



Institutional, societal, and economic determinants of party system size: Evidence from Brazil

International Political Science Review
2016, Vol. 37(1) 3–17
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sagepub.co.uk/journalsPermissions.nav
DOI: 10.1177/0192512114532968
ips.sagepub.com


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Abstract

Institutionalist views emphasize that identical institutional rules should function in similar ways across nations, thus making electoral engineering possible. This article utilizes the case of Brazil (eight elections in 27 states) to show that there is considerable cross-sectional variation in party system size under indistinguishable institutional rules. Confirming previous works, we find that the interaction between institutions and societal complexity plays a key role in determining party system size. In addition, we show that the educational profile of voters and subnational economic conditions also contribute to the phenomenon. Overall, our results call for caution on electoral engineering projects at home or abroad.

Keywords

Party system, fragmentation, Brazil, institution, class

Introduction

The literature on party system fragmentation focuses either on its institutional or societal determinants (Norris, 2004), or the interaction between them. The legatees of the tradition initiated by Lipset and Rokkan (1967) lay emphasis on how salient social cleavages manifest themselves in the party system, organizing it along different lines (left–right, progressive–conservative, secular–religious, and so on). The literature inspired by Duverger’s seminal work (1954), on the other hand, underscores the central role played by institutions in determining how social demands are channeled into the political system, as different institutional rules create distinct sets of incentives and disincentives to the emergence of a bipartisan, three-party or multiparty system (Cox, 1997). A third line of argumentation combines both approaches, making the case that the interaction between the two sets of factors – societal diversity and institutional structure – is vital. From this last perspective, permissive party and electoral legislation allows societal complexity to gain a foothold in the party system, creating incentives for its fragmentation, whereas restrictive party and electoral

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rules act as a gatekeeper of the same social diversity, depressing the overall number of political parties (Amorim Neto and Cox, 1997; Ordeshook and Shvetsova, 1994).

This debate is not merely academic for two main reasons. Firstly, what is at stake is the way in which a political system processes social conflict, in political arrangements that can be more (or less) conducive to producing political stability. Ultimately, party system fragmentation impacts the electoral dynamic, the process of coalition formation both before and after elections, governing, and ultimately, the survival of political systems, especially presidential democracies (Cheibub, 2007; Mainwaring, 1993; Stepan and Skach, 1993). Secondly, the notion that the observation of the institutional framework of a polity enables one to infer, albeit approximately, how it works, implies that electoral engineering can engender relatively precise outcomes (Horowitz, 2003). Needless to say, the latter is exactly the reasoning behind the international policy of countries engaged into state-building projects overseas, and of others enacting political and electoral reforms at home. Thus, the debate has clear public policy implications.

This study aims at contributing to this literature (and public policy debate) through the analysis of the changes in the fragmentation of Brazil's party system when observed at the state level.¹ Which paradigm explains better this case: the institutions-centric one, the societal-focused approach, or the third one, which combines both? As detailed below, subnational party politics in Brazil is an interesting case for two main reasons. Firstly, this country underwent an almost natural experiment. It transitioned from an authoritarian regime (1964–1985), which maintained an artificial bipartisan system for almost two decades, to a democratic regime based on a multiparty system. The key year was 1979, when the existing party laws were relaxed and new political parties were formed. There was, thus, a dramatic move from a highly restrictive to a decidedly permissive legislation.

Secondly, Brazil has a rather unique institutional configuration. Eleven of its 27 state-level units share absolutely indistinguishable institutional features: they all use open-list proportional representation (PR), the same voting system, the same formulae to convert votes into seats, and, perhaps more important, the same district magnitude (DM) for electing representatives to Brazil's lower house, known as the Chamber of Deputies. Each of these states (henceforth called the "homogeneous group" to facilitate the analysis) elects eight seats to the Chamber of Deputies. The remaining 16 states (the "heterogeneous group") have similar institutional features, but different DMs, varying between nine and 70 seats.

This dual configuration of the Brazilian federation enables one to assess the extent to which its institutional framework contributes to shaping party system size. Instead of focusing on a cross-country comparison, thus, this article uses the states of a single polity as units of analysis and directs attention to the subnational party dynamics. Do the party systems of the states with identical institutional configurations share any similarities when it comes to their level of fragmentation? What accounts for in-group and cross-group differences? The institutional structure of the Brazilian case, thus, allows one to control for the impact of DM on party system size at the state level, and simultaneously to explore the weight of non-institutional factors in shaping the fragmentation of the party system. We use the effective number of parties (ENPV) in the electoral arena as a measure of the fragmentation of the party system (Laakso and Taagepera, 1979).²

In addition, this study goes beyond the traditional studies of party system size – such as Amorim Neto and Cox (1997), Cox (1997), Ordeshook and Shvetsova (1994), and Norris (2004) – which work primarily with indicators of societal complexity, such as class-based inequality (measured by the GINI coefficient) and ethnic diversity. We work with those variables, but also include a variable that reflects the average educational level of the voters (illiteracy) and an indicator of subnational economic conditions (unemployment). As we will argue below, illiteracy of voters is an important variable, as the lack of reading skills not only complicates the act of voting, but can hamper party

label recognition as well, which creates difficulties for new political parties to expand their electoral clientele, thus impacting the overall distribution of votes. Furthermore, we include unemployment, as voters react to economic conditions in ways that can also affect the dispersion of votes, and as a consequence, the level of fragmentation of a party system.

In sum, state-level politics in Brazil is a rather unique case for the literature on party politics, as it allows for interesting comparative analysis. Firstly, when centering the analysis on the group of homogenous states, one can examine how differences in societal complexity shape party system size, as we are keeping the institutional component constant among this set of observations. Secondly, the analysis of the heterogeneous states enables us to assess the extent to which different sizes of an important institutional feature (DM) have an effect on the translation of societal diversity into party representation, that is, whether they act as a gatekeeper when DM is set at the level of nine seats, or the opposite, when the latter reaches higher thresholds. Finally, the addition of the indicators of the educational profile of voters and unemployment allows us to refine the understanding of other potentially relevant determinants of party system fragmentation, thus decreasing the bias of the omitted variable.

The importance of the potential lessons of this case cannot be overstated. If we find out that, despite operating under equal institutional rules, the group of homogenous states has very different party system sizes, then that finding will reduce individuals' ability to gauge the dynamics of party politics from a country's institutional framework. Moreover, electoral engineering will be seen even more as an art than a science, if unemployment level is found to influence party system fragmentation, as that will indicate that negative state-level economic conditions help foster distinct subnational party systems, even if formal rules are invariant.

This article is divided into five sections. The first section addresses the case of Brazil as a natural experiment. The second section briefly revisits the key arguments about the institutional and non-institutional determinants of party system size, and the key hypotheses under examination. The third section presents descriptive statistics showing the longitudinal changes in party system size of both groups of states. The fourth section discusses the results of a multivariate regression analysis of the determinants of party system size. The article concludes with essentially three main points. Firstly, a country's institutional framework is a necessary but not sufficient condition; secondly, as others have indicated, the institutional and societal interactive effects yield more explanatory gains than their additive impact; finally, subnational economic conditions and the educational profile of voters matter as well. All in all, the findings of this article have important implications for state-building and electoral engineering projects in general.

The unique case of Brazil

A natural experiment on party system development occurred in Brazil with the transition to democracy. Brazil had had a "forced" two-party system from 1966 until 1979, when a new party law was enacted. The compulsory character of the bipartisan system stemmed from the fact that two years after the 1964 coup, the military junta abolished the existing multiparty system and created two new political parties: the ARENA (National Renewal Alliance) and the Brazilian Democratic Movement, the MDB (Skidmore, 1988). The rigidity of the party laws and the severe repression under way prevented the formation of alternative party labels. The pro-democratic opposition took shelter in the MDB (Kinzo, 1988). The degree of violence perpetrated by the authoritarian regime initially prevented the MDB from exercising any real pressure against the regime, but that changed after the dictatorship started to lose popularity (Lamounier, 1980; Lamounier and Ferrari, 1986; Lamounier and Muszynski, 1983).

In preparation for its withdrawal from power, the outgoing regime decided to put an end to the bipartisan system by allowing other parties to form. The military junta was successful in its strategic objective, which was to fragment the opposition. Under the forced bipartisan system, the MDB had aggregated opposition forces from varied ideological backgrounds. With the relaxation of the party legislation, however, three other parties emerged and the MDB (later PMDB) lost a large number of members.³ Hence, after 1979, by executive *fiat*, the compulsory bipartisan system had its death decreed, and the reorganization of the party system began. The newly created parties were faced with important challenges: build up name recognition and expand their organization to all the subnational units of an almost continental country.

Those were daunting tasks, given that the Brazilian federation comprises 26 states and a federal district (or “Distrito Federal”). The party rules are homogeneous throughout the country; they prohibit the existence of state-based parties.⁴ The electoral system is also the same. Brazil utilizes open-list PR for the selection of members of the Chamber of Deputies, the state assemblies, and councilors at the municipal level. For the election of representatives to the Chamber of Deputies, each state (plus the federal district) is a district in itself. There is no *formal* threshold of representation for any elected position anywhere in the country. Furthermore, state-based elections (i.e. for president, governor, senator, federal and state congressmen) take place simultaneously in all states. There is a two-year gap between those elections and the elections for mayor and councilmen (which also occur simultaneously in all municipalities across the country).

There is only a single but important aspect that distinguishes the states in Brazil: their DM in the case of the PR elections – that is, for the Chamber of Deputies and state assemblies as well. This article focuses on the former, given its importance for national-level politics in Brazil. The federal deputies play an important role when it comes to elaborating and enacting federal laws, examining bills emanating from the Executive power, and articulating state-level and federal-level interests (Figueiredo and Limongi, 2001).

As mentioned before, Brazil has 16 states with variable DM (from nine to 70⁵), besides 11 other states with eight seats per state. The presence of the latter allows us to control simultaneously for all institutional variables and to verify the weight of non-institutional factors in determining the degree of fragmentation of a party system. According to the literature, what is the link between institutional design and the shape of party systems and especially what role does DM play?

Determinants of party system size

From the institutionalist side, classic party theory contends that single-member simple plurality systems create strong incentives to the formation of two-party systems, whereas PR systems – as is the case in Brazil – have a tendency towards multiparty systems (Duverger, 1954). As is widely known, the former occurs due to the mechanics of this institutional setting (Benoit, 2002; Taagepera and Shugart, 1993) and its psychological corollaries (Blais and Carty, 1991), particularly the incentive to strategic voting (Abramson et al., 1992), which reinforce a bipartisan configuration. For Brazil, which has a PR system, this means that its states (all of them) will tend to depart from a two-party system – albeit at an unknown speed and towards an unknown multiparty format.

Furthermore, in political systems based upon PR, at least two other institutional factors work as important predictors of the degree of fragmentation of a party system: the DM and the threshold for representation. The fragmentation refers to the level of dispersion of votes, or seats in the parliament, across parties in a political system and can be measured in different ways (Laakso and Taagepera, 1979; Molinar, 1991; Rae, 1967). As Brazil does not have a formal threshold for representation, the literature that analyses the impact of this factor on party system size – such as Çaha (2003), Krouwel and Lucardie (2008), Lijphart (1994), Pappalardo (2007), Rae (1967), and Sartori (1968) – will not be discussed here.

Several works have indicated that DM affects the fragmentation of a party system in a significant way. In PR systems, the higher the DM, the greater the likelihood that small parties will obtain formal representation, thus increasing the dispersion of votes and parliamentary seats across parties (Cox, 1997; Lijphart, 1994; Taagepera and Grofman, 1985; Taagepera and Shugart, 1989).⁶

The literature considers a single-member district to have a low magnitude, which transforms it into a challenging environment for minor parties. However, it does not possess precise parameters to unequivocally classify other magnitudes as medium, high, or anything in between. Reed (1990) considers Japan, with its three to five seats per district, as having mid-sized districts. Benoit (2002) seems to place the case of Malta, with its five seats per district, in the same range. Nevertheless, there is no clear-cut definition as to what constitutes a high-magnitude district. Monroe and Rose (2002) deem a magnitude of 10 seats per district high. According to the latter, even the small states in Brazil, whose district size is eight, have a sizable magnitude if one is to compare this case with other national experiences. DM, thus, is another factor that should make all states in Brazil move from bipartisan systems towards a multiparty format.

Second, and more importantly, if the DM does have a linear positive impact on the fragmentation of votes, then the effective number of electoral parties should be similar among the group of states whose district size is equal. This implies that the degree of variation of the ENPV for each electoral cycle should be similar among the homogenous group and lower than that of the heterogeneous set.

In sum, the institutional settings of Brazil's subnational party system create very specific sets of incentives. Firstly, the PR system with large DMs suggests that all the Brazilian states should move towards multiparty configurations. However, one should expect substantial differences between the two groups when it comes to the degree of variation of each group's ENPV.

This is the institutional component of the equation. Indicators of societal complexity are also thought to be important factors, as party systems reflect the social structure in which they are embedded. As indicated previously, the literature on social cleavages epitomizes this view (Lipset and Rokkan, 1967), showing that these cleavages tend to gain expression at the political level, shaping a country's party system rather decisively. Other authors have refined this perspective, showing that, in fact, social diversity interacts with the institutional framework (Amorim Neto and Cox, 1997; Cox, 1997; Ordershook and Shvetsova, 1994), resulting in highly fragmented party systems in some cases, and in bipartisan systems in others.⁷

In this article, we make use of two variables that are indicative of societal complexity. The first one is the GINI coefficient, which measures the degree of equality of income distribution (Dorfman, 1979; Gini, 1921) and, as such, is an indicator of class-based disparities. We expect that the higher the coefficient (i.e. the more unequal the society), the more diverse its social structure and the greater the tendency that voters' electoral choices will be dispersed. The second element is an indicator of ethnic-based societal diversity. We use the effective number of ethnic groups to measure ethnic, or racial, heterogeneity (Amorim Neto and Cox, 1997; Ordershook and Shvetsova, 1994).⁸ Similar to class-based societal diversity, we expect more ethnic heterogeneity to lead to more vote dispersion and to a more fragmented electoral arena, as there are potentially more interests to be represented and the possibility of a larger number of parties attempting to represent those constituencies.

We also include two additional variables. The first one is unemployment, measured at the state level. We expect this factor to have a positive relationship with the effective number of electoral parties. The whole body of literature on retrospective voting, starting with the seminal work by Downs (1957), ascribes extreme importance to the economic conditions of a polity before voters go to the polls. Adverse economic conditions, such as unemployment, are said to produce retrospective voting against incumbents (Roberts and Wiebbles, 1999), which, in multiparty systems like Brazil's, can trigger the fragmentation of the vote, as voters will tend to choose one among the many opposition parties.

Secondly, we utilize illiteracy rate as an indicator of the voters' educational profile. The latter presents considerable variation in Brazil.⁹ Illiteracy is an important indicator as not only is there a cost associated with getting to know new party labels and learning who their candidates are and what they propose, but also because all those activities call for literacy skills. Even in the case where political parties have excellent organizational structures and are able to build up name recognition by going door to door, the physical act of voting is easier for voters who are able to read.¹⁰ Furthermore, the literature on the Brazilian voter has provided evidence that lower educational levels, particularly in the more rural regions of the country, associate with the support for traditional long-standing parties, which, in some cases, are also known for making use of clientelistic practices (Leal, 1949; Montero, 2010; Soares, 1973). Needless to say, new parties face difficulties to penetrate those areas. Thus, we expect higher rates of illiteracy to be associated with a less fragmented party system in the electoral arena.

In sum, whereas the institutional-focused accounts predict fragmented party systems in the case of high DMs and PR, societal-centric narratives foresee the same results in the face of high levels of both class-based inequality and ethnic fragmentation. High unemployment should have a similar effect and comparatively higher levels of illiteracy the opposite effect. It will be interesting to see how these factors interact, especially in a country known for its high level of income-based inequality, but only low to moderate levels of ethnic diversity. Before proceeding to the discussion of the multivariate statistical analysis, we will provide some important descriptive statistics on the evolution of state-level party system fragmentation in Brazil.

The state-level outlook of Brazil's national politics

This study analyses the official results of elections for the lower house in Brazil for all states for all the elections that have taken place since the 1980s, which are the following: 1982, 1986, 1990, 1994, 1998, 2002, 2006, and 2010. We calculated the ENPV for each state in each electoral cycle, using the formula proposed by Laakso and Taagepera (1979). The 1982 election is considered as point zero (i.e. the initial moment of the natural experiment), as it was the first election after the military dictatorship relaxed the party rules and allowed for the creation of multiple parties. The 1986 contest, however, was the first election to take place after the military withdrew from power.

Figure 1 displays the evolution over time of the fragmentation of Brazil's state-level party system, separated by the two groups of states.¹¹ The visual inspection alone of the data clearly indicates, firstly, that both sets moved away from a bipartisan configuration; they did so in 1990, that is, within two electoral cycles of party competition. After the 2006 election, all states became cases of "moderate pluralism" (Sartori, 1968), that is, they possessed five or more effective electoral parties.¹² Thus, the large size of the DM in Brazil has had the expected effect. All states have ceased to have bipartisan systems. A quick look at the graphs from Figure 1 also indicates that among the homogenous group, there is considerable diversity in the size of their party system and in the speed at which they moved away from a two-party setting.

In order to move from a mere visual inspection of the data and assess the degree of in-group variation in party system size, we calculated the coefficient of variation of the ENPV, which is the ratio of the standard deviation to the mean,¹³ for each election, taking each group of states as the unit of analysis. This measure is useful in this context, given that we are comparing distributions in which the units are distinct. As one can see in Table 1, the homogenous group presented considerable internal variation of their ENPV, especially in 1986 and 1998. Interestingly, in the 1982 election, the homogenous group of states presented much less internal variation than its heterogeneous counterpart. The latter was almost twice as varied as the former. After 1982, the difference between the coefficients of variation for the two groups decreased considerably. In fact, in the 1998 election, the homogenous group exhibited *greater* intra-group variation than the states with

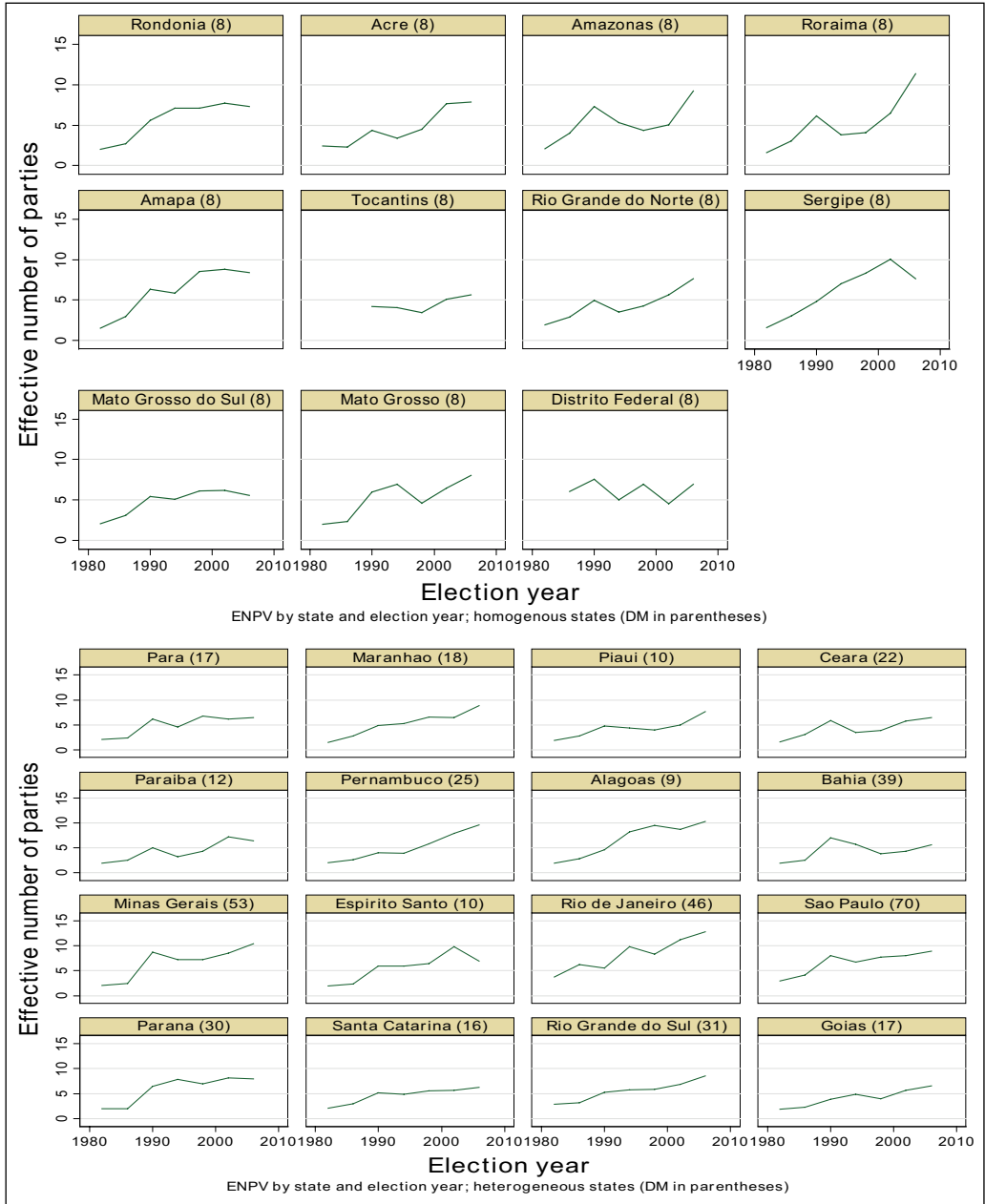


Figure 1. Effective number of parties by group of states and election year (1982–2010).

multiple DMs. In the other years, the gap in the coefficient of variation between the two groups was very small, which, of course, indicates that the degree of internal variability of the homogeneous states is not so different from that of the heterogeneous states.

In sum, the group of 11 states with equal DM moved to a multiparty configuration. In fact, all states did so. Furthermore, their party system presented a level of fragmentation that is as high as that of the heterogeneous states, which shows that factors beyond the institutional framework play

Table 1. Coefficient of variation (%) of effective number of parties in elections for the Chamber of Deputies.

Group	1982	1986	1990	1994	1998	2002	2006	2010
Homogenous states	15.35	33.83	19.32	26.90	31.71	25.43	20.75	17.41
Heterogeneous states	26.30	34.42	23.33	31.71	28.49	25.53	24.17	17.46

an important role as well. One must incorporate other elements into the analysis, which is what we do next.

Analysis of determinants

Other factors that we incorporate into the analysis are an indicator of the educational profile of voters (illiteracy), a measure of state-level economic conditions (unemployment), and two societal variables (the GINI coefficient and the effective number of ethnic groups)¹⁴ – we analyze their combined and independent effect on party system size.

The nature of the independent variables listed above and the overall features of the data create some issues for the statistical analysis. Firstly, we are working with a short panel (a considerable number of sections, 27 states, across a relatively small number of time periods, eight elections) and not all statistical regression models work well with this type of data. Secondly, the institutional factor, the independent variable DM, is constant over time, but presents considerable variation across states and, according to the specialized literature summarized earlier, plays an extremely important role in shaping party system size. Thus, we need a regression model that can run on an independent variable that is time-invariant and simultaneously varies across sections. Fixed-effect estimators are, therefore, inadequate, as they do not compute coefficients for independent variables with zero “within” (i.e. over time) standard deviation (Cameron and Trivedi, 2010: 258). Thirdly, as we are working with panel data, we cannot assume that the regression errors are independently and identically distributed. Quite the contrary, we should expect the errors *not* to be independent over time or across sections (or states, in the analysis). It is reasonable to assume that the level of state party system fragmentation in one election year has a lagged effect on the following year, as parties have bases and more or less captive clienteles – however small or big they are. Furthermore, it is also possible to ignore or underestimate the effects of cross-sectional dependence, as voters in different states may have similar political culture, levels of party identification and party rejection, and electoral behavior in the face of, for instance, rampant, invariant, or decreasing unemployment.¹⁵

In order to properly deal with these difficulties, we utilize a pooled ordinary least squares regression model with Driscoll–Kraay standard errors.¹⁶ This model is adequate for short panels, handles well both cross-sectional and temporal dependence, and can estimate the coefficient for the time-invariant independent variable DM. More importantly, this model has been shown to be robust to the “correlation of regression disturbances over time and between subjects” (Hoechle, 2007: 281).

We ran different models, whose results are presented in Table 2.¹⁷ The coefficients for the homogenous states are presented separately from those of the heterogeneous groups of states. Firstly, starting with model 1, we see that changes in societal complexity (as measured by both the GINI coefficient and the index of ethnic fragmentation) have no statistically significant effect on party system fragmentation. The time-invariant and spatial-invariant DM helps explain this lack of statistical significance, as the group of homogenous states present as much societal diversity as their heterogeneous counterpart, but that diversity cannot reach the party realm due to the

Table 2. Pooled ordinary least squares regressions using Driscoll–Kraay Standard Errors on effective number of parties for the Chamber of Deputies in Brazil.

Variables	Homogenous states	Heterogeneous states	
Models	1	2	3
Voters' profile	-.090***	-.067***	-.070***
Illiteracy	(.014)	(.010)	(.011)
Economic conditions	.060§	.185**	.202***
Unemployment	(.029)	(.052)	(.034)
Societal diversity	-3.802	.348	5.501
GINI coefficient	(3.869)	(3.119)	(3.670)
Ethnic fragmentation	-.728†	1.831**	1.323*
	(.349)	(.448)	(.447)
<i>Institutional factor</i>		.015***	.113***
District magnitude (DM)		(.003)	(.020)
<i>Institutional and societal factors</i>			-.222*
DM*GINI			(.081)
DM*Ethnic fragmentation			.016 (.020)
Constant	11.208**	2.873	.755
	(3.035)	(1.926)	(2.469)
N observations	65	96	96
N groups	11	16	16
Lag	4	4	4
R ²	.191	.333	.347

Notes: (a) time: $t = 8$ (1982, 1986, 1990, 1994, 1998, 2002, 2006, and 2010); (b) sections: $i = 25$ states in 1982; $i = 26$ states in 1986, and $i = 27$ states for all the remaining years; (c) there are 11 with equal district magnitude (DM) and 16 with variable DM; (d) we do not have data on unemployment for any of the states in 1982 and 1986 and the GINI coefficient for the state of Tocantins in 1990, thus $N = 161 [(25 + 26 + (27 * 5)) - (25 + 26 + 1)]$; (e) STATA command used: *xtsc*; (f) Driscoll–Kraay standard errors are in parentheses; (g) * $p < .05$, ** $p < .01$, and *** $p < .001$; h) † $p = .064$ and § $p = .070$.

comparatively lower number of seats, fixed as eight seats per district. In other words, the DM of eight seats does not allow variation in social diversity (whether in income distribution or in the level of ethnic diversity) to foster variation in the ENVP at the state level.

When it comes to the heterogeneous states, the comparison between the models in the two last columns reveal that the inclusion of interaction terms (DM*GINI and DM*Ethnic fragmentation, in model 3) yields greater explanatory power than when the effects of societal complexity and DM are independently added to the equation (as in model 2). Interestingly, distinct levels of DM prevent or foster the translation of greater levels of societal diversity into new political parties. In fact, model 3 in Table 2 indicates that the interaction between DM and the GINI coefficient is a statistically significant positive number when DM reaches any value between 9 and 22 {as $GINI * DM = [\beta GINI + (\beta GINI * DM)] = [5.501 + (-2.222 * DM)]$ }. For any DM values above 22, the interaction DM*GINI results in a negative number; that is, keeping all other factors constant, it contributes to *decreasing* the overall number of effective electoral parties. In other words, the Brazilian case indicates that class-based societal diversity is indeed a key ingredient in the fragmentation of a party system. Greater inequality in income distribution, by and large, tends to lead to an increase in the effective number of electoral parties, but there is an upper limit to this increase, which, in this particular national context, is the magnitude of 22 districts. Thus, one of the principal drivers of the

fragmentation of the party systems is the sheer multiplicity of class-based interests within a society. The more diverse the latter are, the more they will call for political venues that cater to their particular concerns, which will drive up the number of political parties contesting for seats when legislation is permissive. On the other hand, there seems to be a lower limit to this interaction between societal complexity and institutional framework, which, in Brazil, is eight seats per district. As we saw, a DM of this size makes it difficult for class diversity to translate itself into greater party pluralism.

Still in the same table, models 2 and 3 indicate that increases in unemployment significantly contribute to accentuating party system fragmentation; in model 1, this variable falls only marginally out of statistical significance ($p = .070$). Unemployment, thus, does exert an impact on party system size, leading it to become more fragmented. This is an important finding, given that it calls for an increase in the complexity of the analysis of party systems and the longitudinal evolution of their format. As pointed out previously, the literature usually focuses either on institutional or societal determinants of party system fragmentation (Norris, 2004), or the interaction between them (Amorim Neto and Cox, 1997; Ordeshook and Shvetsova, 1994). Our result for unemployment shows that the subnational economic climate under which voters go to the polls also plays an important role in this phenomenon. Voters as a collective respond to subnational economic conditions in ways that affect the degree of fragmentation of the party system. Therefore, in a situation where two countries have absolutely identical institutional frameworks, their party systems may still progress in different ways, partially in response to differences in the state-level economic situation. For federal countries with identical subnational institutional structures, our result for unemployment implies that, should there be significant variation in this aspect of the economic landscape of its states, their subnational party systems will tend to have different formats. However, a word of caution is needed when extrapolating this finding to other national experiences, as the lowest DM in Brazil (eight seats) is either high or moderately high in the international context, which means that this effect may not be found in, for instance, federal systems with uninominal or small-size districts.

Finally, it is interesting to note the important, statistically significant effect of illiteracy on party system size. In every single one of these models (including model 1), illiteracy is shown to significantly depress the overall effective number of electoral parties. Illiteracy, thus, acts as an important force derailing the fragmentation of the vote, which corroborates the view that illiterate voters are more reluctant to cast their ballots for non-mainstream, alternative parties. In other words, at least in Brazil, literacy is an important ingredient for the rise of non-traditional parties and the dispersion of party preferences.

The interaction between ethnic-based diversity and institutional framework is also shown to exert a positive impact on the effective number of electoral parties. Contrary to the interaction with class-based heterogeneity, however, the effect of ethnic diversity is not statistically significant. Even in states with high DMs (such as those in the heterogeneous group), increases in ethnic diversity do not lead to the rise of the ENVP. This result suggests that political parties mobilizing along ethnic lines in Brazil would not have a chance of obtaining a share of votes that is large enough to increase the party system's overall degree of fragmentation – as measured by the ENPV. As mentioned before, this result relates to the fact that, by international standards, Brazil has only low to moderate levels of ethnic diversity.¹⁸ An entirely different outcome could occur in federal polities with an institutional framework similar to Brazil's, but with high levels of ethnic heterogeneity.

Overall, these results validate a point made by Amorim Neto and Cox (1997), according to whom societal diversity interacts with the institutional framework of a polity, leading to a more fragmented party system when the electoral structure is permissive (for instance, when DM is high). Thus, in the case of Brazil, the comparative smaller DM of the states with identical institutional features acts as

a gatekeeper for the translation of societal diversity into party pluralism. On the other hand, when the electoral structure allows, societal diversity can foment the increase of the number of parties in the electoral arena. In addition, the Brazilian case also suggests that the kind of societal diversity that interacts with the institutional structure of the party system and contributes to its state-level fragmentation is context-dependent. Brazilian political parties rallying support along class lines have a better chance of gaining electoral ground (fostering the dispersion of votes and, consequently, the increase in the effective number of electoral parties) than those intent on mobilizing around ethnic diversity.

Conclusions

This article confirms the institutions-centric view that large DMs will engender multiparty systems in the long run. That is, electoral districts with multiple seats in dispute will move away from a bipartisan configuration after a number of electoral cycles (the electoral engineering conducted by the Brazilian dictators did perform as planned). However, the evidence presented has important bearing on the explanatory weight of institutional factors, DM in particular.

DM is just one among several components shaping a party system, that is, its degree of fragmentation. When DM is very low (i.e. one), it will create incentives for the concentration and not dispersion of votes, and the maintenance of a bipartisan configuration over time (Cox, 1997; Duverger, 1954). On the other hand, higher DMs (such as Brazil's) do allow more parties, especially small ones, to become relevant actors in the electoral arena and to potentially have access to political representation. However, district size works more as a necessary but insufficient condition.

The complexity of the societal structure works as a key ingredient of political plurality. In countries like Brazil, a highly segmented class structure calls for more party actors to represent the multifarious social groups. Nonetheless, this factor is also a necessary but insufficient condition. The comparison between the states with identical institutional rules and the heterogeneous states reveals that DM works as a gatekeeper, which facilitates or impedes the political expression of social diversity in the formal arenas of power. In the case of Brazil, we saw that there are thresholds above which an increase in DM opens the door for more social complexity to gain political voice and below which it closes the same door.

Another important lesson of the analysis is that politics with variable DMs pose serious obstacles to the nationalization of politics, when the latter is simply understood as the "territorial homogenization of electoral behaviour" (Caramani, 2004: 1). In newly (re)democratized countries with PR and large DMs, even though substantial social inequality can accelerate the pace of emergence of a full-blown political pluralism, the latter may acquire different shapes across subnational units, depending upon the combined effect of institutional framework, societal complexity, the state-level educational profile of voters, and differences in the economic conditions of each subnational unit. Furthermore, additional research needs to be undertaken to assess the impact of a potentially important omitted variable: the effect of party elites' cohesiveness on party system size. Is this the factor that helps explain the differences in party system size between, for instance, the states of Mato Grosso do Sul and Sergipe? Or, between Santa Catarina or Goiás, and Rio de Janeiro?

Finally, the findings of this article have further implications. Societal differences within countries pose limits to the idea of electoral engineering. Subnational social diversity may engender distinct dynamics under the same institutional framework. Over the long run, party systems with PR, large DMs, and identical features in all the other aspects of the institutional framework may come to develop different dynamics. As pointed out by others, such as Manning and Antic (2003) and Salloukh (2006), more attention should be paid to societal complexity and the diversity of the subnational politics in any given country before recommendations can be made – if they are to be

made at all – as to which electoral system a country should or should not adopt. At the domestic level, reform-oriented politicians should also keep these considerations in mind when they propose changes to their countries' electoral or party system, anticipating outcomes that – for the reasons spelled out in this study – might not materialize.

Acknowledgements

The author would like to thank the anonymous reviewers of *International Political Science Review* for their constructive comments.

Funding

This work was supported by the CNPq, Brazil's National Council for the Development of Scientific Research (Grant 77136/2006-0).

Notes

1. Just to clarify, this study will not be analyzing the results of the elections for the state assemblies in Brazil, but the state-level results of the elections to the national-level lower house.
2. The formula is one divided by the sum of the squared share of votes of each party.
3. The new parties were PT (the Workers' Party), PDT (Democratic Labour Party), and PTB (Brazilian Labour Party).
4. In order to be first recognized by Brazil's electoral management authority (TSE, or Superior Electoral Tribunal) and allowed to participate in elections, aspiring political parties in Brazil need to collect valid signatures from voters in at least one-third of the states. A minimum of half a percent of all valid votes in the last congressional elections (across all states) is needed for TSE to give aspiring parties the license to operate (Law 9906/1995).
5. The states that form this group and their DMs are the following: Alagoas (9 seats), Espírito Santo (10), Piauí (10), Paraíba (12), Santa Catarina (16), Goiás (17), Pará (17), Maranhão (18), Ceará (22), Pernambuco (25), Paraná (30), Rio Grande do Sul (31), Bahia (39), Rio de Janeiro (46), Minas Gerais (53), and São Paulo (70).
6. Other works have tried to determine exactly which parties benefit and lose. Monroe and Rose (2002) suggest that urban-based parties are disadvantaged in countries with multiple DMs.
7. It is important to mention the issue of self-selection, as countries with a complex and diverse societal structure will tend to choose more permissive electoral laws, which will facilitate the electoral and parliamentary representation of different social groups, thus sowing the seeds of a fragmented party system.
8. The formula for the effective number of ethnic groups is one divided by the squared sum of each ethnic group's share of the population.
9. According to preliminary data from 2010 IBGE Census Bureau, the illiteracy rate (as a percentage of the total population, not just the voting population) was 24.3% in Alagoas and 3.5% in the Federal District (www.ibge.gov.br). The 1988 Constitution in Brazil eliminated the last obstacle to the full inclusiveness of the political system, by extending the right to vote to illiterate individuals. Registering to vote and voting are mandatory in Brazil for voters between 18 and 70 years and optional for those between 16 and 17 years and those over 70 years.
10. Brazil has an electronic voting system, whereby voters, who cast their ballots in touch-screen computers, have to be able to type in their candidate number in order to vote, and confirm their choice once the name and picture of their preferred candidate appears on the screen. In the state and federal elections, voters have to type in the numbers of the candidates to the presidency, senate, governor, and state and federal congressmen (i.e. five different numbers), and in municipal elections, the number of their mayoral and councilor candidates (i.e. two different numbers).
11. The total number of states in the homogenous group of states changed over time (from 9 to 10 to 11), due to the fact that the Distrito Federal started to elect representatives to the lower house only in 1986, and the state of Tocantins only in 1990.

12. In his definition of moderate pluralism, Sartori makes allusion to the number of parties (not their effective number) *and* their ideological distribution in the political spectrum. Here we focus solely on the (effective) number of parties.
13. The coefficient of variation (*CV*) has been calculated as the standard deviation (*S*) divided by the mean (*X*). In order to express it as a percentage, we multiplied the ratio by 100. Thus, $CV = 100 * (S / X)$. See Spiegel (1994).
14. The 2010 data for GINI and for ethnic fragmentation were taken from the preliminary results of the 2010 Census made available by the IBGE Census Bureau (www.ibge.gov.br). The table in the Appendix displays the descriptive statistics of these variables.
15. In fact, the Pesaran's test of cross-sectional independence on a full model with all states (results not shown) strongly rejects the null hypothesis of no cross-sectional dependence in the data. We used the Stata command *xtcsd, pesaran abs* to perform this test. See De Hoyos and Sarafidis (2006).
16. In Stata, this model is calculated by the user-written *xtscc* command. See Hoechle (2007). The Driscoll–Kraay standard error estimates have been shown to be robust to temporal and cross-sectional dependence (see Driscoll and Kraay, 1998).
17. All models impose a lag of four years, as elections take place in Brazil every four years.
18. Unfortunately, the lack of uncontested, reliable international statistics on the theme poses an obstacle to the clear placing of the Brazilian case in any ranking. In the 1997 Amorim Neto and Cox article, which is based on 54 nation-states, there were at least eight countries with a level of ethnic diversity higher than Brazil's. In the 2003 Alesina et al. article, Brazil occupies the 139th position amidst 215 countries, ranked from low to high according to their degree of ethnic heterogeneity.

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Author biography

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Appendix

Descriptive statistics on independent variables (all years combined).

Variable	Group	N	Mean	Standard deviation	Minimum	Maximum
Illiteracy	Homogeneous states	87	18.85	9.76	3.31	45.44
	Heterogeneous states	128	21.01	13.04	3.93	54.58
Unemployment	Homogeneous states	66	7.83	3.43	3.3	20
	Heterogeneous states	96	6.78	2.45	2.49	12.5
GINI	Homogeneous states	87	0.6	0.05	0.45	0.72
	Heterogeneous states	128	0.6	0.05	0.45	0.73
Ethnic diversity	Homogeneous states	88	1.84	0.28	1.21	2.4
	Heterogeneous states	128	1.82	0.25	1.21	2.53