

Electoral Systems in Latin America: Explaining the Adoption of Proportional Representation Systems During the Twentieth Century

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ABSTRACT

This article explains the twentieth-century Latin American shift from majoritarian to proportional representation (PR) electoral systems. It argues that PR was introduced when the electoral arena changed significantly and threatened the power of the dominant party. The adoption of PR was therefore an effort by the established party to retain partial power in the face of absolute defeat. Majoritarian systems remained in place when the incumbent party was strong enough to believe that it could gain a plurality of the votes despite electoral changes. An empirical analysis of 20 countries over 104 years (1900–2004) provides support for this argument.

In 1900, no Latin American country allocated legislative seats with proportional representation (PR), but by the middle of the twentieth century, half the region had adopted such an electoral rule, and today all but three countries still employ this system.¹ What explains the movement from a restrictive majoritarianism to a structure that encourages political party competition? This study argues that PR—and more broadly, adjustments to open the electoral system—is introduced when changes in political conditions threaten the hegemony of the dominant party. A shift to PR therefore reflects an effort by the established party to retain partial power when facing the prospect of losing all power under majoritarian rules.

More specifically, this study proposes that three phenomena threaten entrenched party dominance: an influx of voters to the electorate; the advent of new political parties that capture a substantial number of votes from the dominant party; and a shift in the preferences of the electorate away from the major party. As new or oppositional parties become stronger and newly enfranchised voters from previously politically marginalized social classes, the middle and working classes, begin to support these parties, failure to adopt PR would lead to the absolute defeat of the ruling party; and this prospect generates pressure on party leaders to strategically adjust the existing electoral system in the direction of PR.

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Similar theories have been advanced for industrialized democracies (Boix 1999; Rokkan 1970).² This study expands these theories to the Latin American context by proposing that the regional adoption of PR occurred for a reason similar to that of developed countries: a calculation made by ruling parties perceiving a credible threat to their dominance under majoritarian electoral systems. This argument is elaborated by suggesting that restrictive majoritarian systems are maintained when the incumbent party is strong enough to believe that it can gain a plurality of votes despite an increase in the voting population, the emergence of new parties, or a shift in electoral preferences. The theory presented here also explains adjustments to the degree of electoral system proportionality, since openings may emerge not only by adopting PR, but also by increasing the district magnitude (DM) under PR or by reducing it under majoritarianism.³ The literature on electoral system choice has emphasized the shift from one allocation rule to another but has not considered changes in proportionality. The empirical models for this study are based on statistical results from an analysis of a new electoral systems dataset of 20 Latin American countries from 1900 to 2004.⁴

ELECTORAL SYSTEMS AS A DEPENDENT VARIABLE

The literature on electoral systems is unbalanced, with most attention focused on the consequences of electoral systems for political stability and on the number of political parties in both representative institutions and the electorate (Cox 1997; Duverger 1954; Laakso and Taagepera 1979; Rae 1967; Sartori 1976; Taagepera and Shugart 1989). These studies have concluded that in addition to the electoral formula, the most relevant feature is the district magnitude. Indeed, evidence indicates that "the more legislators per district, the smoother the road for new parties" (Willey 1998).⁵

Fewer studies have addressed the origins of electoral rules, probably because such electoral modifications are rare and usually occur only in periods of extraordinary political change. Research for advanced democracies has devoted attention to the introduction of PR at the beginning of the twentieth century (Boix 1999; Rokkan 1970), and to the dynamics of electoral reforms and their impact on party systems. In Latin America, a relatively large amount of research has been conducted since the early 1990s, including case studies that analyze the transformation or stability of electoral systems (Mainwaring 1999; Siavelis 1997), as well as data accumulation regarding the different dimensions of electoral rules, including electoral formulas, electoral thresholds, district magnitudes, and ballot structures (Colomer 2004; Coppedge 1997; Golder 2003; Jones 1995a, b; Lundell and Karvonen 2003; Nohlen 1993, 2005b; Wallack et al. 2003).

In addition, some scholars have addressed the determinants of the choice of electoral rules after Latin American countries moved from authoritarian regimes to democratic governments in the 1980s (Ames 1995, 2001; Crisp 2000; Jones 1995a; Nielson 2003; Siavelis 1999; Tsebelis 1995; Wallack et al. 2003), but few have attempted to explain the origins of electoral systems before the third wave of democratization. In fact, a recent work about the choice of rules to elect Latin American presidents is the only systematic comparative analysis that deals with long-term electoral reform processes (Negretto 2006). Two other efforts have devoted attention to historical factors that determined the adoption of electoral systems in the first half of the twentieth century, but both possess information gaps: Colomer (2004) lacks detailed information about the average district magnitude for each country-year, while Nohlen (2005b) lacks data about rule specificities at the beginning of the century and utilizes case studies rather than a systematic comparative analysis. The new dataset used for the present study fills these gaps and contributes to the literature on the origin of electoral rules. This article therefore represents the first attempt to understand the adoption of PR in twentieth-century Latin America.

RULERS AND THE CHOICE OF ELECTORAL RULES

Electoral rules are formal institutions encouraging both leaders and voters to act strategically. These rules thus constitute a central factor in shaping the distribution of political power: majoritarian formulas assign a majority of (if not all) legislative seats in a district to the winner and therefore tend to produce a single, absolute victor in each district, with a party system that consequently comprises only a few large parties.⁶ PR formulas, by contrast, distribute seats proportionally, based on vote percentage, and permit multiple parties to gain seats in a district. PR party systems tend to be composed of many small parties, since the threshold to participate in elections—and to win—is lower. In between majoritarian and PR rules, semiproportional systems combine properties of both.

Research explaining the introduction of PR in industrialized democracies at the beginning of the twentieth century has attributed electoral rule variation to the interests of political parties and social groups rather than the reverse (Boix 1999; Colomer 2005; Lijphart 1985; Rokkan 1970). The commonly known “Rokkan hypothesis” attributes the introduction of PR in European countries to the extension of the franchise, particularly to the working class, and the consequent pressure that these previously excluded groups exercised over established parties. In order to protect their position against new waves of mobilized voters, established groups demanded and introduced PR, and therefore political elites guaranteed their power—albeit diminished—and simultaneously

granted representation to emerging socialist parties (Rokkan 1970, 157). In other words, changing conditions stimulated political elites to adjust the rules of the game.

Boix (1999) develops a similar argument showing that ruling parties consider and adopt the electoral system that maximizes their representation when the electoral arena changes due to the entrance of new voters or a change in voter preferences.⁷ He shows that advanced democracies adopted PR when new entrants to the political arena—both voters and new parties—were strong and could challenge the entrenched political parties, and that this adoption of PR was especially likely when the new voters' preferences coincided with the new parties' ideologies. In this scenario, the old parties prefer to change rules so that they are certain to retain at least partial power. Thus, if the established dominant party suspects that it will not be able to receive the majority of votes under new conditions and become the absolute winner, it adopts PR to receive at least a portion of seats and to avoid total defeat.

Majoritarian systems will remain, however, when new parties appear weak and cannot challenge the dominant parties. Moreover, the franchise of new voters can also produce outcomes favoring the incumbent party. These new voters, for example, may support traditional parties rather than the emerging opposition or may split themselves between the new parties—thus keeping the old parties in a dominant position—and therefore the majoritarian system continues (see Boix 1999, 609).

Could a similar theory explain the twentieth-century Latin American shift to PR? In 1900, most Latin American countries had highly restrictive electoral systems.⁸ Oligarchic republics dominated the region in the early decades.⁹ These majoritarian electoral systems helped prevailing parties to preserve control, but a progressive growth of electoral systems empowering political minorities began in the 1920s.

This study proposes that a central factor in this adoption of PR in Latin America was the changing condition of the electoral arena. Politicians shape electoral systems to their advantage by defining and deciding the rules most likely to guarantee the continuation of power for themselves and their parties. When facing electoral defeat, however, these dominant leaders will adopt rules to ensure themselves at least a partial victory, because both voters and political leaders prefer "a secure partial victory to betting on a relatively low probability of total victory with the chance that it could end in total defeat" (Colomer 2005, 3). Therefore, incumbent parties uncertain about their dominance can avoid absolute defeat by transforming a majoritarian system to PR. What clues could these political elites receive about threats to their continued supremacy under majoritarianism? Three factors lead a dominant party to question its ability to survive under "winner take all" rules: a sub-

stantial increase in the voting population, new political parties demonstrating an ability to capture votes, and the electorate changing its preferences.¹⁰ But restrictive electoral systems remain when the incumbent party is strong enough to survive competition with new parties.

Some evidence suggests that this argument is plausible in the Latin American context. In the first two decades of the twentieth century, the voting population in most Latin American countries was minimal. It ranged from 2.0 percent (Argentina 1900) to 13.1 percent (Honduras 1920) of the total population (Vanhanen 2005). Few people voted, even though universal male suffrage had existed in many countries since the end of the nineteenth century.¹¹ This institutional formality was not effective until the secret ballot was introduced and all property or literacy restrictions were removed (Nohlen 2005b). Moreover, it had little relevance in the presence of authoritarian regimes, which used violence and electoral fraud to keep or gain control of the government (Lehoucq 2000).

Universal suffrage became relevant only when the cost of committing fraud became high, because opposition parties acquired political leverage. Suffrage and the relaxation of suffrage restrictions during the first decades of the twentieth century were possible when the restrictive authoritarian governments were questioned and democratization of the political regimes began to be a demand from excluded sectors of the population. Effective universal male suffrage stimulated more people to cast votes. Indeed, newly enfranchised voters from the middle and working classes questioned the existing political and social hierarchy by voting for opposition parties that reflected their interests. They demanded openness from restrictive authoritarian regimes (Nohlen 2005b). The electoral arena was changing. The dominant party began to consider altering the existing electoral system when the opposition—either existing or new parties—became stronger and was able to challenge the power of incumbent parties electorally.

Following this argument, the following three hypotheses can be proposed:

- H1. *The entrance of a substantial number of voters makes the incumbent party more likely to adopt a PR system.*
- H2. *The emergence of new parties able to capture votes from the incumbent party pressures these incumbents to shift to a PR system.*
- H3. *Incumbents retain majoritarian rules when—despite an increase in the voting population and the emergence of new parties—the incumbent party is strong enough to gain a plurality of the votes and remain the absolute winner.*

Although most Latin American countries adopted PR between the 1920s and 1950s (see table 1), the degree of proportionality varied over

Table 1. Electoral Systems in Latin America, 1900–2004

Country	Period	Electoral Formula
Argentina	1900–1962	Majoritarian System
	1963–2004	PR System
Bolivia	1900–1955	Semiproportional System
	1956–1966	PR System
	1997–2004	Mixed Proportional System
Brazil	1900–1944	Semiproportional System
	1945–2004	PR System
Chile	1900–1924	Semiproportional System
	1925–2004	PR System
Colombia	1900–1930	Semiproportional System
	1931–1957	PR System
	1958–1977	Semiproportional System
	1978–2004	PR System
Costa Rica	1900–1912	Indirect Elections
	1913–2004	PR System
Cuba	1902–1907	Majoritarian System
	1908–1957	PR System
	1976–2004	Majoritarian System
Dominican Republic	1900–1913	Indirect Elections
	1924–2004	PR System
Ecuador	1900–1944	Semiproportional System
	1946–2004	PR System
El Salvador	1900–1951	Semiproportional System
	1952–1961	Majoritarian System
	1962–2004	PR System
Guatemala	1900–1944	Semiproportional System
	1945–2004	PR System
Haiti	1900–1917	Indirect Elections
	1918–2004	Majoritarian System
Honduras	1900–1953	Majoritarian System
	1957–2004	PR System
Mexico	1900–1911	Indirect Elections
	1912–1963	Majoritarian System
	1964–2004	Semiproportional System
Nicaragua	1900–1984	Majoritarian System
	1985–2004	PR System
Panama	1904–1927	Semiproportional System
	1928–2004	PR System
Paraguay	1900–1992	Majoritarian System
	1993–2004	PR System

Table 1. (*continued*)

Country	Period	Electoral Formula
Peru	1900–1918	Semiproportional System
	1919–1962	Majoritarian System
	1963–2004	PR System
Uruguay	1900–1917	Majoritarian System
	1918–2004	PR System
Venezuela	1900–1945	Indirect Elections
	1946–1992	PR System
	1993–2004	Mixed Proportional System

Note: Multiple historical sources were used to establish the year of PR adoption. Also, researchers with expertise in specific countries were asked to confirm some information. The table includes formulas for electing legislators between 1900 and 2004. It does not show periods when the legislatures were closed or adjustments to the PR systems. At the beginning of the twentieth century, semiproportional systems were designed to favor the incumbent elites; they were closer to majoritarian systems than to PR systems.

Source: Pérez-Liñán and Wills-Otero 2006.

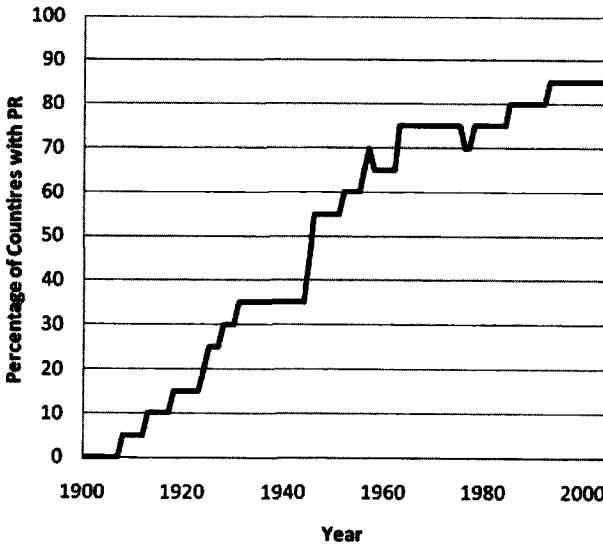
time, even since the beginning of the century, and some reforms to PR have recently been introduced. For these reasons, this analysis accounts for both the adoption of PR systems and the introduction of adjustments in the degree of proportionality before and after the reform. It analyzes the conditions that explain the shift from a majoritarian to a PR system and also explains adjustments to both of them.

Is there an alternative explanation for the adoption of PR systems? At the beginning of the twentieth century, no Latin American country employed a PR system. But Cuba adopted PR in 1908 and soon after, Costa Rica in 1913, and then Uruguay in 1918.¹² The adoption of PR continued: half by 1950, and 17 of 20 by 2000, suggesting the possibility of a regional domino effect (see figure 1). In other words, PR adoptions in Latin American countries may not have been independent events: adoption in one country could have fostered adoption in nearby nations (Brinks and Coppedge 2006) because political elites, particularly the dominant party, may have been cross-pressured by neighboring countries' adoption.

RESEARCH DESIGN

To test the three hypotheses, this study uses a new cross-national, pooled time series dataset for 20 Latin American countries between 1900 and 2004 (Pérez-Liñán and Wills-Otero 2006).¹³ Two sets of models are estimated: one set accounting for the shift from majoritarianism to PR, and another set considering adjustments implemented to either type of system.

Figure 1. Percentage of Latin American Countries with PR
(Lower House, 1900–2004)



Source: Pérez-Liñán and Wills-Otero 2006.

The first set of models employs logistic regression, since the dependent variable is dichotomous; these logistic models are estimated with random rather than fixed effects.¹⁴ The second set of models is estimated with pooled regressions with panel corrected standard errors (PCSE) for a continuous dependent variable accounting for the degree of electoral system proportionality.¹⁵ The sample size is 689 for the logistic models and 1,693 for the PCSE models. The analysis also lags independent variables to ensure a proper causal structure: dependent variable observations for the year after an election until the next election are associated with independent variable observations from the prior election year. In other words, independent variable information is the same for an entire “electoral period”; that is, the year in which elections take place and the subsequent years until the next election.

The second set of models, explaining the degree of electoral system proportionality, is split into two groups. The first group employs PCSE without fixed effects, while the second group uses fixed effects (i.e., countries as dummy variables) to account for the fixed unobserved differences among countries (Green et al. 2001, 442). These country dummy variables will indicate how much the countries included in the analysis differ among themselves, and therefore will indicate if the pooled regression without fixed effects ignores significant national dif-

ferences that led to adoption of PR or to changes in the degree of electoral proportionality.

Dependent Variables

The analysis attempts to explain variation in two dependent variables. A dichotomous PR Adoption variable is coded 0 in all the years before the adoption of PR systems and 1 in the electoral year that a country adopted PR and the corresponding electoral period, with cases then dropped thereafter. The second variable is a continuous Index of Proportionality.¹⁶ This measures electoral system proportionality for each nation in each year in which its legislature functioned normally.¹⁷

Before the introduction of PR systems, authoritarian regimes used restrictive electoral rules to guarantee their dominance in the legislatures. Some majoritarian systems were more restrictive than others; and in some countries, modifications to them were implemented before the shift to PR.¹⁸ Similarly, after PR systems were adopted, several countries introduced reforms that affected either the size of the legislatures or the number of legislative districts, and consequently the average district magnitude changed. A continuous variable that accounts for these changes is useful to assess whether the conditions that determine the adoption of PR systems also explain changes in the electoral systems' proportionality.

The index was calculated as follows. First, the average district magnitude (M) of the lower chamber was estimated, based on the total number of legislative seats ($SIZE$) and the number of districts (ND).¹⁹ The formula for a single-tier system is simply $M = SIZE/ND$; for single-tiered majoritarian systems, M will tend to 1 (e.g., Honduras 1900–53), but will be larger for a PR system (e.g., Costa Rica 1961–2004, with an M of 8.14).²⁰ When the lower chamber has two tiers, seats are awarded in two competitive overlapping tiers (i.e., seats awarded in both single-member districts and PR lists or both regional and national PR lists). For these two-tiered legislatures, M is calculated with the formula $M = (Size_1/Size)(Size_1/ND_1) + (Size_2/Size)(Size_2/ND_2)$, where $Size_1$ is the number of seats in the first tier, $Size_2$ is the number of seats in the second tier, $Size$ is the total number of seats in the lower chamber, and ND_1 and ND_2 are the number of districts in the first and second tier, respectively. For both single- and two-tiered systems, a logarithm function (i.e., $\ln M$) was applied to normalize the distribution of M so that outliers Uruguay and Paraguay would not bias the results.

Contrary to PR systems that, by definition, use multimember districts and distribute seats proportionally, multimember district majoritarian systems permit the dominant party to monopolize power by electing the majority of, if not all seats. To take this into account, the normalized dis-

tribution of M was adjusted, multiplying it by -1 for majoritarian systems, by $+1$ for PR systems, and by $+0.5$ for semiproportional systems. The logic behind this decision was that majoritarian systems with large districts are based on the more restrictive "winner take all" principle, while PR with large districts are the least restrictive, because several parties competing in multimember districts have an opportunity to gain seats. Semiproportional systems, of course, fall between these two extremes, but they are assumed to be closer in nature to PR than majoritarian systems because the larger the district, the more likely that small parties will win seats.²¹

On the basis of this operationalization, lower values of the index of proportionality indicate a less proportional system: observed values of the index range from -4.605 for the most restrictive system (Nicaragua 1972–73) to 4.787 for the most proportional system (Peru 1995–2000).²² The Bolivian semiproportional system (1900–55) ranged between $.16$ and $.18$. The index's mean is $.8532$ and its standard deviation 1.555 . The average index of proportionality has increased constantly since Cuba adopted a PR system in 1908. In the mid-1940s and 1950s and then later in the 1970s, several democratic regimes suffered reverses, and authoritarian dictatorships were installed. During these periods, elections did not take place. Once the representative institutions were reestablished, previous PR systems were reinstated for the subsequent elections. Some countries that did not adopt PR systems before the closing of the legislature introduced them with the advent of democracy. The average index of proportionality in the region increased as soon as several democracies were reestablished in the 1980s and reached the highest level in the last decade of the twentieth century.²³

Independent Variables

To test the first hypothesis about whether an influx of voters influences dominant parties to modify electoral rules, two independent variables are used: a dichotomous Universal Male Suffrage, collected by Nohlen (2005b) and coded 1 both in and after adoption of universal male suffrage and 0 for all other years; and a continuous Voting Population, gathered by Vanhanen (2005) and indicating the number of total voters as a percentage of the total population, with values ranging from zero to 69 percent.²⁴

To test the second hypothesis, that a PR system is introduced when new political parties capture votes from the dominant party, the variable Largest Party is used, based on data collected by Vanhanen (2005) and indicating the percentage of votes that the largest party obtained in the previous legislative election. These values show the variation from one election to the next and reflect whether the votes for the dominant party

increased or decreased. In the latter scenario, votes lost by the dominant party were allocated to alternative political parties; in other words, a decrease in Largest Party votes implies the capture of these votes by opposition parties.

For a PR system to be adopted, both an increase in the voting population and an electoral decrease of the Largest Party must occur before the reform; that is, these events occur before the introduction of changes to the electoral rules. Two examples illustrate this. Chile adopted a PR system in 1925 (Gil 1966). Only in 1932, however, was this formula effectively applied in competitive legislative elections, once the authoritarian government of General Carlos Ibáñez del Campo (1927–31) came to an end (Nohlen 2005a).²⁵ Before the introduction of PR, a semiproportional system using bloc voting was in place (1900–1924). Under that system, the candidate with the highest vote total in an electoral district won all the seats.

Thus, under stable electoral conditions, it was easy for a large party with powerful candidates to maintain its dominant power. In fact, between 1906 and 1914, the largest party in the lower chamber obtained no less than 80 percent of the votes. This percentage decreased to 50.1 percent when elections took place in 1915 and to 50 percent in 1921, the last elections before PR was adopted. Although the voting population was low and did not increase significantly during this period, it started to increase before PR was adopted. At the beginning of the twentieth century, only 3.6 percent of the population voted. This number increased to 4.4 percent from 1920 to 1924. Universal male suffrage was introduced the same year PR was formally adopted. Thus, when the formula was used in the elections of 1932, the voting population doubled.

Nicaragua is another case illustrating how the conditions of the electoral arena changed before the introduction of a PR system. This formula was introduced in 1984 (Krennerich 1993). However, democracy finally triumphed in the country when competitive parliamentary elections took place for the first time in 1990. Between 1937 and 1979, the country had a dictatorship ruled by the Somoza family. The National Liberal Party (PNL) was the dominant party during this period, obtaining no less than 75.6 percent of legislative seats. The opposition party, the National Conservative Party (PCN), was controlled by the conservative oligarchies and was the only party with any political power during the dictatorship. In order to have some parliamentary representation before 1979, other parties had to build alliances with the PCN (Krennerich 1993, 481).

Electoral conditions in the country began to change in 1979 when the Somoza dictatorship fell and the Sandinista revolution, led by the Frente Sandinista de Liberación Nacional (FSLN), triumphed. The FSLN controlled the political institutions and the party system from 1979 to

1990. In 1984, it won the presidential contest with 67 percent of the vote. In the 1990 legislative elections, the alliance composed by opposition parties, the Unión Nacional Opositora (UNO), won the majority of seats (55.4 percent), followed by the FSLN with 42.4 percent. Nicaragua had introduced universal male suffrage in the nineteenth century (1893), but the measure became effective only when democratic competitive elections became legitimate and the costs of fraud grew prohibitive for the dominant political parties. The voting population began to increase before the revolution took place, from an average of 26.5 percent between 1951 and 1970 to 38.4 percent in the presidential and legislative elections of 1974.

To test the third hypothesis, that majoritarian rules are maintained when new entrants in the political arena are not strong enough to challenge the power of the dominant parties, the variables Voting Population and Largest Party are tested interactively. The positive impact of an increase in voting population on the probability of PR adoption and on the index of proportionality will be weaker when the incumbent party retains its dominant position despite changing conditions in the electoral arena.

Control Variables

To account for the alternate explanation of variation in electoral rules, all models include a Diffusion variable that traces the proportion of Latin American legislatures in any given year elected with PR, excluding the country in question.

Also included is a control variable for Electoral Year, coded 1 in a year with an election and 0 for all other years; the expectation is that the index of proportionality will be more sensitive to change during election years. In addition, the analysis controls for democracy and economic development: when political competition and electoral participation increase, the introduction of PR guarantees representation to more parties—in particular minority parties—than majoritarian systems (see, e.g., Norris 1997). In more developed countries, more people demand political representation, and therefore nations with higher levels of gross national product and democracy should be more likely to adopt PR than countries with lower levels. The control for economic development is measured using a lagged GDP Level.²⁶ The democracy variable is operationalized in two separate ways: one is a continuous Polity variable from the Polity IV Database, 1900–2004, which measures the level of democratization, with values ranging from –10 (highly authoritarian) to +10 (highly democratic); the other follows the trichotomization scheme of Marshall et al. (2006) that distinguishes democracies (Polity score +6 to +10) from anocracies (–5 to +5) and from authoritarian governments (–6 to –10).²⁷

DATA ANALYSIS

Six different models are presented. The first two explain the shift from majoritarian to PR systems; the remaining four account for the introduction of adjustments—both before and after any reform—to the degree of proportionality. Table 2 presents the two models explaining the adoption of PR. Model 1 operationalizes democracy with Polity IV scores, and Model 2 as the trichotomous regime type variable, with anocracies and democracies combined and with autocracies as the omitted class.²⁸

The results presented in table 2 support at least three of the main theoretical expectations. The positive and statistically significant coefficient for Universal Male Suffrage suggests that an extension of the franchise predicts changes from majoritarian systems to PR, and the positive and statistically significant coefficient for the Voting Population main effect of the interaction term indicates that the entrance of new voters correlates with the adoption of PR, at least when the value of Largest Party is 0. The negative and statistically significant coefficient for the Voting Population \times Largest Party interaction term indicates, as proposed in the hypotheses, that majoritarian rules are maintained when the incumbent party is strong enough to gain a plurality of the votes despite an increase in the voting population. In other words, a majoritarian electoral system is less likely to change when—regardless of shifting conditions in the electoral arena—the majority party is able to maintain a dominant position and to gain a majority of seats in the legislature.

These models indicate that the effect of Voting Population actually reduces incentives to adopt PR as the vote share of the largest political party increases. Consider now the controls. Diffusion, the democracy variables, and GDP level all possess positive and statistically significant coefficients, indicating that increases in each of these factors increases the probability that a country adopts PR.

The coefficients presented in table 2 cannot be straightforwardly interpreted to gauge substantive significance. Predicted probabilities need to be calculated. Table 3 shows the calculation of the predicted probability of adopting PR at different levels of voting population when the size of the largest party is the lowest and after universal male suffrage has been introduced.²⁹ All other factors are held at their mean. Figure 2 (p. 48) illustrates the substantive effects of the main independent variables. Note that the probability of adopting PR increases with voting population once a 20 percent threshold is reached, and that the probability of adopting PR nears 90 percent when the voting population approaches 50 percent.

Models 3 to 6, shown in table 4 (p. 49), test whether the introduction of adjustments to Latin American electoral systems during the twen-

Table 2. Logit Models: Determinants of PR Systems in Latin America, 1900–2004

Dependent Variable: PR Adoption	Model 1	Model 2
	Polity IV (–10 to +10) Coefficient (SE)	Polity IV (–10 to +10) Coefficient (SE)
Universal Male Suffrage	23.048*** (5.7812)	20.9756*** (5.1205)
Voting Population	.3531* (.1828)	.3432** (.1405)
Largest Party	–.0410 (.0284)	–.0081 (.0233)
Voting Population × Largest Party	–.0044** (.0022)	–.0043** (.0017)
Diffusion	38.7710*** (7.1794)	23.1713*** (5.0264)
Polity IV (–10 to +10)	1.1094*** (.2310)	
Anocracy and Democracy		2.3096** (1.0855)
GDP level	.0002*** (.0001)	.0003*** (.0001)
Electoral Year	.7209 (.6580)	.6416 (.5653)
Constant	–43.1719*** (6.4001)	–32.1190*** (5.3949)
N	689	689
Wald Chi ² (8)	72.71	61.92
Prob>Chi ²	.000	.000
Sigma u	16.7424 (3.7974)	16.7945 (4.4277)
Rho	.9884 (.0052)	.9885 (.0060)

*p<.1 **p<.05; ***p<.01 (two-tailed test)

Note: In Model 2, autocracy is the baseline group, with anocracy and democracy both coded 1 (with autocracy 0) because the number of democracies that adopted PR is very small.

tieth century can be explained by the same variables that account for the shift from majoritarian to PR systems. Models 3 and 4 include no fixed country effects, but Models 5 and 6 do. The regression results in Models 3 and 4 appear to support almost all expectations. The coeffi-

Table 3. Probability of Adopting PR at Different Levels of Voting Population

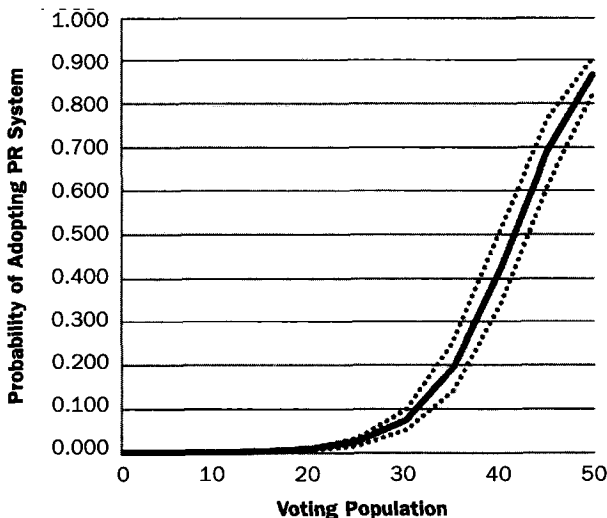
Level of Voting Population (percent)	Percent Probability of Adopting PR (Standard Error)
0	0*** (.000)
10	.001*** (.000)
20	.009*** (.002)
25	.026*** (.005)
30	.075*** (.013)
35	.197*** (.002)
40	.425*** (.044)
45	.691*** (.039)
49.8	.866*** (.021)

* $p < .1$; ** $p < .05$; *** $p < .01$ (two-tailed test)

coefficients of Universal Male Suffrage and Voting Population, as well as the interaction between Voting Population and Largest Party, are statistically significant and in the predicted direction, although the coefficients for Largest Party are negative as expected but not statistically significant. The interaction term suggests that, like the adoption of PR, the effect of increasing voting population on the index of proportionality is conditional on the size of the largest party. Regarding the controls, Models 3 and 4 indicate that the index of proportionality is affected by diffusion, by democratization (measured either with Polity scores or with a regime trichotomization), and by GDP level, all of which are consistent with expectations.

Table 5 (p. 50) presents coefficients for the relationship between voting population and the index of proportionality when the size of the largest party is at its maximum level (100 percent), at its mean (75 percent), and at its minimum level (30 percent).³⁰ With autocratic governments in place—and therefore the size of the largest party at 100 percent—the relationship between voting population and the index of

Figure 2. Probability of Adopting PR at Different Levels of Voting Population



proportionality is low: a one percent increase in voting population is associated with a half percent increase in the index of proportionality. However, when the size of the largest party is 75 percent, the conditional coefficient of voting population increases to 0.8 percent and reaches statistical significance. When the largest party is small (30 percent), a one percent increase in voting population is associated with 1.32 percent increase in the index of proportionality. Figure 3 (p. 51) illustrates this effect, and figure 4 (p. 52) reflects the effect of voting population on the index of proportionality when the size of the largest party is at its maximum and minimum levels.

Models 5 and 6 introduce fixed effects into Models 3 and 4, and the results are similar. Results for country fixed effects (not reported here) indicate that it is necessary to account for unique national circumstances when explaining the adoption of PR in Latin America. One possible factor that may explain cross-national variation is the constitutional design that defines presidential power.³¹ Executive regimes vary in the ways "the president may check, cajole, confront, or simply submit to the assembly majority" (Shugart and Carey 1992, 2), and this factor could be a determinant in each country's choice of electoral system. Changes in these provisions might have influenced reforms to the electoral rules. More powerful presidents, particularly in the early twentieth century, were more likely to govern under restrictive electoral systems than presidents with less or limited power. Under stable electoral conditions, strong presidents promoted restrictive rules that guaranteed them hegemonic power.

Table 4. PCSE Regressions: Determinants of Variations in PR Systems in Latin America, 1900–2004

Dependent Variable:	Model 3 Coefficient (SE)	Model 4 Coefficient (SE)	Model 5 Coefficient (SE)	Model 6 Coefficient (SE)
Index of Proportionality				
Universal Male Suffrage	.6851*** (.1748)	.7148*** (.1763)	1.2097*** (.1666)	1.2299*** (.1732)
Voting Population	.0173*** (.0030)	.0165*** (.0030)	0.160*** (.0026)	.0144*** (.0027)
Largest Party	-.0007 (.0010)	-.0006 (.0011)	-.0001 (.0010)	.0001 (.0010)
Voting Population × Largest Party	-.0001*** (.0000)	-.0001*** (.0000)	-.0001*** (.0000)	-.0001*** (.000)
Diffusion	.4686*** (.1801)	.4581** (.1832)	.4625*** (.1683)	.4718*** (.1733)
Polity (–10 to +10)	.0192*** (.0065)		.0102* (.0063)	
Democracy ^a (Polity 6–10)		.3916*** (.1033)		.2934*** (.0962)
Anocracy (Polity –5 to +5)		.2039** (.0804)		.1698*** (.0758)
GDP level	1.42e–06*** (2.96e–7)	1.37e–06*** (2.74e–07)	9.13e–07*** (2.57e–07)	8.44e–07*** (2.67e–7)
Electoral Year	.0025 (.0145)	.0031 (.0143)	.0061 (.0132)	.0064 (.0128)
Constant	–.1565 (.1781)	–.3768* (.20109)	–2.110*** (.3293)	–2.2628*** (.3527)
N	1693	1693	1693	1693
R ²	.0873	.0885	.2798	.2571
Prob>Chi ²	203.92 .000	201.17 .000	944.65 .000	864.27 .000
Rho	.8551	.8704	.8457	.8626

*p<.1; **p<.05; ***p<.01 (two-tailed test)

^aAutocracy is the baseline group to compare anocracy and democracy.

Note: Dependent variable is the index of proportionality of an electoral system. Models 3 and 4 are estimated with pooled regressions with panel corrected standard errors (PCSE), and Models 5 and 6 are estimated with PCSE with fixed effects (with countries as dummy variables). Fixed effects for countries in models 5 and 6 are not displayed.

Table 5. Conditional Coefficients of Voting Population at Various Sizes of Largest Party

Size of Largest Party	Conditional Coefficient of Voting Population
30	.0132*** (.0026)
75	.0084*** (.0023)
100	.0057** (.0024)

* $p < .1$; ** $p < .05$; *** $p < .01$ (two-tailed test)

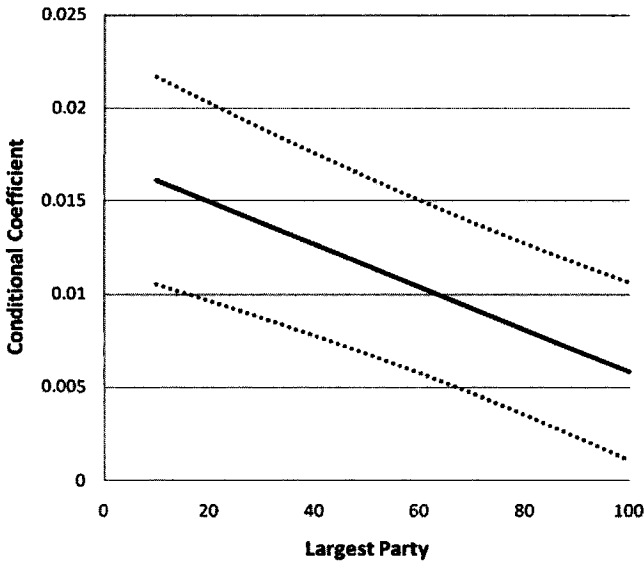
Plurality rules for presidential elections and majoritarian rules for legislative elections reinforced the power of the dominant party. These electoral systems allowed the ruling party to preserve control of the government with minimal effort (or a moderate amount of fraud or harassment). Even when the conditions of the electoral arena changed and PR systems were adopted, the presence of powerful presidents prevented the regular implementation of this formula, either because executives closed the congress or because they ruled under authoritarianism, in which opposition parties did not have political spaces. When presidents were threatened because new voters and parties were able to participate and compete legitimately, however, they used PR to guarantee at least partial power.

CONCLUSIONS

This article has sought to advance the study of electoral systems in twentieth-century Latin America, and in particular to explore the regional causes of PR adoption and of changes to electoral proportionality rules. The results of the analysis presented here suggest that as in advanced democracies, changing conditions in the electoral arena were strong determinants of the adoption of PR in Latin American countries. These findings are consistent with the literature proposing that dominant elites adopt PR and open the electoral system when they face an increase in the voting population, the emergence of new and viable political parties, or a shift in the electorate's preferences.

The evidence indicates that restrictive electoral rules sustained authoritarian republics during the first decades of the twentieth century. Majoritarian systems were useful for the dominant political leaders to preserve control and to impose order according to their political preferences. Modifications to the rules were possible when the electoral arena

Figure 3. Conditional Effect of Voting Population and Largest Party on the Index of Proportionality, 1900–2004



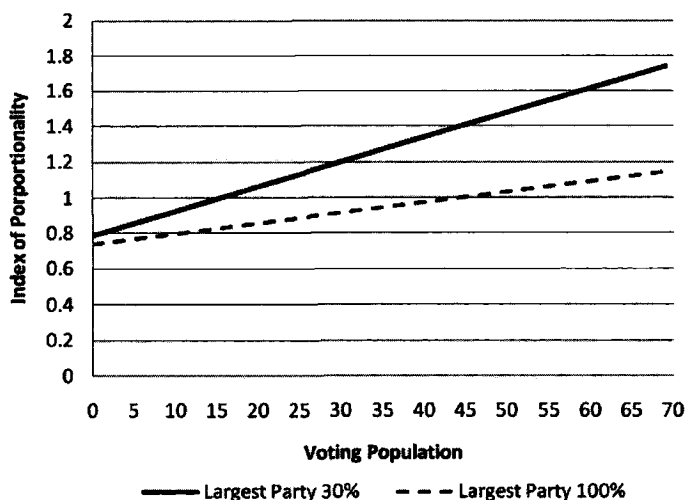
Note: The solid line indicates the conditional coefficient of Voting Population and Largest Party on the index of proportionality. The two dotted lines at the upper and lower extremes correspond to the 95% confidence interval.

changed and the survival of incumbent leaders was therefore threatened. Specifically, the party in power modified the rules of the game and introduced PR when it faced the risk of becoming an absolute loser. By using PR, the dominant party avoided this threat and became more certain of securing for itself at least a partial victory.

This argument and the findings suggest that politicians and party leaders select rules that maximize their political power. When the electoral arena and external political conditions are stable and when the incumbent party is strong and able to compete, these leaders do not have an incentive to introduce changes, or at least not very decisive changes. Only after conditions change—and thereby produce uncertainty—does the ruling party consider the manipulation of electoral rules. The dominant party tries to maintain at least relative, if not absolute power, to avoid its elimination from the political scene.

This study fills an existing gap in the study of electoral systems by presenting an explanation of the adoption of electoral systems in twentieth-century Latin America. Although it has focused on the choice of a particular formula to elect legislators, the theory presented here should apply to the choice of any electoral system and to reforms introduced

Figure 4. Effect of Voting Population on the Index of Proportionality for Different Sizes of the Largest Party



in existing rules. During the last two decades, students of electoral systems in Latin America and other developing countries have seen changes to the rules by which politicians are elected. For example, two Latin American countries, Venezuela (1993) and Bolivia (1997), replaced PR systems with mixed proportional systems, in which some politicians are elected in multimember districts by PR and others are elected in single-member districts by plurality or majority rules. Other countries have introduced different alterations.

The argument developed here suggests that in order to understand these changes, it is necessary to consider how conditions changed before the reforms were introduced. Both institutional and noninstitutional factors are sources of electoral system changes. Therefore, it is necessary to analyze both alterations in the external context and modifications within the political system to understand the incentives of political actors when they adopt rules that increase their ability to survive in the electoral arena.

NOTES

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1. Cuba and Haiti use a majoritarian electoral system, while Mexico employs a semiproportional system.

2. Boix (1999, 612) analyzes electoral laws from 1875 to 1990 in Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, and the United States.

3. The district magnitude is simply the number of seats per legislative district.

4. These data are available from the author on request.

5. According to Lijphart, under plurality and majority systems, increasing the district magnitude "entails greater disproportionality and greater advantages for large parties, whereas under PR it results in greater proportionality and more favorable condition for small parties" (1999, 150).

6. This is not always the case at the national level: some countries (e.g., Canada and India) that use majoritarian electoral systems have party systems that comprise several parties. Majoritarian systems that use the incomplete list also apportion seats to minority parties.

7. Political preferences changed in Denmark, France, and Norway when these countries became urbanized and industrialized. These processes produced "a shift from a rural-urban conflict to a capital-labor cleavage" and a "substantial political realignment" (Boix 1999, 611).

8. Four countries had indirect elections in which legislators were not popularly elected; seven countries had a majoritarian system where plurality winners gained a majority of (if not all) seats; and nine countries had a semiproportional system that combined properties of majoritarian and PR systems. At the beginning of the twentieth century, these semiproportional systems were closer to majoritarian than to PR systems. The average district magnitude was generally small (close to 1), so few parties could elect representatives in a given district. Bolivia, for example, had a semiproportional system from 1900 until 1950, and its average district magnitude during this period ranged from 1.37 and 1.48; after adopting PR in 1956, its average district magnitude increased to 7.5 and ranked between that size and 14.4 until the introduction of an electoral reform in 1997.

9. Oligarchic republics are those periods in which elections were limited to the dominant elites and restricted to less than half of the adult male population.

10. Emergent parties in Latin America were not as strong as the socialist parties that emerged in the developed democracies in the early twentieth century, but challenges to restrictive electoral rules existed nevertheless, given the changing electoral arena in Latin America.

11. According to Nohlen (2005b), the following countries adopted universal male suffrage in the nineteenth century: the Dominican Republic (1865), Ecuador (1861), El Salvador (1883), Guatemala (1879), Honduras (1894), Mexico (1857), Nicaragua (1893), Paraguay (1870), and Venezuela (1857).

12. Costa Rica adopted a type of PR system in 1913. Using a single tier, 80 percent of deputies were elected with PR, and the remaining 20 percent were elected by plurality.

13. The nations included in this analysis are Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, the Dominican Republic, Ecuador, El Sal-

vador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, and Venezuela.

14. When conducting logistic regressions with fixed effects, five groups of observations (i.e., countries) are eliminated from the analysis, because fixed effect logit models assume that the observations that do not vary in the dependent variable are not informative for estimating the effect of the independent variables, and therefore all observations that do not vary across time are eliminated from the sample. In this study, two countries (Haiti and Mexico) never adopted PR, while others (Paraguay, Cuba, and Nicaragua) vary little in both the dependent variable and some independent variables. Therefore, a fixed effects logistic regression excludes these cases. Contrary to this, random effects logit models consider all the cases, even those with small variance. Therefore, this analysis presents the results from the logistic regression with random effects.

15. PCSE is an appropriate technique given the nature of this dataset (a "Small N-Large T" sample in which N is 20 Latin American countries, and T is 104 years). PCSE corrects for spatial autocorrelation and for the heteroskedasticity produced with OLS (Beck and Katz 1995).

16. Alternate measures of proportionality include the well-known Loosemore-Hanby index (see Loosemore and Hanby 1971), the Rose index of proportionality (see Fry and McLean 1991), and the Rae index (see Rae 1967). All these indexes summarize the degree to which each party's share of seats corresponds to its share of votes. The Loosemore-Hanby index measures the number of seats that are not apportioned equitably as a proportion of all seats in the legislature. The index in the present study measures the proportionality of the system considering both the total number of seats and districts in the legislatures and the type of electoral formula—majoritarian, proportional, or semiproportional—in each electoral period during 104 years, but it does not calculate vote-seat share differences.

17. Many Latin American countries suffered periods of dictatorships following coups d'état; the legislatures were closed and no elections took place, and as a consequence the electoral system did not function. Years in which no legislature operated are omitted from the empirical analysis, although years in which the legislature operated under a dictatorship or an authoritarian regime are included. Note that all Latin American democratic governments that fell into dictatorships after having adopted PR kept this system once they reappeared as democracies.

18. For example, when majoritarian systems use incomplete list, a proportion of the seats, usually one-third, is allocated to the list with the second-highest vote (Argentina until 1962; Colombia until 1931) or is distributed proportionally to all other party lists (Paraguay until 1993). These systems are less restrictive than those that use party block vote, where voters cast a single party vote in multimember districts and the party with most votes wins every seat in the district (Peru 1919–30 and 1939–46).

19. Only the lower chamber is analyzed, because it usually elects legislators on the basis of population, while the senate elects on the basis of territory. Moreover, in some cases, only a portion of senators are popularly elected, while others are appointed or are *ex officio* members for life due to their status as former presidents. Lower chambers are therefore more representative of the popular vote.

20. Note that some early-twentieth-century Latin American countries had majoritarian electoral systems with multimember districts, so in these cases the average district magnitude was larger than 1.

21. Latin American countries with semiproportional systems at the beginning of the twentieth century were closer to majoritarian than to PR systems, but as a robustness check, an alternative index of proportionality was created in which the M in semiproportional systems was multiplied by -0.5 rather than 0.5 . The empirical results were basically identical to the results presented in this analysis.

22. Both Nicaragua and Peru had a nationwide district during the indicated periods. The former had a majoritarian system that used incomplete list (75 percent of seats allocated to the majority party), while the latter used a PR system (120 seats distributed proportionally according to the share of votes obtained by each party).

23. Some reforms to PR systems, such as a change in the allocation formula (e.g., from L-R Hare to d'Hont) or the establishment of electoral thresholds, might also affect the index of proportionality, a factor that should be considered in future analyses.

24. The expansion of the franchise in Latin American countries was a complex process. The introduction of universal male suffrage here refers to the formal enfranchisement of adult males. Despite the extension, specific conditions or barriers limited the use of the formally granted franchise, and in some cases only a portion of individuals—e.g., literates—could make use of this right. Expansion of the franchise was furthered with the introduction of female suffrage, the inclusion of illiterates, and finally the lowering of the voting age (Nohlen 2005, 12).

25. This system was reformed in 1958 and in 1962 for the election of deputies and senators, respectively.

26. This variable was created using different sources, such as Banks 2004; Maddison 2003; and World Bank 2005. Maddison's (2003) GDP data covered the period 1900–2001. GDP level for 2002, 2003, and 2004 was estimated by applying annual growth rates reported by the World Bank to the 2001 figures. GDP levels for periods without data—some countries before 1950—were estimated by imputing retrospective values based on the rate of growth in imports and observed series for later periods.

27. As a robustness check, analyses were conducted using three other dichotomous operationalizations: when the Polity IV score was in the “democracy” zone (+6 to +10), was on the positive side of the democracy-authoritarian dimension (+1 to 10), and was in the democracy zone or in the anocracy zone (-5 to +10). The results in all cases were consistent with those reported here.

28. Democracies and anocracies were combined because the number of democracies that adopted PR is very small.

29. Predicted probabilities were calculated using the following formula:

$$p(y) = \frac{e^{\text{logit}}}{1 + e^{\text{logit}}}$$

where $\text{logit} = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + E$. This formula gives the probability of adopting PR (1), given a specific configuration of the predictors. In this case, the

probability of adopting PR is estimated at different levels of voting population, when the size of the largest party is set in its minimum value and after universal male suffrage was introduced. All the other independent variables were set at their mean.

30. The conditional effects were calculated using the "lincom" command in the statistical program Stata 9.

31. Latin American countries modeled their presidential systems after the U.S. Constitution in the nineteenth century. The extent to which presidents influence legislatures and vice versa is determined by each country's constitutional design (Shugart and Carey 1992); in some cases, constitutional reforms modify the attributes of the branches or the amount of power that one branch has relative to the other. The only countries in this study lacking a presidential constitution are Haiti (with a semipresidential system similar to that of France) and Cuba (with a socialist constitution). The British Caribbean countries of Guyana, Surinam, and Belize, which have parliamentary systems, are not included in the analysis. It is important to note that no existing presidential system has ever changed to a parliamentary system.

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Correction

In a review of the book *So Far from Allah, So Close to Mexico* in the summer 2008 issue, the author's first name was misspelled and her national origin misattributed. Theresa Alfaro-Velcamp is a native of the United States.