Making Mobilization Work:

The Adoption of Proportional Representation*

Ignacio Lago
Universitat Pompeu Fabra
Department of Political and Social Sciences
Ramon Trias Fargas 25-27
08005
Barcelona, Spain
Tel.: +34 93 5422266
Fax: +34 93 5422372
E-mail: ignacio.lago@upf.edu

Abstract: This paper examines the adoption of electoral systems in the last two centuries. I argue that PR was adopted to make parties' mobilization easier when majoritarian electoral systems with many small districts were no longer an efficient response to the problem of collective action in mass elections. With the expansion of suffrage and the parallel process of national integration, mass parties became technologically feasible and took care of bringing voters to the ballot box. PR systems with few and large districts facilitated their mobilization efforts. PR was endorsed by those parties that are found it easier to attract voters using a single mobilization strategy with strong economics of scale, and resisted it by locally focused parties. The argument is tested using longitudinal and cross section data both at the country and party levels.

Key Words: Collective Action; Electoral System; Nationalization; Political Parties; Proportional Representation.

The history of democratic electoral systems in the last century is characterized by the declining use of majoritarian systems. While elections were contested under majoritarian electoral rules everywhere until the turn of the twentieth century, by the 2000s they are employed in only one third of elections in the world (Bormann and Golder, 2013: 363).

The rationale for moving away from majoritarian rules has been extensively researched. The focus has been on explaining why certain countries shifted from majoritarian systems to Proportional Representation (PR) in the years around the First World War. A non-exhaustive list of the suggested mechanisms includes the strategic response by established elites to changes to the distribution of preferences and number of political parties (Boix, 1999; Leeman and Mares, 2014; Rokkan, 1970; Walter, 2020), the concentration of voter base (Boix, 2010; Calvo, 2009), political and socioeconomic environments (Blais et al, 2005; Cusak et al., 2007) the demand of party elites for legislative cohesion (Cox et al., 2019), the relationship between socialist parties and trade unions (Penadés, 2008), intra-party divisions over electoral reform (Emmenegger and Walter, 2019), or international diffusion (Bol et al., 2015).

The adoption of PR systems is a decision made by political parties in specific party systems and in moments with a particular democratic and socioeconomic development. A compelling explanation of the choice of electoral rules should clarify why some parties are more *proportionalist* than others, why PR is adopted in some, but not all countries, and why PR is differently popular over time. A strong correlation between macro processes and electoral systems, for instance, is not intelligible if the preferences of the causal agents, the political parties, are not unraveled. Still, we lack an encompassing theory addressing the three levels of analysis at the same time and explaining variation in institutional preferences across parties and countries and over time.

To fill the gap, this article maps the situational and micro conditions under which PR electoral systems are adopted. The point of departure is the intriguing effect of country size, the decisive factor in the years around the First World War, but irrelevant at present. I argue that the problem of collective action is inherent to mass elections with large electorates. As the outcome of elections is a public good, the rational citizen should be ill informed and defect by abstaining. In a restricted suffrage world with poor transportation and communication systems and limited literacy, majoritarian systems are the institution-based solution to the collective action problem.

Through the division of countries into a considerable number of relatively small districts, the small number of individuals electing MPs in the districts and the limited travelling costs to attend group meetings make possible overcoming the collective action problem.

With the expansion of suffrage in the first decades of the twentieth century, the size of the electorates doubled or trebled and therefore the collective action was more difficult under majoritarian systems. Yet, the parallel process of national integration through new communication and transport possibilities and agencies of nationalization (e.g., compulsory education) made the mass party feasible. Mass party was designed to create the organization and resources to mobilize large electorates (Aldrich, 1995: chapter 4) and it becomes the "special device to make individuals to act in their common interest" in the words of Olson (1965: 2). As large and few districts provide incentives for party centralization and make campaigning more efficient, PR systems are the favorite rules for mobilizing parties. Parties supporting more proportional rules should be the most nationalized ones, with a homogenous support across the nation and with campaigns organized at the national level, because they are in better conditions to mobilize their supporters than their competitors. The selection of electoral systems in the twentieth century is thus a shift from an institution-based to a party-based response to a collective action problem.

The argument is tested using longitudinal and cross section data both at the country and party levels. First, I have created a novel dataset with country-election data in all independent and democratic countries from 1800 to 2016 to examine the relationship between the democratization of politics and national integration and the use of electoral systems. The sample includes data for 1,606 elections in 122 countries. Second, I revisit Boix's (1999) influential analysis and show that PR is adopted in the interwar period in the most nationalized party systems. Finally, using the information about the institutional preferences of socialist parties during the interwar period provided by Penadés (2008), I show that the more (less) nationalized socialist parties are in comparison with their main competitor, the more (less) likely they will endorse (oppose) PR.

COLLECTIVE ACTION AND ELECTORAL SYSTEMS

The publication of Boix's (1999) APSR paper has fostered a vivid debate about the selection of electoral systems. Until the turn of the twentieth century, elections were contested under plurality or majoritarian electoral rules everywhere. The drivers of the adoption of PR systems since then have been extensively researched, particularly in the in the years around the First World War.

Roughly speaking, five types of explanations have been proposed to explain the adoption of PR. First, according to the 'seat-maximization theory', PR is the strategic response of established elites when they are challenged by strong new entrants in order to obtain more seats (Boix, 1999; Leeman and Mares, 2014; Walter, 2020). Second, the 'party-building theory' argues that PR adoption is motivated by the desire of national party leaders to increase party discipline and voting cohesion rather than to preserve seat shares (Cox et al., 2019). Third, for the 'external shock argument', PR is the reaction of ruling elites to changing political (Blais et al., 2005) and socioeconomic environments (Cusack et al., 2007; Rogoski, 1987). Fourth, 'the contagion theory' establishes that PR is diffused between peer countries (Bol et al., 2015). Finally, for the 'institutional preference argument', party preferences over electoral systems differ across and within countries: proportionalist socialist parties are strongly connected with strong unions (Penadés, 2008).

In a compelling explanation of why PR is adopted three different levels should be examined: why parties have different preferences over electoral rules, why electoral competition within parties systems shapes PR and why the changing the political and socioeconomic context makes electoral systems vary over time. Unfortunately, existing explanations are single-level and to the best of my knowledge we lack a comprehensive explanation of institutional change.

My argument departs from the puzzling effect of country size on the choice of electoral systems. Existing research has overlooked the elephant in the room: the crucial role of the size of country when explaining the adoption of PR, the "key factor at work" using Andrews and Jackman's words (2005: 79). In the influential Boix (1999) analysis with 22 countries, (the log of) country size alone explains 44 percent of the variance in the effective electoral threshold and even more importantly ruling parties' calculation are ineffective when not controlling for country size. None of the five explanations sketched above is able to account for this correlation. Andrews and Jackman's conclusion (2005: 80) that "we are, indeed, at a loss to identify the mechanism by which

geographic size might plausibly be said to impinge on the electoral threshold … Acreage alone appears to be the thing, a regularity that is difficult to explain" still holds.

Interestingly, the impact of country size on the choice of electoral systems progressively vanishes as time goes by. Using a novel dataset including country-election data for the lower house of national parliaments in all independent and democratic countries from 1800 to 2016, in Figure 1 the impact of (the log of) country size (in km2) on employing a majoritarian system (1) versus a PR or a mixed system (0) is estimated with 95% confidence intervals.[1] I follow Boix et al. (2013) and qualify as democratic those countries with free and fair elections for the legislature, as well as an executive that is accountable either directly to the people or to the elected legislature, and where at least half the male population is allowed to vote. The sample includes data for 1,606 elections in 122 countries. The probit model I run is simple:

$$Majoritarian\ System_i = \beta_o + \beta_1(\log Country\ Size_i) + \varepsilon_i$$

The model is estimated for different time periods: from 1800 to 1939 (Boix's analysis is focused on the 1919-1939 period) and then every twenty years, that is, 1800-1959, 1800-1979. 1800-1999 and 1999-2016. The periods are arbitrarily defined, but the results are qualitatively the same in case of using different intervals. To correct for possible correlations over time, the standard errors are clustered by countries.[2] As can be seen, until 1979, the greater the country size, the greater the probability of using a majoritarian system. The coefficient is statistically significant at the 0.01 percent level in the three estimates, although the greatest impact is in the 1800-1939 period. In this period, when moving from the first to the third quartile in country size, the probability of using a majoritarian system goes from 29.6 to 70.3 percent. In the last two periods, 1800-1999 and 1800-2016, the coefficient on country size is no longer statistically significant.

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[1] The regression outputs are in the appendix.
[2] The results do not change appreciably if countries using mixed electoral systems are excluded.
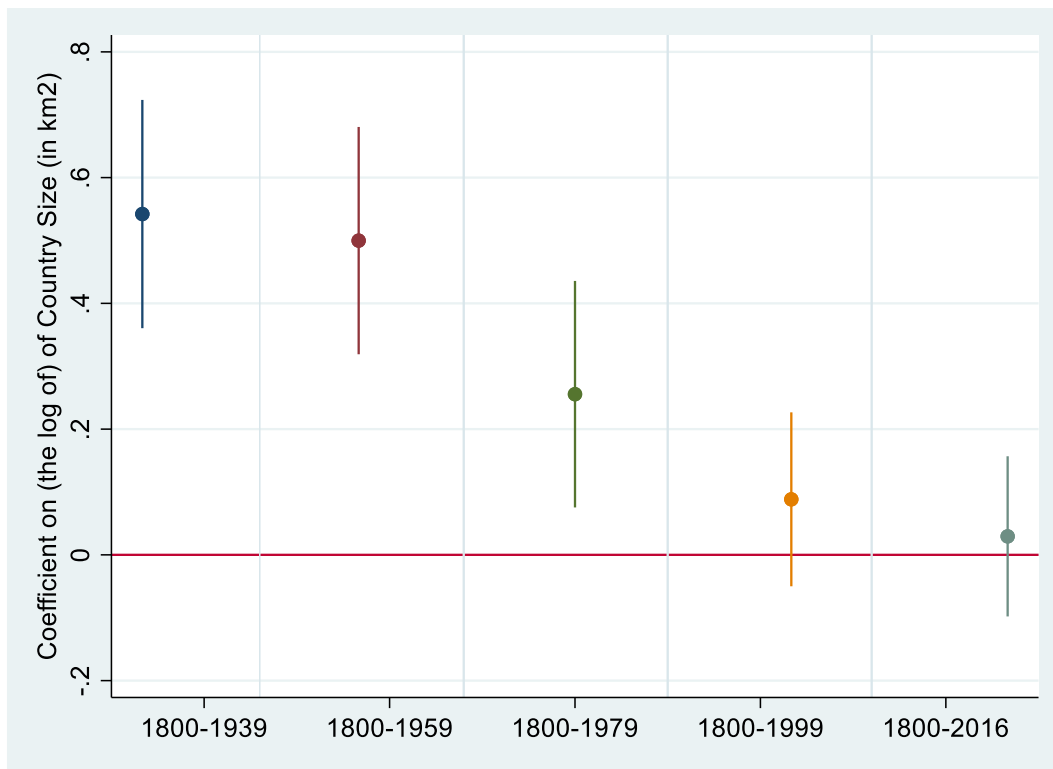
Figure 1: The Effect of Country Size on the Choice of Electoral Rules

In order to make sense of this varying effect of country size on the choice of electoral rules and offer a multi-level explanation of institutional change, I start from the proposition that turnout in mass elections entails a problem of collective action. The outcome of elections is a public good as the winning party or candidate "'is jointly supplied', no one can be excluded from 'consuming' the good, and indeed no one can avoid consuming it" Aldrich, 1995: 47). The collective problem follows from the fact that in large electorates individual votes have a negligible impact of the outcome and therefore citizens have no incentives to becoming informed. In sum, it is rational for citizens to be ill informed and defect by abstaining (Aldrich, 1995: chapter 2).

The crucial question is under what conditions it is rational for individuals to vote. My argument is that majoritarian systems were an efficient solution to the problem of collective action in the early stages of democracy, but this institution-based solution was replaced with a party-based solution relying on mass parties after the expansion of franchise and the longer process of national integration. When moving from the institution- to the party-based solution, the correlation between country size and electoral systems vanishes.

The classical view of when individuals can act collectively provided by Olson (1965) claims that individuals will only act to achieve a common interest if the number of individuals in a group is quite small or there is coercion or some other special device to make them act. According to Olson, two reasons explaining the comparative advantage of small groups are particularly relevant in mass elections. First, the larger the number of members in a group, the greater the organization costs. More specifically, the larger the group the more difficult it will be to locate and organize even a subset of the group, and those in the subset will have an incentive to continue bargaining with the others in the group until the burden is widely shared, thereby adding to the expense of bargaining (Olson, 1965: 46). Second, the larger the group is the less noticeable the individual actions of members are to any other individuals in the group. An individual in a 'latent' group, cannot make a noticeable contribution to any group effort, and since no one in the group will react if he makes no contribution, he has no incentive to contribute (Olson, 1965: 50–51).

In large groups, collective action is only possible with "coercion or outside inducement" according to Olson (1965: 319). In mass elections, forced participation is imposed though compulsory voting in a limited number of countries (around 30 currently) and above all in the early stages of democracy: in recent years a number of countries have switched from mandatory to voluntary voting (Singh, 2019 and the Institute for Democracy and Electoral Assistance).[3]

- *The institution-based solution*

In a restricted suffrage world with poor transportation and communication systems, limited literacy and no mass parties, majoritarian systems are the institution-based solution to the collective action problem in elections.

Majoritarian systems consist of a larger number of districts than PR systems. In the dataset I built, the average number of districts is 185.0 in majoritarian systems (637 elections) and 22.7 in PR (789 elections). The difference is statistically significant at the 0.01 percent level.

Being constant country size and the number of MPs to be elected, a large number of districts has two consequences. First, the size of district-level electorates drops. Second, the geographical area of districts is smaller and therefore travelling costs

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[3] Available at https://www.idea.int/data-tools/data/voter-turnout/compulsory-voting

to attend group meetings are reduced. Both consequences make collective action possible. On the one hand, the group providing the public good (the selection of MPs) is smaller and noticeability increases. This effect is particularly important in the pre-party system of representation as the electorates were very small due to the extremely regulation of the franchise conditions. On the other hand, face-to-face interactions increase trust and noticeability and reduce free riding and clearly are more likely when everyone lives in the same physical community or travels to group meetings: people's utility derived from participation decreases with traveling costs (i.e., the farther they have to go) (Alesina and La Ferrara, 2000).

Not surprisingly, the plurality or majority rule was an essential element of the 'originating' electoral system, widely used in local and national assemblies in pre-democratic or early democratic periods before and during the 19th century. As explained by Colomer (2007: 263), the plurality or majority rule appeared as 'natural' and 'spontaneous' in relatively simple elections with homogeneous electorates, particularly at the beginning of modern suffrage regulations and for small-size local governments.

Political engineers in early democracies, in particular the founding fathers of the United States, were aware of this problem of collective action in elections and the advantages of using a majoritarian system with a large number of small districts. In Federalist paper 14, James Madison argued that

> As the natural limit of a democracy is that distance from the central point which will just permit the most remote citizens to assemble as often as their public functions demand, and will include no greater number than can joint in those functions; so the natural limit of a republic is that distance from the centre which will barely allow the representatives to meet as often as may be necessary for the administration of public affairs." (Hamilton et al., 2009: 68).

Interestingly, the Antifederalists shared this view. According to Thomas Jefferson

> Divide the counties into wards of such size as that every citizen can attend, when called on, and act in person. Ascribe to them the government of their wards on all things relating to themselves exclusively …. and the delivery, within their own wards, of their owns votes for all elective officers of higher sphere, will relieve the county administration of nearly all its business, will have it better done, and by making every citizen an acting members of the

government, and in the offices nearest and most interesting to him, will attach him by his strongest feelings to the independence of his country, and its republican constitution (Appleby and Ball, 1999: 213).

- *The party-based solution*

With the expansion of suffrage in the turn of the twentieth century, the institutional-based solution to the collective action problem was challenged. Between 1900 and 1925, the size of the electorate doubled or trebled in nine major European sovereign states (Bartolini, 2000: 216–217 and 584–588). Clearly, this substantial increase in the number of group members made the provision of the public good increasingly inefficient when using majoritarian systems with a large number of districts. The individual impact on the outcome and noticeability dropped and face-to-face interactions between group members within districts became less likely.

Yet, the expansion of suffrage took place at the same time than the creation of a national community through the process of state formation and nation-building thanks to compulsory education, for instance, the development of communication technologies, and the social and geographical mobility created by industrialization and urbanization. This is what Caramani defines as the nationalization of electoral politics, that is, "the transition from a fragmented and clientelistic type of politics dominated by local political personalities to national representation" in the second half of the nineteenth century until World War I (Caramani, 2004: 2).[4]

The combination of the expansion of suffrage and the creation of national communities led to the formation of national electorates and central party organizations (Caramani, 2004). As explained by Cox (1987: 169-170), with the extension of suffrage in UK after the first Reform Act in 1832 the role that policy played was larger because more of the constituencies were larger and incapable to being managed by old techniques. As the Cabinet grew in importance, voters became increasingly party-oriented, casting their votes not for individual candidates so much as for the parties to which they belonged.

My point is that through the nationalization of electoral politics, the institution-based solution to the collective action problem in elections was progressively replaced

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[4] Electoral or party nationalization has two dimensions, termed static and dynamic. While the former refers to the degree of homogeneity in a party's vote across a country at a particular point in time, the later captures the consistency in the change in a party's vote in each district across time (Morgenstern, 2017: chapter 1). In this article I exclusively refer to static nationalization.

with the party-based solution. In contemporary democracies, the two collective action problem affecting voters (becoming informed and turning or to vote) are solved by political parties: they are the special device to make individuals act in their common interest using Olson's words.

The argument by Aldrich (1995 288) is that mass parties were designed to create the organization and resources to mobilize the electorate. Candidates have private incentives to reduce collective action problem among their supporters and forming a party to maximize the chances of capturing office. On the one hand, affiliation with a party provides a candidate with a reputation that reduces decision-making costs and provides a core of likely supporters. Party labels are efficient shortcuts that allow voters to acquire information with a relatively little effort. On the other hand, party affiliation provides a candidate with economies of scale when campaigning and reduces free riding incentives in the public (Aldrich, 1995: 48-50). Parties rely on cost-reduction techniques as the centerpieces of their turnout drives such as providing transportation to the polls, giving information and sample ballots suggesting how to vote and speechmaking or rallies to lower decision costs.

My line of argument is that PR was introduced to facilitate the mobilization of the electorate. In PR systems there are fewer (and larger) districts than in majoritarian systems. The impact of electoral systems on mobilization mainly operates thought the size and number of districts (Penadés, 2008: 225-226). First, the larger the size of districts, the more efficient the centralization of campaign resources. Second, the smaller the number of districts, the easier to centralize the candidate-selection process. More specifically, the adoption of PR allows leaders to focus their lobbying resources on a smaller number of targets and forces candidates to be part of the official party list (Cox et al., 2019). In sum, large and few districts provide incentives for party centralization.

The expectation is that PR will be adopted first by the most highly nationalized countries. The larger the country, the greater the number of districts in the electoral system. In the sample I built, the correlation between the number of districts (in the lower tier wen using a mixed system) and (the log of) country size (in km2) is 0.437 (0.438 if mixed systems are excluded) in 1,595 (1,426) elections. Both correlations are statistically significant at the 0.01 percent level. According to Morgenstern (2017: 113-114), a large number of districts drives down nationalization for three reasons. First, parties may avoid spending resources where they have little chance of winning and this

is more pronounced when district magnitude drops and the number of districts increases. Second, with smaller geographic areas, districts are more likely to encompass a more homogeneous group of people and this should increase the likelihood that a district is distinct from others. Third, the variability in the quality of candidates will increases as the number of districts increases.[5] The evidence provided by Morgenstern (2017: chapter 6) for about 100 parties across 37 countries clearly shows that (static) nationalization goes up with the number of districts.

In sum, if nationalization drops with the number of districts and small countries use fewer districts than large countries, this means that PR will be first adopted in small countries. This explains why there is a so strong correlation between country size and PR systems in the interwar period. As majoritarian systems become less attractive as times goes by, their correlation with country size progressively disappears.

However, this correlation between the nationalization of politics and the adoption of PR over time and across countries is not a proper explanation of institutional change unless the *action-formation* mechanism is provided. Apart from a relationship between the two phenomena at the macro level, how political parties generate the institutional change should be established.

PR facilitates the mobilization of the electorate and this suits parties that are found it easier to attract voters from different districts using a single mobilization strategy with strong economics of scale. Nationalized parties should endorse PR, whereas locally focused parties should resist it. According to Morgenstern (2017: chapter 2), nationalized parties, with a homogenous support across the nation, attract similar voters in the various districts based on campaigns that are organized at the national level and local forces have limited impact on their decisions. Their voters focus their attention on executive candidates and party platforms rather than legislators. By contrast, locally focused parties, whose support is regionally concentrated, have incentives to compete based on identities rather than national policies given that their supporters' voting decisions are based on candidate qualities or district characteristics.

This expectation about parties' institutional preferences is in line with the arguments that established parties are prone to adopt PR when the support of new

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[5] In a similar vein Similarly, Nikolenyi (2008) and Harbers (2010) argue that party aggregation across districts becomes more challenging as the number of districts increases. Maintaining an organizational structure over a large number of districts is more demanding for a political party than maintaining structure over a few cohesive districts or even a single nationwide district.

entrants is highly concentrated (Calvo, 2009; Boix, 2010). However, the mechanism I am suggesting it not the overrepresentation in seats of territorially concentrated parties, but the mobilizing advantage of nationalized parties-

Three hypotheses in different levels follow from these arguments:

THE MACRO-LEVEL HYPOTHESIS: *The greater the national integration, the less likely the use of majoritarian electoral systems.* As a reult, the effect of country size on the choice of electoral systems should weaken when controlling for national integration.

THE CROSS-NATIONAL HYPOTHESIS: *The more nationalized party systems are, the less likely the use of majoritarian systems.*

THE PARTY-LEVEL HYPOTHESIS: *The more nationalized parties are, the more likely they will endorse PR.*

EXPLAINING THE USE OF ELECTORAL SYTEMS
Sample

Given the three multi-level hypotheses, three samples are used to explain variation on the selection of electoral systems.

To test the macro-level hypothesis, I have engaged in a large data collection effort. As I have already explained, I built a sample including country-election data about the electoral system for the lower house of national parliaments in all independent and democratic countries from 1800 to 2016. In order to decide whether a country is democratic or not I have followed Boix et al. (2013). The sample includes data for 1,606 elections in 122 countries. The number of elections goes from in 1 in Laos, Somalia or Uganda to 109 in the US. The dataset can be found at XXX. To test the cross-national hypothesis, I employ the original dataset for 31 countries in the interwar period and after 1945 built by Boix (1999). Finally, to test the party-level hypothesis, I use the data about the institutional preferences of 18 early socialist parties compiled by Penadés (2008).

Dependent variables

To explain the shift away from majoritarian systems, I use three different dependent variables. To test the macro-level hypothesis, I employ a dummy variable coded 1 if the electoral system used in a specific election is majoritarian (plurality or majoritarian) and 0 if the electoral system is PR or mixed. The sources area mainly Colomer (2016) from those elections held between 1800 and 1945 and Bormann and Golder (2013) since 1945. To test the cross-national hypotheses the dependent variable is the *Effective Electoral Threshold* −the proportion of votes that, for each electoral system, secures parliamentary representation to any party with a probability of at least 50 percent. The data come from Boix (1999). Finally, the party-level hypothesis is examined using a dummy variable coded 1 if the socialist party endorsed PR and 0 if opposed or at least failed to defend it. The data come from Penadés (2008).

Explanatory variables

The key independent variables in the three analyses capture the nationalization of electoral politics. When testing the cross-national hypotheses, I will use two measures to text the robustness of the results: the *Standardized and Weighted Party System Nationalization Score (PSNS_sw)* by Bochsler (2010) and the *Weighted Inflation Score* by Moenius and Kasuya (2004) from the *Constituency-Level Elections Archive* (Kollman, 2019). Nationalization scores correspond to the specific elections included in Boix's analysis (see his footnotes 27, 28 and 29)

Party nationalization captures *inflation* −the extent to which the number of parties at some level of aggregation may be higher than the number of parties at another level of aggregation− and/or *dispersion* −the extent to which parties receive similar levels of electoral support throughout the country.

Dispersion measures are based on calculating how unequal is the distribution of party vote shares across districts through the Gini coefficient. Bochsler (2010) proposes a standardized party nationalisation score that weights for the sizes of territorial units within a country and considers the different numbers of territorial units in different countries. The scores go from 0 (minimum nationalization) to 1 (maximum nationalization). The following formula establishes the party nationalisation score with weighted units (PNSw) for a country with d weighted units [1; …; I; …; d], ordered according to the increasing vote share of party p. Each territorial unit i has v_i voters, and p_i of them vote for political party p.

$$PNSw = 2 \cdot \frac{\sum_1^d (v_i \cdot (\sum_1^i p_j - \frac{p_i}{2}))}{\sum_1^d v_i \cdot \sum_1^d p_i}$$

The standardized measure takes into account the number of territorial units apart from weight for the size of territorial units. The formula is:

$$PNS_{sw} = (PNS_w)^{\frac{1}{\log(E)}}$$

where the variable E is a constant calculated at the national level as follows:

$$E = \frac{(\sum_1^d vot_{cst})^2}{(\sum_1^d vot_{cst})^2}$$

where vot_{cst} is the raw number of cotes in constituency i.

I will also use the inflation measure proposed by Moenius and Kasuya (2004). If the size of the national-level party system is larger than the average size of party systems across districts, the measure indicates that there is inflation of the party system from the district level to the national level. As *inflation I_w* gets larger, party linkage is poorer. Given that district size is not a constant in most countries, the measure is weighted according to the number of votes cast in the district:

$$I_w = \left(\frac{vot_{nat} * ENP_{nat}}{\sum_{i=1}^n ENP_i * vot_i} - 1 \right) * 100 \, ,$$

where vot_{nat} is the total number of votes cast at the national level; vot_i is the number of votes cast in district i, and ENP_i is the effective number of electoral parties in district i.

When examining the party-level hypothesis, however, I will rely on the *PSNS_sw* measure because it is the only one available at the party-level. Nationalization scores correspond to the specific elections where the PR reform was passed (see Penadés, 2008: 211) and, in the countries where PR was not adopted, in the first election with universal suffrage (1903 in Australia and 1918 in UK).

Finally, nationalization measures will be not used to capture national integration when testing the macro-level hypothesis for two reasons. On the one the hand, the

number of elections included in the sample is 1,606, but the *Standarized & weighted Party System Nationalization Score* and the *Weighted Inflation Score* are only available for 1,189 and 1,173 elections, respectively, in the *Constituency-Level Elections Archive* (Kollman et al., 2019). Second, while I argue that nationalization explains the adoption of PR, we know that electoral systems also affect nationalization (Morgenstern, 2017; chapter 6). This circularity emerges when examining elections over time. The proxy for national integration I will employ is the (log of) *GDP per capita* in 2011 US dollars from the Maddison project Database (2020). The data are available for 1,446 elections in my sample of country-election data. As a robustness check, the *GDP per capita* will be replaced with *Rural population* as a percentage of the total population after 1960 and the average years of *Education* in the total population aged 15 years and older for the period 1870-2010. Unfortunately, the data are only available for 1,080 and 1,277 elections in my sample, respectively. The sources are the World Bank (https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS) and the Clio Infra project (van Leeuwen et al., 2015), respectively.

The second set of variables is used to test other possible explanations. First, when examining the macro-level hypotheses, I consider five aspects: (1) *Country Size* is measured as the log value of the geographical area (in km2). The source is The CEPII (http://www.cepii.fr/CEPII/en/bdd_modele/bdd_modele.asp). (2) The transaction costs for the adoption of a new electoral system increases in presidential and semi-presidential regimes and federal countries due to the higher number of veto players (Bol et al., 2015: 384). I have added two dummy variables capturing the *Regime* of the country (parliamentary, semi-presidential or presidential) and whether the country is federal (1) or not (0), *Federalism*. The sources are Anckar and Fredriksson (2019) and Bormann and Golder (2013) for political regimes and Teorell et al. (2021) for federalism. Unfortunately, the data about federalism are only available from 1945. (3) According to Rogowski (1987), PR systems are more likely to be adopted in trade-dependent economies in order to have political and policy stability and strong party systems. I have included a variable, *Trade Openess,* capturing world trade by countries measured as Export/GDP at constant prices from 1800 to 2016. The source is Federico and Tena (2018). The data are only available for 822 elections in my sample. (4) The existence of ethnic minorities might shape the introduction of PR (Rokkan, 1970). The most commonly used measure of aggregate ethnic diversity is *Fractionalization*, defined as the probability that two individuals selected at random from a country will be

from different ethnic groups. If the population shares of the ethnic groups in a country are denoted p_1, p_2 ,p_3 ... p_n, then fractionalization is $F = 1 - \sum_{i=1}^{n} p_i^2$. The higher the value of F, the higher the fractionalization. The data are time invariant. The source is Alesina et al. (2003). (5) Finally, as the institutional design of metropoles are often adopted by former colonies, a dummy variable identifying former *British or French colonies* has been included in the models.

Second, when examining the cross-national hypotheses, apart from the degree of nationalization, I will include in the model the variables in Model 2 in Appendix in Boix's analysis: *Geographical Area* (the log value of the geographic area in thousands of km2), *Strength of socialism* (the percentage of votes won by socialist parties), *the Effective number of old parties* (i.e., non-Socialist parties) and *Threat (*the interaction term between *Socialism* and *Old Parties*).

Finally, there will be no controls variables when testing the party-level hypothesis.

Methods

When examining the macro-level hypothesis, I use binary probit models predicting the use of majoritarian electoral systems since 1800 until 2016. To correct for possible correlations over time, the standard errors are clustered by countries. In the appendix I have re-estimated the models using a multinomial probit model distinguishing between majoritarian, PR and mixed systems. The results are qualitatively the same. When testing the cross-national hypothesis, I follow Boix (1999) and run Ordinary Least Squares (OLS) models. Finally, the party-level hypothesis is examined with correlations as the number of observations is small, only 14 parties.

Results

- *The macro-level hypothesis*

Figure 2 shows the number of elections employing majoritarian, proportional, and mixed electoral systems by decade from 1800 to 2016. Consistent with the macro-level hypothesis, the use of majoritarian electoral systems has significantly declined. In the 1900s, majoritarian systems were employed in 23 out 28 elections (the 82 percent); in the 1950s, in 41 out of 109 elections (the 38 percent); and by the 2000s, in 92 out 280 election (the 32 percent). Interestingly, 36 countries used a majoritarian electoral system

in elections held from 2010 to 2016. Apart from the traditional democracies (Australia, France UK and the US), all the remaining countries were British or French colonies for a relatively long period of time with only three exceptions: Micronesia, the Marshall Islands and Mongolia.
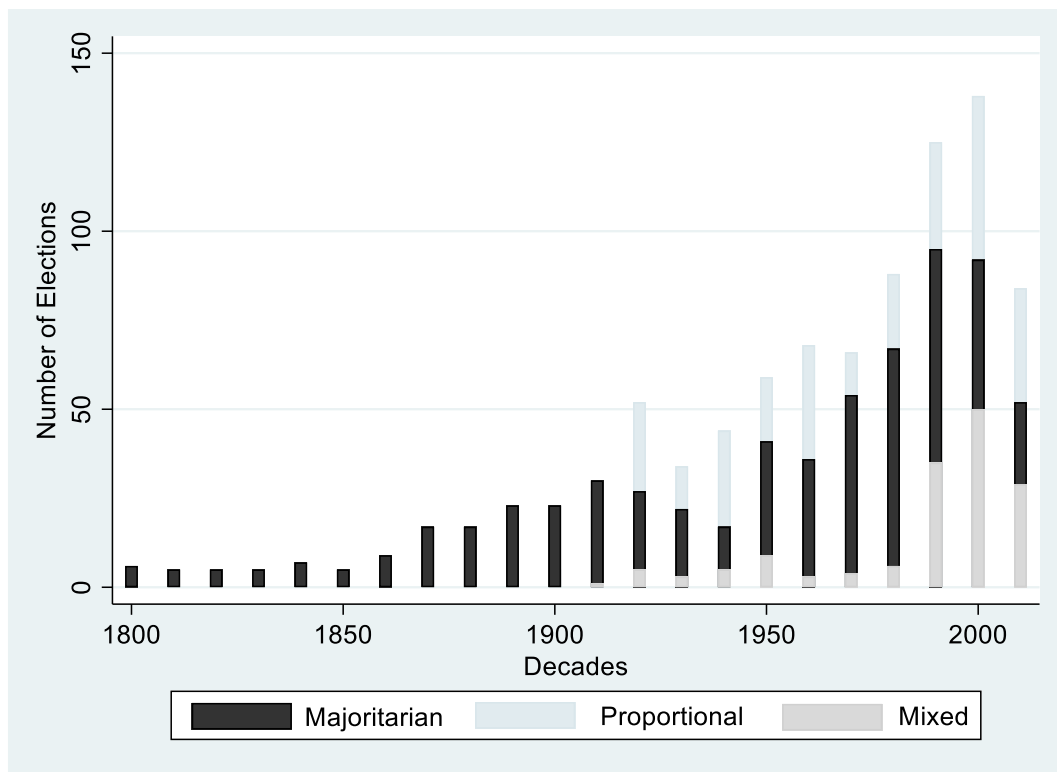

Figure 2: Legislative Electoral Systems by Decade

In Figures 3 and 4 the popularity of electoral systems over time is presented in a complementary way. Using a *lowess* curve, in Figure 2 I show how the average district magnitude (in the lower tier) has changed by decade since 1800. As can be seen, electoral systems are increasingly more permissive. The pattern clearly changed in the 1910s, when the average district magnitude increased from 2.3 to 6.9 seats. In Figure 4 I focus on the direction of major electoral reforms by decade. My understanding of a major electoral reform is the wholesale replacement of the electoral formula through which the chamber of parliament is elected (Katz, 2005: 58). Majoritarian electoral reforms are quite exceptional. If indirect elections are excluded, 63 major electoral reforms have taken place since 1800: in 30 cases the electoral system shifted to PR, in 25 to a mixed system and in only 8 to a majoritarian system.
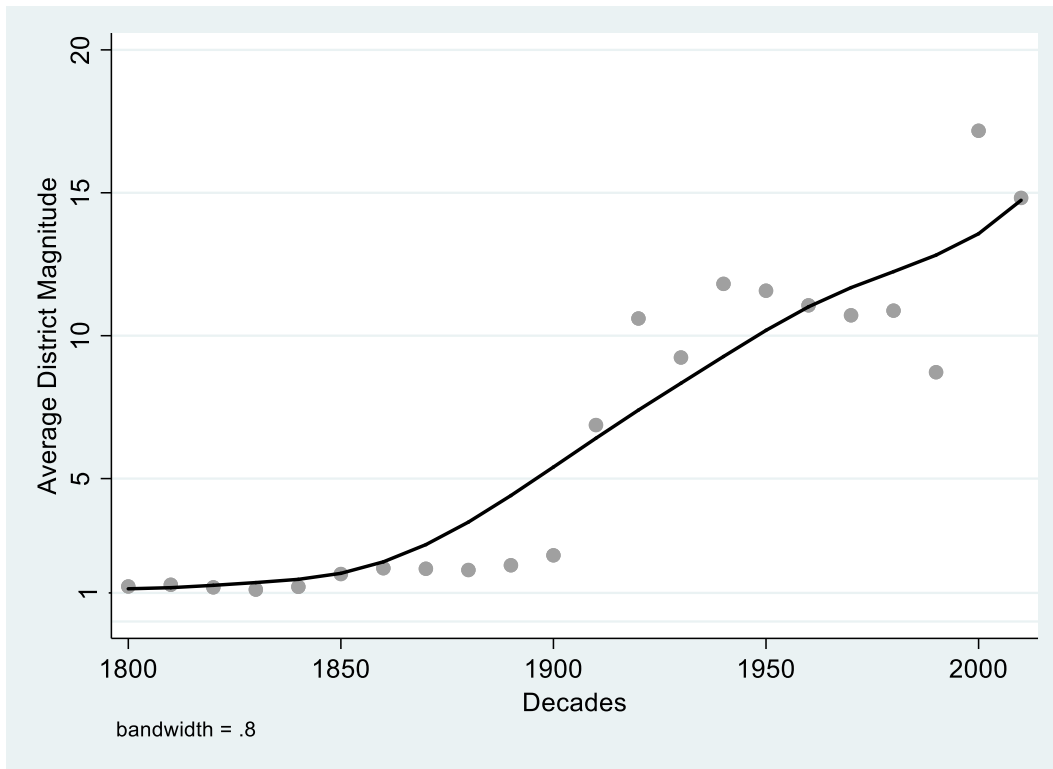
Figure 3: Evolution of the Average District Magnitude

Figure 4: Major Electoral Reforms by Decade

Table 1 and 2 display the results for the sample of elections from 1800 to 2016 using the *GDP per Capita* and *Education* as proxies for national integration in the former and *Rural population a*nd in the latter. The first model in Table 1 shows that the choice of a majoritarian system does not depend on country size: the variable is far from being statistically significant and the fit of the model is very poor. However, in the second model the GDP per capita has the expected negative sign (i.e., economic development reduces the probability of using a majoritarian system) and is statistically significant at the 0.01 percent level.

In the third model country size is again included instead of the GDP per capita and the controls are added. The size of countries is again not relevant, while being former French or British colonies is the only statistically significant controls (at the 0.01 level) and makes the use of a majoritarian system more likely. In the fourth model, country size and GDP per capita and the controls are included at the same time. There are two interesting results. On the one hand, both variables are now statistically significant at the 0.01 percent level. On the other, the effect of GDP per capita becomes stronger and more significant. This suggests that amongst the two variables, country size and GDP per capita, the latter seems more robust and important. In the fifth model I add Trade openness to the previous one. The number of observations significantly drops, but the results are qualitatively the same. *Trade openness* does not affect the type of electoral system employed in the countries. Finally, in the sixth model GDP per capita is replaced with education as proxy for national integration. The number of observations is reduced in comparison with model 4, from 1,418 to 1,277. The coefficient on country size remains positive and statistically significant at the 0.01 percent level, while human capital is negatively correlated with the use of a majoritarian system: the variable is statistically significant at the 0.05 percent level.

Table 1: The Choice of Electoral Rules (I)

	Models					
	1	2	3	4	5	6
Country Size (log)	0.029		0.071	0.27**	0.34**	0.28**
	(0.065)		(0.051)	(0.07)	(0.10)	(0.08)
GDP per Capita (log)		-0.34**		-0.43**	-0.57**	
		(0.11)		(0.13)	(0.16)	
Regime (ref. Parliamentary)						
Semi-presidential			-0.39	-0.62	-0.15	-0.58
			(0.45)	(0.46)	(0.67)	(0.50)
Presidential			-0.43	-1.10**	-1.40**	-1.06**
			(0.33)	(0.33)	(0.43)	(0.31)
French/British Colony			1.80**	1.18**	2.50**	1.66**
			(0.32)	(0.36)	(0.46)	(0.35)
Trade Openness					0.51	
					(0.47)	
Education						-0.09*
						(0.04)
Constant	-0.56	2.54**	-1.53*	1.68	0.75	-3.42**
	(0.70)	(0.89)	(0.60)	(1.48)	(1.56)	(1.08)
Observations	1,606	1,418	1,606	1,418	791	1,277
Number of Countries	122	100	122	100	42	85
Pseudo R^2	0.00	0.04	0.32	0.39	0.50	0.36
Log pseudolikelihood	1085.65	-904.38	-742.85	-568.65	-274.69	-538.34

Probit Models. Standard errors in parentheses.
*p<0.05: **p<0.01.

When using the percentage of rural population in each country as a proxy for national integration in Table 2, the number of observations drops as the data are only available since 1960. Interestingly, urbanization decreases the probability of using a majoritarian system in the five models: the coefficient on rural population is negative and statistically significant at the 0.05 percent level in the second model at the 0.01 percent level in the remaining models. However, country size is not statistically significant when is the only independent variable (model 1) or when adding controls (models 3, 4 and 5). Being a former French or British colony is the control with the most robust effect across models. In Table 2 trade openness has not been included in the estimates, because the number of observations dramatically drops (less than 500 observations). I include, however, ethnic fragmentation (models 4 and 5). As the variable has been measured circa 2001 (Alesina et al., 2003) and is time invariant, it makes more sense imputing the score to all the years and running the model in Table 2 than in Table 1. As can be seen, ethnic fragmentation does not affect the institutional design.

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Table 2: The Choice of Electoral Rules (II)

	Models				
	1	2	3	4	5
Country Size (log)	0.023		0.065	0.072	0.083
	(0.059)		(0.058)	(0.064)	(0.068)
Rural Population (%)		0.018*	0.021**	0.023**	0.029**
		(0.007)	(0.007)	(0.007)	(0.008)
Regime (ref. Parliamentary)					
Semi-presidential	-0.72	-0.84	-0.94	-0.94	-1.64**
	(0.47)	(0.52)	(0.52)	(0.53)	(0.88)
Presidential	-0.59	-0.72*	-0.82*	-0.77*	-1.26**
	(0.38)	(0.36)	(0.35)	(0.35)	(0.36)
French/British Colony	1.86**	1.70**	1.72**	1.75**	1.76**
	(0.31)	(0.33)	(0.32)	(0.34)	(0.32)
Ethnic Fragmentation				-0.40	-0.24
				(0.65)	(0.71)
Federal					0.85
					(0.45)
Constant	-1.13	-1.46**	-2.27**	-2.30**	-2.76**
	(0.70)	(0.36)	(0.76)	(0.80)	(0.82)
Observations	1,080	1,080	1,080	1,071	725
Number of Countries	118	118	118	115	109
Pseudo R^2	0.38	0.42	0.43	0.43	0.49
Log pseudolikelihood	-439.26	-408.90	-402.72	-400.47	-245.95

Probit Models. Standard errors in parentheses.
*$p<0.05$: **$p<0.01$.

- *The cross-national hypothesis*

To test the cross-national hypothesis, I employ the original dataset for 31 countries in the interwar period and after 1945 built by Boix (1999), in particular his model 2 in the Appendix B. The first column model reports the coefficients from the article (page 623). Unfortunately, the nationalization scores for seven observations (Austria, 1911; France, 1914 and 1945; Italy, 1913; Japan, 1928; New Zealand, 1919; and Spain, 1931) are not available in the *Constituency-Level Elections Archive* (Kollman et al., 2019) and therefore the number of observations drops to 24. The second column replicates the original model specification, but using the 24 observations. As can be seen, there are two relevant differences: *Threat* is not statistically significant, while the coefficient on *Geographical Area* is somewhat smaller, but still significant at the 0.01 percent level.

In the third column the *Moenius & Kasuya Weighted Inflation Score* is added to the previous model. The variable has the expected positive sign (i.e., the more denationalized the country, the higher the electoral threshold) and is statistically significant at the 0.01 percent level. *Threat* is again statistically significant at the 0.05 percent level, while the coefficient on *Geographical Area* remains significant at the 0.01

percent level. Finally, when using the *Bochsler standardized & weighted Party System Nationalization Score*, I found that the greater the nationalization of electoral politics in a given country, the lower the electoral threshold. *Threat* is not significant and the coefficient on *Geographical Area* is again statistically significant at the 0.01 percent level. The fit of the model is substantially better when nationalization measures are included in the models.

Table 3: The Choice of Electoral Rules in the Interwar and Post-1945 Period

	Model 2 reported	Model 2 replication	Model 2 with Iw	Model 2 with PSNS_sw
Threat	-34.07*	-20.15	-25.75*	-16.37
	(15.82)	(13.40)	(10.67)	(11.89)
Strength of Socialism	57.70	10.71	27.93	3.87
	(0.46)	(39.22)	(31.27)	(34.64)
Effective Number of Old Parties	7.31	2.75	3.27	0.58
	(4.50)	(3.98)	(3.14)	(3.61)
Geographical Area	9.89*	8.71**	8.07**	10.50**
	(1.99)	(1.61)	(1.28)	(1.58)
Electoral Nationalization			11.82**	-37.06*
			(3.33)	(14.54)
Constant	-18.13	-1.43	-4.27	26.27
	(14.40)	(12.84)	(10.17)	(15.68)
Observations	31	24	24	24
R^2	0.67	0.77	0.87	0.83

Iw: Moenius & Kasuya Weighted Inflation Score.
PSNS_sw: Bochsler standardized & weighted Party System Nationalization Score
Estimation is by Ordinary Least Squares. Standard errors in parentheses.
*$p<0.05$; **$p<0.01$.

- *The party-level hypothesis*

The third step in the empirical analysis is focused on accounting for the variation in the institutional preferences of parties, that is, why some parties endorsed PR while others did not. As the entry of socialist parties in the electoral arena at the turn of the twentieth century is a necessary condition for the adoption of PR (Rokkan 1970; Boix, 1999), I focus on explaining why their preferences were not uniform across countries.

In a fine-grained historical analysis, Penadés (2008) reconstructed the institutional preferences of 18 socialist parties in as many countries in the interwar period. My hypothesis is that socialist parties endorsed PR if they were better nationalized than its main competitor in the country (that is, the party with the highest number of votes in the election excluding the socialists). Using data from the *Constituency-Level Elections Archive* (Kollman et al., 2019), in particular the *Standarized & weighted Party System Nationalization Score* by Bochsler, I have

calculated the difference in their nationalization scores in those elections were PR reform were adopted or in the first election with universal suffrage in those countries were PR was not adopted.[6] Unfortunately, nationalization scores are not available in four countries (France, 1945; Iceland, 1934; New Zealand, 1919; Spain, 1933). The data can be found in Table A4 in the Appendix.

The relationship between party nationalization and institutional preferences is displayed in Figure 5. There are three interesting results. First, in the five countries where the socialist party opposed or at least failed to defend it (Australia, Belgium Denmark, Sweden and UK), the socialist party was less nationalized than its main competitor. Second, if we focus on the most extreme cases, my hypothesis is strongly supported. In the three countries with the greatest gap in nationalization in favor of the socialist party (Germany, the Netherlands and Norway), socialist parties endorsed PR; by contrast, in the two countries with the greatest gap in nationalization in favor of its main competitor (Demark and Belgium), socialist parties did not endorse PR. Third, the Pearson correlation coefficient between preferences and the nationalization difference is 0.52 (statistically significant at the 0.05 percent level).
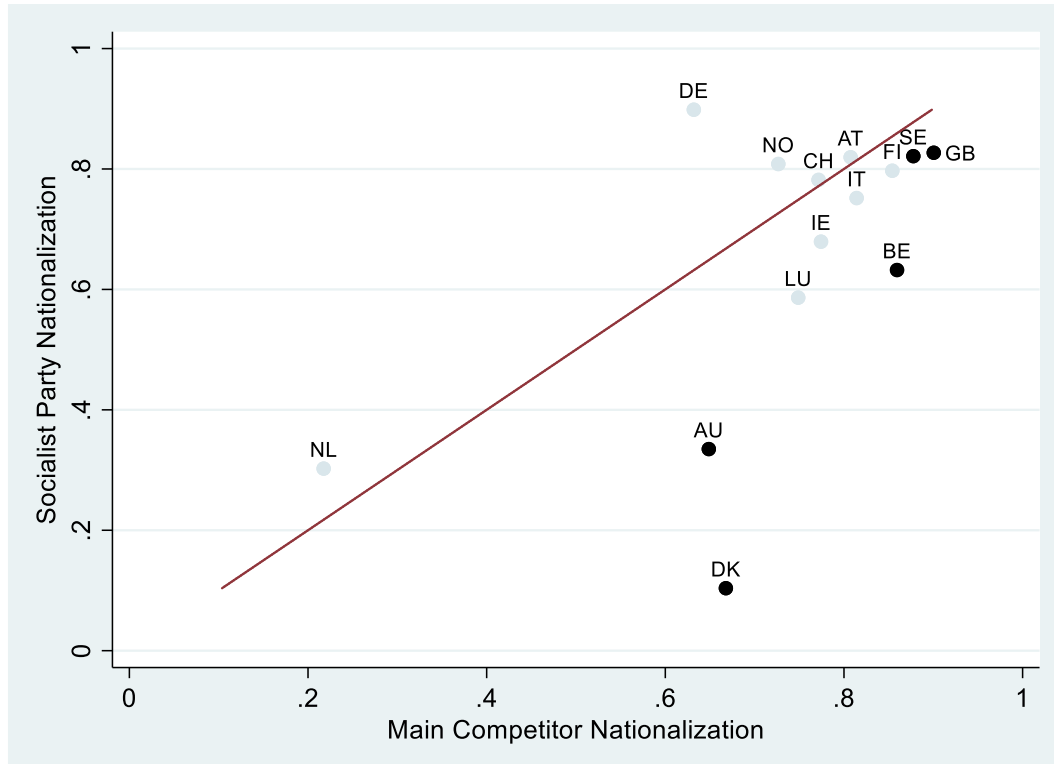

Figure 5: The Effect of Nationalization on the Institutional Preference of Socialist Parties*
*In bold, against PR

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[6] The results do not change appreciably if the difference is replaced with the ratio.

In sum, three conclusions emerge from the empirical analysis. First, the use of majoritarian electoral systems is not driven my country size, but mainly by national integration. Second, party system nationalization is a good predictor of the adoption of PR across countries. Finally, those parties in better conditions to mobilize their supporters than their competitors (i.e., the most nationalized parties) endorsed PR.

CONCLUSION

While existing research is mainly focused on examining the adoption of PR at the macro-level, I have argued that a compelling explanation should address three different levels: why parties have different preferences about electoral systems, why PR is adopted in some countries but not in others in specific periods, and why the propensity to adopt permissive electoral rules varies over time. The intriguing effect of country size, the 'key factor at work' in the years around the First World War, but irrelevant at present, clearly shows that we lack a proper explanation of institutional change.

The selection of electoral rules can be traced to the changing strategic decision of parties when facing the collective action problem inherent to mass elections. During the era of limited suffrage in the nineteenth century, with poor transportation and communications systems and limited literacy, majoritarian electoral systems with many small districts reduced the size of electorates electing the representatives and facilitated face to face interactions to hamper voter free riding.

However, with the expansion of suffrage at the turn of the twentieth century, majoritarian systems progressively become inefficient responses to the collective action problem. The parallel process of national integration through new communication systems and compulsory education made mass parties technologically feasible and they became the 'special device to make individuals to act in their common interest': the mobilization of large electorates is at the core of political parties. Taking care to bring voters to the ballot box is a crucial factor explaining how and why factions developed into gradually more cohesive machines (Boix, 2009). As PR systems with few and large districts make mobilization easier due to the centralization of resources and the stronger economies of scale, it is not surprising the decreasing popularity of majoritarian systems.   When making sense of this macro-level relationship at the micro-level, I have argued that the most nationalized parties were the more prone to adopt PR given their mobilizing advantage over locally focused parties. Not surprisingly, PR systems are first adopted in highly nationalized countries. The empirical evidence from three

analysis using data at the party and country-levels over time has strongly supported these theoretical expectations.

My argument about the selection of electoral systems in the twentieth century as a shift from an institution-based to a party-based response to a collective action problem immediately opens up a specific research question: why some countries (specifically three traditional democracies, Australia, UK and the US) did resist PR. Boix (2010: 411) argues that constitutional systems, and in particular the composition of parliament and negotiation taking place within each chamber and across them, make a difference. Clearly, this question should be in the spotlight in future research. Additionally, it is crucial collecting more data at the district level in the early stages of electoral democracies and investing in historical inquiries about the emergence of parties.

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APPENDIX

Table A1: The Effect of Country Size on the Choice of Electoral Rules

	Models				
	1800-1939	1800-1959	1800-1979	1800-1999	1800-2016
Country Size (log)	0.54**	0.50**	0.26**	0.088	0.029
	(0.09)	(0.09)	(0.09)	(0.071)	(0.065)
Constant	-6.59**	-6.36**	-3.29**	-1.20	-0.56
	(1.17)	(1.18)	(1.13)	(0.80)	(0.70)
Observations	334	501	732	1,139	1,606
Number of Countries	30	46	69	110	122
Pseudo R^2	0.33	0.30	0.14	0.03	0.00
Log pseudolikelihood	-149.10	-241.28	-435.38	-762.86	-1085.65

Probit Models. Standard errors in parentheses.
$**p<0.01$.

Table A2: Multinomial Probit Model of The Choice of Electoral Rules (I)

	Model 1		**Model 2**	
VARIABLES	Majoritarian / Proportional	Mixed / Proportional	Majoritarian / Proportional	Mixed / Proportional
Country Size (log)	0.12	0.11		
	(0.10)	(0.06)		
GDP per Capita (log)			-0.44*	0.086
			(0.17)	(0.17)
Regime (ref. Parliamentary)				
Semi-presidential	-0.55	-0.17	-0.57	0.075
	(0.63)	(0.44)	(0.63)	(0.443)
Presidential	-0.69	-0.58	-0.71	-0.23
	(0.47)	(0.45)	(0.58)	(0.44)
French/British Colony	2.47**	0.25	2.25**	0.31
	(0.49)	(0.49)	(0.58)	(0.56)
Constant	-2.13*	-2.41**	3.19*	-2.14
	(0.85)	(0.77)	(1.60)	(1.53)
Number of countries	122		100	
Log Likelihood	-1146.76		1020.58	
Observations	1,606		1,418	

Probit Models. Standard errors in parentheses. $*p<0.05$, $**p<0.01$.

Table A3: The Choice of Electoral Rules (II)

VARIABLES	Model 1	
	Majoritarian / Proportional	Mixed / Proportional
Country Size (log)	0.12	0.14
	(0.083)	(0.078)
Rural Population (%)	0.030**	0.009
	(0.010)	(0.010)
Regime (ref. Parliamentary)		
Semi-presidential	-1.34	-0.45
	(0.73)	(0.46)
Presidential	-1.24*	-0.68
	(0.50)	(0.47)
French/British Colony	2.35**	0.22
	(0.48)	(0.48)
Constant	-3.22**	-2.85*
	(1.08)	(1.12)
Number of countries	118	
Log Likelihood	-714.50	
Observations	1,080	

Probit Models. Standard errors in parentheses. *p<0.05, **p<0.01.

Table A4: Nationalization and the Institutional Preference of Socialist Parties

Country	Election	Preference	Nationalization of Socialist Party	Nationalization of Main Competitor	Main Competitor
DK	1918	Non-PR	0.10374	0.6678	Liberal Party
AU	1903	Non-PR	0.67536	0.79077	Free Trade
BE	1900	Non-PR	0.63218	0.8594	Catholic Party
LU	1919	PR	0.5863	0.7488	Party of the Right
IE	1922	PR	0.6793	0.7743	Sinn Fèin
GB	1918	Non-PR	0.78963	0.76366	Conservative
IT	1919	PR	0.7517	0.81417	Italian People's Party
FI	1907	PR	0.79706	0.8541	Finnish Party
SE	1911	Non-PR	0.82128	0.87766	Free-minded National Association
CH	1919	PR	0.78186	0.77156	Democratic Party
AT	1919	PR	0.81948	0.8075	Christian Social Party
NO	1921	PR	0.80824	0.7265	Conservative and Free-minded Liberal Party (average)
NL	1917	PR	0.30239	0.2175	General League
DE	1919	PR	0.8984	0.6319	Liberal Party