2009).

Until 1993 the municipalities system was characterized by a form of parliamentary government. Citizens can only elect councillors,[9] then, once elected, the members of the city council must negotiate among themselves to form the government and elect the mayor and the members of the executive committee. This broad structure has been time-invariant since 1964 up to nowadays but on March 25, 1993, the National Parliament approved the Law no. 81 which represented a radical change in the form of the local government which shifted from a parliamentary to a presidential one. The municipality's electoral system up to 1992 was ruled by the DPR 570/1960 and by the L.663/1964. While some aspects of this electoral system varied across population thresholds, the same form of the local government, a parliamentary one, was shared by all the municipalities, unregarding their population size.

In particular:

1. citizens could only vote for parties and local member of the council;

2. after the election the councillors met to appoint the mayor and the executive committee from *within their own ranks*;

3. the government form was a parliamentary one (i.e. the mayor and the executive commitee had to ask for the "fiducia" to the council).

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[9]Art. 4. D.L.L. 7-01-1946, n. 1

2.3.1 Electoral laws across the 5000 threshold

While an indirect election system for the mayor was in place both above and below the 5000 threshold, the electoral rule according to which the municipal council was elected was not invariant across the same threshold. The main changes are summarized as follows:

- Above 5000 inhabitants

  A Party-List Proportional System, where the seats were allocated with a proportional system besides each voter can choose him the preferred list and may express from one up to five preferences for his preferred councillor's candidate.

- Below 5000 inhabitants

  A Plurality System with Limited Vote and the Possibility to Panachage, where the seats were assigned to those candidates that obtain the highest number of preferences. Every candidate had to register in a list, but in those lists can be registered a number of candidates until 2/3 of the seats in the council. The voters elect the council, and each voter has got a pack of votes equal to 4/5 of the seats available. The electoral system ensures the governability with a majority bonus, which allows the winning party to obtain the absolute majority of 2/3 of the seats in the council.

Besides all the technicalities, to our purposes the main difference between these two system is the rule transforming votes to seats[10]. Below 5,000 inhabitants, the party obtaining the relative majority of votes is able to gain the absolute majority of seats (i.e. not less than 10) whatever their share of citizens' votes. This is not the case in municipalities above 5,000 inhabitants where council seats are allocated to each party-list proportionally to the share of citizens' votes according to the D'Hondt method. Accordingly, a party-list is able to obtain

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[10]Another difference, not important for our purposes, is that voters in the party-list proportional system must write in the name of the councillors for whom they want to vote, while in the plurality system the ballot paper contains all the names of running councillors (Gulino 2020).

the absolute majority of seats (i.e. not less than 10) only if the share of votes obtained is large enough (around 45%)[11]. A major implication of this feature, which is key for our identification strategy, is that municipalities below the 5,000 inhabitants are relatively much more likely to display a *single-party government* with respect to municipalities above the 5,000 thresholds where different parties are more likely to negotiate to find a post-election agreement and which are therefore relatively more likely to display a *coalition governments.*

2.3.2   Population and policies change

The electoral rule is not the only policy which changes at the 5000 threshold. Since 1963, the earnings of mayors are a step-function of the resident population size.[12] From 1974 up to 1999, the allowance scheme involved seven different thresholds for which, once it was crossed, the salary increases. For our purposes, it is worth highlighting that when the inhabitants of a municipality exceeded the threshold of 5000, the mayor earned a 30% wage increase. These allowances have been corrected for price inflation almost every year; therefore, the Mayors' wages in real terms and the relative differences between these have not changed across time and among each population bracket.

In table 2.1 there is a summary of the policies that change across population thresholds, and over time. As we can see, above the 5000 threshold the wage of the mayor (measured in 2000 prices) increases from 2169 to 2789 euros per month. At the same threshold, also the compensation for executives increases from 0 to 45% of the mayor's wage. Importantly, column 6 and 7 show that the remuneration of councillors is invariant across the 5,000 threshold, being 0 for its fixed part and 18 euros for its variable part (reimboursement per session) both above and below the threshold. However, since both mayors and executives

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[11]https://user.eng.umd.edu/~yavuz/electioncalcEE.html

[12]The municipality's allowance system then was ruled by the "Law n. 148 - 1963, Law n. 169 - 1974", "Law n. 632 - 1979" and by the "Law n. 816 - 1985"

are appointed by the councillors among themselves, each councillor has an ex-ante positive expected wage and the latter sharply increases above the 5,000 thresholds.

Table 2.1: Legislative thresholds for Italian municipalities 1985-92

Population	System	Size Ex. Com.	Size Council	Wage Ex. Com.	Wage Council	Wage Mayor
1000-3000	Majority	15	4	0	0	1,446
3000-5000	Majority	20	6	0	0	2,169
5000-10000	Proportional	20	6	1255	0	2,789
10000-30000	Proportional	30	6	1395	0	3,099

Notes: *Population is the number of resident inhabitants in the last year. Wage Mayor and Wage Ex. Com. refer to the monthly gross wage of the mayor and the members of the executive committee, respectively; the latter is expressed as a percentage of the former, which refers to 2000 and is measured in euros. Fee Council is the reimbursement per session paid to councillors and is measured in euros. Ex. Com. Size is the maximum allowed number of executives appointed by the mayor. Council Size is the number of seats in the City Council.*

2.4 Data

We combine several datasets from different sources to obtain a unique dataset containing information about the municipal elections held in Italy from 1985 to 1992.

Figure 2.1 report the distribution of electoral term during this period. Most municipal elections are held in 1985 and 1990, although some elections took place in between and in 1991. Data on the results of elections up to 1992 (shares of votes and council seats by party-list for any municipality) was only available in paper format and contained in books stored at the Italian Ministry of Internal Affairs. We scanned and OCR all these information and construct a database on Italian municipal elections.

Data on the characteristics of local politicians (mayors, councillors and executives) have been

Figure 2.1: Electoral terms
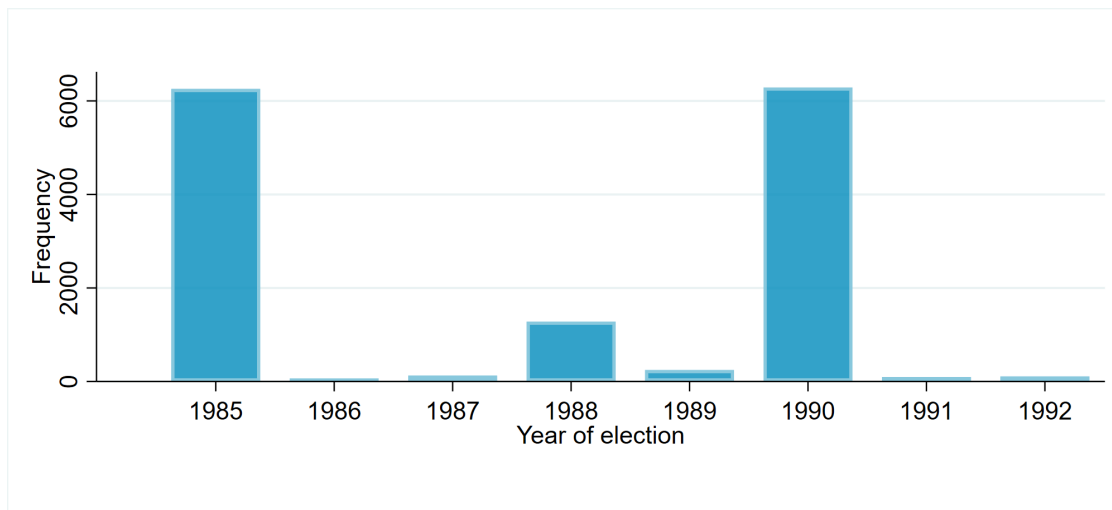
collected from the "Anagrafe degli amministratori locali e regionali", an online database from the Ministry of Internal Affairs containing specific information on all the members of the local governments in Italy.[13] This dataset contains information about gender, age, highest educational attainment, years of schooling, political affiliation, and (self-declared) previous occupation.

Data on national election at the municipal level, from 1983 to 1992, have been collected from the website of the Ministry of Internal Affair and have been used to define the sample of stronghold municipalities. Electoral terms are mostly concentrated in 1985 an 1990 but some municipal elections are held in 1988 and in 1991-2.

Table 2.2 reports some summary statistics related to the characteristics of mayors, councillors and members of the executive committee. For the sake of homogeneity, we restrict here our attention on municipalities below the 10000 threshold and above the 3000 threshold. We present information about the dependent variables that we use to explore the quality of the politicians. Years of schooling represent the educational attainment of the politicians,

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[13]Anagrafe degli Amministratori Locali e Regionali - https://dait.interno.gov.it/elezioni/anagrafe-amministratori

as we depict in table 2.2 mayors have higher level of educational attainment in respect to executive committee and councillors. White collar includes lawyers, professors, physicians,

Table 2.2: Descriptive statistics

	Mean	SD	Observations	Min	Max
Mayors					
Years of Schooling	13.7	3.33	4914	0	17
At least a degree	0.39	0.49	4930	0	1
White collar	0.64	0.48	4923	0	1
Female	0.033	0.18	4930	0	1
Age	43.6	9.43	4930	20	83
Councillors					
Years of Schooling	11.8	4.05	82049	0	21
At least a degree	0.24	0.43	82547	0	1
White collar	0.55	0.50	82393	0	1
Female	0.085	0.28	82547	0	1
Age	40.1	10.2	82547	18	100
Ex. com.					
Years of Schooling	11.9	3.92	27468	0	21
At least a degree	0.24	0.43	27617	0	1
White collar	0.58	0.49	27574	0	1
Female	0.080	0.27	27617	0	1
Age	40.2	9.63	27617	18	81

Notes: *Characteristics of the elected politicians in Italian municipalities from the 1985 to the 1992. Municipalities above the 3000 threshold and below the 10000 threshold.*

and managers. Mayors also exhibit a higher probability to have at least a degree and to have been a white collar worker, while executives and councillors shows similar characteristics. In addition, the proportion of women in the sample decreases in the executive committee and dramatically drops in the sample of mayors.

2.5   Identification Strategy

In this section, we present our strategy to identify the causal effect of the political fragmentation on the quality of the elected politicians.

We exploit the exogenous variation of the change in the electoral rules across the threshold of 5000 inhabitants, whose details have been explained in section 1.3.1. Whether the 5000's threshold experienced only the change in the electoral rule, we would have been able to point identify the effect of the high fragmentation on the politicians' quality. However, as we have shown in table 2.1 this is not the case, indeed, at the 5000's threshold, an increase in the executives' salary occurs. Thus, a standard assumption of the RD is violated, and a sharp regression discontinuity estimator is not the right instrument to isolate the effect of interest. To better highlight the policy changes, we illustrate the institutional framework in figure 2.2 in which we show the differences between coalition and single-party government. We define as stronghold all those municipalities above and below the 5000's threshold in which the first party gained at least the 45% of votes and consequently are more likely to form a single-party government. While, municipalities above and below the threshold in which the first party obtained less than the 45% of votes are defined as non-stronghold. We refer to section 1.3.1 for the definition and for the discussion of the stronghold argument.

Municipalities below the threshold are characterized by politicians with low wage, but they have a high probability of having a single-party government due to their electoral rule. Instead, municipalities above the threshold have a single-party government only when the first party gains at least the 45% of votes. To tackle the double policy change, we take advantage of a difference in discontinuities strategy (Grembi, Nannicini, and Troiano, 2016). This strategy allows for cleaning from the confounding treatment of the wage increase and thus causal estimate the effect of the high fragmentation (need to form a coalition) on the characteristics

Figure 2.2: The framework
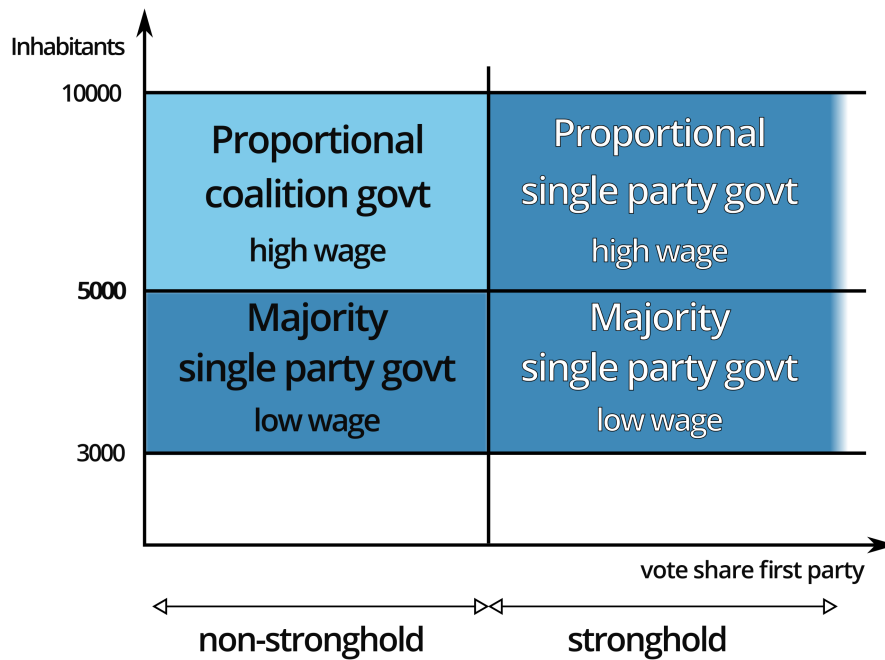
Notes: *Number of inhabitants and vote share gained by the first party*

of the elected politicians.

This identification is based on the assumption that in stronghold municipalities (where political fragmentation is very low and the probability to observe a single-party government is very high) the quality jump at the threshold can be only associated to the effect of the wage increase.[14]

Notice in fact that, despite the sample of strongholds includes both majority and proportional municipalities, the key assumption here is that since they share the same and very low degree of party fragmentation in the council (i.e. they generate a very high and similar fraction of single-party governments) the effect at the cutoff is clean from the one generated by the electoral rule and only due to the wage increase.

By contrast, non-stronghold municipalities differ across the thresholds for two reasons: 1)

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[14]This is actually the main idea over which we base the identification strategy in the previous chapter

the wage increase of local administrators; 2) the change in the electoral rule because in this case while non-strongholds majority municipalities will display in any case a very low degree of party fragmentation, this is not the case for proportional municipalities where being politically *fragmented* results in a high degree of party fragmentation because of the different way votes translate into seats.

By subtracting from the quality jump at the threshold for non-stronghold municipalities the quality jump generated in stronghold municipalities, we end up therefore with the effect we are interested in: the one associated by the change from single-party to coalition government (i.e. an increase in party fragmentation), the latter being generated by the different way stronghold and non-stronghold municipalities react to the change in the electoral rule across the threshold.

As shown in Grembi, Nannicini, and Troiano (2016), to causal identify our effect of interest, we need two assumptions. Firstly, we need to assume the steadiness of the confounder at the threshold. This assumption is satisfied because the wage jump is constant among the time span we analyze and affects stronghold and non-stronghold municipalities identically. Thus, it is easy to assume that its related effect is constant. Secondly, we need to assume that the two policy changes do not interact with each other. In this case, this implies that party fragmentation and the salary increase must not interact. Or to put it differently, the impact of the wage policy on mayor's quality should be the same non-stronghold and stronghold councils. This scenario seems plausible if the impact of the wage increase on the quality of councillors, who appoint mayors, is equal in fragmented and single party municipalities.

We estimate the diff-in-disc performing a Local Linear Regression (LLR), with symmetrical optimal bandwidth. The LLR is a semi-parametric methodology that allows selecting the right allocation of bias and variance to optimize RD estimates. Basically, we restrict our

sample, with the symmetrical optimal bandwidths:[15] (Δ), to municipalities in the interval

$$P_i \in [P_c - \Delta; P_c + \Delta]$$

Optimal bandwidths are estimated using the selector offered by Calonico, M. D. Cattaneo, Farrell, et al. (2019), thus allowing us to optimally compute bandwidth for RD in which covariates are included in the local polynomial estimation. Then we estimate the following equations for mayors, councillors and Executive Committees:

$$
\begin{aligned}
X_{int} = {} & \delta + f(P_{it}^*)\lambda + Above\ 5000_{it}\gamma \\
& + No-stronghold_{it}[\alpha + f(P_{it}^*)\eta + Above\ 5000_{it}\beta] + \varepsilon_{it}
\end{aligned}
\tag{2.1}
$$

where $P_i^* t$ is the distance from the threshold P_c computed as the difference from the number of inhabitants in the municipality i and the 5000 threshold. *Above* 5000 is a dummy variable equal to 1 when $P_i \geq P_c$ and $No-stronghold$ is a dummy variable equal to 1 for coalition municipalities. So our parameter of interest is β, the one obtained by the interaction between *Above* 5000 and $No-stronghold$. X_{in} is a vector of characteristics of the Politician n in municipality i in electoral term t. P_{it} is the population in the municipality i the year of the National Census before elections, and $f(.)$ is a function of the distance from the threshold $P_{it}^* = P_{it} - P_c$. Finally, errors ε_{it} are obtained with a cluster-robust nearest neighbor variance estimation at municipality level following M. D. Cattaneo, Idrobo, and Rocío Titiunik (2019).

2.5.1 Identifying stronghold municipalities

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Our (inverse) measure of party fragmentation is the share of votes for the 1st party in

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[15]We compute it with one common MSE-optimal bandwidth selector

national election at the municipal level. We use national rather than municipal election to identify strongholds because according to the well known Duverger's law (Duverger, 1959) a majority electoral system may produce psychological effects in voters which, by learning the mechanics of the electoral system, are induced not to waste the vote and to express their preference for one of the major parties (strategic voting).

To avoid the strategic voting we thus focus on the national elections held before the municipal elections, those in 1983 and 1987, and we define stronghold and non-stronghold municipalities using the vote share of the first party in those elections.

Table 1.3, in the previous chapter, provides further support to the choice of the 45% threshold to identify stronghold municipalities. Shifting from majority to proportional at the 5000 threshold is associated to a statistically significant reduction (-8,6%) in the probability of observing a single party government (a council where the leading party obtains at least 10 seats. This result is confirmed when restricting the sample to municipal councils where the leading party obtained a vote share in the previous national election either below 42,5% (-14,1%) or below 45% (-15%). The difference in the probability of observing a single party government vanishes if we restrict the sample to stronghold municipalities, i.e. those in which the leading party obtained at least 45% in the previous national election (column 4 and 5). To use national elections as a proxy for the political fragmentation might lead some difficulties to sharp identify the difference between stronghold and non-stronghold councils. Using this proxy, we can incur the risk of having strongholds and non-stronghold in the same group. We then remove those observations around the 45% of votes which may invalidate our estimates. Precisely we remove the 2.5% on the left of 45% and 2.5% on the right, dropping 5% around the 45%. This procedure results in having as non-stronghold municipalities those where the first party obtained at most 42.5% and as strongholds those where the first party obtained at least 47.5% of votes in national elections. Our estimates are robust, even leaving more

and fewer observations around the 45%. We report in section 2.6.1 several test showing how our parameters are stable trimming our sample.

2.6 Results

In figure 2.3, we plot graphs for the years of schooling of the elected mayors across the 5000's threshold. We plot scatter-points of our variable of interest averaged over intervals of 125 inhabitants. Two different trend lines are also included, both the lines are computed separately above and below the threshold, the dashed line represents a quadratic fit while the solid one a linear fit. Graph (a) illustrate the difference between mayors' years of schooling in non-stronghold and stronghold municipalities. Mayors' years of schooling across the threshold in non-stronghold municipalities are plotted in the graph (b) and those in strongholds in the graph (c). Figure 2.3 highlights a difference in the jumps at the threshold between non-stronghold and stronghold municipalities. In non-stronghold, no evident jump is reported crossing the threshold; instead, in strongholds, we observe a sharp decrease of more than one year of schooling. The difference between the former and the latter is plotted in the graph (a) and shows a positive jump of the mayor's quality due to the different council fragmentation. Table 2.3 presents the main results of our analysis showing the effects of the higher fragmentation on the years of schooling of the elected politicians. We decompose the difference in discontinuity strategy to better understand the results of our investigation. Panel (a) reports results of a Regression Discontinuity Design at the 5000 threshold using only non-stronghold municipalities (only those in which the first party gained less than 42,5% of votes). Panel (b) also reports results of a Regression Discontinuity Design but using only stronghold municipalities (only those in which the first party gained more than 47,5% of votes). Finally, panel (c) shows the results of our difference in discontinuities strategy, in particular, we report the estimated β presented in equation 2.1.

Figure 2.3: Mayor - Years of schooling
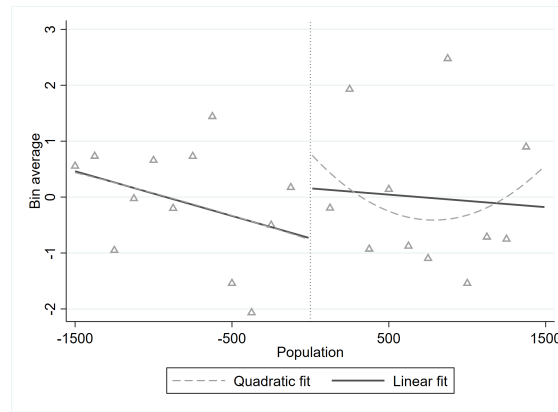
(a) Diff-in-disc
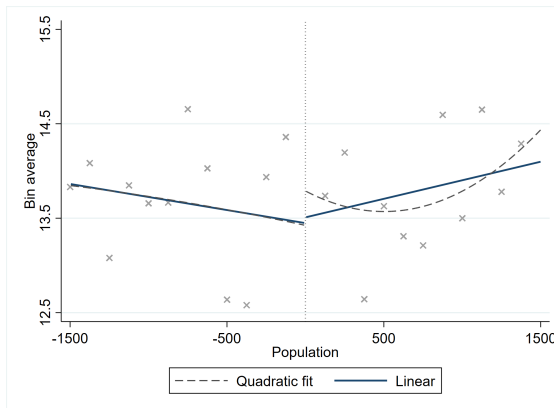
(b) Non-stronghold
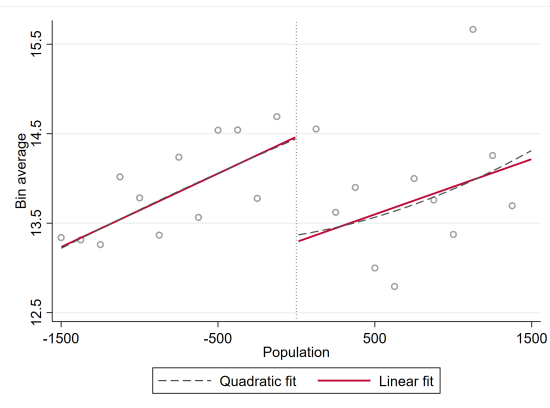
(c) Stronghold

Notes: *Mayors' years of schooling jump at the 5000 threshold in municipalities between 3500 and 6500 inhabitants. (a) difference in discontinuities obtained doing the difference between the Mayors' years of schooling in non-stronghold and stronghold municipalities; (b) regression discontinuity design in non-stronghold municipalities; (c) regression discontinuity design in stronghold municipalities. Scatter are averaged over intervals of 125 inhabitants, dashed lines are a quadratic fit and solid lines are a linear fit.*

We analyze the quality jumps in all the groups of politicians in our sample and also the differences in quality among politicians. In column (1) results on the mayor's education are reported, in column (2) those for the members of the executive committee and in column (3) those for councillors. In column (4), we report the difference between the mayor's education

Table 2.3: Years of Schooling

	(1)	(2)	(3)	(4)	(5)
	Mayors	Ex.Comm.	Councillors	Diff May - Con	Diff May - EC
Panel a. RDD - Non-stronghold municipalities					
Above 5000	0.311	-0.468***	0.394***	-0.238	0.341
	(0.411)	(0.134)	(0.0449)	(0.401)	(0.523)
Mean	13.71	11.87	11.72	1.892	1.840
Observations	1626	5331	31698	1721	1528
Bandwidth	1108	642	1300	1185	1035
Panel b. RDD - Stronghold municipalities					
Above 5000	-1.142**	0.791***	0.824***	-1.870***	-1.892***
	(0.457)	(0.0802)	(0.0789)	(0.395)	(0.429)
Mean	13.70	11.84	11.74	1.938	1.886
Observations	1758	7682	24620	2115	2125
Bandwidth	1214	942	1011	1455	1462
Panel c. Difference in Discontinuities					
High fragmentation	1.359*	-0.833*	-0.474	1.564**	2.076***
	(0.800)	(0.429)	(0.362)	(0.721)	(0.795)
Mean	13.73	11.85	11.73	1.927	1.876
Observations	1994	10574	28141	2099	2005
Bandwidth	1372	1295	1157	1441	1378
Standard errors in parentheses				* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$	

Notes: *Politicians' years of schooling jump at the 5000's threshold. Panel (a) difference in discontinuities to estimate the causal effect of the high fragmentation on the politicians' quality; (b) regression discontinuity design in non-stronghold municipalities; (c) regression discontinuity design in stronghold municipalities. Local linear regressions with symmetrical MSE-optimal bandwidth and triangular kernel. Robust standard errors, in parentheses, are clustered at municipality level*

and the average value of the executive committee's education. Finally, in column (5), we show the difference between the mayor's quality and the average value of the councillors' education.

Table 2.3 confirms what we present in figure 2.3as far as mayors are concerned. The

mayor quality does not significantly increase in non-stronghold and significantly decrease in strongholds (-1.1 years of schooling). The diff-in-disc strategy highlights an increase in the quality of the elected mayor of about 1.4 years of schooling. Similar findings are depicted in column (4) and (5), which reports the jumps in the education gap of mayors in respect to councillors and executive committee. The diff-in-disc result shows that the higher fragmentation results in the election of mayors with a higher education gap of 1.6 years of schooling when are compared to their colleague councillors, and an education gap increase of 2.1 when they are compared to the appointed executive committee. Furthermore, we report the opposite results for the executive committee; they experience a decrease in education in non-stronghold municipalities and an increase in educational attainment in strongholds. The higher fragmentation brings a decrease in the quality of the executive committee of -0.8 years of schooling.

Finally, councillors experience an increase in their quality both in non-stronghold and stronghold municipalities. Noteworthy is that when we compute the diff-in-disc, we find no significant difference among these effects. These jumps are only the result of the increase in the expected wage for councillors and affect both municipalities equally. As expected councillors quality is not affected by the increase in fragmentation.

In figure 2.4 we illustrate the same results reported in column (4) and (5) of table 2.3. In graph (a) we illustrate the diff-in-disc among mayor's years of schooling and the average value of the executive committee's education, and in the graph (b) that among mayor's years of schooling and the average value of councillors' education. Both the graph report similar results to those exposed in table 2.3 highlighting a positive jump in the selection of mayors due to an increase in council fragmentation.

We also extend our analysis studying the effect of higher fragmented council on other politicians characteristics. In table 2.4 we report difference in discontinuities results based on all

Figure 2.4: Difference in Discontinuities - Years of schooling
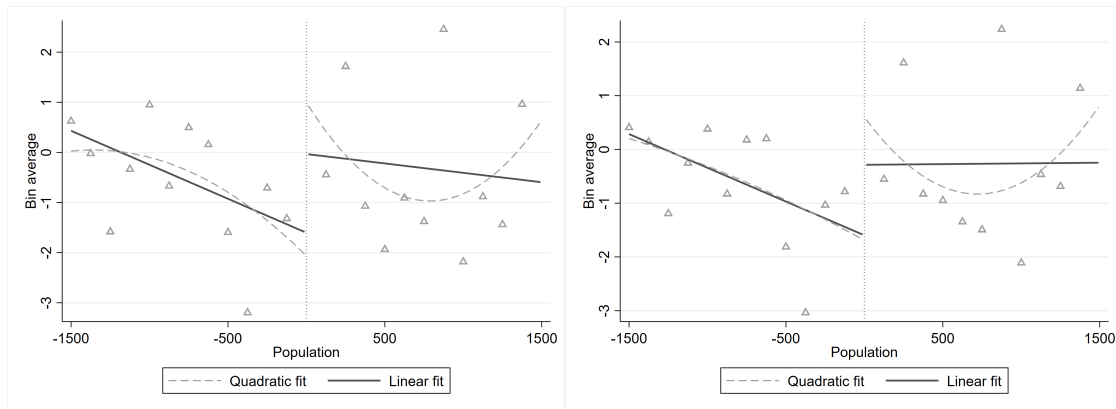
(a) Difference mayor - ex.com.   (b) Difference mayor - councillors

Notes: *Differences in quality jump at the 5000's threshold in municipalities between 3500 and 6500 inhabitants. (a) difference in discontinuities for the differences in years of schooling between mayor and executive committee; (b) difference in discontinuities for the differences in years of schooling between mayor and councillors. Scatters are averaged over intervals of 125 inhabitants, dashed lines are a quadratic fit, and solid lines are a linear fit.*

the local politician figures and their differences. Panel (a) reports the fragmentation effect on the probability to have at least a degree, panel (b) on the probability to be a White Collar Worker, panel (c) on the age of the elected politician and panel (d) on the probability to be a Female.[16] Our findings of table 2.3 are confirmed by results on the probability to have at least a degree and to be a white-collar. Focusing on at least a degree, the executive committee exhibits a decrease of -8% of this probability and the difference mayor executive committee increases (+0.192). For what concerns the white-collar, we observe a positive effect of the fragmentation on the elected mayor equal to an increase of 28% in the likelihood to be a white-collar worker. Similar results are also observed for the differences between mayor and councillors and the mayor and executive committee. No significant results have been found

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[16]White collar includes lawyers, professors, physicians, and managers as in Gagliarducci and Nannicini (2013)

Table 2.4: Difference in Discontinuities

	(1)	(2)	(3)	(4)	(5)
	Mayors	Ex.Comm.	Councillors	Diff May - Con	Diff May - EC
Panel a. At least a degree					
High fragmentation	0.131	-0.0881*	-0.0201	0.123	0.192**
	(0.114)	(0.0530)	(0.0331)	(0.0973)	(0.0974)
Mean	0.406	0.227	0.236	0.163	0.177
Observations	2053	7817	31416	2133	2437
Bandwidth	1403	948	1285	1464	1645
Panel b. White Collar					
High fragmentation	0.281***	-0.0332	0.0165	0.232***	0.225***
	(0.0924)	(0.0662)	(0.0488)	(0.0755)	(0.0800)
Mean	0.638	0.569	0.548	0.101	0.0725
Observations	2416	7215	19112	3343	3730
Bandwidth	1634	874	781	2172	2367
Panel c. Age					
High fragmentation	1.941	2.082	0.142	1.145	0.322
	(1.873)	(1.881)	(1.259)	(1.435)	(1.567)
Mean	43.61	40.25	40.12	3.511	3.508
Observations	2282	5150	16302	3370	3399
Bandwidth	1548	619	664	2191	2219
Panel d. Gender					
High fragmentation	-0.0473	0.00205	-0.0188	-0.0285	-0.0541
	(0.0431)	(0.0295)	(0.0197)	(0.0325)	(0.0381)
Mean	0.0367	0.0833	0.0879	-0.0503	-0.0450
Observations	1882	9818	29324	3685	3326
Bandwidth	1288	1204	1201	2343	2152
Standard errors in parentheses				* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$	

Notes: *Politicians' characteristics difference in discontinuities at the 5000's threshold. Local linear regressions with symmetrical MSE-optimal bandwidth and triangular kernel. Robust standard errors, in parentheses, are clustered at municipality level*

for age and gender. [17]

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[17]We provide further evidence of the robustness of these results in section 2.6.1 and in the appendix. In appendix B we report diff-in-disc results of the effect of the higher fragmentation on the quality of

2.6.1 Robustness

In this section, we find some support on the assumption we made in section 2.2, and we check the robustness of our results. The main diff-in-disc assumption shared with the RD is the absence of manipulation across the threshold. Precisely, this assumption implies that mayors have not control over the number of inhabitants resident in the municipality. This assumption seems plausible as the number of inhabitants determining the treatment is based on the latest census, and it is performed every ten years by the Italian national institute of statistics (ISTAT). We provide evidence of the absence of manipulation implementing the manipulation test developed by M. D. Cattaneo, Jansson, and Ma (2020) based on a local-polynomial density estimation technique. We report these densities in figure 2.5, graph (a) depicts the density computes using all the sample municipalities and graph (b) those for the estimation sample without observations around the 45%. The estimated densities reported in Figure 2.5 show that no significant discontinuity arises when considering the whole sample (a) nor when focusing on the restricted sample (b). Taken together, these results show that there is no strategic manipulation of the assignment variable, and thus support the validity of our identification assumption.

In table 2.5 we depict the RD results of the balance test using as dependent variable the time-invariant municipalities characteristics and also political characteristics of the national elections in that municipality. We check the composition of our sample, looking at whether the time-invariant characteristics statistically jump when crossing the threshold. Besides, testing for the political characteristics, we also verify the robustness of our definition of non-stronghold municipalities and his interaction with the confounding treatment.

Table 2.5 do not show any evident jump at the threshold for all our testing characteristics.

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mayors, councillors, and executive committees using different methods for calculating the optimal bandwidth (CERRD, MSESUM, CERSUM) and different functional forms (quadratic, cubic).

Figure 2.5: Densities

(a) Density - all the sample   (b) Density without 0.425-0.475
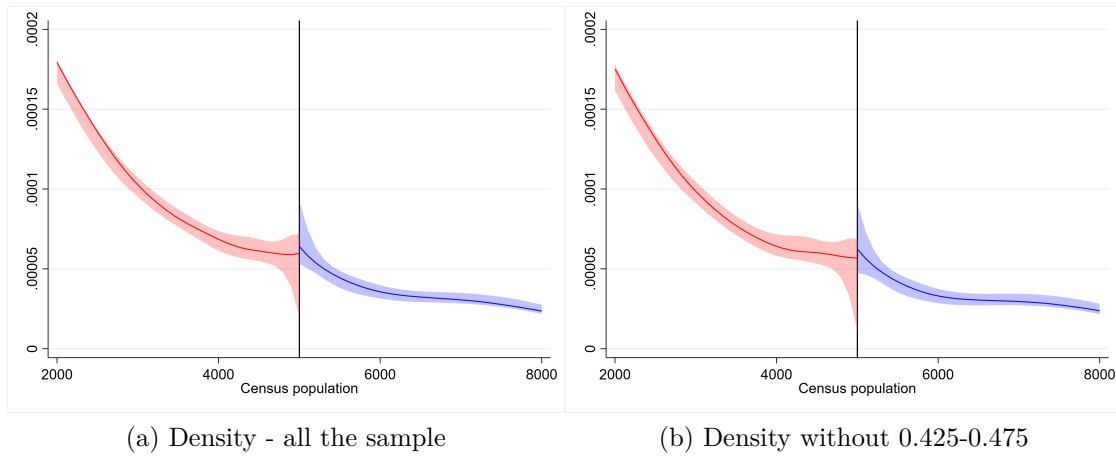
Notes: *Density tests performing local-polynomial density estimation technique on munic-*
ipalities between 2000 and 9000 inhabitants. (a) Density using all the sample municipal-
ities; (b) density using municipalities in which the first party gains more than 47.5% and
less than 42.5% of votes.

Finally, we stress the method of splitting between stronghold and non-stronghold munici-
palities. We divide the sample, starting from the percentage of votes of the first party in
the previous national election. However, the national election is only a proxy for the council
fragmentation, and thus any choice of a threshold is not able to point identify the two groups.
In fact, our estimates are performed, removing all the municipalities in which the first party
gained less than 47.5% of votes and more then 42.5%.

Finally, we provide evidence that our estimates are not driven by choices of this threshold.
In figure 2.6, we show how including these removed observations or removing more of these
swing municipalities our years of schooling results remain stable. We start removing the
1% around the 45% of leading party votes, and we estimate the diff-in-disc; afterwards, we
proceed illustrating the β and its confidence intervals. Then we remove another 1% around
the 45% and so on, widening the differences between stronghold and non-stronghold till re-
moving an around of 20%. Our representation shows that our results are not driven by the

Table 2.5: Balance tests

	Municipalities characteristics				
	Coastal municipality	Area in km2	Altitude zone	North-West	
Above 5000	-0.0294	3.881	-0.142	-0.0292	
	(0.0443)	(4.959)	(0.182)	(0.0574)	
Observations	1231	1627	1184	1190	
	North-East	Centre	South	Islands	
Above 5000	-0.00906	-0.0412	0.0855	0.0393	
	(0.0447)	(0.0366)	(0.0611)	(0.0414)	
Observations	1716	1690	843	1581	
	Unemployment rate	M^2 by occupied dwelling	Adults with tertiary education	High/middle school rate	Population density
Above 5000	2.667	-0.258	-0.309	6.238	0.471
	(1.737)	(0.579)	(0.544)	(4.688)	(47.58)
Observations	981	1133	1691	911	1323
	Political characteristics				
	Fragmentated Council	N. of voters	Share 1st party	1st party is DC	1st party is PCI
Above 5000	0.0277	-33.67	-0.00363	0.0521	-0.0310
	(0.0619)	(33.76)	(0.0121)	(0.0400)	(0.0481)
Observations	1059	1478	1099	1903	1296
Standard errors in parentheses				* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$	

Notes: *Balance test for municipalities time-invariant characteristics and national political characteristics at municipality level. Regression discontinuity design by performing LLR with symmetrical MSE-optimal bandwidth and triangular kernel. Robust standard errors, in parentheses, are clustered at municipality level with a robust nearest neighbour variance estimation*

non-stronghold definition.

2.6.2 Discussion and mechanism

The higher fragmentation leads to a positive selection for mayors in terms of higher years of schooling and a better previous job. We also remark these findings by looking at the differences in quality at the threshold between mayors and the executive committee and mayors and councillors. We observe a higher positive effect of 1.6 years of schooling for the former and a jump of 2.1 years of schooling for the latter and also similar results for the previous

Figure 2.6: Robustness test - Years of schooling

(a) Ex. com.   (b) Councillors   (c) Mayors

(d) Diff Mayor - Councillors   (e) Diff Mayor - Ex. com.
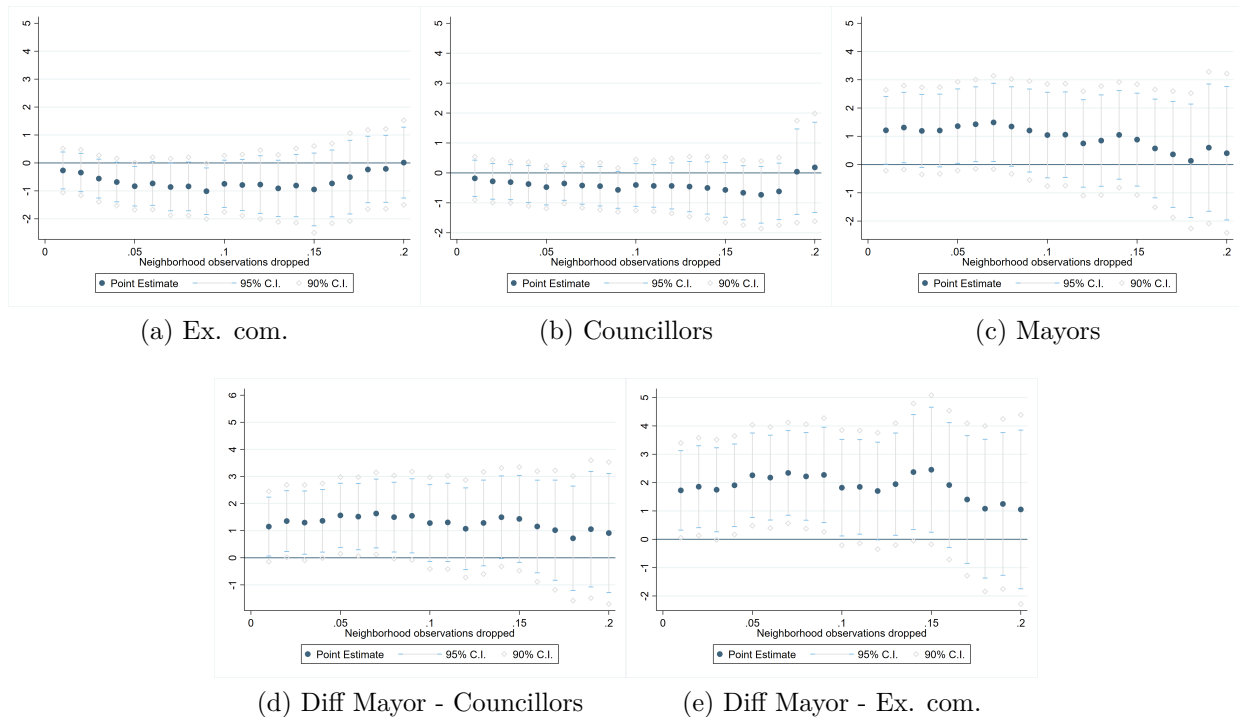
Notes: *Difference in discontinuities estimate increasing the differences between stronghold and non-stronghold. Remove the 1% around the 45% of leading party votes and we then remove another 1% around the 45% and so on, widening the differinces between stronghold and non-stronghold till removing an around of 20%. Diff in disc estimates obtained performing local linear regressions with symmetrical MSE-optimal bandwidth. Robust confidence intervals at 90% and 95% are depicted*

job. Besides, the councillors' quality positive jumps at the threshold, in both stronghold and non-stronghold municipalities, resulting in no evident differences for councillors quality. Finally, we report a negative effect of the high fragmentation for the executive committee quality decreasing by -0.8 years of schooling at the threshold.

We discuss these results starting from the intuition of for whom national party leaders prefer less educated politicians as they can extract higher surplus (loyalty) from them. When councillors have the relative majority of the seats, they are able to elect their favourite candidate (less quality), but when they need to form a coalition because of the fragmentation of seats,

this opportunity might be limited by the bargaining among the council.

Higher political fragmentation leads to an elected mayor which is more educated and and with a better previous job both in absolute terms, both relatively to the councillors who elected her and the member of the executive committee. By contrast, as expected, a more politically fragmented council has no effect on the absolute quality of councillors while it has a negative effect on the quality of the executive committee.

There seems to be no trivial or immediate explanation behind these strongly significant results. The mechanism we propose here is based on the idea, theoretically explored by Cerina and Deidda (2017) and put forward by Besley (2005), according to which political parties and their leadership might not have the incentive to support the election of skilled politicians and might prefer the election of less educated politicians. The latter, in fact, are associated to lower outside option in the labor market so that, being more concerned of re-election, parties can extract higher surplus from them in terms of service duties or higher degree of unconditional loyalty.

To see how the mechanism might work, we explore the different implications of this idea in single-party rather than in coalition government. In the first case, a single party has the absolute majority of seats so the party leadership could impose the election of an unskilled (and thereby loyal) profile without the need to persuade any other councillors belonging to other parties.

By contrast, in the second case, the majority party needs the vote of councillors from one or more minority parties. Under these circumstances, the latter might veto the election of a profile which is too loyal to the majority party and would rather accept to support a warranty and more independent. As far as the degree of independence from the party is positively associated to education, this argument would ultimately lead to the election of a more educated mayor in coalition rather than in single-party governments. In table 2.6, we

test if the chance to elect their favourite candidate is limited by the weakening of their power inside the council. We present how the share of members of the executive committee from

Table 2.6: Share of members of the executive committee from the same party

	All the sample	**Non-stronghold**	**Stronghold**
Above 5000	-0.0831***	-0.0797***	-0.0135
	(0.0310)	(0.0303)	(0.0283)
Mean	0.698	0.703	0.704
Observations	1376	1846	2136
Bandwidth	1115	1496	1708
Standard errors in parentheses		* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$	

Notes: *Share of members of the executive committee from the same party at the threshold. Regression discontinuity design by performing LLR with symmetrical MSE-optimal bandwidth and triangular kernel. Robust standard errors, in parentheses, are clustered at the municipality level with a robust nearest neighbour variance estimation*

the same party changes in non-stronghold and stronghold municipalities. Using sharp RD, we show the different jump at the threshold occurring when councillors elect the executive committee. We report the results obtained using all the sample data and our sub-sample of non-stronghold and stronghold. The share of members of the executive committee from the same party decreases of about 8 percentage points when crossing the threshold in non-stronghold municipalities while no evidence is reported in strongholds. The result highlighted in all the sample data closely resembles that showed in non-stronghold, indicating that the first may have been pushed by the latter. These results suggest that higher fragmentation leads to a weaker power inside the non-stronghold councils.

We then investigate whether the time elapsed from the election and the appointment differently jump in strongholds and non-stronghold municipalities In table 2.7 we report RD results using as dependent variables the elapsed time between election and appointment for mayor and executive committee. In non-stronghold municipalities we report a jump at the

Table 2.7: Elapsed time from the election and the appointment

	(1)	(2)
	Mayors	Ex.Com.
Panel a. RDD - All the sample		
Above 5000	16.48	64.71***
	(22.16)	(8.597)
Mean	136.4	156.8
Observations	2002	11380
Bandwidth	1104	1391
Panel b. RDD - Non-stronghold municipalities		
Above 5000	53.87*	89.54***
	(28.76)	(8.464)
Mean	132.1	160.2
Observations	3132	6657
Bandwidth	2027	804
Panel c. RDD - Stronghold municipalities		
Above 5000	-22.63	27.01***
	(32.54)	(9.788)
Mean	137.5	159.0
Observations	1658	9276
Bandwidth	1131	1124
Standard errors in parentheses	* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$	

Notes: *Elapsed time from the election and the appointment for mayors and executive committee. Regression discontinuity design by performing LLR with symmetrical MSE-optimal bandwidth and triangular kernel. Robust standard errors, in parentheses, are clustered at municipality level with a robust nearest neighbor variance estimation*

threshold of about 54 days to appoint the mayor and a bigger jump to appoint the executive committee. Instead in stronghold the elapsed time in appointing the mayor is negative but no longer significant, while the time elapsed in appointing the executive committee is 1/3 of that employed in non-stronghold municipalities.

We conclude that in non-stronghold municipalities, the need to form a coalition leads to a bargaining process which is not necessary in stronghold municipalities. During this phase, the councillors bargain among them to elect their representatives, could it be that the executives' election is affected by this phase?

We investigate if it is so by looking at the quality differential between mayors and councillors from the same party, in order to test whether the councillors from the same party choose the best among them or not. In table 2.8 we report the results of a diff-in-disc and RD with all the sample, non-stronghold and stronghold municipalities data. In strongholds, the quality

Table 2.8: Difference in education between Mayor and Councillors from the same party

	All the sample	**Non-stronghold**	**Stronghold**	**Diff in Disc**
Above 5000	-0.999***	-0.171	-1.880***	
	(0.287)	(0.409)	(0.421)	
Fragmented Council				1.625***
				(0.629)
Mean	1.947	1.904	1.943	1.935
Observations	1973	1612	1975	1947
Bandwidth	1348	1101	1352	1333
Standard errors in parentheses			* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$	

Notes: *Difference in years of schooling between Mayor and Councillors from the same party. Local linear regressions with symmetrical MSE-optimal bandwidth and triangular kernel. Robust standard errors, in parentheses, are clustered at municipality level*

of the elected mayor dramatically decreases at the threshold, while in non-strongholds no significant jump are reported. When a coalition is needed, councilors elect a better mayor as

well from those in their own party. If we look at the difference among these results, the high fragmentation leads to a more accurate choice among party candidates. The estimated effect is of 1.62 years of schooling, higher than that reported table 2.3 (1.56), suggesting that our result might be driven by party bargaining.[18] The need to find an agreement on a candidate who is accepted by all the parties in the coalition might be the reason why councillors votes for a more educated candidate.

2.7 Conclusion

In this paper, we exploit a natural experiment to causally identify the effect of an increase in party fragmentation on the quality of the elected officials. We merge several datasets to obtain one unique database on Italian local election between 1985 and 1992. Taking advantage of a double discontinuity in the institutional framework, we identify the effect of the high fragmentation using a difference in discontinuities strategy.

Higher party fragmentation leads to a positive selection of mayors in terms of higher years of schooling (+1.4 years of schooling) and better previous job (+30% probability of being a white-collar). These results are confirmed also in relative terms: councils in non-stronghold municipalities (which are more politically fragmented) tend to elect mayors which is relatively more educated than both councillors and executives with respect to strongholds municipalities, which are more likely to generate single-party governments

We interpret these results by looking at party behaviour and election timing, and we suggest that the higher quality mayor may be the result of the need to find an agreement among councillors in coalition governments.

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[18]The difference in table 2.3 is computed using all the average councillors education instead of the average education of the councillors from the same party

Our results shed some light on the effect of fragmentation on the political selection. When a single party have enough power to elect the favourite politician, they might decide to support unskilled but loyal candidates. When this power decreases due to party fragmentation, the bargaining process might help to select higher quality politicians. A natural future development of this research is that of formally investigating, under a game-theoretic framework, the proposed mechanism behind the positive impact of political fragmentation on politicians' quality.

CHAPTER NO. 3

TO SHIRK OR NOT TO SHIRK?

THE ECONOMIC DETERMINANTS OF PARTY DISCIPLINE

3.1   Introduction

Italian democracy allows members of the national parliament (MPs henceforth) to work outside their parliament during their mandate. This feature of the Italian system is common to most modern democracies (Geys and Mause, 2013) and has long been debated in the Italian public opinion especially by those citizens who consider politicians too privileged while they should instead be fully dedicated to their parliamentary activity once elected. As a matter of fact, allowing members of the parliament to keep an outside job may affect their productivity in the Parliament since they have to split their effort between their public and private obligations. More generally, the choice of the time to devote in political activities clearly generates a potential conflict of interest between voters as principals and elected politicians as agents (Geys and Mause, 2012). This conflict of interest can be a concern, in terms of neglecting their parliamentary duties, for those who do not have adequate multitasking skills.

On the other hand, the ability to generate income in the labor market is believed to be highly correlated with political skills[1] so that allowing MPs to *moonlight* can increase the quality of candidates and ultimately that of elected politicians .

In this paper we test how the ability to generate income outside the parliament is correlated with party discipline, i.e, the extent to which party members support their party line dictated by party leadership.The impact of outside income (and thereby skills) on party discipline might have important yet rather unexplored consequences on the selection of politicians. We know that political parties are concerned with MPs' defections because, in addition to damaging the image of the party in voters' eyes, they can cause delays in legislative activity, produce sub-optimal policies and create instability within the legislature putting the survival of the government at risk (Curini, Marangoni, and Tronconi, 2011; Hazan, 2003). Accord-

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[1]Gagliarducci, Nannicini, and Naticchioni, 2010.

ingly, since party discipline is costly to the MPs, party leaders may reward loyalty with, for instance, greater amounts of discretionary spending allocated to the politician's costituency (Curto-Grau and Zudenkova, 2018). But given the importance of party discipline and since political selection is highly controlled and strongly mediated by parties who play the role of gatekeepers in parliament (Galasso and Nannicini, 2011, 2017)[2], it is reasonable to expect parties to provide less electoral support to those candidates whose characteristics are negatively correlated with party discipline. For instance, if the ability to generate outside income is one of such characteristics, that would identify an incentive for political parties to support the election of relatively less-skilled candidates.[3]

We consider two measures of the degree of party discipline performed by the MP: the *rebellion* rate (i.e. the number of votes contrary to the party leadership over the total number of voting sessions that she should have attended) and the *absenteeism* rate (i.e. the number of unjustified absences over the total number of voting sessions that she should have attended). Rebel votes are recognized as an important (inverse) proxy of party loyalty in political science literature (Kernecker, 2017). The literature suggests that parties do reward low rebellion rates (Curto-Grau and Zudenkova, 2018) and in this work we provide evidence suggesting an increase in the rebellion rate is associated with a significant reduction in the probability of re-election. Yet, their economic determinants are surprisingly overlooked by the literature on political economics.[4] The observed relation between the propensity to vote against the party line and the MPs' outside income can be thought as the result of the interplay between two

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[2]The role of parties in political selection is well recognized in the literature. Parties might influence political selection trough campaigning activities (Coate, 2004; Schultz, 2007) and media capture (Durante and Knight, 2012; Enikolopov, Petrova, and Zhuravskaya, 2011). More generally, "(c)andidates are typically chosen by political parties. This fact raises the question of why a party would ever put a bad candidate up for election", (Besley, 2005, p. 55)

[3]Cerina and Deidda (2017) explore the theoretical implications of such an incentive on the relationship between pay and selection of politicians.

[4]There are of course few exceptions (Gerber and Lewis, 2004; Levitt, 1996; Mian, Sufi, and Trebbi, 2010) but the main focus of these works is different. Indeed, these works focus on the relationship between party loyalty and the composition of electoral districts, legislators' ideals, and the effects of constituent and special interests on politician voting behavior.

opposing effects. On the one hand, having an outside job might increase the MPs independence from the party, as pointed out by Norris (1996) , reducing the MPs opportunity cost of leaving politics. Thus, an higher outside income might result in higher rebellion rate because a more productive/skilled MP is less afraid of loosing the support of his party leadership in the next election round.

On the other hand, we know that outside income generates an opportunity-cost of parliamentary activities (Maddox, 2004, Becker, Peichl, and Rincke, 2009, Gagliarducci, Nannicini, and Naticchioni, 2010). Accordingly, since being constantly informed on the details of the bills on the voting agenda is a time-consuming activity, and since the opportunity cost of time is higher for MPs with higher outside income, the latter might be more likely to simply follow the party line, and allocate the time needed to get informed on the bill in other more remunerative activities. In other words, just as like in the corporate governance literature overburdened directors are widely recognized to *rubber-stamp* corporate decisions taken by the management (Tirole, 2010), overburdened MPs (i.e. those with a higher opportunity cost of time) might be more likely expected to rubber-stamp political decisions taken by the party leadership.

Absenteeism can be considered as a more subtle and understated form of defection with respect to the rebellion rate (Kernecker, 2017). Still, participating to voting session could be seen as an indicator of commitment and diligence that parties may reward (Høyland, Hobolt, and Hix, 2019) for instance by supporting reelection[5]. Here the expected relationship with outside income is less ambiguous and highly driven by the opportunity cost of time: an MP with higher outside income is expected to exhibit an higher absenteeism rate because of the higher cost associated to each voting session attended in terms of forgone outside income.

The relation between party discipline and outside income is investigated using Italian MPs micro-data during the years between 2008 and 2019. In particular, we study the MPs' be-

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[5]We highlight that our measure of absenteeism excludes absences with a legitimate reasons.

havior during the XVI, XVII and XVIII legislatures taking advantage of a unique dataset on daily voting results from the Italian parliament and by using different estimation methods (OLS, Fractional Logit, Poisson). While the main contribution of this work is the one related to rebel votes, we also extend and complete the existing literature on the economic determinants of absenteeism.

Our results show that outside income Is a good predictor of party discipline. As far as absenteeism is concerned, we find the expected positive relationship with outside income: depending on the estimation method used, an increase in the outside income of 1 standard deviation (255000 euros) is associated to an increase in the absenteeism rate between 1.1 and 1.8 percentage points, respectively 7% and 12% with respect to the mean[6]

As far as rebel votes are concerned, we find a significant and negative relationship between outside income and the rebellion rate. The magnitude in this case is considerably larger. More precisely, depending on the estimation method used, an increase in the outside income of 1 standard deviation results in a decrease in the rebellion rate between 0.2 and 1 percentage points, respectively 13% and 77% with respect to the mean. Such results are qualitatively confirmed when we focus on the sub-sample of key voting sessions. However, in this case, the coefficients are slightly weaker.

If we read these results under the light of our previous discussion, as far as rebel votes are concerned, we should conclude that the channel related to the opportunity cost of time more than offsets the one related to the cost of not being re-elected. All in all, our analysis suggests that outside income might have important effects on party discipline. Since party discipline is valuable to parties, and since the latter have a major role in political selection, our results suggest that the ability to generate outside income by an MPs might be a key determinant of the electoral support she will receive by its party. Interestingly, while the analysis on

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[6]Despite focusing on different time span (1996-2006) and using a slightly different estimation methods, these results are quantitatively not far from those found by Gagliarducci, Nannicini, and Naticchioni (2010)

absenteeism suggests that parties might have an incentive to support and select less-skilled candidates, the evidence obtained on the rebellion rate suggests a novel channel through which parties might have the opposite incentive: moonlighting politicians which are more valuable in the labor market are in fact those who significantly display more party discipline providing therefore further motivation for the party to support their election.

The remainder of the chapter is organized as follows. In the next section (3.2), we review the literature. In section 3.3 we describe the institutional background, then, in section 3.4 we review our data including some descriptive statistics and graphs. Then, in section 3.5 we outline the estimation methodology while the results of our empirical analysis are presented and discussed in section 3.6 and finally section 3.7 concludes.

3.2   Background literature

Our work is linked to two main strands of literature in Political Economy: the one which relates moonlighting politicians[7] (i.e. those allowed to carry out (un)paid jobs in addition to their political mandate) with parliamentary effort and the one which studies the causes and consequences of party discipline. As for the former, the closest work is that of Gagliarducci, Nannicini, and Naticchioni (2010) which, focusing on Italian MPs from 1996 and 2006, find evidence that outside income of is positively correlated with absenteeism. We extend and complete their analysis along several lines. First, we consider a different time-span (2008-2019); second, while their estimation method is based on macro district fixed effect, we run an individual fixed effect panel regression which allows us to account for initial (and unobservable) differences between MPs; third, and most importantly, we also study the relationship between outside income and rebel votes.

Using recorded votes from German Bundestag Arnold, Kauder, and Potrafke (2014) study

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[7]For a review on moonlightinig politicians see Geys and Mause, 2013

if the same positive relation is still working in Germany and extend the analysis to other parliamentary activity. They find that outside earnings are not correlated with absence rates and speeches; they are instead negatively correlated with oral contributions, interpellations, and group initiatives. Staat and Kuehnhanss (2017), by using data on the 7th European Parliament, highlight a negative relationship between parliamentary effort and moonlighting, showing that outside earning are negatively correlated with the production of draft, reports and opinions. There is also evidence for the negative relation between electoral competition and absences rates (Gagliarducci, Nannicini, and Naticchioni, 2011, Bernecker, 2014). The parliamentary effort is also related to electoral cycle, as argued by Geys and Mause (2016) politicians serving their last period in office decrease intra-parliamentary effort.

The second stream of literature which we refer to is the one investigating of party discipline. Kernecker (2017), using survey data from 14 Latin American countries, shows that Members of the Chamber of Deputies seeking office in the national executive are more likely to follow the party line. Bender and Lott (1996) state that politicians may be removed from office even for small deviations in voting patterns. Curto-Grau and Zudenkova (2018) study the impact of party discipline on the distribution of discretionary spending, finding that parties reward loyal politicians with greater amounts of targeted spending. As highlighted by Cohen and Malloy (2014), personal connections are a determinant of voting behaviour in term of vote-trading (logrolling). Party loyalty may also be function of the electoral rule in place (Kunicova and Remington, 2008, Becher and Sieberer, 2008) and it is also related to the recruitment pattern of elected politicians (Gallagher and Marsh, 1988). We contribute to this strand of literature by providing empirical evidence on the relation between outside income and rebel votes, something that, to our knowledge, has not been provided so far.

3.3   Institutional Framework

In this section, we frame the Italian institutional background from 2008 to 2019. The form of the Italian government is a parliamentary republic; the parliament is directly elected by citizens who vote for two different chambers with symmetrical powers. Citizens with at least 18 years can vote for the election of the 630 members of the Chamber of Deputies. Instead, only constituents with at least 25 years can vote for the election of the 315 members of the Senate. Voters became eligible to be elected as Deputy only after turning 25 years old, and as Senator only after the age of 40 years[8]. Members of the two chambers are elected simultaneously and their mandate last five years.

Importantly, the Italian MPs are free to vote without any constraint, especially independently from the dictates of their own party. The Art. 67 of the Italian Constitution states that 'Each Member of Parliament represents the Nation and carries out his duties without a binding mandate.' This article, has been included among the constitutional provisions to protect the freedom and autonomy of the members of parliament (Zanon, 1991).

MPs outside income is ruled by DPR n.361 - 1957 which provides no limits to the amount of outside income earned by politicians. Possible incompatibilities due to previous jobs and activities are monitored by the Committee on Elections, which is the institutional body in charge of evaluating the suitability with other non-elective public offices. The Committee on Elections is also responsible for ensuring the collection of MPs income tax returns data. MPs are in fact required to deposit their asset documentation and tax return bills at the Bureau of the Chamber to which they belong within three months of the proclamation[9]. This data are published online since 2014, and the information on assets and income situation of members

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[8]Art. 56 and Art. 58 of the Italian Constitution
[9]Law 441/1982 of 5 July

of parliament is published in the official *website of the Italian Parliament*.[10],[11]

3.4 Data

We combine data from several sources to obtain a unique panel dataset containing information on personal characteristics, voting behaviours and financial status of elected MPs from 2008 to 2019 in the Italian parliament. The database covers three different electoral terms, the XVI legislature (2008-2013), the XVII legislature (2013-2018) and the XVIII legislature (2018 - ongoing). Politician characteristics informations are collected from *Chambers of Deputy and Senate Open-data*[12]. Voting behaviour data are collected by *Openparlamento website*[13], which collects daily information on all public voting sessions held in Italian Parliament. Data on MPs' financial status are more difficult to obtain because they are not available in digital format.[14] We gather this information by digitalizing scans of financial MPs' self-declaration published in the Parliament website.[15] These statements are attached with scans of the tax return, and contain information about ownership of the real estate, land, vehicles and assets. From tax returns bills we retrieve the exact amount of the total gross income gained by MPs in the year before the declaration.[16] In table 3.1, we show some descriptive statics of the variables we use in our analysis, reporting information on the mean, standard deviation, number of non-missing observations and maximum and minimum. We also report descriptive statistics divided by election term in appendix. Rebellion rate is the ratio between times the

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[10]Law 13/2014 of 21 February

[11]Data on outside income has been published since 2008,but at that time there where no compulsory requirement for MPs to publish their personal information in the Italian Parliament website.

[12]url of websites: http://dati.senato.it and http://dati.camera.it

[13]url of websites: https://parlamento16.openpolis.it, https://parlamento17.openpolis.it and https://parlamento18.openpolis.it

[14]We would like to thank Michele Racis and Elisa Demontis for their precious help in collecting the data

[15]url of websites: www.camera.it and www.senato.it

[16]Politicians must compulsorily upload all this information since 2014, and this means that we have full financial documentation only from XVII legislature.

Table 3.1: Descriptive statistics

	Mean	SD	Count	Min	Max
Rebellion rate	0.013	0.034	12844	0	0.78
Absenteeism rate	0.17	0.19	12844	0	1
Income in 100K euros	1.37	2.55	7961	-1.93	107.0
Outside Income in 100K euros	0.58	2.55	7961	-1.93	107.0
Number of buildings	1.84	2.76	7995	0	36
Number of lands	0.47	2.23	7959	0	65
Shareholder	0.30	0.46	8063	0	1
Administrator duties	0.15	0.36	8065	0	1
Gender	0.72	0.45	12754	0	1
Age	51.8	10.7	12748	19	94
Freshmen	0.56	0.50	12754	0	1

Notes: *The data refer to the XVI, the XVII legislature and the XVIII legislature. Income and outside income are expressed in thousand of Euros. The variables age, buildings, lands, are expressed in units, absenteeism and rebel votes are ratio and the remaining are dummies*

MP has voted against her parliamentary group and all the voting sessions she should have attended, and it assumes values in the range between 0 and 0.78 as summarised in table 3.1. Instead, absenteeism is computed as the ratio between the times that the MP has been absent during voting sessions and the total number of voting sessions she should have attended and it assumes values between 0 and 1. MPs have been absent more than ten times compared to how many times they voted rebel.

In figure 3.1 we depict bar plot of the distribution of our dependent variables, rebellion rate and absenteeism rate. The distribution of the rebellion rate is skewed to the right and is concentrated on values close to 0. Comparing the rebellion rate distribution with that of absenteeism rate it turns out that both distributions are skewed to the right, but the distribution of absences is more uniform.

Figure 3.1: Dependent variables distribution

(a) Rebel votes

(b) Absenteeism
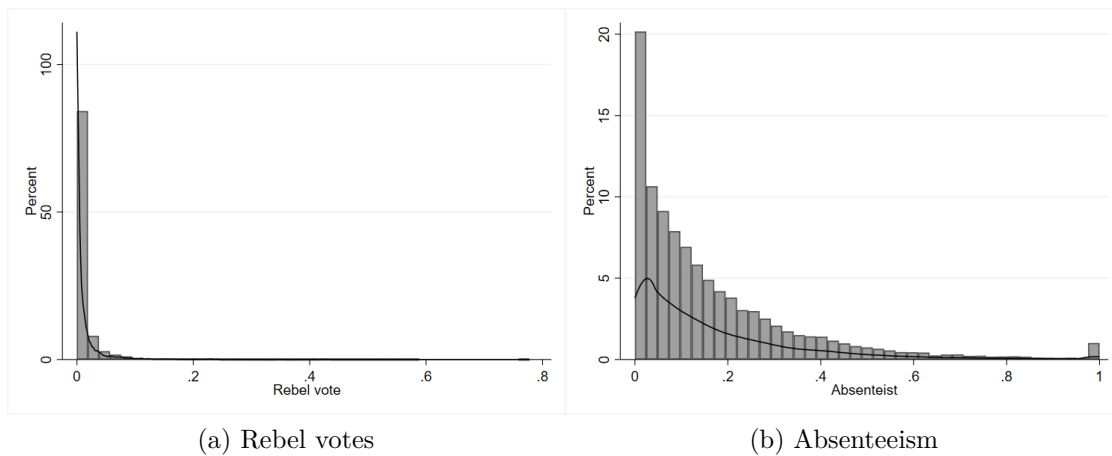
3.4.1   Outside income

Outside earnings are computed starting from the total gross income earned by the MP in the previous year. This is composed by the sum between rewards from parliamentary office and outside income. Given that the former is time and politician-invariant and equal to 98471, we can obtain the outside income by simply substracting this amount from MPs' total income.[17] We proceed subtracting the parliamentary allowance only for those politicians who have been in charge in the previous year. The Outside income is expressed in 100 thousand Euro to make our result interpretation easily since this amount is almost equal to the parliamentary income. As depicted in table 3.1 both outside earnings as total gross income vary between -193 thousand and 10.7 millions euros per year among MPs, they have equal maximum and minimum because of the computation method used.[18] In order to deal with outliers and negative values we retain in our sample all the observation between the 1st and the 99th

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[17]MPs with only the parliamentary allowance earn this amount https://www.camera.it/leg18/921?shadow_deputato=305704 for the calculus see https://espresso.repubblica.it/palazzo/2014/02/07/news/tasse-ecco-come-la-casta-si-e-dimezzata-l-aliquota-1.151800

[18]Since we use data on tax bills, we depict also a negative earned income due to past financial troubles reported by a MP: https://www.camera.it/leg18/921?shadow_deputato=307371

percentile of the income distribution.[19] We have collected also information regarding MPs' wealth (number of owned buldings and lands), age, gender and a set of dummy variables that indicate whether the MPs is a shareholder, a freshman or if she has administrative duties in private companies.

3.5 Empirical Approach

In this section, we present empirical evidence about the relationship occurring between voting behaviour and outside income. The dependent variable Y are Rebel vote and Absenteeism, the key explanatory variable is the amount of annual outside earnings (expressed in 100K euros) earned the year before. A problem arising when estimating the impact of outside earnings on political behaviour is the fact that MPs voting is not only related to income but will also depend on other personal characteristics affecting their preferences. We account for this by including individual and year fixed effects and a vector of additional explanatory variables. In particular, we control for several personal characteristics that might vary over time as patrimonial characteristics, being or not a Senator, elected with a majority and a Freshman. Using an individual fixed effects estimation, our model isolates the relation between outside income and voting behaviour of those politicians who experience a change in outside earnings over the course of the years.[20] Hence, the value of the coefficients results only from the change in outside income only for those parliamentarians where this change occurs. Therefore, those who experience constant earning do not contribute to identify the correlation. In addition, individual fixed effects are useful because using them we can con-

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[19]We remove the outliers accordingly to Gagliarducci, Nannicini, and Naticchioni (2010)

[20]We distinguish from the previous literature analyzing the relation between politician behavior and outside income in Italy using an individual fixed effect model. Gagliarducci, Nannicini, and Naticchioni (ibid.) uses pre-parliamentary freshmen's incomes as an instrumental variable for outside earnings, and tested the relation between outside income and absences from parliament. Our approach is closer to that employed by Arnold, Kauder, and Potrafke (2014).

trol for the initial differences among MPs. Controlling for time-invariant characteristics, we obtain further information on the direction of the effect of the change in the explanatory variables. This feature is useful for our purposes allowing us to partial out the effect of MPs with an initial large outside income on voting behaviour. In fact, politicians with a high outside income might be those who dictate the party line which would imply some relevant endogeneity issue. In our framework we are capturing only the effect of changes in outside income so that we can rule out this endogeneity concern.

After controlling with fixed-effect, our results might still be affected by the reverse causality distortion, because parliamentarians decide simultaneously on external activities and participation in parliamentary activities. We tackle this issue by using outside income earned the previous year which clearly affect the voting behaviour in the parliament without the latter being able to affect the former. Despite all of this, this empirical strategy does not ensure that the analysis provides reliable causal estimates. For this reasons, despite our analysis might suggest that outside income does affect party discipline, our results should be taken with caution as they formally represents correlations rather than causal relationship.

The full panel data model we estimate has the following form:

$$Y_{it} = \delta Income_{i(t-1)} + \beta X_{i(t-1)} + \gamma C_{it} + \theta_i + \eta_t + \epsilon_{it} \tag{3.1}$$

Y_{it} represent Absenteeism and Rebellion rates of politician i in year t and the Outside income earned in the previous year is $Income_{i(t-1)}$. $X_{i(t-1)}$ and C_{it} are vectors of respectively financial information for the previous year and Politician characteristics. Finally, we add year fixed effect η_t and individual fixed effect θ_i. We estimate our model with standard errors robust to heteroskedasticity (Huber/White/sandwich standard errors ϵ).[21]

We estimate this model using OLS and both a fractional logit a la Papke and Wooldridge

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[21]See Huber et al. (1967) and White (1980)

(1996), because of our response variable assumes values between 0 and 1.

3.6   Results

This section starts with the exploration of the relation between reelection and politician behavior and characteristics in order to motivate the analysis we perform in the next pages. It is reasonable to think that, when deciding how much effort put in political activities, MPs take into account which behaviour may attract the attention of voters and parties. MPs are probably differently concerned about the effects of these behaviors. Politicians who do not follow the party line may be put on trial by parties and therefore not be candidate in the next elections or to be destined to tougher districts.

In table 3.2, we report results of the correlation between voting behaviors and the probability of re-election to investigate how parties react to rebellion and absenteeism. We report average marginal effects from a fractional logit estimate with term, district and group fixed effect also extending the analysis to income and other MP characteristics.

Our results highlight that reelection probability is negatively correlated with rebel votes while it is not correlated with absenteeism. We also show a negative correlation between reelection probability and age, and a positive correlation with being excused. In addition, we find no relation between outside income levels and reelection.

Being excused means that the politician has not attended the voting session because of a documented illness or because of other administrative commitments. The positive coefficient could be explained by the fact that politicians with other parliamentary commitments might be also the most important one and therefore the party might push for their re-election. The negative correlation with rebel votes and the lack of correlation with absences suggest that parties or voters punish more the rebellious behaviours than absenteeism. This may be seen

through the lens of Kernecker (2017), which asserts that parties may punish differently various degrees of disloyalty to the party. In fact, voting against the party line is the maximum dissent communicable to parties and voters. In contrast, an intermediate level of dissent known as "implicit" as abstention or absenteeism allows politicians not to put themselves in full opposition to the party.

3.6.1   Rebel votes

In this section we present results of rebel vote estimates. In table 3.3 are reported estimates results from OLS (1st, 2nd and 3rd column) and Fractional logit (4th, 5th and 6th column). We present 3 different specification used with both estimations method, In the 1st and 4th column we estimate equation 3.1 without the control variables and in the 3rd and 6th we add data from the XVI electoral term. However, since income data from the XVI were collected on voluntary basis, the latter may suffer from selection bias and therefore we don't consider column 3 and 6 as our benchmark estimates. Nonetheless, they are useful to see how this potential selection bias might affect the results. These parameters are expressed as average marginal effects, which is to say, the percentage points change in voting behaviour for 100 thousands increase of the outside income.[22] Estimates are computed removing outliers below the 1st and above the 99th percentile of income distribution.[23] Table 3.3 shows the relation between rebel vote and MPs' characteristics. Using both OLS and fractional logit the coefficient of Outside income is positive and statistical significant. OLS estimates shows that an increase by 100 thousands of euros of the outside income lead to a decrease of 0.4 percentage points in the probability of vote rebel, while fractional logit highlights a decrease

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[22]It worth to highlight that 100 thousand euros increase from an initial income of 100 thousands is roughly equivalent to doubling the salary as a parliamentarian

[23]In the appendix we perform a similar analysis using a Poisson estimation method to account for the skewness of the dependent variable distribution. Such analysis delivers similar results

Table 3.2: Probability of re-election

	(1)	(2)	(3)
Outside income	-0.00272		-0.00445
	(0.799)		(0.654)
Freshmen	-0.0474*		-0.0261
	(0.077)		(0.360)
Age	-0.00987***		-0.00976***
	(0.000)		(0.000)
Gender	-0.0234		-0.0227
	(0.359)		(0.372)
Senatore	-0.0335		-0.0131
	(0.401)		(0.739)
Absenteeism		-0.0373	0.000323
		(0.550)	(0.997)
Excused		0.198***	0.189**
		(0.000)	(0.011)
Rebellion rate		-1.777**	-2.385***
		(0.027)	(0.006)
Observations	1436	2113	1436
Log likelihood	-771.6	-1209.0	-763.2
Term FE	yes	yes	yes
Parliamentary group FE	yes	yes	yes
District FE	yes	yes	yes
p-value in parentheses		* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$	

Notes: *Average marginal effects from fractional logit estimates with probability of re-election as dependent variable. Estimates include term, district and group fixed effects using XVII and XVII terms data. Outside income is expressed in 100 thousand of Euros and errors are robust to heteroskedasticity*

of 0.07 percentage points in the rebellion rate. The Senator dummy show that deputies who become senators increase their rebel vote probability by 2 percentage points.

To better understand the relationship between the dependent variable and outside income, we have reported in figure 3.2 the predictions of the fractional logit model (5) of table 3.3.[24]

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[24]We plot results using the model 5 because it represents our more conservative estimate

Table 3.3: Rebel votes

	OLS			Fractional Logit		
	(1)	(2)	(3)	(4)	(5)	(6)
Outside income	-0.00392**	-0.00387**	-0.00278**	-0.000673***	-0.000675***	-0.000607***
	(0.017)	(0.016)	(0.030)	(0.000)	(0.000)	(0.000)
Number of buildings		0.000122	-0.0000508		0.00154***	0.000320
		(0.842)	(0.893)		(0.000)	(0.235)
Number of lands		-0.000476	-0.000464		-0.00167**	-0.000993
		(0.787)	(0.743)		(0.036)	(0.193)
Number of vehicles		0.000549	-0.000229		0.000576	-0.000232
		(0.672)	(0.805)		(0.342)	(0.644)
Shareholder		-0.00411	-0.00240		-0.00170	-0.000591
		(0.337)	(0.430)		(0.285)	(0.697)
Senator		0.0279***	0.0192***		0.0164***	0.0130***
		(0.000)	(0.000)		(0.000)	(0.000)
Elected with majority		-0.00968	-0.0138*		-0.00524**	-0.00544**
		(0.228)	(0.067)		(0.014)	(0.017)
Freshmen		0.00725	0.00204		0.000150	-0.000322
		(0.104)	(0.409)		(0.909)	(0.763)
Observations	5760	5746	7489	5760	5746	7489
Adjusted R^2	0.501	0.513	0.491			
Log likelihood				-341.9	-340.5	-457.7
Year FE	yes	yes	yes	yes	yes	yes
Parliamentary FE	yes	yes	yes	yes	yes	yes
XVI data included	no	no	yes	no	no	yes
p-value in parentheses				* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$		

Notes: *Average marginal effects from OLS and fractional logit estimates with rebel votes ratio as dependent variable. Estimates include year and MP fixed effects using XVI,XVII and XVII therms data. We remove observations from the 1st and 99th percentile of the income distribution. Outside income is expressed in 100 thousand of Euros and errors are robust to heteroskedasticity*

For the plotting of figure 3.2 all the marginal effects of the income have been considered, the outside income varies from 0 euro to 500 thousand euros for gradual increments of 25,000 euros. We observe the same negative relationship, between income and rebel votes, we present in the results table. The average marginal effect from the fractional logit estimation is about -0.000673, or equivalently, when a MP witness an increase of 1 standard deviation of her outside income the rebel vote probability decreases by 0.17 percentage points. That is, an increase by 1 standard deviation lead to a decrease in the probability to vote rebel of about the 13% of the sample average. The OLS estimation shows that an increase in the outside income of 1 standard deviation results in a decrease in the rebellion rate of 1 percentage points, that is the 77% with respect to the mean.

Figure 3.2: Rebel Vote predictions
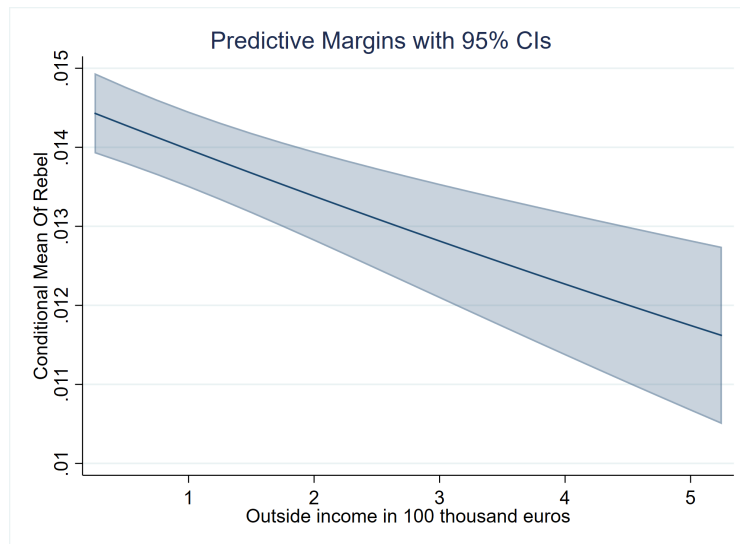
Notes: *Outside income marginal effects from fractional logit estimates, outside income varies from 0 euro to 500 thousand euros for gradual increments of 25,000 euros.*

3.6.2 Absenteeism

Table 3.4 shows the results for absenteeism. Both in the OLS and fractional logit estimation, the coefficient of outside income are positive and significant. Also, the magnitude of the effect is more similar across estimation methods. OLS estimates shows an increase of 0.7 percentage points in the probability of being absent when the outside income increases by 100 thousand of Euros, while fractional logit highlights an increase of 0.45 percentage points. The Senator dummy show that deputies who become senators decrease their absence probability by 5 percentage points. In figure 3.3 we report the predictions of model 5 of table 3.4. For the plotting of figure 3.3 all the marginal effects of the income have been considered, the outside income varies from 0 euro to 500 thousand euros for gradual increments of 25,000 euros. The average marginal effect is about 0.00437, or rather, when a MP experience an increase of 1 standard deviation of her outside income the absenteeism probability decreases by 1.11 percentage points. That is, an increase by 1 standard deviation lead to a decrease in the absenteeism rate of about the 6.55% of the average.

As far as absenteeism is concerned, our results confirm the one by (Gagliarducci, Nannicini, and Naticchioni, 2010) as they also find a positive relationship between outside income and absenteeism. However, we observe that our results cannot be directly compared with theirs. In fact, their estimation method is based on macro district fixed effect, while we run an individual fixed effect panel regression which captures only the effect of changes in outside income across years.

3.6.3 Discussion

The evidence provided suggests that outside income is a good predictor of higher absenteeism and lower rebellion rate in for the Italian MPs. We observe that the absenteeism rate has

Table 3.4: Absenteeism

	OLS			Fractional Logit		
	(1)	(2)	(3)	(4)	(5)	(6)
Outside income	0.00722**	0.00735**	0.00436	0.00437**	0.00437**	0.00255
	(0.047)	(0.036)	(0.147)	(0.029)	(0.021)	(0.150)
Number of buildings		-0.00230	-0.00212		-0.00423	-0.00345
		(0.558)	(0.437)		(0.214)	(0.134)
Number of lands		-0.00339	-0.000902		-0.000535	0.00134
		(0.263)	(0.769)		(0.897)	(0.745)
Number of vehicles		0.00175	-0.00218		0.00263	-0.00128
		(0.748)	(0.606)		(0.571)	(0.701)
Shareholder		0.00202	0.00109		0.000271	0.000489
		(0.865)	(0.905)		(0.981)	(0.953)
Senator		-0.0413**	-0.0290**		-0.0501**	-0.0327**
		(0.037)	(0.013)		(0.032)	(0.014)
Elected with majority		0.0181	0.0282		0.0274	0.0325
		(0.523)	(0.250)		(0.365)	(0.211)
Freshmen		-0.00806	-0.0106		0.00262	-0.00608
		(0.624)	(0.296)		(0.870)	(0.534)
Observations	5760	5746	7489	5760	5746	7489
Adjusted R^2	0.672	0.672	0.634			
Log likelihood				-2236.5	-2229.0	-2847.6
Year FE	yes	yes	yes	yes	yes	yes
Parliamentary FE	yes	yes	yes	yes	yes	yes
XVI data included	no	no	yes	no	no	yes
p-value in parentheses				* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$		

Notes: *Average marginal effects from OLS and fractional logit estimates with absences ratio as dependent variable. Estimates include year and MP fixed effects using XVI,XVII and XVII therms data. We remove observations from the 1st and 99th percentile of the income distribution. Outside income is expressed in 100 thousand of Euros and errors are robust to heteroskedasticity*

Figure 3.3: Absenteeism predictions
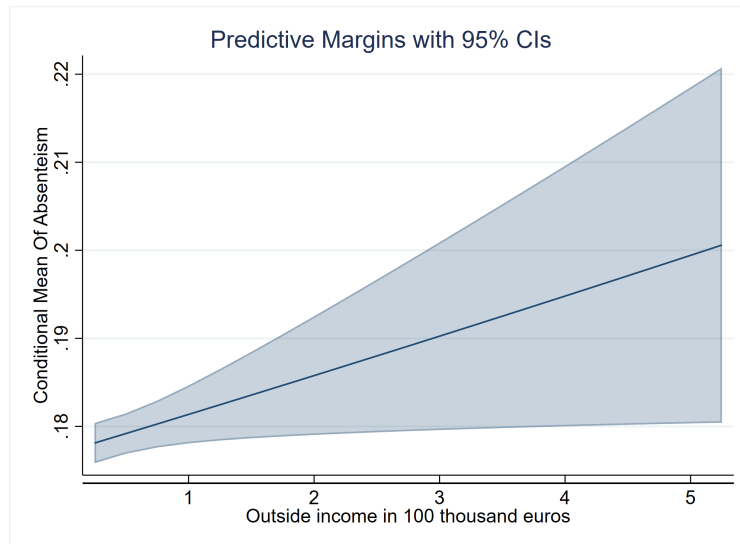
Notes: *Outside income marginal effects from fractional logit estimates, outside income varies from 0 euro to 500 thousand euros for gradual increments of 25,000 euros.*

a positive correlation with outside income while rebellious rate has a negative correlation. The same opposite relation is also depicted for what concern the senator dummy. In fact, we report a positive correlation between becoming a Senator and the rebellious rate and a negative correlation between becoming a Senator and the absenteeism rate. The opposite sign between the outside income and senator dummy and the dependent variables suggests that the rebellious rate may be a measure of shirking which is opposite to the absenteeism rate.

While the positive correlation between outside income and absenteeism is intuitive and has been already discussed and documented by Gagliarducci, Nannicini, and Naticchioni (2010),[25] the negative relationship between outside income and party disloyalty is puzzling at first sight. As suggested by Norris (1996) outside income should be positive related with higher

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[25]We observe that our, however, findings are not perfectly comparable with Gagliarducci, Nannicini, and Naticchioni (2010): while we estimate the effect of the increase of outside income earned during the whole duration of the legislature, they estimate the effect on absenteeism of higher outside income politicians between legislatures

independence from politician reward. As a consequence, high income politicians are *a-priori* expected to care less about reelection and thereby to be less afraid to vote in opposition to the party line, especially in bills where they urge to respond to local needs which are in contrast to those of the party (Curto-Grau and Zudenkova, 2018).

However, once we consider that getting informed about the details of a bill takes time, then we could identify another potential channel working on the opposite direction and which might potentially offset the one described just above. One member of the Parliament which is able to generate a high outside income, *ceteris paribus*, might be more likely to skip the costly information gathering and simply follow the line of the party leadership in order to allocate his (scarce) time into more remunerative private activities. The nature of the channel we highlight is very close to the one related to absenteeism: voting according to conscience requires a great amount of information which is time consuming just like attending voting sessions is. And since the opportunity cost of time is higher for more skilled politicians (as they produce higher outside income), then the latter are expected to both deserting more voting session *and* to "rubber-stamping" [26] the decisions taken by the party leadership.

The analogy with the corporate governance literature on the boards of directors might help to further motivate this view. Members of the board of directors have similar trade-offs to those of members of Parliament as well as shareholders have the same need for oversight as voters. In principle, members of the board of directors represent shareholders as well as members of the parliament represent voters, and the board of directors monitors management on behalf of shareholders more or less how the Parliament monitors the work of the government on behalf of the citizens. The problem they share lies in motivating agents to act in the principals' interest rather than simply in the agents' interest. On the one hand, MPs may do not fulfill their duties and act in their own interest by avoiding sessions or bypassing the costly

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[26]Rubber-stamp has become synonymous with "routine authorization of an action without questions" (H. M. Gray, 1972)

gathering of the necessary information to participate in voting sessions. On the other hand, directors may not fulfill their duties and act in their interest by not preparing for boards meeting or directly deserting them in order to employ their time, a scarce resource, in more productive activities.

Actually, boards of directors have typically been depicted as ineffective rubber stampers that are controlled by management rather than controlling it.[27] Tirole (2010) explains why directors rubber stamp. First of all, directors are generally chosen among very overburdened people: many of the external directors of the largest U.S. firms are CEOs of other companies. Despite their commitments, these overburdened directors are also in charge in a large number of firms as member of the board, and at the end of the day, they will not be able to devote sufficient effort to any of those board. In such conditions, they may attend board meetings unprepared and entirely rely on (selective) information disclosed by the firm's management. The arguments that motivate overburdened directors to rubber-stamp management decisions, are not so far from those that, according to our view, might convince overburdened MPs (those with a higher opportunity cost of time, i.e, the more valuable in the labor marker) to rubber-stamp decisions taken by the party leadership. Also, just like directors are associated with higher tendency to be absent from board meetings (Jiraporn, Singh, and C. I. Lee, 2009, S. Gray and Nowland, 2018), rubber-stamping MPs are associated to higher absenteeism.

Another possible interpretation of our results would be that for which an MP with a high income might benefit more from his or her role as an MP in terms of increased opportunities to earn money. We explore this channel in appendix C, analyzing the different correlation between the political behavior and outside income of MPs with pre-election income above the median and those with pre-election income below the median. All the specifications' results show that there is no different correlation between outside income and political behavior

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[27]For a review of rubber stamping in board of directors see among others H. M. Gray (ibid.), Herman (1981), Hung (1998) and Stiles (2001)

for high-income MPs and low-income MPs, suggesting that we should reject this possible channel.[28]

All in all, our view suggests that the negative relationship between rebellion rate and outside income is the result of a shirking behavior of the MPs against voters. However, this shirking behavior also creates an incentive for parties to support and select those MPs who generate more outside income and therefore are more likely to be competent.

3.6.4   Key votes

In key voting sessions MPs vote is crucial for their parties and the former might be more likely to be express congruent votes. In this section, we present results focusing only on the key votes of the legislatures. Key votes are the most critical votes in the legislature, they are essential because of the importance of the subject and for the political value of the vote. During these voting session MPs should be on the spotlight and their rebellious vote or absenteeism are more likely to be punished by parties and voters.[29] Therefore, we should expect shirking behaviors to be reduced or avoided in these particular sessions.

In table 3.5 we report average marginal effects from fixed-effect OLS estimates, which is to say, the percentage points change in voting behaviour for 100 thousands increase of the outside income.[30] Results depicted are obtained using only XVII and XVIII term data and removing outliers. In key votes, politicians witnessing an increase in outside income have a negative probability of voting rebel and a higher probability of being absent. These results

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[28]There might be in principle another reason why we could observe a negative relationship between outside income and party discipline. It might be that party leaders, which usually are themselves MPs, are those with higher outside income. According to this view, the causality direction runs the other way round: party leaders are more likely to be skilled and therefore to produce higher outside income and since they dictate the party line they also display more party discipline. However, our methodology allows to dismiss this channel: in fact our fixed-effect estimator allows us to eliminate the initial differences between the various politicians and focus only on the outside income variations

[29]Similarly Galasso and Nannicini (2011) use the absenteeism rate during the last year of the legislative term, because at that time reelection incentives are at their maximum

[30]We do not use fractional logit because of the high presence of zeros in the dependent variable

Table 3.5: Key votes

| | Rebel vote | | Absenteeism | |
	(1)	(2)	(3)	(4)
Outside income	-0.00438**	-0.00414**	0.00528*	0.00558*
	(0.010)	(0.013)	(0.084)	(0.066)
Number of buildings		-0.00160		0.00119
		(0.233)		(0.780)
Number of lands		-0.000747		-0.00397*
		(0.772)		(0.093)
Number of vehicles		-0.00141		0.000678
		(0.388)		(0.899)
Shareholder		-0.00450		0.00326
		(0.294)		(0.745)
Senator		0.0244***		-0.0667***
		(0.000)		(0.001)
Elected with majority		0.00833		-0.0202
		(0.376)		(0.466)
Freshmen		0.0110**		-0.00594
		(0.039)		(0.683)
Observations	5688	5674	5688	5674
Adjusted R^2	0.401	0.410	0.664	0.665
Year FE	yes	yes	yes	yes
Parliamentary FE	yes	yes	yes	yes
p-value in parentheses			* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$	

Notes: *Average marginal effects from OLS estimates with year and MP fixed effects using XVI and XVII therms data. We remove observations from the 1st and 99th percentile of the income distribution. Dependent variables are absences and rebel votes rates during key voting sessions. Outside income is expressed in 100 thousand of Euros and errors are robust to heteroskedasticity*

are similar to those obtained using the non-restricted sample of votes. Moreover, if we look only at rebel votes, they differ only in term of variance and in magnitude as far as absenteeism is concerned. The key voting sessions are those in which there is high media coverage, such as

votes in which confidence is placed, thus, parties and voters are particularly interested in the result of these. We would have expected a reduction in the magnitude of the parameters, but this is only weakly occurring for the absenteeism rate. During these voting sessions politicians who are afraid to not be re-elected should vote differently with respect to every day voting, nevertheless, our results show a similar pattern of voting suggesting that politicians do not behave differently even though that vote is important.

3.7   Conclusions

In this paper we test the relationship between outside income and party discipline in Italian MPs between 2008 and 2019. We proxy party discipline with two (inverse) measures: the absenteeism rate and the rebellion rate. The evidence we provide is not univocal: absenteeism is positively and significantly related to outside income and the rebellion rate display the opposite but likewise significant relationship.

While the positive correlation between outside income and absenteeism is intuitive and documented in literature, the negative relationship between outside income and rebellion rate might look puzzling at first-sight. On one hand, a higher outside income is supposed to result in higher rebellion rate because a more productive MP is less afraid of loosing the support of his party leadership in the next election. On the other hand, since being informed on the bills details on the voting agenda is a time-consuming activity, and since the time opportunity cost is higher for high outside income MPs, the latter might be more likely to simply follow the party line, and allocate their time in other more remunerative activities. Our evidence suggests that outside income has important effects on party discipline and it is therefore a key determinant of the electoral support she will receive by its party. Interestingly, while the analysis on absenteeism suggests that parties might have an incentive to support and select less-skilled candidates, the evidence obtained on the rebellion rate identifies a novel channel

through which parties might have the opposite incentive: moonlighting politicians which are more valuable in the labor market are in fact those who significantly display more party discipline providing therefore further motivation for the party to support their election.

A natural future development of our analysis is that of a deeper investigation of the relationship between outside income and rebellion rate. In particular, it seems necessary to provide direct evidence of the mechanisms behind this relationship and to disentangle between opposing channels.

Appendices

A   Appendix chapter 1

In the following pages we provide further evidence of the robustness of the results in section 1.5. We report RDD results of the effect of the 30% income increase on the quality of mayors, councillors, and executive committees using different methods for calculating the optimal bandwidth (CERRD, MSESUM, CERSUM) and different functional forms (quadratic, cubic). We also calculate the same effect, but with a different definition of stronghold, i.e., municipalities where the first party obtained at least 45% of votes in the previous regional and provincial elections; and in the national elections that took place in 1987 and 1992, thus, those general elections following the municipal elections. The results of the following investigation are consistent with the evidence provided in Section 1.5 highlighting the robustness of these results

Table A1: Different definitions of Stronghold

	(1) Mayors	(2) Mayors - Cllr.	(3) Councillors	(4) Mayor rank
National election T+1				
Above 5000	-1.299	-2.409***	0.428***	2.881**
	(0.943)	(0.820)	(0.104)	(1.318)
Mean	13.61	1.752	11.63	10.46
Observations	1258	1859	9678	32139
Bandwidth	1370	1920	573	1870
Regional election				
Above 5000	-0.184	-1.751***	1.193***	1.851**
	(0.661)	(0.635)	(0.128)	(0.722)
Mean	13.70	1.505	11.78	10.39
Observations	2413	2826	23234	69466
Bandwidth	1335	1544	772	2155
Provincial election				
Above 5000	-0.287	-1.279*	1.007***	1.436*
	(0.604)	(0.751)	(0.0703)	(0.843)
Mean	13.90	1.373	12.05	10.40
Observations	2135	1684	16937	38785
Bandwidth	1861	1490	1000	2168
Standard errors in parentheses			* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$	

Notes: *Effect of the 30% wage increase at the 5000 threshold on the years of schooling of the politicians by different definition of stronghold. Results for municipalities in which the first party gained at least the 45% of votes in the following elections are reported in panel 1, in the last regional elections are depicted in panel 2 and in the last provincial election in panel 3. Terms from 1985 to 1992. Local linear regression (LLR) with optimal symmetric bandwidth. Standard errors robust to clustering at the municipality × election level in column 3 while at the municipality level in columns 1,2 and 3.*

Table A2: Quadratic fit

	(1) Education	(2) At least a degree	(3) White collar	(4) Female	(5) Age
Councillors					
Above 5000	0.792***	0.0363***	0.0919***	0.00754	-0.417
	(0.136)	(0.0107)	(0.0197)	(0.00861)	(0.346)
Mean	11.65	0.231	0.543	0.0854	40.07
Observations	58496	66507	38105	71593	59953
Bandwidth	1869	2049	1257	2238	1883
Mayor - Mean Councillor					
Above 5000	-2.120***	-0.137**	-0.389***	0.0336	-2.374*
	(0.613)	(0.0653)	(0.103)	(0.0306)	(1.390)
Mean	1.516	0.359	0.0377	0.0333	4.575
Observations	2856	6002	4209	6997	4693
Bandwidth	1562	2838	2201	3179	2383
Mayors					
Above 5000	-1.041*	-0.170**	-0.138*	0.0335	-2.713*
	(0.589)	(0.0693)	(0.0798)	(0.0305)	(1.483)
Mean	13.67	0.390	0.640	0.0335	43.75
Observations	3190	5752	3189	7050	4550
Bandwidth	1742	2763	1739	3196	2336
Executive Committee					
Above 5000	0.356*	0.0182	0.0475	-0.00517	-0.825*
	(0.187)	(0.0174)	(0.0301)	(0.0150)	(0.458)
Mean	11.81	0.229	0.574	0.0796	40.17
Observations	19234	16996	18542	21855	23301
Bandwidth	1854	1655	1794	2026	2218
Standard errors in parentheses			* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$		

Notes: *Effect of the 30% wage increase at the 5000 threshold on the characteristics of Councillors (panel 1), the difference in the characteristics between Mayors and the mean Councillor (panel 2), the characteristics of the appointed Mayors (panel 3) and the characteristics of the Executive committee (panel 4). Terms from 1985 to 1992. Second order polynomial RDD with optimal symmetric bandwidth. Age and Years school are measured in years; the other variables are dummies. White collar includes lawyers, professors, physicians, and managers. Standard errors robust to clustering at the municipality $\times$ election level in panel 1 and 4 while at the municipality level in panel 2 and 3.*

Table A3: Cubic fit

	(1)	(2)	(3)	(4)	(5)
	Education	At least a degree	White collar	Female	Age
Councillors					
Above 5000	0.777***	0.0441***	0.0873***	-0.000271	-0.914**
	(0.143)	(0.0119)	(0.0199)	(0.0122)	(0.439)
Mean	11.52	0.229	0.532	0.0855	40.07
Observations	95574	80996	68772	66133	66133
Bandwidth	2848	2488	2132	2019	2023
Mayor - Mean Councillor					
Above 5000	-2.305***	-0.0942	-0.406***	0.0440	-3.522**
	(0.693)	(0.0949)	(0.116)	(0.0500)	(1.747)
Mean	1.613	0.364	0.0656	0.0329	4.524
Observations	4058	4912	6696	7656	4490
Bandwidth	2117	2470	3065	3360	2320
Mayors					
Above 5000	-1.140*	-0.165*	-0.147	0.0438	-3.892**
	(0.684)	(0.0935)	(0.0943)	(0.0502)	(1.910)
Mean	13.66	0.384	0.640	0.0332	43.77
Observations	4287	6700	4216	7598	4352
Bandwidth	2246	3061	2210	3345	2266
Executive Committee					
Above 5000	0.391*	-0.0112	0.0463	-0.00624	-2.870***
	(0.228)	(0.0222)	(0.0363)	(0.0169)	(0.731)
Mean	11.78	0.228	0.570	0.0793	40.25
Observations	22116	17762	23904	28506	16882
Bandwidth	2082	1723	2279	2672	1641
Standard errors in parentheses			* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$		

Notes: *Effect of the 30% wage increase at the 5000 threshold on the characteristics of Councillors (panel 1), the difference in the characteristics between Mayors and the mean Councillor (panel 2), the characteristics of the appointed Mayors (panel 3) and the characteristics of the Executive committee (panel 4). Terms from 1985 to 1992. Third order polynomial RDD with optimal symmetric bandwidth. Age and Years school are measured in years; the other variables are dummies. White collar includes lawyers, professors, physicians, and managers. Standard errors robust to clustering at the municipality × election level in panel 1 and 4 while at the municipality level in panel 2 and 3.*

Table A4: CERRD bandwidth

	(1)	(2)	(3)	(4)	(5)
	Education	At least a degree	White collar	Female	Age
Councillors					
Above 5000	0.817***	0.0400***	0.0782***	0.00189	-0.697*
	(0.140)	(0.0103)	(0.0174)	(0.00961)	(0.360)
Mean	11.78	0.241	0.548	0.0856	39.99
Observations	22059	25215	20388	23260	22561
Bandwidth	727	834	672	767	744
Mayor - Mean Councillor					
Above 5000	-1.691***	-0.0966	-0.360***	0.0395	-2.767**
	(0.429)	(0.0671)	(0.0877)	(0.0321)	(1.369)
Mean	1.454	0.371	0.0120	0.0362	4.057
Observations	2236	2084	2170	2323	1857
Bandwidth	1241	1153	1205	1281	1020
Mayors					
Above 5000	-1.120**	-0.149*	-0.131*	0.0395	-3.687**
	(0.536)	(0.0826)	(0.0689)	(0.0322)	(1.545)
Mean	13.65	0.402	0.658	0.0362	43.41
Observations	1501	1681	1708	2318	1615
Bandwidth	829	929	947	1277	885
Executive Committee					
Above 5000	0.400**	0.0185	0.0601**	-0.00699	-2.096***
	(0.178)	(0.0157)	(0.0305)	(0.0170)	(0.583)
Mean	11.89	0.230	0.574	0.0831	40.11
Observations	8261	8543	7917	7007	6604
Bandwidth	820	840	776	687	637
Standard errors in parentheses			* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$		

Notes: *Effect of the 30% wage increase at the 5000 threshold on the characteristics of Councillors (panel 1), the difference in the characteristics between Mayors and the mean Councillor (panel 2), the characteristics of the appointed Mayors (panel 3) and the characteristics of the Executive committee (panel 4). Terms from 1985 to 1992. Local linear regression (LLR) with CERRD optimal symmetric bandwidth. Age and Years school are measured in years; the other variables are dummies. White collar includes lawyers, professors, physicians, and managers. Standard errors robust to clustering at the municipality $\times$ election level in panel 1 and 4 while at the municipality level in panel 2 and 3.*

Table A5: MSESUM bandwidth

	(1) Education	(2) At least a degree	(3) White collar	(4) Female	(5) Age
Councillors					
Above 5000	0.808***	0.0353***	0.0849***	0.00446	-0.453
	(0.125)	(0.00898)	(0.0172)	(0.00743)	(0.308)
Mean	11.75	0.235	0.548	0.0859	40.03
Observations	34290	48363	22915	45915	34727
Bandwidth	1137	1564	755	1499	1142
Mayor - Mean Councillor					
Above 5000	-1.576***	-0.130**	-0.297***	0.0297	-2.137*
	(0.391)	(0.0562)	(0.0657)	(0.0210)	(1.144)
Mean	1.554	0.368	0.0364	0.0332	4.434
Observations	3327	3710	4503	4847	3172
Bandwidth	1807	1949	2324	2450	1720
Mayors					
Above 5000	-0.961**	-0.147**	-0.105*	0.0298	-2.381*
	(0.454)	(0.0601)	(0.0608)	(0.0211)	(1.364)
Mean	13.70	0.400	0.642	0.0333	43.60
Observations	2494	3698	2766	4808	2519
Bandwidth	1382	1946	1517	2438	1391
Executive Committee					
Above 5000	0.405**	0.0398***	0.0546**	-0.00680	-0.780*
	(0.163)	(0.0145)	(0.0251)	(0.0130)	(0.467)
Mean	11.88	0.232	0.573	0.0812	40.22
Observations	12998	14956	12380	13602	11633
Bandwidth	1293	1473	1232	1342	1144
Standard errors in parentheses			* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$		

Notes: *Effect of the 30% wage increase at the 5000 threshold on the characteristics of Councillors (panel 1), the difference in the characteristics between Mayors and the mean Councillor (panel 2), the characteristics of the appointed Mayors (panel 3) and the characteristics of the Executive committee (panel 4). Terms from 1985 to 1992. Local linear regression (LLR) with MSESUM optimal symmetric bandwidth. Age and Years school are measured in years; the other variables are dummies. White collar includes lawyers,professors, physicians, and managers. Standard errors robust to clustering at the municipality × election level in panel 1 and 4 while at the municipality level in panel 2 and 3.*

Table A6: CERSUM bandwidth

	(1)	(2)	(3)	(4)	(5)
	Education	At least a degree	White collar	Female	Age
Councillors					
Above 5000	0.821***	0.0375***	0.0816***	0.00639	-0.714**
	(0.141)	(0.00970)	(0.0200)	(0.00851)	(0.362)
Mean	11.78	0.240	0.556	0.0857	39.99
Observations	22159	30399	14696	29164	22363
Bandwidth	731	1005	485	964	734
Mayor - Mean Councillor					
Above 5000	-1.703***	-0.106*	-0.330***	0.0366	-2.365*
	(0.437)	(0.0631)	(0.0759)	(0.0257)	(1.304)
Mean	1.447	0.371	0.0127	0.0354	4.118
Observations	2147	2325	2798	2967	2054
Bandwidth	1191	1285	1531	1615	1133
Mayors					
Above 5000	-1.061**	-0.131*	-0.125*	0.0367	-3.478**
	(0.517)	(0.0685)	(0.0677)	(0.0258)	(1.526)
Mean	13.63	0.403	0.659	0.0357	43.42
Observations	1643	2323	1809	2944	1653
Bandwidth	911	1283	1000	1606	917
Executive Committee					
Above 5000	0.400**	0.0214	0.0613**	-0.00248	-1.529***
	(0.178)	(0.0152)	(0.0301)	(0.0150)	(0.543)
Mean	11.88	0.231	0.574	0.0835	40.18
Observations	8430	9632	8112	8810	7566
Bandwidth	831	947	792	863	736
Standard errors in parentheses			* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$		

Notes: *Effect of the 30% wage increase at the 5000 threshold on the characteristics of Councillors (panel 1), the difference in the characteristics between Mayors and the mean Councillor (panel 2), the characteristics of the appointed Mayors (panel 3) and the characteristics of the Executive committee (panel 4). Terms from 1985 to 1992. Local linear regression (LLR) with CERSUM optimal symmetric bandwidth. Age and Years school are measured in years; the other variables are dummies. White collar includes lawyers, professors, physicians, and managers. Standard errors robust to clustering at the municipality × election level in panel 1 and 4 while at the municipality level in panel 2 and 3.*

In figure A1, we replicate the same exercise provided in figure 1.3 but using the cumulative frequency distribution rather than kernel density. We show that, using the results of the national election, the percentage of votes obtained by the first party distributes equivalently, above and below the threshold, while this does not happen if we use the municipal election.

Figure A1: Cumulative distribution

(a) Municipal election   (b) National election
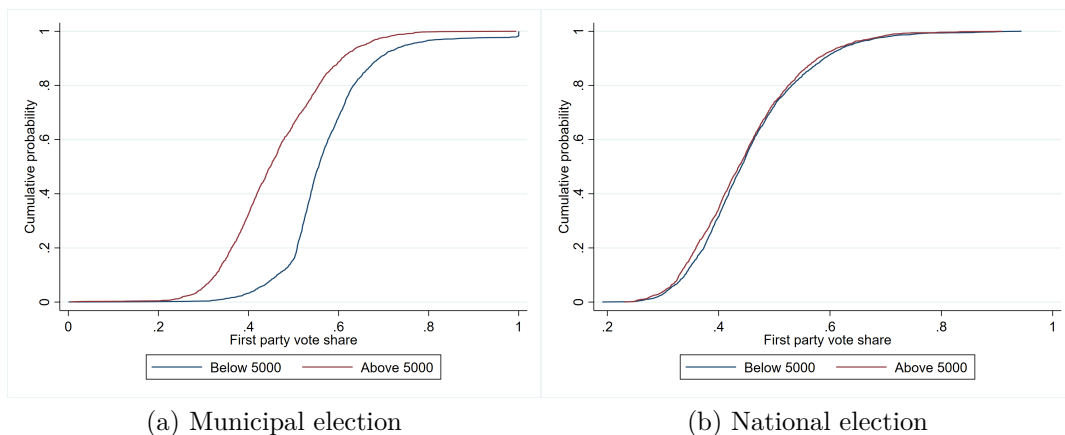
Notes: *(a) Cumulative distribution function of vote share for the leading party in municipalities elections 1985-1992; (b) Cumulative distribution function of vote share for the leading party in national elections 1983-1987. In both panels, blu lines refer to majority municipalities and red lines to proportional ones.*

B   Appendix chapter 2

In the following pages we provide further evidence of the robustness of the results in section 2.6. We report Diff-in-disc results of the effect of the 30% income increase on the quality of mayors, councillors, and executive committees using different methods for calculating the optimal bandwidth (CERRD, MSESUM, CERSUM) and different functional forms (quadratic, cubic). The results of the following investigation are consistent with the evidence provided in Section 2.6 highlighting the robustness of these results

Table B1: Quadratic fit

	(1) Education	(2) At least a degree	(3) White collar	(4) Female	(5) Age
Councillors					
High fragmentation	-0.407	-0.0182	0.0139	-0.0211	-0.385
	(0.361)	(0.0290)	(0.0396)	(0.0190)	(0.884)
Mean	11.65	0.229	0.537	0.0858	40.18
Observations	45747	64071	44386	54623	50577
Bandwidth	1843	2467	1789	2120	1963
Mayor - Mean Councillor					
High fragmentation	1.898**	0.155	0.354***	-0.0352	3.592
	(0.936)	(0.117)	(0.113)	(0.0454)	(2.495)
Mean	1.957	0.159	0.102	-0.0505	3.319
Observations	2844	3380	3353	4255	2435
Bandwidth	1896	2220	2194	2614	1656
Mayors					
High fragmentation	1.791*	0.165	0.388***	-0.0494	3.376
	(1.048)	(0.133)	(0.127)	(0.0494)	(2.661)
Mean	13.67	0.395	0.644	0.0353	43.65
Observations	2606	3467	2862	3314	2518
Bandwidth	1781	2262	1907	2160	1714
Executive Committee					
High fragmentation	-0.932**	-0.0877*	-0.0348	-0.00178	1.141
	(0.437)	(0.0473)	(0.0514)	(0.0297)	(1.205)
Mean	11.77	0.225	0.566	0.0800	40.32
Observations	18412	16620	20528	18485	18877
Bandwidth	2196	1950	2441	2193	2250
Standard errors in parentheses			* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$		

Notes: *Effect of the high fragmentation at the 5000 threshold on the characteristics of Councillors (panel 1), the difference in the characteristics between Mayors and the mean Councillor (panel 2), the characteristics of the appointed Mayors (panel 3) and the characteristics of the Executive committee (panel 4). Terms from 1985 to 1992. Second order polynomial diff-in-disc with optimal symmetric bandwidth. Age and Years school are measured in years; the other variables are dummies. White collar includes lawyers, professors, physicians, and managers. Standard errors robust to clustering at the municipality × election level in panel 1 and 4 while at the municipality level in panel 2 and 3.*

Table B2: Cubic fit

	(1) Education	(2) At least a degree	(3) White collar	(4) Female	(5) Age
Councillors					
High fragmentation	-0.344	-0.0146	0.0248	-0.0188	-0.330
	(0.439)	(0.0416)	(0.0444)	(0.0226)	(0.993)
Mean	11.60	0.229	0.528	0.0849	40.26
Observations	59696	60972	64473	70069	74865
Bandwidth	2349	2382	2503	2670	2811
Mayor - Mean Councillor					
High fragmentation	1.059	0.0833	0.388***	0.0277	3.764
	(1.402)	(0.163)	(0.147)	(0.0824)	(3.234)
Mean	1.941	0.160	0.0975	-0.0503	3.309
Observations	2145	3244	3736	2404	2304
Bandwidth	1491	2133	2398	1646	1580
Mayors					
High fragmentation	1.791*	0.165	0.388***	-0.0494	3.376
	(1.048)	(0.133)	(0.127)	(0.0494)	(2.661)
Mean	13.67	0.395	0.644	0.0353	43.65
Observations	2606	3467	2862	3314	2518
Bandwidth	1781	2262	1907	2160	1714
Executive Committee					
High fragmentation	-1.083*	-0.102*	-0.00600	0.0210	1.257
	(0.616)	(0.0611)	(0.0685)	(0.0391)	(1.583)
Mean	11.76	0.223	0.564	0.0795	40.37
Observations	17801	18170	21257	19299	20852
Bandwidth	2117	2170	2533	2318	2487
Standard errors in parentheses			* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$		

 Notes: *Effect of the high fragmentation at the 5000 threshold on the characteristics of Councillors (panel 1), the difference in the characteristics between Mayors and the mean Councillor (panel 2), the characteristics of the appointed Mayors (panel 3) and the characteristics of the Executive committee (panel 4). Terms from 1985 to 1992. Third order polynomial diff-in-disc with optimal symmetric bandwidth. Age and Years school are measured in years; the other variables are dummies. White collar includes lawyers,professors, physicians, and managers. Standard errors robust to clustering at the municipality × election level in panel 1 and 4 while at the municipality level in panel 2 and 3.*

Table B3: CERRD bandwidth

	(1) Education	(2) At least a degree	(3) White collar	(4) Female	(5) Age
Councillors					
High fragmentation	-0.411	-0.0183	0.0297	-0.0175	0.474
	(0.351)	(0.0334)	(0.0447)	(0.0194)	(1.204)
Mean	11.75	0.237	0.547	0.0867	40.01
Observations	22058	22442	16102	23338	14385
Bandwidth	925	934	664	970	588
Mayor - Mean Councillor					
High fragmentation	1.644*	0.109	0.298***	-0.0281	1.866
	(0.911)	(0.116)	(0.0933)	(0.0396)	(1.750)
Mean	1.856	0.168	0.0968	-0.0498	3.344
Observations	1343	1542	2110	2374	2249
Bandwidth	939	1062	1471	1625	1548
Mayors					
High fragmentation	1.528	0.135	0.345***	-0.0375	2.889
	(0.998)	(0.140)	(0.114)	(0.0518)	(2.308)
Mean	13.68	0.406	0.654	0.0388	43.27
Observations	1317	1415	1588	1393	1520
Bandwidth	916	986	1101	970	1047
Executive Committee					
High fragmentation	-0.928**	-0.105**	-0.0314	0.00284	1.966
	(0.471)	(0.0507)	(0.0596)	(0.0297)	(1.647)
Mean	11.83	0.224	0.568	0.0842	40.33
Observations	7306	6620	7251	8496	5259
Bandwidth	902	812	887	1034	639
Standard errors in parentheses			* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$		

Notes: *Effect of the high fragmentation at the 5000 threshold on the characteristics of Councillors (panel 1), the difference in the characteristics between Mayors and the mean Councillor (panel 2), the characteristics of the appointed Mayors (panel 3) and the characteristics of the Executive committee (panel 4). Terms from 1985 to 1992. Diff-in-disc local linear regression (LLR) with CERRD optimal symmetric bandwidth. Age and Years school are measured in years; the other variables are dummies. White collar includes lawyers, professors, physicians, and managers. Standard errors robust to clustering at the municipality × election level in panel 1 and 4 while at the municipality level in panel 2 and 3.*

Table B4: MSESUM bandwidth

	(1) Education	(2) At least a degree	(3) White collar	(4) Female	(5) Age
Councillors					
High fragmentation	-0.462*	-0.0216	-0.00702	-0.0196	-0.267
	(0.279)	(0.0305)	(0.0327)	(0.0156)	(0.763)
Mean	11.73	0.236	0.543	0.0861	40.14
Observations	31906	26151	28579	35123	28723
Bandwidth	1330	1078	1191	1457	1195
Mayor - Mean Councillor					
High fragmentation	1.508**	0.0672	0.238***	-0.0259	0.964
	(0.731)	(0.0805)	(0.0756)	(0.0320)	(1.391)
Mean	1.931	0.160	0.102	-0.0498	3.534
Observations	2055	3311	3333	3916	3679
Bandwidth	1425	2183	2210	2479	2371
Mayors					
High fragmentation	1.295	0.108	0.283***	-0.0540	1.563
	(0.787)	(0.0988)	(0.0910)	(0.0355)	(1.812)
Mean	13.72	0.400	0.641	0.0354	43.64
Observations	2075	2743	2500	2770	2424
Bandwidth	1442	1864	1718	1874	1672
Executive Committee					
High fragmentation	-0.728**	-0.0805*	-0.0304	-0.00153	0.914
	(0.340)	(0.0442)	(0.0446)	(0.0225)	(1.078)
Mean	11.82	0.225	0.572	0.0822	40.42
Observations	12972	8433	11991	13935	10376
Bandwidth	1601	1027	1487	1706	1290
Standard errors in parentheses			* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$		

Notes: *Effect of the high fragmentation at the 5000 threshold on the characteristics of Councillors (panel 1), the difference in the characteristics between Mayors and the mean Councillor (panel 2), the characteristics of the appointed Mayors (panel 3) and the characteristics of the Executive committee (panel 4). Terms from 1985 to 1992. Diff-in-disc local linear regression (LLR) with MSESUM optimal symmetric bandwidth. Age and Years school are measured in years; the other variables are dummies. White collar includes lawyers, professors, physicians, and managers. Standard errors robust to clustering at the municipality $\times$ election level in panel 1 and 4 while at the municipality level in panel 2 and 3.*

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Table B5: CERSUM bandwidth

	(1) Education	(2) At least a degree	(3) White collar	(4) Female	(5) Age
Councillors					
High fragmentation	-0.432	-0.0101	0.0199	-0.0167	0.0178
	(0.377)	(0.0415)	(0.0422)	(0.0200)	(1.039)
Mean	11.76	0.242	0.547	0.0860	40.12
Observations	19908	16262	17915	21925	18036
Bandwidth	832	674	745	911	747
Mayor - Mean Councillor					
High fragmentation	1.643*	0.114	0.302***	-0.0274	1.944
	(0.923)	(0.101)	(0.0951)	(0.0400)	(1.768)
Mean	1.840	0.163	0.103	-0.0495	3.356
Observations	1312	2017	2041	2317	2204
Bandwidth	914	1400	1417	1589	1520
Mayors					
High fragmentation	1.531	0.112	0.345***	-0.0488	2.731
	(0.993)	(0.126)	(0.113)	(0.0454)	(2.281)
Mean	13.69	0.400	0.654	0.0360	43.34
Observations	1328	1711	1588	1722	1549
Bandwidth	925	1195	1102	1202	1072
Executive Committee					
High fragmentation	-0.853*	-0.116**	-0.0322	0.00148	1.509
	(0.443)	(0.0582)	(0.0580)	(0.0292)	(1.440)
Mean	11.83	0.229	0.566	0.0844	40.47
Observations	8087	5299	7545	8692	6612
Bandwidth	1002	643	930	1067	807
Standard errors in parentheses			* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$		

Notes: *Effect of the high fragmentation at the 5000 threshold on the characteristics of Councillors (panel 1), the difference in the characteristics between Mayors and the mean Councillor (panel 2), the characteristics of the appointed Mayors (panel 3) and the characteristics of the Executive committee (panel 4). Terms from 1985 to 1992. Diff-in-disc local linear regression (LLR) with CERSUM optimal symmetric bandwidth. Age and Years school are measured in years; the other variables are dummies. White collar includes lawyers, professors, physicians, and managers. Standard errors robust to clustering at the municipality × election level in panel 1 and 4 while at the municipality level in panel 2 and 3.*

C Appendix chapter 3

Table C1: Descriptive statistics by term

	XVI	XVII	XVIII
Absenteist	0.15	0.20	0.13
Rebel vote	0.014	0.011	0.016
Income in 100K euros	1.58	1.36	1.17
Outside Income in 100K euros	0.71	0.52	0.64
Number of buildings	2.36	1.75	1.56
Number of lands	0.49	0.48	0.41
Shareholder	0.28	0.31	0.30
Administrator duties	0.17	0.14	0.15
Gender	0.80	0.70	0.64
Age	54.5	50.9	48.8
Freshmen	0.38	0.65	0.73
Number of MPs' groups	11	18	10

Table C2: Poisson - Rebel votes

	(1)	(2)	(3)
Outside income	-0.000584***	-0.000596***	-0.000526***
	(0.000)	(0.000)	(0.000)
Number of buildings		0.00156***	0.000317
		(0.000)	(0.250)
Number of lands		-0.00154**	-0.000961
		(0.033)	(0.150)
Number of vehicles		0.000589	-0.000239
		(0.331)	(0.634)
Shareholder		-0.00171	-0.000593
		(0.252)	(0.682)
Senator		0.0170***	0.0134***
		(0.000)	(0.000)
Elected with majority		-0.00501**	-0.00521**
		(0.019)	(0.021)
Freshmen		-0.0000369	-0.000424
		(0.977)	(0.691)
Observations	5760	5746	7489
Log likelihood	-304.2	-302.9	-407.7
Year FE	yes	yes	yes
Parliamentary FE	yes	yes	yes
XVI data included	no	no	yes
p-value in parentheses		* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$	

 Notes: *Average marginal effects from Poisson estimates with rebel votes ratio as dependent variable. Estimates include year and MP fixed effects using XVI,XVII and XVII therms data. We remove observations from the 1st and 99th percentile of the income distribution. Outside income is expressed in 100 thousand of Euros and errors are robust to heteroskedasticity*

Table C3: Poisson - Absenteeism

	(1)	(2)	(3)
Outside income	0.00324**	0.00317**	0.00192
	(0.032)	(0.027)	(0.149)
Number of buildings		-0.00452	-0.00398*
		(0.191)	(0.087)
Number of lands		0.000447	0.00129
		(0.865)	(0.599)
Number of vehicles		0.00344	-0.000415
		(0.476)	(0.903)
Shareholder		0.00259	0.00231
		(0.827)	(0.791)
Senator		-0.0574**	-0.0376**
		(0.026)	(0.011)
Elected with majority		0.0340	0.0377
		(0.310)	(0.181)
Freshmen		0.00847	-0.00525
		(0.608)	(0.610)
Observations	5760	5746	7489
Log likelihood	-2092.8	-2086.0	-2649.1
Year FE	yes	yes	yes
Parliamentary FE	yes	yes	yes
XVI data included	no	no	yes
p-value in parentheses		* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$	

Notes: *Average marginal effects from Poisson estimates with absences ratio as dependent variable. Estimates include year and MP fixed effects using XVI,XVII and XVII therms data. We remove observations from the 1st and 99th percentile of the income distribution. Outside income is expressed in 100 thousand of Euros and errors are robust to heteroskedasticity*

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In the following pages we report our results of the analysis on the relation between the political behavior and outside income of MPs with pre-election income above the median and those with pre-election income below the median. We add to model 3.1 a dummy identifying MPs above the median and an interaction between outside income and above the median. We report the margins of the fractional logit estimates for the sample of MPs from the 17th and 18th legislatures and the sample of freshmen. We aim to test whether the MP with high income would benefit more from his role as an MP in terms of increased earning opportunities. One way to test this would be to observe that the parameter of the above interaction has an opposite sign to that of the Outside income of MPs below median. Otherwise, we should observe a different trend between the predictive margins of the two groups. All specifications suggest that there is no different correlation between outside income and political behavior for high-income MPs and low-income MPs.

Table C4: Politician behavior and outside income by pre-election income earned

	Rebel votes		Absenteeism	
	(1)	(2)	(3)	(4)
Above median	-0.00205	-0.00201	0.0325	0.0330
	(-1.36)	(-1.31)	(1.57)	(1.60)
Outside income	-0.000553***	-0.000508***	0.00282	0.00274
	(-3.26)	(-2.99)	(1.04)	(1.01)
Above median*Outside income	-0.000228	-0.000266	0.000803	0.000744
	(-0.59)	(-0.69)	(0.22)	(0.21)
Number of buildings		-0.000162		-0.00164
		(-0.48)		(-0.50)
Number of lands		-0.00144*		-0.00104
		(-1.85)		(-0.24)
Number of vehicles		0.0000436		0.00404
		(0.07)		(0.92)
Shareholder		0.000481		-0.000619
		(0.28)		(-0.07)
Observations	5778	5778	5778	5778
Log likelihood	-344.5	-344.4	-2245.7	-2245.6
Year FE	yes	yes	yes	yes
Parliamentary FE	yes	yes	yes	yes
Standard errors in parentheses			* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$	

Notes: *Average marginal effects from fractional logit estimates with rebel votes and absenteeism ratio as dependent variable. Above median indicates MPs with pre-election income above the median of the distribution. Estimates include year and MP fixed effects using XVII and XVII therms data. We remove observations from the 1st and 99th percentile of the income distribution. Outside income is expressed in 100 thousand of Euros and errors are robust to heteroskedasticity*

Figure C1: Margins median
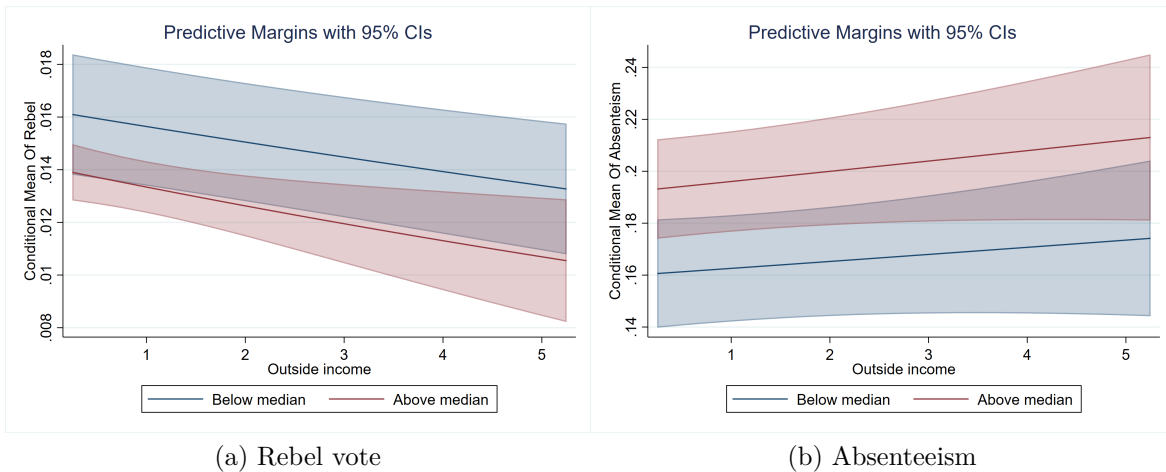
(a) Rebel vote   (b) Absenteeism

Notes: *Outside income marginal effects from fractional logit estimates, outside income varies from 0 euro to 500 thousand euros for gradual increments of 25,000 euros. In both panels, blu lines refer to MPs below the median of the pre-election income distribution and red lines to those above the median. Estimates include year and MP fixed effects using XVII and XVII therms data. We remove observations from the 1st and 99th percentile of the income distribution. Outside income is expressed in 100 thousand of Euros and errors are robust to heteroskedasticity*

Table C5: Politician behavior and outside income of Freshmen MPs

	Rebel votes		Absenteeism	
	(1)	(2)	(3)	(4)
Outside income	-0.000584***	-0.000591***	0.00167	0.00553***
	(-4.54)	(-4.83)	(0.88)	(6.14)
Above median		-0.00787***		-0.00338
		(-3.47)		(-0.08)
Above median*Outside income		0.000180		-0.00697**
		(0.37)		(-2.48)
Observations	4137	4137	4137	4137
Log likelihood	-231.8	-231.6	-1531.0	-1530.9
Year FE	yes	yes	yes	yes
Parliamentary FE	yes	yes	yes	yes
Standard errors in parentheses			* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$	

Notes: *Average marginal effects from fractional logit estimates with rebel votes and absenteeism ratio as dependent variable. The sample includes only freshmen parliamentarians. Above median indicates MPs with pre-election income above the median of the distribution. Estimates include year and MP fixed effects using XVII and XVII therms data. We remove observations from the 1st and 99th percentile of the income distribution. Outside income is expressed in 100 thousand of Euros and errors are robust to heteroskedasticity*

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