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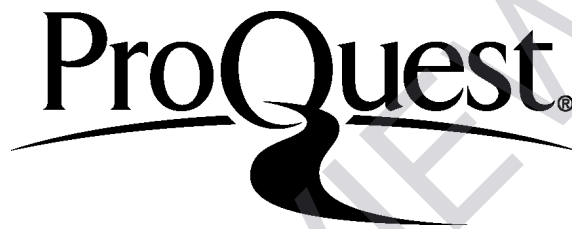
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PREVIEW

Abstract

This collection of essays provides an empirical investigation on political institutions and electoral systems. All of the chapters use a regression discontinuity design and exploit the framework of Spanish municipalities. Chapter 1, which is forthcoming in *Political Science Research and Methods*, compares turnout under closed-list proportional representation and under an open-list, plurality-at-large system in which voters can vote for individual candidates from the same or different party-lists. This chapter finds that the open-list system increases turnout by between 1 and 2 percentage points, which suggests that introducing competition both across and within parties leads to more voter turnout. Chapter 2 compares economic policy in direct and representative democracy. Using data from the budgets of the municipal governments, it finds that direct democracy in the form of open town meetings leads to a smaller government, reducing public spending and revenues by 4%. Consistent with a model in which direct democracy allows voters to curb special-interest spending, all of the difference is driven by current expenditures, while capital (infrastructure) expenditures are not affected. Chapter 3, joint with Thomas Fujiwara, presents a finding that is difficult to reconcile with previous literature on legislative bargaining and government formation, which mostly derives a party's bargaining power from its number of seats. Using data from more than 3,000 local elections in which two parties tie in seats, it shows that the party with slightly more votes is substantially more likely to appoint the mayor (form a government). This is a surprising result, as it implies that there is a "first-place" effect that is strong enough to override any other consideration that parties may take into account when forming coalitions, such as ideological affinity. The effect holds not only when the two most voted parties tie in seats, but also in ties between the second and third most voted parties. The chapter provides evidence that is consistent with voters enforcing a norm of the most-voted party forming the government: second-placed parties that form the government are

“punished” by voters in the subsequent election. These results imply the existence of some degree of first-past-the-post in proportional representation.

PREVIEW

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A mis padres y a mi hermano.

PREVIEW

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Chapter 1

The Effect of Electoral Systems on Voter Turnout: Evidence from a Natural Experiment

1.1 Introduction

Voter turnout varies widely across countries. How much of that variation can be explained by differences in the electoral system? What is the causal effect of the electoral system on voter turnout? Do citizens participate more when they are allowed to decide which individual candidates get elected (open list systems), than in elections where they vote for a party-list (closed list systems)? These questions have attracted the attention of economists and political scientists for a long time (see Blais (2006), Blais and Aarts (2006), and Geys (2006) for reviews of the literature).

There are two main characteristics of electoral systems: the degree of proportionality, determined mainly by the electoral formula and the district magnitude, and the ballot structure (open vs. closed lists). While the literature has extensively studied the former and generally agreed that more proportionality increases voter turnout

(see, for example, Blais and Dobrzynska (1998), Bowler, Donovan, and Brockington (2003), Fornos, Power, and Garand (2004), Jackman and Miller (1995), Ladner and Milner (1999), Milner and Ladner (2006), Schram and Sonnemans (1996), Selb (2009), St-Vincent (2013)), little is known about the effects of the ballot structure.¹ This is unfortunate, as changes between closed and open lists have been debated in several countries.² Understanding their influence on voter turnout is crucial to enlighten that debate and to the design of electoral systems.

Previous empirical evidence on this issue is mostly based on cross-country regressions, where small sample sizes and the endogeneity of electoral rules raise concerns about the causal interpretation of the estimates, as it is difficult to isolate the effect of the voting systems from other economic, cultural or institutional variables that may also affect voter turnout.³ To the best of my knowledge, this is the first paper to use a quasi-experimental design to estimate how open list systems affect voter turnout. I focus on a previously unexplored setting in which electoral systems are exogenously assigned. In Spain, municipalities with more than 250 inhabitants elect a city council by closed list proportional representation while municipalities with 250 or fewer inhabitants elect a city council in a plurality-at-large, open list election, in which voters can vote for up to four individual candidates from the same or different party-lists. While the two systems differ in both proportionality and ballot structure (open vs. closed lists), in Section 5 I show that the difference in proportionality is small and provide evidence that the effect on turnout is driven by the difference in the ballot structure.

The institutional framework of Spanish local elections is a unique opportunity to study the causal effect of the electoral system on voter turnout for several reasons.

¹As Blais and Aarts (2006) put it, “one aspect of electoral systems that has been neglected is the ballot structure” and “we know preciously little about the impact of ballot structure on turnout”.

²For example, Japan introduced an open list preference vote in elections for the upper house in 2001, while Italy abandoned an open list proportional representation system in 1993.

³Countries that use open list systems include Belgium, Brazil, Chile, Colombia, Denmark, Finland, Indonesia, Iraq, Ireland, Italy, Japan, the Netherlands, Slovakia, Sweden and Switzerland.

First, the electoral system a municipality has to follow is determined by a *national* law as a function of the population size of the municipality, which reduces endogeneity concerns. Second, the number of observations is very high (around 72,000), as there are more than 8,000 municipalities in Spain and election results by municipality are available for 9 election years. Furthermore, there are many municipalities with a population size close to the population threshold that separates the two electoral systems (around 700 municipalities in a window of 50 inhabitants around the threshold). Third, all the municipalities under any of the electoral systems follow the exact same electoral system. This is in opposition to cross-country studies, where it is inevitable to pool into the same electoral system a set of systems that are only somewhat similar. Fourth, unlike what is often the case in situations where a policy changes at a municipal population threshold (Campa (2011), Eggers (2015), Grembi, Nannicini, and Troiano (2012)), no other rule changes at the threshold. Therefore, we can be confident in attributing the differences in outcomes between municipalities at each side of the threshold to the electoral system and not to some other regulation.

To carry out the analysis, I have collected a rich dataset with results from all elections held in Spain since the restoration of democracy in 1977. Combining regression discontinuity design and fixed effects estimation, I find that the open list system increases voter turnout with respect to the closed list system by between one and two percentage points. There are many channels that may be conducive to these results - e.g. rational-choice calculations about the pivotality of votes or perceived fairness of the systems. I provide evidence that the differences in turnout are at least partially driven by the number of parties that enter competition. A higher number of parties in competition may in turn affect voter turnout by increased aggregate mobilization efforts and by providing voters with a more compelling set of options. I find that the open list system increases by 0.35 the average number of lists in competition. This effect is most likely driven by the fact that the open list system makes it much

easier for popular candidates from small parties to get elected, as voters can choose individual candidates from the same or different party lists.

An issue that requires special attention is that there exists some evidence that municipalities may be able to partially control their population size, as some sorting is observed around the threshold. I carefully study this question in Section 6, assessing the validity of the empirical strategy and checking the robustness of the results to donut-regression discontinuity design estimation in the spirit of Barreca, Guldi, Lindo, and Waddell (2011), by dropping observations within a window where the sorting is most likely to occur.

The rest of the paper is organized as follows. Section 2 reviews the literature on the impact of electoral systems on voter turnout, analyzing both theoretical predictions and the available empirical evidence. Section 3 provides background on the Spanish electoral systems. The data and empirical strategy are laid out in Section 4. Section 5 presents the main results and looks into the mechanisms at work. The robustness of the results is analyzed in Section 6. Section 7 concludes.

1.2 Literature Review

This paper contributes to the literature that tries to explain voter turnout (see, for example, Downs (1957), and Riker and Ordeshook (1968)) and, in particular, to the literature that studies the link between the electoral system and voter turnout. The electoral systems that I compare in this paper differ mainly in their ballot structure. In this section, I review the theoretical arguments and the previous empirical evidence on the effect of the ballot structure on voter turnout.

In some elections, voters can express a preference for candidates within the party lists (open list systems, OL), while in others they are limited to choose between

different lists (closed list systems, CL). There are opposing views in the literature about how the use of OL vs. CL systems should affect voter turnout.

On the one hand, it has been argued that OL systems should increase turnout. Mattila (2003) argues that since voters can choose the candidate they wish to vote for, they are likely to feel more satisfied with the act of voting. Along the same lines, Karvonen (2004) indicates that voting for individual candidates makes the election more personal and concrete and that both elements should provide a stimulus for active electoral participation. Supporting this hypothesis, Hix and Hagemann (2009) find that citizens in EU states who use OL are almost five percent more likely to be contacted by candidates or parties than citizens in member states with CL systems. They are also more than 20 percent more likely to be contacted by candidates or parties and about 15 percent more likely to feel well informed about the elections than citizens in states with CL systems.

On the other hand, Robbins (2010) hypothesizes that turnout should be higher in CL systems. His argument is that in OL systems parties may not exert the same level of resources to solicit support or mobilize voters as in CL systems. Individual candidates, for their part, will appeal to their supporters but will likely avoid mobilization strategies that involve the entire population. In CL systems, on the contrary, “parties place greater emphasis on mobilizing voters everywhere in hopes of soliciting additional support. After all, if they construct the list, then they are responsible for the success of their candidates and will devote more time, energy and resources calling individuals to the polls”.

The empirical evidence for the effect of the ballot structure is scarce, probably due to limited cross-country variation. Hix and Hagemann (2009) find that voters are almost 10 percent more likely to cast their votes on election day in OL systems. Robbins (2010), on the contrary, finds that OL decreases turnout levels. Mattila (2003)’s empirical findings, with data from elections to the European Parliament, show that a

variable indicating a CL system is not significant. The empirical analyses in Blais and Aarts (2006), Santos (2007), and Karvonen (2004) also conclude that there is not sufficient evidence to support the hypothesis of a positive correlation between preferential voting and electoral participation. Eggers (2015) uses a discontinuity in the electoral rules of French local elections and finds that a closed list proportional representation system leads to more turnout than an open list plurality system, but he attributes the effect to the different proportionality of the systems. In sum, the empirical evidence is non-conclusive: the effect of the ballot structure on turnout is still an open question.

Finally, another strand of literature has studied the effects of OL systems on other outcomes.⁴ Farrell and McAllister (2006) find that preferential voting systems where voters are given more freedom in completing the ballot paper lead to higher satisfaction with democracy. Other papers have found that OL systems increase the value of personal reputation with respect to party reputation by enhancing intra-party competition and electoral uncertainty (Carey and Shugart (1995), Chang (2005)) or by inducing voters to focus more on candidates' characteristics and less on parties' positions (Shugart, Valdini, and Suominen (2005)). Ames (1995a) and Ames (1995b) study the use of OL elections in Brazil and supports these conclusions by highlighting the very weak role played by national parties in the country. Persson, Tabellini, and Trebbi (2003) find that OL systems reduce corruption, while Chang and Golden (2007) find the opposite effect. Negri (2014) develops a theoretical model and predicts that, in general, CL proportional representation is associated to lower minority representation within Parliaments than OL systems.

⁴This discussion is partially based on the literature review in Negri (2014).

Table 1.1: Services of Spanish municipalities by population

Municipalities	Services
All	Public lighting, cemeteries, waste collection, street cleaning household water supply, sewerage, access to villages, paving roads, food and beverage control
> 5000	Public park, public library, waste treatment, organization of markets
> 10000	Civil protection, social services, prevention and fire-fighting, sports facilities for public use
> 20000	Urban public passenger transport and environmental protection

Note: The table shows the services that Spanish municipalities are required to provide, as a function of population size. Source: Law 5/1985 and Campa (2011).

1.3 Spanish Electoral Systems

Spain is politically decentralized in 17 regions and more than 8,000 municipalities. Each municipality elects a local government in free elections. A national law requires local governments to provide a variety of services, including public lighting, waste collection, cemeteries, street cleaning and road pavement (see Table 1.1 for a comprehensive list). In addition, municipalities are allowed to provide any other service that they consider useful to the municipality. For example, it is common that they provide touristic information to visitors and organize local festivities. Municipalities can levy a number of taxes and charges (most importantly, a property tax) and receive transfers from regional and national governments to finance some of their expenditures. Approximately 55 percent of their revenues come from the taxes imposed by themselves (Sweeting (2009)).

Local elections are held simultaneously in all municipalities in Spain every fourth year.⁵ The elections follow one of three electoral systems, depending upon the population size of the municipality.

Municipalities with more than 250 inhabitants use a closed list proportional representation system (henceforth, the CL system).⁶ They elect a city council in a single-district, closed list election, where each party presents a list of candidates and citizens can vote for one of the party lists. The size of the council increases with population at certain population cutoffs but all municipalities in the CL system used for identification elect a 7-member council (as the empirical strategy relies on municipalities close to the threshold). The conversion from votes to seats is done according to the D'Hondt rule.⁷ The council elects a mayor among its members and is entitled to approve the budget, decide on expenditure in various fields, control the governing bodies and to the roll-call vote of confidence on the mayor. The mayor chairs the meetings of the council, casts the decisive vote in the event of a tie, decides on some expenditures, heads the local police and appoints mayoral deputies and cabinet members, among other responsibilities.

Municipalities with a population between 100 and 250 inhabitants follow an open list, plurality-at-large system (henceforth, the OL system). Under this system, a council of five members is elected. Political parties can present candidate-lists of up to five candidates and voters can vote for up to four candidates from the same or different party lists. The five most voted candidates are elected members of the

⁵Local elections coincide with regional elections in 13 of the 17 Spanish regions and in one year (1999) they also coincided with elections for the European Parliament. The implications of this are studied in the empirical strategy.

⁶The population size that determines the electoral system is the official population in the municipal register (*padrón municipal*) the 1st of January of the year before the elections.

⁷There is an electoral threshold at 5 percent, i.e. parties need to get at least 5 percent of the votes to enter the D'Hondt distribution of seats. However, given the size of the council of the municipalities we are studying, that threshold does not play an important role in these elections.

council.⁸ As in the CL system, the council elects a mayor among its members and the responsibilities of the council and mayor are identical under the two systems.

Finally, municipalities with fewer than 100 inhabitants directly elect a mayor in a simple plurality, first-past-the-post election, i.e. each political party can present one candidate and the most voted candidate is elected mayor. These municipalities follow a direct democracy system in which the role of the council is played by open meetings that any citizen in the municipality can attend.⁹

The paper focuses on the 250-inhabitant threshold and compares voter turnout under the CL and OL systems, as only the electoral system changes at that threshold. The results for the 100-inhabitant threshold are discussed in Section 5.

The CL and OL systems differ in two main dimensions. First, the electoral formula differs as under the OL system seats are allocated by plurality to the most voted individual candidates, while under CL they are allocated to parties according to the D'Hondt rule. Both the change in the electoral formula and the increase in the council size (from 5 to 7 members) imply that the CL is a more proportional system *at the party level*. Second, the two systems differ on the ballot structure: while the CL system is a closed list system where competition is limited to across-parties competition, the OL system allows voters to express their preferences for individual candidates, making it easier for popular candidates from small parties to get a seat in the council and introducing competition both across and within parties. In Section 5, I provide evidence that the difference in proportionality is small in practice, and that it is the difference in ballot structure what drives the results, with open lists increasing voter turnout.

⁸The fact that candidates can vote for fewer candidates than there are seats to elect means that it is a *limited voting* system.

⁹Municipalities with more than 100 inhabitants could decide to adopt this system. In order to do that, a majority of the citizens of the municipality had to sign a petition and two thirds of the members of the council and the regional government had to approve it. To the best of my knowledge, no municipality ever used this procedure. Therefore, the regression discontinuity design can be sharp, as the probability of treatment jumps from 0 to 1 at the threshold.

1.4 Empirical Strategy and Data

1.4.1 Empirical Strategy

To estimate the effect of the electoral system on voter turnout, I combine regression discontinuity and fixed-effects estimation. In particular, I consider the following estimating equation:

$$y_{mt} = \alpha_m + \gamma_t + \beta D_{mt} + f(x_{mt} - x^*) + u_{mt}, \quad (1.1)$$

where y_{mt} is the outcome of interest (in the main specifications, voter turnout), D_{mt} is a treatment dummy that captures the electoral system municipality m is required to follow in election year t , x_{mt} is the assignment variable (log population the year before the elections)¹⁰, x^* is log of the population threshold (250 inhabitants), so that treatment status depends on whether x_{mt} is bigger or smaller than x^* , f is a smooth function of the assignment variable, α_m is a municipality fixed effect, γ_t is a year fixed effect and u_{mt} is an error term. The parameter of interest is β .¹¹

To estimate f , I use non-parametric estimation (local linear regression). A key ingredient to this approach is the bandwidth. There is a trade-off between precision and bias: a bigger bandwidth increases precision at the cost of more bias. I choose a baseline bandwidth according to the procedure suggested by Imbens and Kalyanaraman (2012) and provide the results at different fractions of that bandwidth to see how sensitive the results are to bandwidth choice. Notice that we may not want the bandwidth to be bigger than 150 inhabitants (remember that municipalities with

¹⁰Geys (2006) recommends using log population for turnout studies.

¹¹Similar strategies to the one used in this paper have been used by Grembi, Nannicini, and Troiano (2012), Lemieux and Milligan (2008), and Pettersson-Lidbom (2012). More generally, population thresholds have been widely used in recent years as a way to get a credible estimation of causal effects (Arnold and Freier (2015), Bordignon, Nannicini, and Tabellini (2013), Brollo, Nannicini, Perotti, and Tabellini (2013), Campa (2011), Casas-Arce and Saiz (1995), Egger and Koethenbueger (2010), Eggers (2015), Ferraz and Finan (2009), Fujiwara (2011), Fujiwara (2015), Gagliarducci and Nannicini (2013), Hinnerich and Pettersson-Lidbom (2014), Litschig and Morrison (2013).

fewer than 100 inhabitants follow a different system), as if that happened we would be mixing outcomes from the three electoral systems in the same specification. For that reason, I restrict the analysis to bandwidths of less than 150 inhabitants. I use a rectangular kernel, as recommended by Imbens and Lemieux (2008) and Lee and Lemieux (2010). This is equivalent to estimating standard linear regressions over the interval of the selected bandwidth on both sides of the cutoff point. I cluster the standard errors at the municipality level.

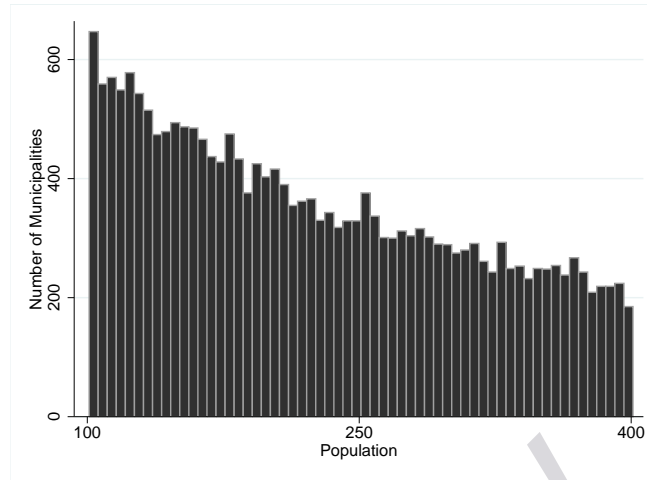
A possible cause of concern in a pure regression discontinuity framework would be that a discontinuity in the density of population size is observed at the threshold (Lee and Lemieux (2010)) (see Figure 1.1).¹² To deal with that issue, I add municipality and year fixed effects to the basic regression discontinuity framework. The identification assumption is that there are no unobservable factors that may simultaneously affect voter turnout and whether a municipality's population is just above or just below the threshold, *conditional on municipality and year fixed effects*. The identification therefore relies on switchers: intuitively, the regressions do not compare municipalities just above and just below the threshold but municipalities that switch from one system to another with those that remain in the same system.¹³ If the factors that make municipalities sort around the threshold are time invariant, β will identify the average treatment effect of the electoral system on voter turnout for municipalities close to the threshold.

Although the identification assumption is fundamentally untestable, in Section 6 I present three sets of tests to address the validity of the strategy. First, I test whether municipalities at each side of the threshold differ, conditional on the fixed effects, in other variables that may themselves affect the outcomes of interest. Second, I

¹²The discontinuity is significant using McCrary (2008) test in a pooled cross section of all the municipality-years, but not if each election-year is considered separately. In Section 7 I describe in detail why and how that discontinuity appears.

¹³The inclusion of fixed effects implies that municipalities just above and just below the threshold *can* differ in other factors that affect voter turnout.

Figure 1.1: Histogram of population size



estimate a dynamic model to test for pretrends: in particular, I study whether this period’s electoral system has an effect on previous period’s turnout. Third, I consider donut regressions to examine the robustness of the results to the exclusion of some observations where any problem of self-selection that might remain after the inclusion of the fixed effects is likely to be concentrated.

Another issue that requires some consideration is that local elections are held on the same day as regional elections in 13 of the 17 Spanish regions. In 1999, local elections also coincided with elections to the European Parliament. This can be analyzed as a measurement error issue. Observed turnout t_{mt} , is measured with error as it differs from the “true” turnout t_{mt}^* , which is the turnout that would have been observed if local elections had been the only elections on election day. Let the error be $e_{mt} = t_{mt} - t_{mt}^*$. If (1) captures the true relationship between the outcome and independent variables, then $y_{mt} = t_{mt}^*$.

Thus, the estimated model is

$$t_{mt} = \alpha_m + \gamma_t + \beta D_{mt} + f(x_{mt} - x^*) + u_{mt} + e_{mt}. \quad (1.2)$$

If the new error term $u_{mt} + e_{mt}$ is uncorrelated with the regressors, the estimators will be unbiased and consistent. Thus, if e_{mt} is not correlated with the electoral system (and there is no reason to think it is, because the population threshold does not play any role in regional or European elections), measurement error will not affect the unbiasedness and consistency of the estimators.¹⁴

1.4.2 Data

I have collected data from all local elections that have taken place in Spain since the restoration of democracy after General Franco's death in 1975. In this period, local elections have been held in 9 years (1979, 1983, 1987, 1991, 1995, 1999, 2003, 2007, 2011) in all municipalities in the country (around 8000).¹⁵ In addition to the data from local elections, I have collected data at the municipality level from all national Congress elections in that period.¹⁶ These data will be used in Section 6 to analyze the validity of the identification strategy. All data are from the National Statistics Institute (INE) and are publicly available.

Table 1.2 presents summary statistics for the variables used in the paper. The main outcome of interest is *Turnout*, defined as the number of votes cast divided by the electoral census. That is, *Turnout* measures the proportion of citizens that cast a vote over the set of potential voters (the electoral census). There is no voter registration in Spain: potential voters are all citizens from Spain, EU countries and countries under Reciprocity Treaties, older than 18 and not disenfranchised by court

¹⁴The estimators will nonetheless be inefficient, but the big sample size helps to overcome that problem.

¹⁵Due to some missing values or errors in the official elections data, the final dataset used in this paper contains observations for 71,780 out of the approximately 73,026 local elections in this period, i.e. 98.6 percent of the elections. I cannot know the number of total elections because for the first years in the sample I only observe municipalities with elections data, so I do not know how many municipalities held elections that are not in my sample. I calculated 73,026 by assuming that the number of municipalities remained constant over time.

¹⁶Spain is a bicameral parliamentary system. The national elections data are for elections to the Lower House (*Congreso*), which concentrates most of the political power. Throughout the paper, "national elections" refer to these elections.

order.¹⁷ The other outcome variable of interest is *Lists*, defined as the number of party-lists that run for election.

I consider six variables from Congress elections: the percent of voter turnout (N *turnout*), defined analogously to the one for local elections, the percent of blank (N *blank*) and spoilt (N *spoilt*) votes, defined as the number of blank and spoilt votes divided by the number of votes cast, and the share of votes for the three main parties in Spain: the right-wing Popular Party (N *right*), the left-wing Socialist Party (N *left*) and the far-left United Left (N *far left*)¹⁸, defined as the votes for these parties divided by the number of valid votes.¹⁹

1.5 Results

1.5.1 Main Results

Table 1.3 presents the main estimates of the impact of the electoral system on voter turnout. The table shows the results of estimating equation (1) by local linear regression, using *Turnout* as the dependent variable. The treatment variable is *OL*, which takes the value of 1 if the municipality follows the OL system and 0 if it follows the CL system. The coefficient on *OL* therefore captures the effect on turnout of using the OL system in relation to the CL system, i.e. it measures the effect on turnout of crossing the threshold from right to left.

¹⁷Disenfranchisement is mostly for disability reasons. In 2011 the figure of disenfranchised individuals was 79398 (including individuals younger than 18), or around 0.18 percent of the population.

¹⁸United Left (*Izquierda Unida*) is a coalition of parties created in 1986 whose main party is the Communist Party. For elections before that date, votes for the Communist Party are considered. The sample size is smaller than for the main parties because, in some years, the coalition did not run in some regions.

¹⁹Valid votes include votes for candidates and blank votes, but not spoilt votes. I use this denominator because it is the relevant one for the allocation of seats, as it is used to determine whether parties reach the election threshold to get seats (3 percent in Congress elections). Accordingly, it is the one that is normally reported by the media.