Do Voters Choose Better Politicians than Political Parties?
Evidence from a Natural Experiment in Italy

Maria Rosaria Alfano

Dipartimento di Economia, Università della Campania L. Vanvitelli, C.so Gran Priorato di Malta 81043 Capua, Italy.
mariarosaria.alfano@unicampania.it

Anna Laura Baraldi

Dipartimento di Economia, Università della Campania L. Vanvitelli, C.so Gran Priorato di Malta 81043 Capua, Italy.
annalaura.baraldi@unicampania.it

Erasmo Papagni

Dipartimento di Economia, Università della Campania L. Vanvitelli, C.so Gran Priorato di Malta 81043 Capua, Italy.
erasmo.papagni@unicampania.it

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Abstract

This work analyses the impact of different ballot structures on the quality of elected politicians. The exogenous variation in the electoral system introduced with the Law n. 270/2005, allows us use a difference-in-differences approach to compare the politicians' quality between the proportional system with blocked lists with 1) the proportional system with open list where voters could express up to four preferences for candidates (Laws 6/1948 and 29/1948), 2) the two-tier system (Laws 276/1993 and 277/1993) which prescribed to cast a vote for a candidate in single-member districts. We identify a treatment group (the parliamentarians) and a control group (regional politicians) and we find that the introduction of the reform lowered the politicians' quality measured by their average education level. The result is stronger for Senators than Deputies: the years of education decreased of around 8 months more in the treated group than in the control group. This result holds if we consider the panel of male and female politicians and it is robust to the exclusion of regions with special statute from the sample, to the inclusion of control variables and to a measure of political competitiveness. This evidence suggests that voters are able to choose more qualifying politicians than political parties and it may be an argument in favor the re-introduction, in the electoral law, of ballot structure with preferential voting for candidates.

JEL Classification:

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1. Introduction

Parliamentary democracies rely on the interaction between electors and political parties that takes place at elections. Politicians pursue both their own particular interests as well as the interests of the community; they, often, differ and conflict. The general interest can be achieved in two ways: the first one is by selecting good politicians (in terms of honesty and competencies); the second one is by giving right incentives to politicians. This paper focuses on the first way. Political selection is of utmost importance for several reasons: 1) the credibility of a policy depends on who is picked for public office; 2) an increase in the honesty, integrity or skill of those who are elected leads to an improvement in the quality of institutions; 3) high-quality politicians can adopt voters' oriented policies. Therefore, searching for appropriate mechanism for selecting high quality politicians becomes a primary goal for society in order to improve social welfare.

Democratic elections are the fundamental instrument available to society for the selection of politicians. Elections are governed by electoral laws that define the characteristics of electoral systems in terms of district magnitude (the number of politicians elected in a district), electoral formula (how votes are translated into seats) and ballot structure (or voting schemes). This work studies the effect of different ballot structures on political selection. The ballot structures allows to identify preferential and non-preferential systems, that is, to define how voters can vote for candidates. It defines: 1) that voters can vote for a list of candidates (without expressing the preference for a given candidate) drawn up by political parties where the ranking of candidates has been previously decided by political leaders; or 2) that voters can cast votes (expressing their own preference) for candidates chosen by political parties to run for office. The ballot structure can affect the quality of politicians through the different distribution of power that it gives to voters and political parties. Indeed, if voters can vote for a list, party leaders can effectively decide candidates to the Parliaments by allocating them in the secure positions at the top of the party list; if voters can cast vote for candidates, the ranking of elected politicians depends on the number of votes each candidate receives from electors. Such voting schemes affects both voters (in the sense of determining the nature and extent of choice available to them at the Election Day) and politicians (who are conscious of the effect on voters and react accordingly).

The crucial difference between the two voting schemes is linked to rationale followed by voters and political leaders, respectively, in the choice of their preferred candidates. Looking at the voters, the central premise is that they agree that competent politicians are more desirable. Voters cast vote to candidates that they feel more "able", i.e., that they consider capable to implement policies in their interest, as well as, in the public interest. Voters use the "identity" (in the meaning of personal characteristics) to infer the ability of candidates, that is, to infer about competences (that is, the skill

to select the appropriate policy objectives and to achieve them at minimum social cost) and honesty (that is, the character that leads an official to perform his duties without harassing private citizens for bribes or other kickbacks) of future politicians. Therefore, identity ultimately drives the selection process of talented politicians which is of primary importance for the functioning of democratic systems and for the successful adoption of important economic policies (Jones and Olken, 2005). Otherwise, looking at the political leaders behaviour, they tend to rank candidates within the list according to criteria that not always coincide with that of voters. Leaders, with the aim to be in power, do not look at the ideological commitment to a party or to the extent to which candidates seek to represent the interests of voters; they choose candidates because they can win elections and, once involved in the policymaking process, they follow the guidelines of political parties. As Besley (2005) underlines, if parties as well as successful candidates share the rents, and protection of those rents depends on the selection of politicians with no public interest motivation (bad politicians), then the party may have an interest in putting up bad candidates.

To sum up, under voting schemes where voters vote for closed party lists, party leaders have considerable power because they determine the ranking of each candidates on that list; thus, elected politicians are likely to feel more accountable towards the party leadership than to voters, given that their political future lies with the party rather than with the electorate. Conversely, where voters can directly select their preferred candidate, the accountability of politicians towards voters grows leading to an elected body more incline to promote more effective policies in the interest of voters.

The electoral law in many European countries permits voters to indicate preferred candidates, within or not a party list, rather than to make a choice only between parties. We focus on the effect of casting votes for voters' preferred candidates versus casting votes for a closed list of candidates on the quality of elected officials. Given the choice of candidates running at elections made by political parties, politicians that will be elected ultimately depends on the possibility that voters have to express their own preference for candidates or for a party list. We argue and test that voting schemes that allow electors to cast votes for preferred candidate are better mechanisms of selection of higher quality politicians than closed list voting schemes; in other words, voters choose better politicians than political parties. Thus, we test the link between voting schemes and the quality of politicians. We perform an empirical analysis focusing on the change in the voting scheme of the parliamentary election in Italy introduced with the Law n. 270/2005, a pure proportional system with blocked list of candidates. We compare the politicians' quality between the proportional system with blocked list (no preferences) just mentioned with 1) the proportional system with open list where voters could express up to four preferences for candidates within the same list (Laws 6/1948 and 29/1948), 2) the two-tier system (Laws 276/1993 and 277/1993) which prescribed, for the greatest part of the

Parliament, to cast a vote for a candidate in a majoritarian scheme. We refer to 1) as the *proportional-proportional* case and to 2) as the *majoritarian-proportional* case. The exogenous variation in the institutional setting introduced with the Law n. 270/2005 allows us to use a difference-in-differences approach to estimate the effect of the change in the ballot structure on the quality of Italian parliamentary politicians. The counterfactual of the quasi-experiment is made of regional politicians (politicians elected in regional councils) for who the ballot structure prescribed by the electoral Laws for regional councilors (Law n. 108/1968 and Law n. 43/1995, proportional with open list of candidates) remained unchanged over the period under consideration.[1]

Therefore, the exogenous treatment for national elections allows us to compare the change in the average education level of politicians (the measure of the quality of politicians as in Galasso and Nannicini, 2011; Kotakorpi and Poutvaara, 2011) between the treatment group (parliamentary politicians) and the control group (regional politicians) before and after the introduction of the reform. In this way, we disentangle the effect of the reform on politicians' quality from the temporal trend, which we assume to be common to the two groups. In both the cases we find that the introduction of the ballot structure with closed lists of candidates lowered the average education level of elected Parliamentarians. Namely, the years of education of politicians in the treatment group decreased of around 8 months more than in the control group in the *proportional-proportional* case and of around 3 months in the *majoritarian-proportional* case. This result holds in the cross-section data of male politicians. We perform robustness check by splitting the sample of Parliamentarians into Senators and Deputies: overall, the reform lowers the quality of Senators more than that of Deputies. For Senators, the effect is stronger for female than for male; for Deputies, reform does not affect the quality of female but lowers the quality of male in the *proportional-proportional* case. Other robustness checks concern the restriction of the sample to politicians elected into regions with ordinary statute, the introduction of control variables at regional level and of a measure of political competitiveness in the *majoritarian-proportional* case (as Galasso and Nannicini (2017) suggested). Results are always confirmed. Therefore, the proportional electoral system with blocked lists of 2005 lowered the quality of Parliamentarians; this allows saying that voters, expressing their preferences over candidates, are able to select more qualified politicians than political parties under ballot structures prescribing no-preferences.

The rest of the paper is organized as follows. Section 2 discusses the related literature. Section 3 describes the Italian institutional framework, variables and data. Sections 4 and 5 present the empirical strategy and results, respectively. Section 6 discusses the issues related to results and

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[1] Law n. 43/1995 reduced the number of preferences a voter could express at regional elections from 3 to 1. In the following of the paper, we perform a Chow test that supports the hypothesis that the trend in the quality of regional politicians did not change after 1995.

performs some robustness checks. Finally, Section 7 concludes. The Appendix provides a detailed description of Italian national and regional electoral laws.

2. Literature Review

In a well-functioning democracy, we should expect political parties to select candidates that best represent the interests of voters. Parties can select their candidates in many different ways. In numerous cases, the existing legal framework establishes that political parties should "democratically" elect their candidates, but this concept is very vague, and there are few if any applicable legal provisions. Only in a few cases does legislation lay down the process by which candidates should be selected, and the selection process can have a direct impact on the depth and breadth of the democratic process—particularly if a given party's candidate selection process is non-transparent

The political economy literature has recognized the importance of having good politicians to achieve good policy. Numbers of papers examine how to give the right incentives in order to have high-quality politicians. According to the standard efficiency wage theory, a higher wage is likely to attract more skilled individuals into politics, to enhance performance and to discourage the rent seeking (Besley, 2004; Gagliarducci and Nannicini, 2013). Other models suggest that an increase in the wage of politicians may have a negative impact on their quality when high-quality citizens have other incentives to enter politics (Mattozzi and Merlo, 2008; Brollo et al., 2013).

In a democratic setting, electoral rules are the primary selection mechanism of politicians. Political economy literature largely studied the effect of electoral systems on policy outcomes (Person and Tabellini, 2000) and on the recruitment of politicians (Caselli and Morelli, 2004). From a theoretical point of view, Galasso and Nannicini (2015), comparing closed list and open list proportional systems, predict that parties optimally allocate low quality politicians to safe seats and high quality politicians to uncertain positions. Galasso and Nannicini (2017) study the different patterns of political selection in majoritarian versus proportional systems: when the number of competitive districts increases, the majoritarian system becomes more effective; the opposite is true when safe districts are the majority. In the same direction, the theoretical model implemented in Besley and Preston (2007) predicts that electoral competition has beneficial effects, since parties choose to send their high-quality politicians to the most contestable districts. Empirical evidence on Italian members of parliament confirms this prediction. Independently of political ideology, high-quality politicians tend to be allocated to non-safe districts and, once elected, they show a lower absenteeism rate in electronic parliament votes (Galasso and Nannicini, 2011). In a purely citizen-candidate environment, Beath et al. (2014) showed that the quality of politicians is higher in at-large elections. Comparing the behaviour of politicians elected in single-member majoritarian districts with those of politicians

elected under proportional representation, Gagliarducci et al. (2011) find that being elected in a majoritarian district increases the amount of geographically targeted bills and reduces the absenteeism rate. All these works concentrated on politicians behavior; instead, the paper of Mayerson (1993) deals with the impact of electoral systems on political selection showing how higher entry barriers in majoritarian systems may lead to the election of low quality (dishonest) candidates.

The way electoral systems affect the politicians' quality has also been largely investigated to the light of political corruption. The Italian electoral system from the post-war period to 1993 was the scenario of several studies on that issue. Under open-list proportional system, the traditional view, which suggests that electoral uncertainty helps to discipline politicians, collides with the contrasting position that incumbent politicians' electoral uncertainty drives them to seek illegal rents in order to finance electoral campaigns (Chang, 2005). Moreover, the analysis of the Italian open-list proportional system in force until 1993 nourished the huge literature on the pork barrel allocations that caused the bureaucratic corruption and, consequently, the inefficiencies of Italian public sector (Chang and Golden, 2007; Golden and Picci, 2008).

The Italian municipalities have been the scenario to test the link between the politicians' quality and, both, the gender quotas and the organized crime. Baltrunaite et al. (2014) find that gender quota increases the quality of elected politicians, measured by the average years of education of the Municipal council members. Daniele and Geys (2015) shows that the dissolution of the Italian local government due to mafia infiltration induces a significant upward shift in the average education level of local politicians after the commissioners step down and a new elected government takes place.

At least in our knowledge, very little attention has been paid to the effect of different ballot structures characterizing electoral systems, which may largely modify the selection incentives for both voters and political parties. The ballot structure defines whether the choice is between parties or candidates (Bowler and Farrell, 1993; Farrell 2001) and allows to distinguish between preferential and non-preferential systems. In non-preferential systems, such as closed list, voter makes a simple choice between parties. In preferential systems, such as the single transferable vote system, voter can rank order all the candidates (from all parties) on a ballot paper.[2] The ballot structure may affect the process of political selection. Indeed, voting schemes prescribing that voters can cast a vote for closed (blocked) list, allow party leaders to nominate candidates to the Parliament by allocating them in the secure positions at the top of the party list. In choosing their candidates, they follow criteria that often are not in the voters' interest and face a trade-off between high quality politicians, instrumental to win the election, and low quality politicians, that are loyal and hence valuable to the party. Instead, voting rules prescribing the possibility to cast votes for preferred candidates give to voters the power

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[2] This latter kind of ballot structure can prescribe that voters may assign more than one preference for candidates.

to elect politicians according to their perception of the quality of politicians in terms of acting in the public interest. Therefore, the knowledge about the identity of the candidates is of huge importance (Norris, 2004). The strength of the power given to political leaders and voters, respectively, to select high quality politicians relies on the concept of accountability; in the first case, politicians are accountable to political parties; in the second case they are accountable to voters. When accountable to voters, they can award competent politicians through the reelection and punish bad ones removing them from office at the next elections. When accountable to political leaders, politicians' future depends even on the political parties' choice that not always relies on the promotion of policies in the interest of voters. Carey and Shugart (1995) explained that candidates have strong incentive to differentiate themselves from others in their party where the vote was cast for a candidate and not a party.

3. Institutional framework, Variables and Data

3.1 Italian electoral laws

As Italian Constitution states, different electoral laws discipline the election of representatives at the various levels of government. Here we are interested in national and regional electoral laws.

The electoral rules for the Italian Parliament have changed frequently over time. Since 1946 up to the legislative term XI (1993), members of parliament were elected under an open-list proportional system (Laws 6/1948 and 29/1948) with large districts. Voters could express up to four preferences for Deputies while the territory was divide single-member districts for the election of Senators. Thereafter, we will refer to this electoral law as *proportional with preferences*.

After the referendum of 1991, the parliamentary electoral rule was disciplined by Laws 276/1993 and 277/1993, known as "Legge Mattarella", that introduced a mixed electoral system. According to that Law, members of the House of Representatives were elected with a two-tier system: 75% majoritarian with single-member districts and 25% proportional with blocked lists. All the members of Senate were elected under majoritarian rule with single-member districts. Thereafter, we will refer to this electoral law as *majoritarian with preference*.

Laws of 1993 were in force up to 2005 when Law no. 270/2005, known as "Legge Calderoli" was introduced, implementing a pure proportional system with blocked lists of candidates. Thereafter, we will refer to this electoral law as *proportional with no-preferences*.

To sum up, Italian Parliament electoral rules experienced, sequentially, three changes with different ballot structures: 1) proportional with preferences (up to four preferences for candidates); 2) majoritarian with preference (one preference); 3) proportional with no-preferences (no preferences for candidates, just a vote for the list). Table 1 below summarizes the main characteristics of national electoral laws we consider in the analysis.

Table 1: Electoral systems and ballot structure of national electoral laws

	Proportional with preferences (Laws 6/1948-29/1948)	*Majoritarian with preference (Laws 376/1993-277/1993)*	*Proportional with no-preferences (Law 270/2005)*
Electoral system	Proportional with open lists	Two-tier system: - 25% proportional - 75% majoritarian	Proportional with blocked lists
Ballot structure	<u>House</u>: up to 4 preferences <u>Senate</u>: 1 preference	<u>House</u>: 1 preference for the 75% of members. <u>Senate</u>: 1 preference	<u>House</u>: no preferences <u>Senate</u>: no preferences

The election of regional councilors was firstly disciplined by Law n. 108/1968, a proportional electoral system where voters could express up to three preferences. In 1995, Law No. 43/1995, known as "Legge Tatarella", substituted the previous Law 108/1968. The "Legge Tatarella" implemented a proportional system with a majority bonus, giving to the elector the possibility to express only one preference. Table 2 below summarizes the main characteristics of regional electoral laws we consider in the analysis.[3]

Table 2: Electoral systems and ballot structure of regional electoral laws

	Law 108/1968	*Law 43/1995*
Electoral system	Proportional	Proportional system with a majority bonus for the winning coalition
Ballot structure	Up to 3 preferences	1 preference

The change in the parliamentary electoral system as well as in the ballot structure, just described above, allows us to define a natural experiment in order to test the hypothesis that the possibility for voters of expressing the preference for their preferred candidates instead of voting for a list of candidates, reflects in more qualifying politicians. We perform a two-cases analysis. Firstly, we compare the quality of parliamentary Italian politicians under the proportional with preferences and proportional with no-preferences (the *proportional-proportional* case). Otherwise, regional electoral law remained unchanged in its ballot structure: proportional system with open list and preferences.[4] Thereby, we identify parliamentary politicians as the *treatment* group (where treatment is defined as being exposed to the change in the ballot structure) and regional politicians as the *control* group.

Secondly, we go further by considering that voters can cast votes for their preferred candidates even under majoritarian electoral system with single-member district. Therefore, we compare the quality of parliamentary politicians under the majoritarian with preference and proportional with no-preferences (the *majoritarian-proportional* case). The counterfactual remains the regional electoral law, and the treatment and control group are defined as above.

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[3] A detailed description of Italian national and regional electoral laws is in Appendix.
[4] In the Robustness section we control for the change in the number of preferences (from three to one) in regional electoral laws.

It is important to underline that, for our purpose, under the "Legge Tatarella" we take only the share of the 80% of the regional Council politicians elected under proportional method with one preference, and, under the "Legge Mattarella" we take only the share of House of Representative (Deputies) seats distributes under plurality rules with the expression of one preference (the 75% of the seats).[5]

The exogenous shock makes the treatment and the control group unrelated to other unobserved politicians' characteristics affecting the dependent variable of our analysis, that is, the quality of politicians.

3.2 Data and variables

In our analysis we use administrative data provided by the Ministry of Interior on parliamentary and regional politicians. Regional elections do not occur at the same time as national ones. Tables 3 and 4 respectively show national and regional elections that we consider.

Table 3: Italy's Legislatures under analysis

Legislature	Beginning	Yearly duration	Electoral Law
X	June 1987	5	6/1948-29/1948
XI	April 1992	2	6/1948-29/1948
XIII	May 1996	5	376/1993-277/1993
XIV	May 2001	5	376/1993-277/1993
XV	April 2006	2	270/2005
XVI	April 2008	5	270/2005

Table 4: Regional elections

Regions	1° election	2° election	3° election	4° election	5° election	6° election
Abruzzo	1985	1990	1995	2000	2005	2008*
Basilicata ,Calabria, Campania, Emilia Romagna, Lazio, Liguria, Lombardia, Marche, Piemonte, Puglia, Toscana, Umbria, Veneto	1985	1990	1995	2000	2005*	2010
Friuli Venezia Giulia	1988	1993	1998	2003	2008	2013
Molise	1985	1990	1995	2001*	2006	2011
Sardegna	1984	1989	1999	2004	2009	2014
Sicilia	1986	1991	1996	2001	2006	2008
Trentino Alto Adige	1988	1993	1998	2003	2008	2013
Valle D'Aosta	1988	1993	1998	2003	2008	2013

Note: *The Abruzzo regional election of 2008 took place on 14/15 December 2008, due to the early resignation of President Ottaviano Del Turco, after his indictment for alleged corruption. *Basilicata did not vote along with the other Italian regions in the 3-4 April 2005 regional elections because of some legal issues with the presentation of the list of Social Alternative. It voted a couple of weeks later instead, on 17 -18 April 2005. *The Molise regional election of 2001 took place on 11 November 2001. It was an early election as the 2000 regional election was invalidated due to irregularities in the vote.

For both the cases of analysis we compare two legislatures before the national reform of 2005 and two after the reform, at national and regional level. In detail, in the *proportional-proportional* case, for national elections, we consider the X and XI legislatures before and the XV and XVI legislatures

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[5] Recall that, under "Legge Mattarella", for the Senate the same voting rule is applied for the 100% of the assembly.

after the reform; for regional elections, we consider the corresponding 1°-2° elections and 5°-6° elections (see table 4). In the *majoritarian-proportional* case, for national elections, we consider the XIII and XIV legislatures before and the XV and XVI legislatures after the reform; for regional elections, we consider the corresponding 3°-4° elections and 5°-6° elections.

We measure politicians' quality (the dependent variable of the empirical analysis) with the years of education, which is recognized by the literature as a good proxy for human capital level (Dal Bò et al., 2006; Besley and Reynal-Querol, 2011; Galasso and Nannicini, 2011; Fortunato and Panizza, 2011; Kotakorpi and Poutvaara, 2011; Glaeser et al., 2004).

No Italian institution provides comprehensive database on the years of education of national politicians (Deputies and Senators). Thus, we collected them to build our own database. Our main source of information is the official website of the Ministry of Interior. For each parliamentary term, the website shows the list of the parliamentary in office at that time and gives out the education level as well as some personal information such as date and place of birth, previous job, date of election, date of notification and validation date, political movement and so on and so forth.

For how it concerns regional politicians, the datasets[6] were supplied by the Italian Ministry of Interior and cover the period between 1984 and 2019. For each year, the databases provide information about identity, gender, age, regional function, previous job, as well as any private information concerning regional politicians. More importantly, evidence related to politicians' education is provided. In particular, these data report the type of highest qualification attained for each regional politician.

We translate the qualitative information on the level of education of national and regional politicians (their degree) into years of education following the approach suggested by De Paola and Scoppa (2010), Baltrunaite et al. (2014) and Daniele and Geys (2015). In other words, the degree of each politician is converted into the number of years required to achieve the degree itself. Table A.1 in Appendix shows this conversion

The following table 5 shows average years of the education of national and regional politicians in each of the six legislatures/elections under analysis.

Table 5: years of education of Senators, Deputies and Regional councillors in the six Legislatures/Elections.

Legislature/Elections	Senators		Deputies		Regional	
	mean	sd	mean	sd	mean	sd
X/1°	18.10	2.41	17.55	2.71	15.70	3.58
XI/2°	17.79	2.70	16.98	2.89	15.70	3.49
XIII/3°	17.67	2.31	16.88	3.01	15.79	3.38
XIV/4°	17.36	2.68	16.86	2.79	15.93	3.22
XV/5°	17.03	2.50	16.93	2.89	15.86	3.20
XVI/6°	17.20	2.76	16.83	3.00	16.00	3.11
Overall	17.49	2.59	17.00	2.90	15.83	3.33

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[6] Available online at http://amministratori.interno.it/AmmIndex5.htm.

On average over the six Legislatures, Senators have the higher level of education that reduces in the two legislatives term after the reform. For Deputies there is not substantial variation in the years of education as well as in the regional councillors.

Table 6 shows the average years of education according to the gender of politicians. In both the groups of national politicians, the female presence is the greatest in the two legislatures after the reform; it more than doubled with respect to the previous term before. In regional Council the female presence smoothly increases over time. In the Senate, on average, women are more educated than men as well as in regional Council; in the House seems to be the reverse.

Table 6: average years of education of male/female politicians in the four legislatures

	Senators			Deputies			Regionals		
	3°-4° Bef	1°-2° Bef	1°-2° Aft	3°-4° Bef	1°-2° Bef	1°-2° Aft	3°-4° Bef	1°-2° Bef	1°-2° Aft
Men	17.94	17.46	17.10	17.29	16.83	16.89	15.67	15.82	15.89
Sd	2.51	2.54	2.64	2.81	2.92	2.99	3.53	3.34	3.17
%	91.68	92.36	84.25	89.90	91.01	80.50	92.68	89.82	88.15
Women	17.85	18.18	17.19	16.74	17.24	16.86	16.09	16.20	16.25
Sd	3.15	1.96	2.61	2.93	2.71	2.76	3.52	2.84	3.04
%	8.32	7.63	15.74	10.09	8.98	19.49	7.31	10.17	11.84

Finally, table 7 shows the descriptive statistics on the average years of education of the two groups of politicians overall and by gender. The averages are calculated using data on the national and regional politicians elected in the two elections before the reform and in the two elections immediately after it, according to the two cases-analysis we refers to. Panel A comprises all politicians; in Panel B and Panel C we distinguish between male and female politicians, respectively. The statistics show that the education level of the elected regional councilors is on average lower than that of Parliamentarians both before and after the reform. The temporal change is negative for the treatment group; the difference is significantly different from zero and equals to about 6 months of education in the *proportional-proportional* case and to about 2 month in the *majoritarian-proportional* case. The difference in the average years of education of the elected female Parliamentarians is not significant in the *proportional-proportional* case and it is in the *majoritarian-proportional* case; the reverse happens for male Parliamentarians. Looking at the comparison between the treatment and control group, before as well as after the reform the average years of education of parliamentary are significantly higher than that of regional politicians.

Table 7: Descriptive analysis on the average years of education

	Proportional with preferences	Proportional with no-preferences	Difference	Majoritarian with preferences	Proportional with no-preferences	Difference
Panel A : all politicians						
Treatment group	17.458	16.966	0.491***	17.135	16.966	0.168*
Control group	15.705	15.935		15.862	15.935	
Difference	1.752***	1.031***		1.273***	1.031***	
Panel B : male politicians						

Treatment group	17.501	16.967	0.533***	17.093	16.967	0.125
Control group	15.674	15.891		15.823	15.891	
Difference	1.827***	1.076***		1.269***	1.076***	
Panel C : female politicians						
Treatment group	17.046	16.960	0.080	17.589	16.960	0.629**
Control group	16.098	16.251		16.204	16.251	
Difference	0.948***	0.708***		1.384***	0.708***	

Note: table shows the average years of education of politicians in treatment and control group at the last two elections before the introduction of Law no. 270/ 2005 and the first two elections after the adoption of the Law. The following symbols indicate different significance levels: *** - significance at 1% - ** significance at 5%- * - significance at 10%

4. Empirical strategy

The aim of this study is to identify the effect of the change from a ballot structure implying to vote a preferred candidate to another implying to vote for a blocked list of candidate drown up by political parties (i.e., no preferences for electors) on the quality of politicians, as measured by their years of education. We want to test the hypothesis that vote system allowing electors to choose between candidates is a more effective mechanism of selection of high quality politicians than closed list vote system.

We exploit the change in the Italian parliamentary voting rule occurred with the electoral law n. 270/2005 that allows to identify Italian Parliamentarians (which were exposed to the electoral reform) as the treatment group, and regional politicians (which were not exposed to electoral reform) as the control group. We use a Difference in Differences estimation to compare the change in the average education level of politicians across the two groups in the two elections before and after the introduction of the reform (the *proportional-proportional* and *majoritarian-proportional* cases). In this way we can infer about the effect of the expression of preferences by voters for candidates on the quality of elected politicians. We focus on the effects of the electoral reform; it may be likely that within the time-period under consideration there were no sharp changes in the institutional environment other than the reform, which could have differentially affected the quality of elected politicians.

Our key identification assumption is that, without the introduction of the reform, the differences in politicians' quality between the treatment and the control group would have remained constant over time. Formally:

$$E[\varepsilon_{ist}|Treat_i, AfterLaw_t, \delta_t, \mu_s] = 0$$

where *Treat$_i$* is a dummy variable which takes value 1 for parliamentarians and 0 otherwise; *After Law$_i$* is a dummy variable for elections taking place after the introduction of the reform; μ_s are the

dummies for each region; δ_t are the dummies for each legislature;[7] ε_{ist} is an error term. Index i refers to the elected politicians, s to regions, and t to the legislature.

The baseline Difference in Differences estimator is of the form:

$$Y_{ist} = \alpha + \gamma Treat_i + \varphi AfterLaw_t + \beta Treat_i AfterLaw_t + \delta_t + \mu_s + \rho_{st} + \pi_{st} + \varepsilon_{ist} \quad (1)$$

where Y_{ist} is the outcome of interest which measures the years of education of a politician i elected in region s, at legislature t. The dummy *Treat* allows us to control for the unobserved time-invariant characteristics that may differ across politicians in the two groups; *AfterLaw* captures the temporal trend common to both groups; *Treat*AfterLaw* is the interaction term between the two dummies and measures the treatment effect of our interest, i.e. the difference in the politicians' quality between Parliamentarians and regional councilors. δ_t are the dummies for each legislature. μ_s are the dummies for each region and account for the characteristics that are common to politicians in the same region and are constant over time. ρ_{st} captures the regional specific time trend. π_{st} is the interaction between regional dummies and the dummy *AfterLaw*: it accounts for time and region-varying shocks in politicians' education; it allows us to control that these shocks do not contribute to the identification of our parameter of interest β. Finally, ε_{ist} is an error term.

5. Results

In the baseline analysis, we consider as dependent variable the average years of education of elected politicians at Italian Parliament and at regional Council. Table 8 presents the results of the *proportional-proportional* case. Panel A focuses on the effect of the national electoral reform on the average years of education of all politicians; Panel B and Panel C look at male and female politicians respectively, to investigate the existence of differential effects according to the gender of elected politicians. In all panels, column 1 reports estimates of Eq. (1) without considering dummies for legislatures, regional time trend and *region-AfterLaw* dummies; column 2 includes regional time trend; column 3 adds dummies for legislatures and, finally, column 4 uses the full specification as in Eq. (1). Standard errors of parameter estimates, clustered at the level of regions, are calculated using the wild bootstrap methodology (Cameron, Gelbach, and Miller, 2008).[8]

In Panel A the coefficient β of the interaction term *Treat∗AfterLaw* is statistically significant and negative in all columns suggesting that the reform has worsened the average level of education of elected Parliamentarians. Namely, after the introduction of the reform, the average education of them decreased by 0.68 to 0.63 years more than of regional politicians. This corresponds to approximately

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[7] At the X and XI Legislatures correspond respectively the 1° and 2° regional elections; at the XIII and XIV Legislatures correspond respectively the 3° and 4° regional elections; at the XV and XVI Legislatures correspond respectively the 5° and 6° regional elections.

[8] Bootstrapped standard errors were obtained using the unofficial STATA command `boottest` by David Roodman (Roodman, MacKinnon, Nielsen, and Webb, 2018).

8 months of education on average. The improvement of the specification from column (1) to (4) does not change the significance of the coefficient of interest but it decreases when we gradually strengthen the identification. It is consistent with the presence of an upward bias in the initial estimate. The coefficient of the *Treat* variable is statistically significant and positive meaning that politicians in regional council have on average less years of education than Parliamentarians. The *AfterLaw* coefficient is positive and significant only in column 1, indicating no trend in the level of education of elected politicians.

Table 8. *proportional-proportional* case estimations

	Average years of education			
	(1)	(2)	(3)	(4)
Panel A: all politicians				
Treat	1.67***	1.67***	1.67***	1.64***
	(13.19)	(12.65)	(12.51)	(12.25)
After Law	0.21**	0.20	0.13	0.08
	(2.20)	(1.08)	(0.56)	(0.35)
Treat*After Law	-0.68***	-0.68***	-0.67***	-0.63***
	(-5.06)	(-4.63)	(-4.45)	(-3.94)
N. obs.	7716	7716	7716	7716
R-sq	0.07	0.07	0.07	0.07
Panel B: male politicians				
Treat	1.74***	1.74***	1.74***	1.72***
	(12.07)	(12.07)	(11.79)	(11.89)
After Law	0.19**	0.19**	0.13	0.09
	(2.12)	(2.12)	(0.58)	(0.69)
Treat*After Law	-0.70***	-0.70***	-0.69***	-0.66***
	(-5.04)	(-5.04)	(-4.53)	(-4.16)
N. obs.	6814	6814	6814	6814
R-sq	0.08	0.08	0.08	0.08
Panel C: female				
Treat	0.92***	0.93***	0.92***	0.86***
	(2.63)	(2.70)	(2.71)	(2.41)
After Law	0.20	0.27	0.22	0.10
	(0.56)	(0.44)	(0.28)	(0.14)
Treat*After Law	-0.35	-0.37	-0.36	-0.26
	(-0.68)	(-0.70)	(-0.69)	(-0.51)
N. obs.	901	901	901	901
R-sq	0.05	0.05	0.05	0.05
Region FE	Yes	Yes	Yes	Yes
Regional Trend	No	Yes	Yes	Yes
Leg	No	No	Yes	Yes
Regions*After Law	No	No	No	Yes

Notes. OLS regressions of average years of education of politicians. Panel A shows the results for all politicians, Panel B for male politicians and Panel C for female politicians. Columns 2–4 include regional specific time trend; columns 3–4 control for the legislature dummy; column 4 includes interactions between region dummies and the dummy After Law; coefficients are not reported. Standard errors are clustered at regional level and calculated with the bootstrap method; t-values are in parenthesis. The following symbols indicate different significance levels: *** - significant at 1 percent, ** - significant at 5 percent, * - significant at 10 percent.

Focusing on the gender differences in the quality of politicians, estimations in Panel B are in line with that in Panel A. The quality of male politicians decreases by 0.7 to 0.66 years more in the treatment group than in the control group. Instead, Panel C shows that for the treated female politicians the education level does not evolve differently after the reform compared to the regional female politicians. It seems to be an increasing trend in the level of education for male politicians.

Table 9 shows the results of the *majoritarian-proportional* case analysis: plurality system vs proportional system. We recall that, under the "Legge Mattarella", for the Deputies we take only the data on the 75% elected with plurality rule.

Table 9. *majoritarian-proportional* case estimations

	Average years of education			
	(1)	(2)	(3)	(4)
Panel A: all politicians				
Treat	1.29***	1.29***	1.29***	1.29***
	(8.82)	(8.95)	(9.01)	(9.25)
After Law	0.08	0.04	0.09	0.12
	(0.90)	(0.44)	(0.77)	(0.92)
Treat*After Law	-0.24*	-0.24*	-0.24*	-0.26**
	(-1.65)	(-1.69)	(-1.76)	(-2.05)
N. obs.	7801	7801	7801	7801
R-sq	0.06	0.06	0.06	0.06
Panel B: male politicians				
Treat	1.28***	1.28***	1.28***	1.29***
	(8.35)	(8.44)	(8.51)	(8.78)
After Law	0.07	0.04	0.07	0.07
	(0.80)	(0.41)	(0.34)	(0.52)
Treat*After Law	-0.19	-0.19	-0.19	-0.21*
	(-1.28)	(-1.30)	(-1.33)	(-1.66)
N. obs.	6848	6848	6848	6848
R-sq	0.07	0.07	0.07	0.07
Panel C: female politicians				
Treat	1.36***	1.36***	1.37***	1.36***
	(4.02)	(4.02)	(4.22)	(4.18)
After Law	0.06	0.11	0.72	0.71
	(0.19)	(0.19)	(1.30)	(1.30)
Treat*After Law	-0.62	-0.63	-0.68	-0.67
	(-1.29)	(-1.29)	(-1.46)	(-1.43)
N. obs.	952	952	952	952
R-sq	0.06	0.06	0.06	0.06
Region FE	Yes	Yes	Yes	Yes
Regional Trend	No	Yes	Yes	Yes
Leg	No	No	Yes	Yes
Regions*After Law	No	No	No	Yes

Notes. OLS regressions of average years of education of politicians. Panel A shows the results for all politicians, Panel B for male politicians and Panel C for female politicians. Columns 2–4 include regional specific time trend; columns 3–4 control for the legislature dummy; column 4 includes interactions between region dummies and the dummy After Law; coefficients are not reported. Standard errors are clustered at regional level and calculated with the bootstrap method; t-values are in parenthesis. The following symbols indicate different significance levels: *** - significant at 1 percent, ** - significant at 5 percent, * - significant at 10 percent.

In all the Panels, results are in line with the previous one but both the significance and the magnitude of the coefficient of interest weaken. Looking at all politicians, after the reform the average education decreased of about 0.24 years more than of regional politicians (that corresponds to approximately 3 months of education on average). Male politicians seems to drive this result with a significant coefficient of the interaction term of 0.21 in the last column. Contrary to the *proportional-proportional* case, the improvement of the model specification is consistent with a downward bias in the initial estimates.

Therefore, our results show that the introduction of a proportional electoral system with blocked lists of candidates, that is, no possibility for voters to express their own preference for candidates, lowered the quality of Italian Parliamentarians. The comparison between estimations in tables 8 and 9

guarantees that results are robust to the kind of electoral system but depend only on the ballot structure. The greatest effect on the politicians' quality is in the *proportional-proportional* case.

6. Discussion and Robustness Checks

In the following section, we provide further evidence to support our result. We discuss the extent to which the change in the number of preferences prescribed by the ballot structure, as tables 1 and 2 showed, can affect results. We discuss if results are robust to the exclusion of politicians elected in the regions with special statute and to the introduction of control variables affecting the quality of politicians. In the *majoritarian-proportional* case we control for an index of political competition in order to control for the different kinds of electoral competition the electoral systems induce.

The first possible concern is that the reduction in the number of preferences for voters due to the change in the regional electoral law (from Law 108/1968 to "Legge Tatarella" of 1995) can have affected the education level of regional politicians. Given that the identification assumption of our empirical strategy implies that the ballot structure of the control group remained unchanged, we have to check if this reduction in the number of preferences given to voters (from up to 3 to 1) has affected the education level of regional politicians.[9] We, thus, split the sample of regional politicians into two and define a dummy variable taking value 0 until 1994 (when law 108/1968 was in force) and 1 from 1995 to the end of the period of analysis (thereafter *Pref*). Then we interact this dummy with the trend variable and we run the following regression

$$Y_{it} = \alpha + \gamma Trend_t + \varphi Pref_{it} + \beta Trend_t * Pref_{it} + \varepsilon_{it} \qquad (2)$$

where Y_{it} is the years of education of regional politicians and ε_{it} is an error term. The coefficient β of the interaction term is not significantly different from zero meaning that switch from a ballot structure with 3 preferences to another one with 1 preference does not affect the trend in the education level of regional politicians.[10] It gives support to our identification assumption.

6.1 Senators and Deputies

In the first robustness analysis we verify if the baseline results hold splitting the sample of Parliamentarians into Senators and Deputies. We do that for two reasons: 1) the two sub-groups present very different average education levels (as tables 5-7 show); 2) the first national electoral law we consider (Laws 6/1948 – 29/1948) prescribes two different kinds of ballot structure for the two Houses of Parliament (as table 1 clearly summarizes): up to 4 preferences for the House of Representatives and 1 preference for the Senate.

Table 10 shows results for all the Senators and Deputies and divided by gender.

Table 10. Estimations by Senators and Deputies and their gender

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[9] We do that by performing a Chow test for the presence of a structural break in the education level of regional politicians in the two period before and after the "Legge Tatarella".

[10] Results of estimation of equation (2) are not shown and are available upon request.

Average years of education	Prop-prop (all) (1)	Maj-prop (all) (2)	Prop-prop (male) (3)	Maj-prop (male) (4)	Prop-prop (female) (5)	Maj-prop (female) (6)
Senators						
Treatment	1.86***	1.68***	1.87***	1.66***	1.77***	1.936***
	(12.30)	(10.09)	(12.27)	(10.30)	(6.65)	(5.76)
After Law	-0.02	0.15	0.08	0.17	-0.76	0.39
	(-0.07)	(0.77)	(0.31)	(0.77)	(-1.07)	(0.63)
Treatment*After Law	-0.67***	-0.49***	-0.66***	-0.44**	-0.81*	-0.97**
	(-3.44)	(-2.82)	(-3.14)	(-2.38)	(-1.73)	(-2.14)
N. obs.	8204	5619	7383	4992	820	626
R-sq	0.07	0.07	0.08	0.07	0.08	0.09
Deputies						
Treatment	1.23***	1.04***	1.27***	1.04***	0.83**	1.05**
	(11.72)	(7.53)	(11.13)	(6.90)	(3.05)	(2.72)
After Law	-0.01	0.18	-0.05	0.11	0.48	0.84
	(-0.07)	(1.31)	(-0.22)	(0.83)	(0.55)	(1.28)
Treatment*After Law	-0.29**	-0.10	-0.28*	-0.04	-0.29	-0.45
	(-1.96)	(-0.63)	(-1.71)	(-0.26)	(-0.59)	(-0.83)
N. obs.	9735	6543	8664	5736	1070	806
R-sq	0.06	0.05	0.06	0.06	0.04	0.06
Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Regional Trend	Yes	Yes	Yes	Yes	Yes	Yes
Leg	Yes	Yes	Yes	Yes	Yes	Yes
Regions*After Law	Yes	Yes	Yes	Yes	Yes	Yes

Notes. OLS regressions of average years of education of senators and deputies, divided by gender. All the regressions include regional specific time trend, the legislature dummy and the interactions between region dummies and the dummy After Law; coefficients are not reported. Standard errors are clustered at regional level and calculated with the bootstrap method; t-values are in parenthesis. The following symbols indicate different significance levels: *** - significant at 1 percent, ** - significant at 5 percent, * - significant at 10 percent.

The even numbers of the table refer to the *proportional-proportional* case (*prop-prop*); the odd numbers refer to the *majoritarian-proportional* case (*maj-prop*). We estimate the full specification, with dummies for legislatures, regional time trend and *region-AfterLaw* dummies. A first and general look of table 10 shows that the reform affected Senators more than Deputies. For Senators, in column (1), the coefficient of interest remains almost the same as in the baseline analysis in table 8. Column (2), instead, shows a coefficient of the interaction term of -0.49 that is twice that in table 9, corresponding to a reduction of about 6 month of education of Senators after the reform in the *majoritarian-proportional* case. Looking at the Deputies, only the coefficients of interest in the *proportional-proportional* case are significantly different from zero: the reform of 2005 does not affected the quality of Deputies when compared with that of Deputies elected under plurality rule, nevertheless it lowers the quality of Deputies when compared with that of Deputies elected under open list proportional rule.

The gender analysis in columns (3)-(6) table 10 adds some more information: in both the cases, reform lowers the quality of both male and female Senators; the greatest effect is for female (up to one year of education less *majoritarian-proportional* case). For Deputies, the coefficient of interest is significant only for male in the *proportional-proportional* case; thus, we cannot claim that for female Deputies the education level evolved differently after the reform compared to the control group. Table 11 below provides a summary of the main results.

Table 11. Summary of results

	Proportional-proportional			Majoritarian-proportional		
	All	*Male*	*Female*	*All*	*Male*	*Female*
Effect of the reform	8 months for Senators	8 months for Senators	9 months for Senators	6 months for Senators	5 months for Senators	12 months for Senators
	3-4 months for Deputies	3-4 months for Deputies	No effect for Deputies	No effect for Deputies	No effect for Deputies	No effect for Deputies

The comparison between columns (1) and (2) of table 10 can be of interest according to the kind of ballot structure prescribed by the two electoral systems under consideration: the proportional with preferences and the majoritarian with preference. Indeed, for Deputies, the two electoral systems just mentioned prescribed, respectively, to cast up to 4 preferences and just 1 preference (see table 1). Given that the effect of the reform is significant only in the *proportional-proportional* case (column (1)), we could argue even the number of preferences for voters matters in the selection of high quality politicians. However, this result must be treated with caution because we are comparing two different electoral systems.

6.2 Excluding special statute Regions

The Italian Constitution distinguishes between regions with ordinary statute and regions with special statute. The latter enjoy particular forms and conditions of autonomy. The regional electoral laws described above hold, in broad terms, for Regions with special statute but they show slightly different path in some aspects. For them, the electoral law in force up to 1995 prescribed a proportional system with preferences with some differences with respect to the Laws 108/1968. The following "Legge Tatarella" was enforced by Sicilia, Sardegna and Friuli Venezia Giulia; while Trentino Alto Adige and Valle d'Aosta adopted proportional electoral systems with different characteristics for election of the President. Given these differences, we restrict our attention only to the regions with ordinary statute and carry out the main specification of our model on this sample. Results are in table 12. As before, we present results splitting the treatment group of politicians into Senators and Deputies, also according to their gender.

Table 12. Estimations by Senators and Deputies and their gender

Average years of education	Prop-prop (all) (1)	Maj-prop (all) (2)	Prop-prop (male) (3)	Maj-prop (male) (4)	Prop-prop (female) (5)	Maj-prop (female) (6)
Senators						
Treatment	2.31***	1.78***	2.36***	1.74***	1.91***	2.11***
	(11.12)	(9.08)	(10.92)	(9.06)	(3.23)	(5.94)
After Law	0.53	0.20	0.62*	0.23	0.09	0.34
	(1.75)	(0.78)	(2.21)	(0.91)	(0.13)	(0.53)
Treatment*After Law	-1.08***	-0.50**	-1.08***	-0.42*	-1.19	-1.19**
	(-3.86)	(-2.36)	(-3.57)	(-1.87)	(-1.40)	(-2.48)
N. obs.	3891	4119	3459	3625	431	493
R-sq	0.08	0.07	0.09	0.08	0.08	0.10
Deputies						
Treatment	1.47***	1.08***	1.57***	1.05***	0.50	1.23**
	(10.28)	(6.52)	(10.19)	(5.78)	(1.09)	(2.95)
After Law	0.31	0.10	0.24	-0.01	0.93	0.95
	(1.19)	(0.55)	(0.99)	(-0.01)	(1.03)	(1.29)
Treatment*After Law	-0.53**	-0.12	-0.58***	-0.04	-0.01	-0.62
	(-2.83)	(-0.64)	(-3.12)	(-0.19)	(-0.02)	(-1.00)
N. obs.	4937	4907	4315	4251	621	655

R-sq	0.06	0.05	0.07	0.06	0.04	0.06
Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Regional Trend	Yes	Yes	Yes	Yes	Yes	Yes
Leg	Yes	Yes	Yes	Yes	Yes	Yes
Regions*After Law	Yes	Yes	Yes	Yes	Yes	Yes

Notes. OLS regressions of average years of education of senators and deputies, divided by gender. All the regressions include regional specific time trend, the legislature dummy and the interactions between region dummies and the dummy After Law; coefficients are not reported. Standard errors are clustered at regional level and calculated with the bootstrap method; t-values are in parenthesis. The following symbols indicate different significance levels: *** - significant at 1 percent, ** - significant at 5 percent, * - significant at 10 percent.

The first look of the table 12 shows that: 1) the impact of the reform is confirmed to be greater for Senators with respect to Deputies; 2) including regions with special statute into the sample is consistent with a downward bias of estimations. We compare results in table 12 with that in table 10. Look at the *proportional-proportional* case. The coefficient of the interaction term we are interested in strongly decreases, going from -0.67 to -1.08 for Senators and from -0.29 to -0.53 for Deputies. This corresponds to a further decrease in the education level respectively of about 5 and 3 months; with respect to the control group, the introduction of blocked lists of candidates lowered the education of more than a year for Senators and more than 6 months for Deputies. Male politicians drive these results, while the coefficient for female remains not significantly different from zero. Therefore, regions with special statute bias results downward. This bias is not confirmed in the *majoritarian-proportional* case where the significance and the magnitude of the treatment coefficient in columns (2), (4) and (6) table 10 almost repeated in the corresponding columns in table 12.

6.3 Control variables

A further robustness check concerns the control for variables that can affect the education level of politicians. We introduce in the regression equation as in (1) the size of the regional resident population over 18 in natural log (thereafter *ln_pop*), the regional education level defined as share of university graduates over resident population over age 18, in natural log (thereafter *ln_education*) and the regional GDP per capita, in natural log (thereafter *ln_gdp*). Table 13 shows results for Senators and Deputies, also divided by gender.

Table 13. Estimations by Senators and Deputies and their gender

Average years of education	*Prop-prop* (all) (1)	*Maj-prop* (all) (2)	*Prop-prop* (male) (3)	*Maj-prop* (male) (4)	*Prop-prop* (female) (5)	*Maj-prop* (female) (6)
Senators						
Treatment	2.14***	1.69***	2.21***	1.67***	1.67***	1.95***
	(10.72)	(9.95)	(10.67)	(10.03)	(10.67)	(5.80)
After Law	0.05	0.73	0.11	0.68	0.06	2.07
	(0.07)	(1.20)	(0.20)	(1.14)	(0.20)	(1.20)
Treatment*After Law	-0.96***	-0.47**	-1.00***	-0.43**	-0.89***	-1.00*
	(-3.66)	(-2.53)	(-3.66)	(-2.23)	(-3.66)	(-1.93)
Ln_pop	-2.08	-1.37	-1.37	-0.36	-6.62	-9.14
	(-1.18)	(-0.48)	(-0.72)	(-0.12)	(-1.27)	(-1.13)
Ln_education	0.52	-0.53	0.63	-0.48	-0.28	-1.79
	(0.91)	(-0.72)	(1.05)	(-0.62)	(-0.13)	(-0.86)
Ln_gdp	-0.47	-1.03	-0.79	-0.98	0.26	-0.29
	(-0.32)	(-0.48)	(-0.52)	(-0.43)	(0.05)	(-0.05)
N. obs.	5380	5619	4830	4992	549	626
R-sq	0.07	0.07	0.08	0.07	0.09	0.09

Deputies						
Treatment	1.39***	1.04***	1.49***	1.05***	0.35	1.08**
	(11.61)	(7.42)	(10.90)	(6.81)	(0.92)	(2.78)
After Law	0.15	0.32	0.09	0.21	1.06	1.93
	(0.30)	(0.68)	(0.22)	(0.42)	(0.37)	(1.02)
Treatment*After Law	-0.45***	-0.10	-0.49***	-0.04	0.15	-0.53
	(-3.22)	(-0.57)	(-3.49)	(-0.57)	(0.30)	(-0.95)
Ln_pop	-1.75	-1.68	-0.37	-0.01	-10.95	-14.12*
	(-1.09)	(-0.61)	(-0.22)	(-0.24)	(-2.47)	(-1.82)
Ln_education	0.13	-0.11	0.13	-0.09	-0.15	-0.86
	(0.25)	(-0.16)	(0.23)	(-0.12)	(-0.08)	(-0.44)
Ln_gdp	-0.02	-0.05	-0.25	-0.18	0.71	0.60
	(-0.02)	(-0.02)	(-0.18)	(-0.08)	(0.16)	(0.10)
N. obs.	6607	6543	5843	5736	763	806
R-sq	0.07	0.05	0.07	0.06	0.05	0.06
Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Regional Trend	Yes	Yes	Yes	Yes	Yes	Yes
Leg	Yes	Yes	Yes	Yes	Yes	Yes
Regions*After Law	Yes	Yes	Yes	Yes	Yes	Yes

Notes. OLS regressions of average years of education of politicians. All the regressions include regional specific time trend, the legislature dummy and the interactions between region dummies and the dummy After Law; coefficients are not reported. Standard errors are clustered at regional level and calculated with the bootstrap method; t-values are in parenthesis. The following symbols indicate different significance levels: *** - significant at 1 percent, ** - significant at 5 percent, * - significant at 10 percent.

Control variables are never significantly different from zero. Their introduction in the estimations does not change the sign and significance of the treatment coefficient. In the *proportional-proportional* case, both for Senators and Deputies as a whole and male only, the *Treatment*After Law* almost doubles with respect to table 10 arriving to -1 for Senators (12 months of education less).

6.4 Political competition

Galasso and Nannicini (2017), comparing majoritarian and proportional electoral systems, theoretically predicted that, for a high concentration of safe districts, the proportional system is more effective in selecting good politicians; as the share of competitive districts increases, the majoritarian system becomes instead more effective. Indeed, political parties, in selecting the candidates to be included in their electoral lists, face a tradeoff. On the one hand, high quality politicians are instrumental to win the election, because voters value their expertise. On the other hand, low quality politicians are loyal and hence valuable to the party. In majoritarian systems, in order to increase the probability of winning in more competitive single-member districts, parties have an incentive to allocate high quality politicians to these districts and to send low quality politicians to safe ones. Therefore, given that in the *majoritarian-proportional* case the electoral reform under consideration changed the ballot structure as well as the electoral system, we need to take into account the pre-existing political environment, such as the level of political competition in the majoritarian districts. In order to do that, we introduce in the estimated equation a measure of political competitiveness among political parties. Following Alfano and Baraldi (2015), we measure political competition with the normalized Herfindahl index. It ranges from 0 (theoretically perfect competition with n equally sized parties) to 1 (monopoly) and it is computed as:

$$NHerf = \frac{\left(Herf - \frac{1}{n}\right)}{1 - \frac{1}{n}}$$

where, n is the number of political parties at an election, and Herf is the standard Herfindahl index, $Herf = \sum_{i=1}^{N} v_i^2$, where v_i is the vote share of each political party (i = 1,....,n political parties) at each of the four parliamentary and regional election under analysis. Given that the data to construct the index are available on regional basis, we cannot calculate it for Deputies. Therefore, we restrict the treatment group to Senators. Table 14 shows estimation results controlling for political competition (thereafter *pol_competition*). As before, we consider the all the Senators and divided by gender.

Table 14. Estimations; treatment group: senators

Average years of education	all	male	female
Treat	1.80***	1.82***	1.89***
	(9.68)	(9.66)	(3.91)
After Law	0.19	0.22	0.40
	(0.92)	(0.97)	(0.71)
Treat*After Law	-0.59***	-0.58***	-0.93*
	(-3.37)	(-3.03)	(-1.74)
Pol_competition	-1.34	-1.74	0.46
	(-1.27)	(-1.53)	(0.93)
N. obs.	5434	4815	618
R-sq	0.07	0.08	0.09
Region FE	Yes	Yes	Yes
Regional Trend	Yes	Yes	Yes
Leg	Yes	Yes	Yes
Regions*After Law	Yes	Yes	Yes
Controls	Yes	Yes	Yes

Notes. OLS regressions of average years of education of politicians. All the regressions include regional specific time trend, the legislature dummy, the interactions between region dummies and the dummy After Law; coefficients are not reported. Standard errors are clustered at regional level and calculated with the bootstrap method; t-values are in parenthesis. The following symbols indicate different significance levels: *** - significant at 1 percent, ** - significant at 5 percent, * - significant at 10 percent.

Results of the coefficient of interest are, once again, confirmed in sign, significance and the magnitude slightly increases compared to those in table 10.

7. Concluding Remarks

We investigate the effect of the change in the ballot structure introduced by the national electoral reform occurred with the Law n. 270/2005 on the quality of politicians. We compare the change in the average education level of politicians (the measure of the politicians' quality) across the treatment (parliamentarians) and the control (regional) group of politicians before and after the national electoral reform. We performed two analyses: 1) the *proportional-proportional* case, where we compare the quality of parliamentary Italian politicians under the proportional with preferences and proportional with no-preferences; 2) the *majoritarian-proportional* case, where we compare the quality of parliamentary politicians under the majoritarian with preference and proportional with no-preferences. The counterfactual of the quasi-experiment is made of regional politicians (politicians elected in regional councils) for who the ballot structure prescribed by the electoral Laws for regional councilors (Law n. 108/1968 and Law n. 43/1995, proportional with open list of candidates) remained

unchanged over the period under consideration. We find that the introduction of closed list ballot scheme lowered the average education level of elected national politicians. Results are stronger in the *proportional-proportional* case: the reform lowers the average education level in the treatment group of Senators of about 8 months more than in the control group; while the decrease in the education level is lower for Deputies (about 4 months). Looking at the gender of politicians, previous results repeat for male politicians while it seems that the change in the ballot structure under analysis did not affect the quality of female Deputies (contrary to the quality of female Senators that reduces of 9 months). In the *majoritarian-proportional* case, the greatest negative effect of the reform is verifiable for female Senators with a reduction of the education level of more than one year with respect to female regional councilors. Instead, no effect was found for Deputies. Results hold under robustness checks concerning the restriction of the sample to the regions with ordinary statute, the inclusion of control variables affecting the education level of politicians and the degree of political competition affecting politicians' quality of candidates in majoritarian and proportional electoral systems. The evidence in the declining of the politicians' quality after the introduction of the "Legge Calderoli" confirmed that voters, casting the vote for their preferred candidates, are able to select better politicians than political parties. The stronger effect in the *proportional-proportional* case than in the *majoritarian-proportional* case allows us to say that also the number of preferences available to voters at the Election Day matters for choosing more qualifying political class. This may be an argument in favor the re-introduction, in the electoral law, of voting schemes prescribing the chance for voters to express the preference over candidates.

Appendix

A.1. Italian national electoral laws

Italy is a parliamentary democracy with a perfect bicameral structure, where the House of Representatives ("Camera dei Deputati") and the Senate ("Senato della Repubblica") have symmetric legislative power. The House is composed of 630 members, and the Senate has 315 members.[11] The constitutionally mandated duration of a parliamentary term (Legislature) is five years. Within seventy days before the end of a Legislature new elections have to take place to nominate the members of the new Parliament. Early elections may however take place before the regular end of the Legislature.[12] The President of the Republic can dissolve Parliament and call early elections.

The active electorate for the House is composed of all Italian citizens who have reached 18 years of age, whereas the voting age for the Senate is 25 years.

Laws 6/1948 and 29/1948 disciplined election of Parliamentarians under an open-list proportional system with large districts. The House of Representatives was divided in 32 large districts with 3 to 54 seats per district depending on the population; each voter could express up to four preferences for candidates.[13] For the election of Senate the territory was divide in 21 large district, with 1 to 47 single-member district.[14]

After the referendum of 1991, the parliamentary electoral rule was disciplined by Laws 276/1993 and 277/1993, known as "Legge Mattarella" or "Mattarellum", that introduced a mixed electoral system. According to that Law, members of Parliament were elected with a two-tier system (25% proportional and 75% majoritarian). The House of Representative's election was slightly different from the one enacted for the Senate's election. In the House of Representatives voters received two ballots on Election Day: one to cast a vote for a candidate in their single-member district, and another to cast a vote for a party list in their larger proportional district. 75% of House members were elected with plurality voting in 475 single-member districts, while 25% were elected using proportional representation with closed party lists in 26 multiple-member districts (2 to 12 seats per district).[15] In the Senate voters received one ballot to cast their vote for a candidate in a single-member district, and

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[11] All the 630 members of the House are chosen during political elections. The majority of the 315 members of Senate are elected during political elections and a minority is made of non-elected members that are the past Italian Presidents ("senatori di diritto a vita") and citizens who have been declared senators for life ("senatori a vita") by the Italian Presidents, due to the highest national recognition for exceptional achievements in science, art or social life.

[12] Early elections have been relatively frequent in Italy. Indeed, in 18 Legislatures from 1948 until now, 8 experienced untimely end.

[13] Each voter could express up to three preferences in constituencies up to 15 seats and up to four preferences in constituencies beyond 15 seats.

[14] In 1953 the government leaded by De Gasperi tried to introduce a majoritarian premium (the so called "legge truffa"). This premium was never set because no political parties passed the threshold of 50% of votes. The next year it was abrogated.

[15] In line with what was established by the law, any Italian region was considered a primary constituency and it was divided in a number of single seat district ("collegi").

the best losers in the 232 majoritarian districts were assigned to the remaining 83 seats according to the proportional rule.[16] The macro districts common to House and Senate members are the Italian Regions.

Laws of 1993 were in force up to 2005 when Law no. 270/2005, known as "Legge Calderoli" or "Porcellum" was introduced. The major aim of the new electoral law was to bring back the proportional system. However, the law not only implemented a pure proportional system, but introduced a majority bonus and a threshold of votes, in order to avoid the dispersion of votes. The way the majority bonus was granted is the main difference between House and the Senate. Looking at the House, the electoral law prescribed that the national territory had to be divided into 27 constituencies. Single parties or party coalitions were able to run for office. Parties had to present their own list of candidates but voters were not able to express any preference (blocked lists). According to the number of the seats allocated to the party, new candidates were elected given the order of the list. The allocation of the seats took place at a national level. Each party had to reach a threshold of 4 percent (10% for coalitions) of national votes in order to gain seats. Each party obtained a number of seats proportional to the number of votes received. If none of them was able to reach 55% of the seats, the most voted coalition was entitled to receive a majority bonus, that is, 340 parliamentary seats. The majority bonus was allocated between the parties of the coalition according to the number of votes achieved by each list.

Looking at the Senate, the allocation of the seats took place at a regional level. Thus, in each region, the party or the coalition who won the majority, without achieving the 55% of the seats, was entitled to receive a majority bonus in order to reach this percentage. Thresholds required were 8% for a single party, 20% for the coalition and 3% for each list of the coalition.

A.2 Regional electoral law

Regions, with municipalities, provinces, metropolitan cities and the State are one of the five constituent element of the Italian Republic. According to the article 114 of the Constitution, it is possible to define regions as "autonomous entities having their own statutes, powers and functions in accordance with the principles laid down in the Constitution".[17] The Regional Council ("Consiglio Regionale"), the Regional Executive ("Giunta Regionale") and the President are the body who

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[16] At the Senate, after the electorate has nominated a senator for any single-seat district, the remaining seats were assigned with a repechage mechanism. This mechanism, known as "scorporo totale", implemented the repechage of all the candidates who were not elected but received the highest number of votes. Here, no threshold was planned. The reason behind this choice was that the number of the remaining seats for the Senate was small enough to avoid the election of candidates who gained less than 10% of the votes cast.

[17] The Constitution distinguishes between two main categories: the Special Status regions (regioni a statuto speciale) that are Valle d'Aosta, Trentino Alto Adige, Friuli Venezia Giulia Sicilia and Saregna; the ordinary status regions (regioni a statuto ordinario) that are Abruzzo, Basilicata, Calabria, Campania, Emilia Romagna, Lazio, Liguria, Lombardia, Marche, Molise, Piemonte, Puglia, Toscana, Umbria, Veneto.

governs the Region. The Region is represented by the President who is directly elected by all the citizens within the Region (if nothing different is provided for the regional Statute). The Regional Council, who exercises the legislative power, is elected by all the citizens living in the Region and it is composed by Regional Councilors. The executive body of the Region is the Regional Executive; it is made of the Regional Councilors designed by the President.

Law n. 108/1968 disciplined a proportional electoral system for the ordinary status regions: seats are assigned on provincial basis using the Hagenbach-Bishoff method; the residual seats was attributed to a single-regional district and assigned with the method of the highest remains. Voters could express up to three preferences.

Law No. 43/1995, known as "Legge Tatarella" or "Tatarellum" (modified by the Costitutional Law No 1/1999) have substituted the previous Law 108/1968 in the regulation of regional elections. The "Legge Tatarella" implemented a proportional system with a majority bonus for the winning coalition, and provided the direct election of the Regional President. According to the mixed system, in order to elect the Regional Council, the elector casts two votes: the first to elect the 4/5 (80%) of the councilors with proportional method based on the lists presented at the provincial level (voters can express the preference over candidates within the list); the second, that is the remaining 1/5 (20%), represents the majority bonus that is awarded with a majority multi-member system to a "listino bloccato" at the regional level (in which it is not possible, therefore, to express preferences), linked to the candidate President of the region.[18] Party lists that obtain less than 3% of votes do not receive any seats if they are not linked with a presidential candidate who reached a threshold of 5% of votes. The coalition supporting the winning candidate for president is awarded with a bonus of seats, thus ensuring a majority in the regional assembly. The bonus is then redistributed amongst the parties of the winning coalition. Law 43/1995 gives to the elector the possibility to express only one preference.[19]

A.3 Table of conversion of the level of education into years of education

Table A.3: Categories of school and academic degree.

Categories	Degrees	Years of education
University	Specialisation Schools that enable to practice chosen professions and to use the title of specialist. In this case, admission requires students to obtain a specific degree and to pass a selective examination. Other qualifications officially recognized as equivalent	23
University	University Researcher, Phd, Other post-graduate's degree, Other qualifications officially recognised as equivalent	21
University	Bachelor of Medicine, Bachelor of Surgery. Master Degree, Other qualifications officially recognised as equivalent	19

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[18] The regional territory is divided into a number of multi-seat districts corresponding to the provinces. In every district the seats are allocated in accordance with the previous Law 108/1968: by the Hagenbach-Bischoff method, first, and by the Hare method, for the residual seats.
[19] This is the direct consequence of the referendum held in 1991.

University	Bachelor Degree, Other qualifications officially recognised as equivalent	18
Higher Secondary	High School Degree, Professional Diploma, Other qualifications officially recognised as equivalent	13
Lower Secondary	Middle School Degree, Other qualifications officially recognised as equivalent	8
Primary Education	Elementary School Diploma	5
No education	No Diploma/Degree	0

In case no education level is specified, we use the variables "job" to derive an estimation of years of education according to the minimum level of education that the Italian law prescribes to attain that job. Instead, in case where is not possible to infer directly the years of education from the variable "job", we assign an average value. The latter is equal to 15.5 years of education if the job of the politician can be exercise with both a university degree and a high school degree. Moreover, we assign a value of 10.5 when the job requires either a high school degree or a middle school degree.

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