Territorial and Electorate Size Influence: Participation/ Competitiveness in Costa Rica's 2016 Local Scale Elections

Daniel A. de Azevedo *

Bruno Lessa Meireles +

Abstract

In recent years, political geography has begun to revisit traditional geographical theories using quantitative methodologies. Size, location, density, position, and other important geographic characteristics have re-emerged as central data points in the analysis of political phenomena. In this article, we analyze possible relationships between size (territorial and electoral) and electoral outcomes (competitiveness and participation) in Costa Rica's 2016 local (canton) elections. In this effort, we seek to revisit a tradition abandoned by some currents of geography, often erroneously associated with geographic determinism and widely criticized by geography researchers since the 1960s. Costa Rica was chosen for the study because it is considered one of the most successful democratic systems in Latin America, and it is now facing important issues about its new decentralization process. Linear Ordinary Least Squares (OLS) regressions were used to analyze the 2016 elections in 82 Costa Rican cantones. This article reveals that there are important causal relationships between territorial size and electoral participation/competitiveness in Costa Rica. Conclusion Geographical analyses are crucial to understand voter turnout and competitiveness. Our conclusion could help Costa Ricans create new strategies to further develop their democracy and its decentralization process.

Keywords: Costa Rica, electorate size, electoral geography, quantitative methodology, territorial size.

Highlights: research article about electoral turnout and competitiveness in Costa Rica and its possible relationship with territorial and electoral sizes. Using quantitative methodology, we seek to understand spatial influence in local scale elections.

* Universidade de Brasília (UnB), Brasilia–Brazil. ✉ daniel.azevedo@unb.br – ORCID: 0000-0001-5354-128X

+ Universidade de São Paulo, São Paulo – Brazil. ✉ brunomeireles@usp.br – ORCID: 0000-0003-1267-6457

✉ Correspondence: Daniel A. de Azevedo. Campus Darcy Ribeiro, ICC Norte, Mezanino, Asa, Norte – Brasília DF, Brazil

Influencia territorial y del tamaño del electorado: participación/competitividad en las elecciones cantonales de 2016 en Costa Rica

Resumen

En los años recientes, la geografía política comenzó a revisar las teorías geográficas tradicionales empleando metodologías cuantitativas. Tamaño, ubicación, densidad, posición y otras importantes características geográficas volvieron al centro de los análisis de los fenómenos políticos. En ese sentido, en este artículo se analizan posibles relaciones entre los tamaños de territorio y de electorado con competencia electoral y participación. Además, el documento busca retomar una tradición abandonada por algunas corrientes de la geografía, usualmente asociada al determinismo geográfico y ampliamente criticada a partir de1960. En el artículo se emplea el caso de Costa Rica porque se considera uno de los países de más éxito entre los sistemas democráticos latinoamericanos y que actualmente enfrenta un nuevo proceso de descentralización. La metodología cuantitativa de regresión lineal por mínimos cuadrados ordinarios (MCO) fue utilizada para analizar las elecciones de los 82 cantones en 2016. El texto revela que hay importantes relaciones causales entre tamaño de territorio y del electorado con participación/competencia electoral en Costa Rica. Los análisis geográficos son cruciales para entender la participación y la competencia electoral. El artículo puede ayudar a los costarricenses en la creación de nuevas estrategias para perfeccionar su democracia y profundizar el proceso de descentralización.

Palabras clave: Costa Rica, geografía electoral, metodología cuantitativa, tamaño del electorado, tamaño territorial.

Ideas destacadas: artículo de investigación sobre participación electoral y competitividad en Costa Rica y su posible relación con los tamaños territoriales y electorales. A través de una metodología cuantitativa, se busca comprender la influencia espacial en las elecciones a escala local.

Influência territorial e do tamanho do eleitorado: participação/competitividade nas eleições cantonais na Costa Rica em 2016

Resumo

Nos anos recentes, a geografia política começou a revisitar as teorias geográficas tradicionais usando metodologias quantitativas. Tamanho, localização, densidade, posição e outras importantes características geográficas retornaram ao centro das análises dos fenômenos políticos. Nesse sentido, este artigo analisa possíveis relações entre os tamanhos do território e do eleitorado com competição e participação eleitoral. Além disso, o artigo retoma a tradição abandonada por algumas correntes da geografia, em geral associada ao determinismo geográfico e amplamente criticada a partir de 1960. O artigo utiliza o caso da Costa Rica porque é o país considerado de maior sucesso dentre os sistemas democráticos latino-americanos e atualmente enfrenta um novo processo de descentralização. A metodologia quantitativa de regressão linear por mínimos quadrados ordinários (MCO) foi utilizada para analisar as eleições dos 82 cantões em 2016. O texto revela que há importantes relações causais entre tamanhos do território e do eleitorado com participação/competição eleitoral na Costa Rica. As análises geográficas são cruciais para entender a participação e competição eleitoral. O artigo pode ajudar os costarriquenhos na criação de novas estratégias para aperfeiçoar sua democracia e aprofundar o processo de descentralização.

Palavras-chave: Costa Rica, geografia eleitoral, tamanho do eleitorado, metodologia quantitativa, tamanho territorial.

Ideias destacadas: artigo de pesquisa sobre participação eleitoral e competitividade na Costa Rica e as possíveis relações com os tamanhos territorial e do eleitorado. Por meio de uma metodologia quantitativa, procura-se entender influências espaciais nas eleições em escala local.

Introduction

We tested whether the territorial size of Costa Rican *cantones* is related to (1) electoral participation and (2) competitiveness. In addition, we tested the influence of the size of the electorate on the two items mentioned[1]. Costa Rica is considered one of the best examples of a mature democracy in Latin America (Freedom House 2018), and it is important to understand the reasons for differences in electoral participation and competitiveness in the 82 *cantones* of the country. We agree that democracy is a political system that is always in construction (Dahl 1998; Bobbio 2000 [1984]). Two hypotheses based on the vast literature on the subject that led to this work include: (1) the larger the municipality and the number of voters, the lower the voter turnout measured by voter abstention rates; (2) the larger the municipality and the number of voters, the larger the electoral competitiveness (measured by the difference between the votes received by the winner and the runner-up), that is, both have positive influence; in other words, larger territory and larger electorate results in increased competitiveness (i.e., less concentrated votes). Based on the literature, we focus on vote distribution however, we will use electoral fragmentation (total amount of political parties/candidates) data and concentration of votes on the winner data to corroborate our hypotheses. We return to the implications of this data in the next section of this paper.

Participation and *Competitiveness* represent the two main characteristics of the democratic system, as observed in different theoretical approaches, from the authors of representative liberal democracy (see, for example, Gray 1995 [1986]) on the one hand, or participatory democracy (see, for example, Pateman 1970) on the other hand. Thus, these two pieces of information serve to reasonably analyze the development of a country's democratic system (Dahl 1998). Participation is about "citizen involvement in the political process [and it] is essential for democracy to be viable and meaningful" (Dalton 2008, 902) and competitiveness "is a significant indicator for the vitality of democracy" (Lachat 2011; Rogowski 2014).

This article seeks to reintroduce classical spatial characteristics to the analysis of the Costa Rican democratic

system, relying on the capacity of the theoretical and conceptual bases of geography to produce a valuable analysis for democratic vitality. The article is divided into three main sections: first, the theoretical premises and two hypotheses of research are discussed to reveal the importance of this Costa Rican case study. In the second section, the object of study, we present and justify the database and the methodology used, highlighting how quantitative research can offer useful reflections for political geography. Finally, the results are briefly exposed and analyzed under the light of specialized literature. It is important to emphasize that territorial and electorate sizes do not determine the quality of a local scale democracy, but rather comprise the factors that need to be considered within this debate.

Territorial and electoral sizes in electoral geography

An increasing literature within contemporary political geography has re-emerged in recent years seeking to identify relationships between size, distance/proximity, and demographic density with electoral behavior, building on a tradition of geography that has been marginalized since the 1960s along with the important contributions of critical geography (Castro 2005; Painter and Jeffrey 2009). From the critics of André Sigfrield's ([1913] 2010) famous phrase about elections in France, "granite votes on the right and limestone on the left", the relations between vote and space were viewed with suspicion, usually classified as deterministic (Barnett and Low 2004; de Castro 2005).

Our article suggests that there are important geographic factors to be considered in electoral analysis. If temporal effect is one of the possible reasons to explain electoral behavior (Kostadinova and Power, 2007) we believe space is also necessary to understand the political phenomena (Taylor and Johnston, 1979; Racu et al. 2020). Considering geographic space as absolute, relative, and relational (Harvey 2012), we do not deny the contributions of John Agnew and many other geographers who have argued that the geographical context needs to be considered in electoral analyses. Instead, we have reevaluated spatial characteristics that have been ignored for the most part since 1970. Finally, we believe this paper does not deny or diminish the importance of research that points out the political determinants (Dalton 2008; Blais 2006; Rogowski 2014) to electoral participation. On the other hand, we do criticize different analyses that

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have looked for a single explanation of cause and effect. For example, Blais (2006) confirmed that the institutional variables that explain the difference in participation are overvalued. Traditional explanations sought the explanatory reason for difference in electoral participation/competitiveness in institutions. Currently, political determinants and voting behavior are more prominent, as Rogowski (2014) has already shown. We argue that in the current context of declining democratic participation in elections throughout the world (Inglehart and Welzel 2009; Dalton 2017; Souza 2019), it is necessary to expand the analysis to examine the geographic conditions of electoral behavior.

According to Fradsen (2002), it is possible to draw three theoretical explanations to understand voter behavior. First, the theory of rational voting stipulates that the individual is prepared to vote based on a calculation of gains and losses. That is, when the voter believes that his individual vote can generate effective changes, it will be worthwhile to use his/her resources (such as time) to choose a candidate and go vote. Second, the psychosocial theories (Campbell et al. 1960) of voting found that collective processes are also factors in the choice of the individual in the electoral process. Individual characteristics such as education, health conditions, and occupation are associated with a collection of identities as religion, ethnicity, race, etc. that help explain electoral behavior. Finally, institutional analyses associate participation with the electoral system (proportional, parliamentary, presidential, etc.) and point out relationships between them. Some studies, for example, associate a greater electoral participation with the proportional system of party representation than with majority systems (Franklin 1996; Blais and Dobrzynska 1998).

In general, electoral participation (turnout) and competitiveness are two primary subjects in any type of electoral analysis. The purpose of our paper, however, is also to examine them from a spatial perspective. While we measure the former by the number of people who abstain from voting, we measure the latter by the difference in votes between the first and the second candidates. To corroborate and make the data more robust, we also used the concentration of votes for the winner (shown in the main article) and the total number of political parties per election (electoral fragmentation), a well-known indicator in research on voting behavior (in Appendix B). We agree with Fowler (1993), Kjaer (2007), Lachat (2011) and Rogowski (2014) that the "elections are more competitive when parties are numerous (fragmentation)"

(Lachat 2011, 648) and, because of that, "citizens in more competitive election make their voting decisions in a way which is closer to the normative ideal of political representation" (Lachat 2011, 660). On the other hand, in general, research in Political Science examines the relationship between fragmentation and participation, placing the former as an independent variable for the latter, however, this is not our case.

There are plenty of articles that analyze Costa Rican democracy under the light of voter psychosocial factors, as those that associate the system's quality with supposed ethnic homogeneity and small social and regional inequality (Ameringerm 1982); although several studies have already found this factor to be a myth (Gudmundson 1986; Booth 1998). Others studies rest on an institutional analysis that reveals unique features of the country's constitution and its political engineering (Sartori 1996), as the dismantling of the Armed Forces in the 1950s, helping to explain the development of the democratic system in the country (Booth 1998). In our decision of analyzing the relationship between territorial/electoral size and turnout/competitiveness, we are investigating spatial reasons as a factor of an individual's decision to vote.

Our approach is influenced by the empirical work of Voda et al. (2017) and Veenendaal (2013), as well as in multidisciplinary literature on the importance of local scale for the functioning of the democratic system (Mabileau 1993; de Castro 2005; Chemerinsky 2008). Although electoral studies are more focused on a nation-state scale, international comparisons or even state/province units, we follow the contemporary trend of research on local scale electoral geography. Along with the change in scale, new quantitative methodologies have grown increasingly common as a tool to analyze traditional geographical characteristics (Johnston and Pattie 2006), bringing new impetus to electoral geography.

Various studies analyze whether creating new states (provinces, departments, etc.) and/or new local entities (municipalities, counties, *alcaldías*, *cantones*, etc.) would bring benefits to political functionality, in addition to the important discussions about the creation of new nation-states and regionalist movements (Agnew 1996). Some of them look to the possible relationship between municipal division and the democratic or authoritarian context of the country (Resnick 2017; Voda et al. 2017), while others examine the political consequences of those spatial processes (Swianiewicz 2010; Saarimaa and Tukiainen 2016). In the background of all

these studies is their attempt to identify an ideal size for virtuous political functioning.

Exploring possible reasons for differences in political participation is fundamental to the improvement of the democratic system, especially considering that democracy is neither fixed nor permanent fixed and permanent (Gallie 1956; Bobbio 2000 [1984]; Plane and Gershtenson 2004; Dahl 2012; Rauschenbach 2014). We agree with Plane and Gershtenson (2004, 92) when they confirm the importance of "the electoral context for understanding citizen behavior" and that is why it is critical that we seek new political and geographic strategies that might improve citizen participation in decision-making processes. This is the heart of the issue in political science regarding the difference between representative democracy and participatory democracy (Pateman 1970; Pieterse 2001; Avritzer 2008), and our article argues that geographic features play a central role that cannot be neglected.

Hypothesis 1–Territory and Electoral Size x Turnout

We expect a negative relationship between *territorial size* and competitiveness; that is, the larger the territory, the lower the turnout. We expect a similarly negative relationship for electorate size; that is, the larger the number of voters, the lower the voter turnout rate.

Optimum size for political participation is a traditional theme in philosophy and political science. Montesquieu had already stated that a larger territory[2] means a reduction of citizen participation, making it difficult to create a republican regime enabling despotism (Montesquieu [1748] 2010). Along the same lines, Schumpeter argued that the territorial size of the nation-state precluded the direct participation of the population (Schumpeter [1942] 2017). Benjamin Constant believed that a larger territory meant, along with other social factors as the end of slavery, the change of the notion of freedom (what he calls "freedom of the ancients and freedom of the moderns"), liberating citizens from the political function and creating the image of representation (Constant [1819] 1985). According to those philosophers, greater

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2   We use "territory" as the area controlled by the *cantón,* a State political scale in Costa Rica. We do not think it is necessary to deepen a theoretical debate about it. For an excellent debate about territory as a concept, see Elden (2013).

territory would lead the population to engage in other tasks and diminish their direct political participation.

As Downs (1957) had already stated, the costs and benefits of voting are central to understanding differences in electoral participation, especially in the comparison between social classes. We assume that political participation is the result of a series of resources, motivations and mobilization factors available to citizens. *Resources* include time, money, knowledge, and political skills, whereas *motivations* may be external (relying on electoral institutions) or internal (relying on one's own choice). *Mobilization* corresponds to the environment around the citizens: political parties, organizations, and community affiliation. Citizens are more willing to participate when they have more resources and when they are effectively motivated and mobilized (Verba et al. 1995; Voda et al. 2017).

We expect *territorial size* influences at least two of the three above. Smaller municipalities tend to decrease the resources necessary for participation, since the movement to the ballot box costs less in terms of money and time. The electoral process itself is usually conceptualized in a way that reduces the distance between citizens and polling places (Gimpel and Schucknecht 2003). Like Blais said, "it makes sense to assume that people are more prone to vote if it is easy" (Blais 2006, 116). Ballots, whether electronic or manual, are taken to the different corners of a country to diminish the resources spent in the act of voting itself. Good material conditions help what Robert Dahl (1998) calls "intrinsic equality", that is, the ability of all adults to contribute to public decisions. Without such equality of access, democracy is put at risk excluding groups and their territories from processes of representation and participation.

This is the reason why the location of participatory and representative institutions is one factor in the costs of participation, as the parliaments themselves and their ordinary meetings that could promote or diminish the existence of participants (Gimpel and Schuknecht 2003; Parkinson 2012; Azevedo 2019). The territorial size of political units can be effectively reduced through central positioning of participatory institutions and through efficient means of transportation. On the other hand, transportation helps in reducing time but it often increases monetary resources for participation. As a result, absolute territorial size is still important.

Some authors argue that, theoretically, there should be a positive correlation between citizen proximity to representative institutions and institutional accountability

(Dubus et al. 2010; Jakobsen and Kjaer 2016). In other words, the greater the physical distance between representatives and the represented, the lesser the concern of public officials/institutions with the wishes of the citizens. The chances of seeing and being seen increase in a smaller territory, promoting a closer relationship between "Parliament and Square" (Bobbio, Matteucci and Pasquino 2010).

Although it is difficult to find satisfactory evidence to absolutely validate this argument, in recent years some research has emerged pointing out that micro-states tend to be more democratic than larger ones. That is, data suggests that there is a negative relationship between territorial size and quality of democracy. As Veenendaal (2013) investigated, all twenty smaller states that are part of the United Nations (except for the Kingdom of Tonga) are consolidated democracies. The participation in smaller territories is greater, although the dynamics are completely different, as we will see later.

Building on the recent work of Voda et al. (2017), we anticipated in the case of Costa Rica that the *size of the electorate* would directly and negatively correlate with electoral participation (i.e., participation at the polls would diminish as the number of citizens increases). Lower populations, although typically voting less ideologically (Veenendaal 2013; Keheller and Lowery 2004, 2009; Oliver, Ha and Callen 2012), tend to participate more. Factors as proximity to the representative institution and proximity to other voters are crucial to understand why participation increases with a smaller population. In addition, places with lower populations tend to be more homogeneous, stimulating voter satisfaction with local politics (Dahl and Tufte 1973; Denters 2002; Denters et al. 2014).

Voda et al.'s research on the Czech Republic illustrates a finding that counters more well-known studies, such as Fornos, Power and Garand (2004) and Pérez-Liñán (2001) about Latin American countries. Voda et al. (2017) follows Olson's ([1965] 2015) Theory of Collective Action, that states that populations with a greater number of people believe less in the power of the individual vote to change anything. In this sense, Voda et al's (2017) main argument states that individuals rationally balance the cost of participation against the possible benefits. The individual may decide that the cost of going to meetings, choosing representatives, and actively participating, is too high for the possible positive outcomes this may yield for him or her.

Olson clarifies in his Theory of Collective Action that there are differences between small groups and large groups. In the former (as, for example, a group of some companies) individuals are motivated to participate in the common interests of the group, because they know that not participating would mean their exclusion from the benefits produced by the collective. Moreover, the participation of an individual in a small group is decisive for success or failure in obtaining the desired product. This difference leads to different behaviors in the process of participation: from leaders who find motivations in individual interests (as status, economic benefits, ideological, etc.) to common people who see the costs of participation outweighing the benefits and prefer to be absent. Participation is related to the size of the group involved. In our analysis, we attempt to test the validity of Voda et al's (2017) conclusions in the Costa Rican context, and evaluate whether Fornos, Power, and Garand (2004), and Pérez-Liñán (2001) are still more precise about Latin American countries.

Robert Dahl and Edward Tufte (1973) are also important authors in our analysis, because they show how big and small populations influence political systems in contradictory ways. They analyzed how democracy is related to size, from the creation of U.S. federalism to the electoral process. For the authors, the demographic size of the nation-state brought new challenges to a political system devised for categorically smaller Greek city-states. The representative system and federalism were creations to lessen the constraint generated by this geographic factor.

Geys (2006) analyzed 83 studies to explain voter turnout based on aggregated data, evaluating which variables were used, the theories that justified them, the success rate of these variables, and the level of the estimated impact of each of them in explaining voter turnout. The expected effect of population size was negative for turnout because, in this line of reasoning, more voters would mean a less decisive vote from a single voter for the election's outcome.

Blais (2006) argued that less populated countries have fewer electors per elected member, which makes it easier for candidates and parties to mobilize the vote. In addition to other attributes inherently connected with demographic size, Dahl and Tufte (1973) illustrated that citizen participation and the personal sense of effectiveness are also influenced by the greater or lesser numbers of voters in a political unit. Systems defined by the authors as "very small" (those with less than 10,000

inhabitants) tend to be more homogeneous (see also Keheller and Lowery 2009; Oliver, Ha and Callen 2012), with greater incentives to respond to general ballot and, therefore, dissent less.

Hypothesis 2–Territory and electoral size x Competitiveness

We expect that *territorial size* influences competitiveness in a positive way; that is, the larger the territory, the greater the dispersion of votes. We assert this because political representation has an obvious territoriality (de Castro 2005; Magdaleno 2010). The representatives have connections with their territories and, therefore, when a great territorial extension is at stake, it is likely that distinct interests arise and candidates from different corners of the territory compete for the position.

It is important to note that based on the work of Voda et al. (2017) we also use the number of candidates and the vote distribution as an element of calculation. As already stated above, we agree with different authors who argue that fragmentation (the amount of candidates or political parties) is a significant indicator local democratic vitality. On the other hand, we believe that using only this data is a mistake, because there can be many candidates competing and the votes remain heavily concentrated in only one of them. For this reason, we believe that the number of candidates, in and of itself, is not a satisfactory representation of political competitiveness. For this reason, the number of candidates is an important factor, but an even more important factor is the percentage difference of votes between the winner and the runner-up, as even bipartisan democracies can have competitiveness, reflective of deep democratic values.

In the aforementioned research by Veenendaal (2013), the author finds that their microstate electoral competitiveness, in addition to being smaller, presents quite differently than in the territorially large states. Richards's (1982) work on the Lighthouse Islands, Malta, and the Isle of Man, drew the same conclusions. In those cases, the added factor of a small demographic size with small territories results in increased homogeneity of political interests, thus diminishing their electoral competitiveness. In addition, it is well-known that many Pacific island democracies do not have political parties (Anckar and Anckar 2000), since "existing cleavages are less produced by ideological differences, and more as a result of 'who' about 'what' and 'as'" (Veenendaal 2013, 251). It is the geographical differentiation of interests that increases with the growth of a territory.

It is interesting to note an apparent paradox between the two hypotheses above. While, on one hand, a larger territory would reduce citizen participation due to resources and motivations, on the other, it would also increase the power of dissent and, consequently, political competitiveness. The work of Saarimaa and Tukiainen (2016) reveals the same ambiguity. It is, therefore, a greater competitiveness but with less participation. It should be remembered that those sociopolitical dilemmas are part of the very discussion of different forms of political representation, such as the pure district type, the mixed district and the proportional district, used in different ways in democracies around the planet.

Electorate size, on the other hand, can influence electoral competitiveness differently. First, as shown by Voda et al. (2017), there are typically fewer candidates per capita as the electorate increases. That is, the electoral fragmentation is reduced when the total number of those who can vote is increased, because the candidates organize themselves more ideologically in political parties. However, dissent increases, resulting in less concentration of votes for a single candidate, and a smaller difference in votes cast for the winner and the runner-up. As stated earlier, in cases where this does occur, we argue that the result is greater electoral competitiveness.

In Voda et al. (2017), the authors found that when the absolute demographic size of the political unit increases there are negative effects on the number of candidates. In analyzing post-communist municipalities in the Czech Republic, the authors concluded that the absolute and relative size of political unity is a strongly influential element in electoral behavior. For them, local elections in a more populous territory have proportionally fewer candidates than those with smaller electorates. Thus, in demographically smaller units, there are more candidates per population (Aars and Offerdal 1998; Krebs 1999; Kjaer 2007; Denters and Rose 2013; Ryšavý and Bernard 2013; Saarimaa and Tukiainen 2016).

Meanwhile, Robert Dahl and Edward Tufte (1973) argue that there is a directly proportional relationship between the social cost to the individual of political dissent from prevailing opinions within the community, and population size. In demographically smaller units it is more difficult for an individual to diverge from the rest of the community, unlike the larger units where anonymity and greater heterogeneity are expected, which makes the vote more ideological and partisan, and consequently a greater dispersion of votes is expected. The greater number of candidates per capita tends to be more

personalized, with higher value placed on the Executive than other representative institutions (Farrugia 1993; Sutton 2007).

In sum, the literature suggests that in political units with less population (and the Costa Rican case, fewer voters), despite a larger number of candidates per capita, there is a greater concentration of votes for a few candidates, calculated by the difference between the candidates in the first and the second places and the concentration of the votes for the winner. The examples of the microstates again stand out: although some are multi-party (except for Palau, which does not have political parties), the voting is always concentrated in one or a few political parties (Veenendaal 2013).

Case study, materials and methods

Costa Rica is a small country in Central America, just 51,060 km², that in 2018, according to the *Instituto Nacional de Estadística y Censos* (INEC), reached its historic high mark of five million inhabitants. There are seven provinces, divided into 81 *cantones* (Figure 1), and 485 districts which have representative seats in their respective Town Halls (*Concejos Municipales).*

Despite its relatively smaller demographic and territorial sizes globally and even in the context of Latin America, Costa Rica is consistently considered an exemplar democracy for the region and it was built in the second wave of democracy (O'loughlin et al. 1998). Renowned institutions of democracy measurement (see, for example, Freedom House 2018), put Costa Rica as the most solid democracy (along with Uruguay and Chile) across Latin America, and one of the most reliable on the planet. Costa Rican democracy intrigues us because it developed at the same moment when theories of Latin American politics correctly predicted several emerging dictatorships in the region.

In this sense, the country presents an interesting case study to explore socio-spatial dynamics that help explain the differences between democratic systems, especially in the politically turbulent region of Central America. Despite its well-known democratic quality, in recent years there has been a significant decrease in citizen participation in regular elections, in what many authors call the "crisis of representative democracy" (Fung and Wright 2003; Cameron et al. 2012). Analyzing Costa Rica could help us discover reasons and/or geographic solutions to explain this crisis.

For this analysis, we decided to use data from the 2016 election, since it was the first one performed only for the cantonal local scale. As the literature already points out, choosing an election where a national-level voting is also at stake, distorts the analysis of the local scale as national issues change the incentives for local voting (Milbrath and Goel 1977; Ryan 2004).

Finally, it is important to note that since the 1990s Costa Rica has undergone a process of decentralization of political power, following a worldwide trend in the late twentieth and early twenty-first century (Coppedge 2012). Thus, Costa Rica created new units for the local scale, politically transforming a country that was highly centralized until then (Rivera 1998; Ryan 2004; Alfaro 2009). From this process of decentralization, the cantonal figure gained strength. Although there is the scale of the province, the source of representation in the national legislature; this division is more administrative than political. *Cantones* (or municipalities) represent the second level of government of the country, followed by the districts that are considered the third and smallest political-administrative unit. Thus, Costa Rica can be understood to have a national and local scale, but not a state or provincial scale of political power (Booth 1998; Alfero-Redondo 2008).

According to Ryan (2004), the virtuous economic and political effects associated with decentralization (which he pointedly criticizes), directly influenced Latin America, whose countries sought in decentralization a solution to the crisis of the *decadas perdidas* ("lost decades") of the 1980s and 1990s. In this regard, the cantonal election of 2016 also offers a way to examine if there has been any knowledge of the Costa Rican citizen with that political-electoral change of the country.

Data

Our analysis uses data from multiple sources. These sources include the details of 82 *cantones* of the country's seven different provinces: San Jose, Alajuela, Cartago, Heredia, Guanacaste, Puntarenas, and Limón. In total, there are twelve sets of data from each canton (totaling 984 data sets), that were acquired in the 2016 *Atlas de Desarrollo Cantonal de Costa Rica* and the electoral data from the *Tribunal Supremo de Elecciones* (TSE) website. It is important to note that the universal participation rate in the 2016 elections was 35 % (TSE 2016), but its geographical distribution is very different, as we see in our analysis.

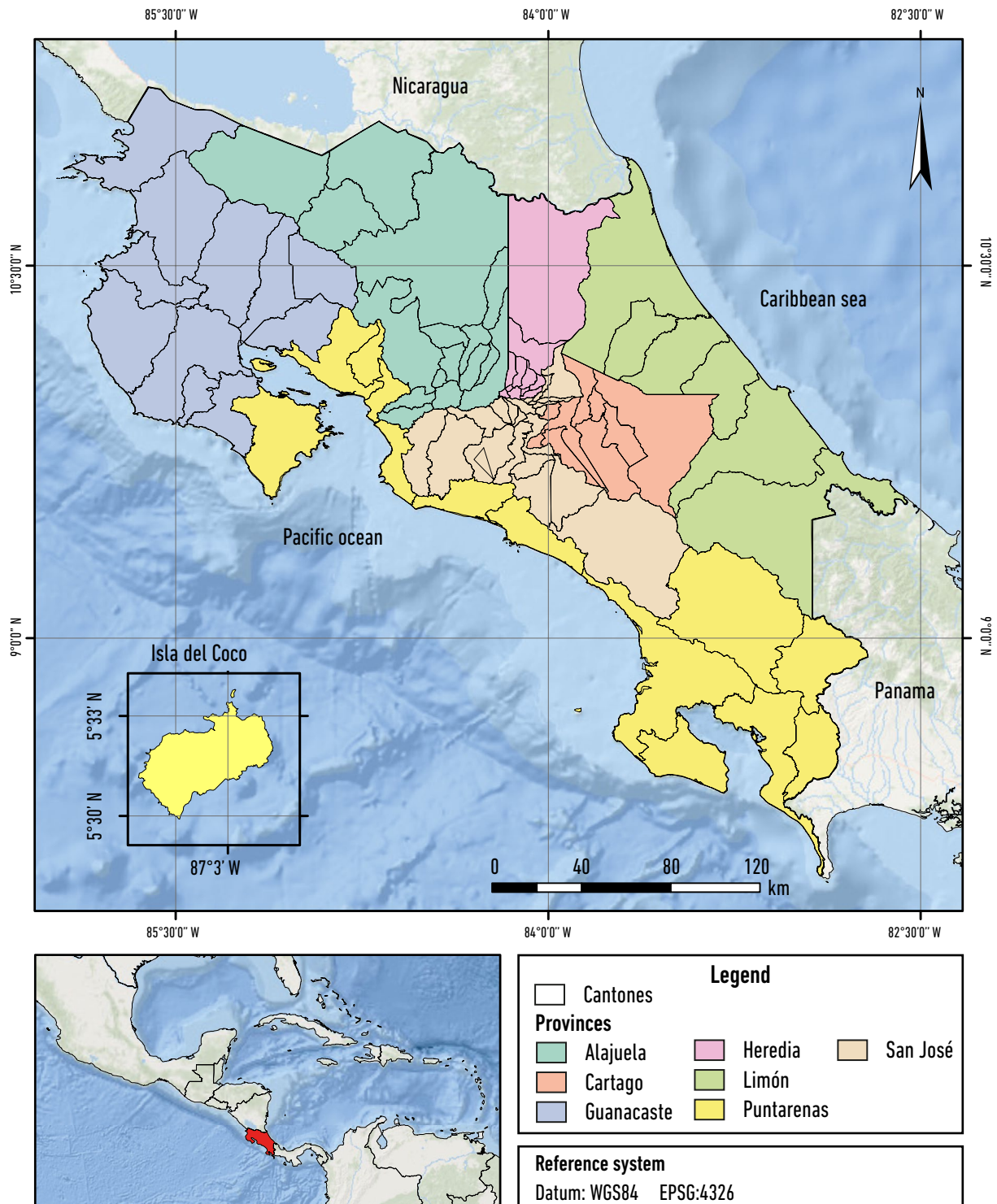**Figure 1.** Administrative territorial division of Costa Rica–*Cantones* (2016).
Source: Instituto Geográfico Nacional (2016).
Note: In 2017, a new *cantón* was created in Alajuela province ("Río Cuarto"), so, now there are 82 *cantones* in Costa Rica.

For each canton, we gather information of (1) abstentionism, (2) the number of valid votes, (3) the number of null votes, (4) the number of votes for the winning candidate, (5) the number of votes for the runner-up, (6) the number of citizens entitled to vote, (6) the number of competing parties or coalitions, (8) territorial size, (9) population size, (10) schooling rate, (11) human development index (HDI), and (12) demographic density. New proportional data using this information were added to the database.

Definition of dependent and independent variables

Our sample is defined by a cross-section based on the Costa Rican 2016 elections, where the unit of analysis that determines each observation is the *cantón*. Thus, we have 82 observations for each of the dependent and independent variables. We reiterate that we seek possible relations between size (both territorial and electorate) and voter turnout and electoral competitiveness. Voter turnout is measured by the abstentionism rate, and electoral competitiveness is measured by the most often used proxy indicator, the difference in votes between first and second place candidates (disputed contests are settled by dividing by the total number of votes in the territory) (Geys 2006; Souza 2019). Data about concentration of votes for the winner and fragmentation are used as indicators of democratic robustness check. We have chosen these data because *Regidor* is the Executive Power of the *canton,* that is why we cannot replicate the data and methodology used by other authors (Rae 1967; de Carvalho 2003; Magdaleno 2010; Lachat 2011).[3]

To remove the effects of local characteristics of each province from the betas of the other independent variables, we added dummy variables for each one of the analyzed provinces. Taken together to avoid perfect multicollinearity, the dummy variable for the province

of San José was not placed in the regressions and it was thus used as the reference category in the analyses of these dummies (Suits 1957). The methodology of using dummies in Ordinary Least Squares (OLS) regressions requires that we take one of the provinces out of the regression to be the element of comparison for the remaining ones. Thus, we selected San José due to its political and economic centrality.

The used control variables included the HDI, schooling rate, and population density at the *cantón* level. Although not the object of study, these variables (used here as a control) have already demonstrated significant influence in the main issues analyzed in this article (participation and electoral competitiveness). Therefore, we include them in the equation so that their effects do not affect the betas' estimates for the main variables (Table 1). These control variables were selected according to the literature on electoral behavior, as noted in Lappie and Marschall (2018).

Although we work with a cross-section that includes data from just one election, the diversity that the 82 *cantones* present is noteworthy for their ability to produce estimators in their regressions. For example, the number of voters among the 82 *cantones* varies from 4,365 to 231,682 people. In addition, it is important to note that the variables "abstentionism", "number of candidates", "winner votes", "number of eligible voters", and "rate of schooling" entered the database with numbers between 0 and 100, representing percentages.

Method

Like Voda et al. (2017), we use regressions to estimate the proposed relationships. However, while those authors use the Poisson regression, we chose the traditional OLS. Those authors argued that in their data the distribution of relative candidate counts is very specific, precluding their use of the OLS regression. This becomes a problem for Voda et al. (2017) if, and only if, the residues distribution was not normal. However, the authors do not make it clear whether that was specifically the case.

Another possible problem on the data distribution is linearity. In other words, the relationship between the predictors and the predicted variable must be linear. In our case, the data indicate that this issue requires special attention. To avoid this setback, we use the logarithmic or cubic form of those estimators that presented this problem. This procedure is best detailed in Appendix A.

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3   These four authors have investigated Legislative elections in proportional systems. Carvalho (2003) and Magdaleno (2010), for example, use the Electoral Competitiveness Index, based on the division between the number of candidates and the number of vacancies available. We can also see a nice methodology in Laakso and Taagepera (1979), however the division between quantity of elected candidates of each political party make sense for proportional elections. This is not our case. Articles about Executive elections (see Settle and Abrams 1976; Souza 2019) are more interesting for our paper.

Table 1. Summary of variables in the different regressions

Variable	Type	Identification
Abstentionism	Dependent	(Number of people eligible to vote–valid votes)/Number of people eligible to vote
Difference	Dependent	Difference in number of votes for first and second place candidates
Winner's Share of Votes	Dependent	Number of votes for the winner/Number of people eligible to vote
Number of Parties or Coalitions	Dependent	Number of Parties or Coalitions
ln (Territorial Size)	Independent	Natural logarithm of [Territorial size of the canton (km²)/Territorial size of Costa Rica (km²)]
Electorate	Independent	Number of people eligible to vote/Population of the canton
Electorate²	Independent	(Number of people eligible to vote/Population of the canton)²
Electorate³	Independent	(Number of people eligible to vote/Population of the canton)³
HDI	Control	Human Development Index (HDI)
Educational Rate	Control	Canton's educational rate
Demographic Density	Control	Canton's demographic density
g1(Alajuela)	Control	Equals 1 if observation Province = Alajuela. Otherwise, equals 0. San José is taken as the reference Province.
g2(Cartago)	Control	Equals 1 if observation Province = Cartago. Otherwise, equals 0. San José is taken as the reference Province.
g3(Guanacaste)	Control	Equals 1 if observation Province = Guanacaste. Otherwise, equals 0. San José is taken as the reference Province.
g4(Heredia)	Control	Equals 1 if observation Province = Heredia. Otherwise, equals 0. San José is taken as the reference Province.
g5(Limón)	Control	Equals 1 if observation Province = Limón. Otherwise, equals 0. San José is taken as the reference Province.
g6(Puntarenas)	Control	Equals 1 if observation Province = Puntarenas. Otherwise, equals 0. San José is taken as the reference Province.

Voda et al. (2017) further argue that simply using OLS would allow the predicted value to be negative in the linear regression – another reason not to use it. This would be a problem because the values of the dependent variables chosen by them (number/proportion of candidates) cannot be negative. However, Tobit's regression (albeit linear) allows upper and lower limits to be set in the expected results. Thus, we used this tool to compare its results with those from the OLS regression. The results comparison shows absolutely no negative result for the dependent variable in both the Tobit and OLS regressions. In other words, there is no difference in results between the regression types. Consequently, we chose to use the traditional OLS regression.

To avoid problems in the order of magnitude of betas estimated in the regressions, the logarithmic scale was applied to the population value of each *cantón*. The variables in our data were *winsorized*, that is, to prevent problems with outliers, observations with extreme values are replaced by the maximum or minimum values within certain percentiles (Barnett and Lewis 1994). We used the fifth and 95th percentiles as our minimum and maximum values.

In all the Tobit regressions we ran, no predicted result was censored left or right. Thus, negative predicted values are not a problem for all our regressions. Consequently, we chose to use traditional OLS linear regression.

We tested OLS assumptions for our three main regressions. As for the first one (Abstentionism), we checked for heteroskedasticity using both (1) Cameron and Trivedi's decomposition of the IM-test and (2) the Breusch-Pagan/Cook-Weisberg test. Both pointed for homoscedasticity – that is to say, we are protected from the problem of nonconstant variations at different levels of "x". These tests did not indicate the same results for our second regression (Difference of Votes). Thus, because the choice of weights is arbitrary in a weighted least squares solution, we opted for the robust error technique because it does not cause changes to the beta estimates nor the R-squared. In our third regression (Winner's Share of Votes), both tests had the same result as in the second regression and we kept our previous choice (robust error technique) for this as well.

In all three regressions, multicollinearity was not a problem. We checked the Variance Inflation Factor (VIF) and no different independent variables had VIF higher than 10.0 (except for the cases of the same variable inserted more than once for squared and cubic tests, which is expected). The normality assumption was analyzed using the Shapiro-Wilk W-test. It was conducted for the dependent variables and for the regression' errors and it implied that the normality of those variables could not be statistically denied.

Results

In addition to the regressions presented below, others were also modeled, including the interaction between Territorial Size and Size of the Electorate (i.e. Territorial Size x Size of Electorate), but for all three dependent variables this interaction did not reach statistical significance. So, using this sample, we cannot say that its relation to these dependent variables is not different from zero.

The main results are as follows:

Table 2. Regression of the Expected Abstentionism Level

Dependent variable: Abstentionism				
	No control variables		With control variables	
	Coef.	Std. Dev.	Coef.	Std. Dev.
ln (Territorial Size)	-1.155*	0.648	5.719***	0.997
Electorate	44.048	28.002	28.552	20.932
(Electorate)²	-0.685	0.447	-0.428	0.334
(Electorate)³	0.004	0.002	0.002	0.002
HDI			-31.961	20.289
Educational rate			3.512***	0.845
Demographic Density			0.005***	0.001
g1(Alajuela)			-2.656	2.505
g2(Cartago)			0.208	2.722
g3(Guanacaste)			-9.838***	2.742
g4(Heredia)			4.181	2.661
g5(Limón)			-5.617	3.42
g6(Puntarenas)			-3.274	2.833
Constant	-865.66	576.97	-915.992**	432.626
Obs.	81		81	
R-squared	0.085		0.575	
F(4, 76)	1.75			
F(13, 67)			6.98	
Prob > F	0.1468		0.0000	

Note: the levels of significance are *** 1 %, ** 5 %, * 10 %.

The regression is composed of independent variables previously proposed in this article and of control variables already pre-established in the literature to define the level of abstentionism in the election. In addition, it removes local bias through the dummies of the provinces.

The first hypothesis is tested in the regression above since it deals with abstentionism and possible relationships with territorial and demographic sizes. We can see a changing sign for the Territorial Size coefficient from the first to the second regression. In the first regression, at a 10 % level of significance, the territorial size would have an impact on abstentionism. However, without control variables, this could present a spurious relationship. Indeed, we verified that the omitted variable bias takes place here. Its both conditions are fulfilled: territorial size is correlated with demographic density (-0.7748), and at least two control variables (including demographic density) are determinants of the dependent variable (abstentionism) for this regression. Even more important, the overall model does not show statistical significance if we take the F-test results in the bottom part of the table. It is important to look for spatial differences within the overall rate of general abstentionism that the country presented in 2016.

As the table above indicates, our hypothesis was partially confirmed. There is a strong statistical relationship (as the three asterisks show in the table) between territorial size and abstentionism rate in our sample: if we increase the territorial size by 1 % it is expected that, on average, abstentionism will increase by 5.719 %. The relationship was, therefore, even stronger than we had anticipated.

These indicators point in the direction that in Costa Rica the territorial factor has a great influence on citizen participation in local elections: the larger the canton, the lesser the willingness of Costa Ricans to vote. Returning to the literature discussed above, in a country that has sought in recent years to decentralize, citizens in larger *cantones* need more resources and greater mobilization incentives to participate in elections on a political scale that they do not consider to be as important as the citizens in smaller *cantones*. As Riviera (1999) stated at the end of the 20th century, local political electoral life in Costa Rica already suffered from poor nutrition. We have reasons to believe that this interpretation is still valid.

It is important to note that a few studies show that "political culture" (Bisanz et al. 1982; Booth 1998) or "political capital" (Booth 1998; Diamond, Linz and Lipset 1989) could not be the reason that Costa Ricans avoided

participating in the 2016 elections. We must find other explanations. The regression above suggests that low citizen regard for the importance of the local scale is amplified by the size of the territory, thus reducing the resources and motivations for participation. The cost/benefit of participation is largely influenced by the territorial size of the *cantones*.

On the other hand, some of the aforementioned studies in the literature also argue that the greater the number of citizens, the lower the voter turnout. Our regression did not detect this. Despite using the proportion of voters rather than the total number of voters, we believe that the outcome of the regression would be similar to our model. In addition, the regression revealed that there was no statistical significance on the independent variable electorate size. That is, statistically, it cannot be said that the impact of the electorate size on abstentionism is different from zero. Thus, we cannot assume any relationship between these two variables. The theoretical and empirical defense previously presented (as the empirical case presented by Voda et al. 2017) does not correspond to the case studied in Costa Rica. So, in this case, our article agrees more with Pérez-Liñán (2001) and Fornos, Power and Garand (2004), whose studies regarding with Latin America have already reported no association between larger electorate and turnout.

Although there is no statistically significant relationship between electoral size and abstentionism, one could still argue that there is a small relationship when examining demographic density (even as a control variable). That is, each increase of one unit of demographic density corresponds with an increase, on average, of 0.005 % in abstentionism for this sample. This result indicates that the absolute number of this population has no influence on abstention, but it is possible to detect a relation when its distribution in the territory is analyzed. However, it is important to confirm these considerations with a regression of abstentionism against demographic density (as the main independent variable and its proper control variables) to avoid an omitted variable bias.

These outcomes are relevant to the objectives of this research. For Costa Rica, the theory of participation and population size does not apply, but when we take territory again as a variable (in population density) a relationship is revealed. In other words, our results suggest that the proportional number of voters does not influence abstentionism, but its spatial concentration does. The perception of one's ability to affect change by an individual vote is also affected by a spatial factor and not by a demographic number.

The dummy variables created for the seven Costa Rican provinces did not reveal clear distinctions in the abstentionism factor, except for Guanacaste and Limón. When we take the province of San José as reference, only Guanacaste and Limón contrast (-9.8 % and -5.6 % of abstentionism, respectively) with the main province of the country. For all others, there is no statistically significant difference. Future research needs to be carried out to understand why these two provinces are distinctions in this regard.

Finally, it is worth mentioning something we discovered in the previous regression. According with what is usually noted in part of the literature (including Dahl and Tufte 1970), the data demonstrates a positive linear relationship between schooling rate and abstentionism. That is, with each 1 % increase in the schooling rate, there is an increase, on average, of 3.512 % of voter turnout. This information about Costa Rica agrees with the reality of other countries, such as the United States (Hess and McAvoy 2015; Dalton 2017) and also converges to classical theories of political economy of the vote, such as the important work of Downs (1957).

Two important historical surveys on the electoral behavior of the Costa Rican citizens make this analysis data even more intriguing. Both surveys refer to national-level elections, since they were developed before the decentralization process that took place in the country. In the 1973 survey, data showed that wealthier people were more active in their communities; that is, the national survey revealed a positive correlation between voter participation of people and voter higher education level and occupational status. The explanation for this, according to Booth (1998), is that this better educated and better employed population had more information to make voting decisions, and better communication skills to understand campaigns and political issues. Moreover, citizens with higher education tend to have more resources —time and money— to participate.

In the 1995 survey, the social participation structure (including gender, race, and social class) remained the same, except in the electoral process. There was still a strong relationship between education and levels of community participation, but there were no significant differences between more or less educated people. Thus, 22 years after the 1973 survey, people with lower levels of schooling already participated equally in regular elections (Booth 1998).

Table 3. Regression of the difference in votes between first and second place candidates

Dependent variable: Difference

	No control variables		With control variables	
	Coef.	Std. Dev.	Coef.	Std. Dev.
Ln (Territorial Size)	-0.567	178.273	1451.128***	418.620
Electorate	-986.063	7453.943	-6521.243	6184.961
(Electorate)^2	18.221	120.754	107.167	100.288
(Electorate)^3	-0.106	0.644	-0.580	0.536
HDI			9157.924	7088.195
Educational Rate			528.156*	291.789
Demographic Density			1.039***	0.379
g1(Alajuela)			43.322	852.255
g2(Cartago)			-94.008	1020.771
g3(Guanacaste)			-2325.427***	865.803
g4(Heredia)			-485.463	936.521
g5(Limón)			-828.350	1410.674
g6(Puntarenas)			-2282.542***	859.264
Constant	18202.617	51083.559	66168.172	125338.257
Obs.	81		81	
R-squared	0.012		0.328	
F(4, 76)	1.02			
F(13. 67)			1.63	
Prob > F	0.4036		0.0982	

Note: the levels of significance are *** 1 %, ** 5 %, * 10 %.

In our research, this picture was different. In the cantonal elections of 2016, we found a positive relationship between the level of schooling and electoral participation. We have some ideas to explain this phenomenon, although more qualitative research is required to draw more accurate conclusions. As already discussed, the process of decentralization of Costa Rica is an ongoing and complicated phenomenon. The country was previously considered one of the most centralized in the Western hemisphere and it is well-known that the citizens of Costa Rica distrust the local scale government (Brenes and Martorel 2000). Compared with the presidential elections of 2018, the difference in general abstention in the 2016 cantonal elections is striking. In 2016, only 35 % of eligible voters turned out, while 66 % of the people voted in 2018 (STE 2018).

Regarding our finding in the regression presented in Table 2, educational level positively correlates with participation in cantonal elections, we argue that there are two potential reasons for this finding. First, better educated people are more informed and familiar with the importance of decentralization process introduced by *cantones* reform (Brenes and Martorel 2000; Ryan 2004), due to its historical centralist tradition. And second, less-educated populations may have relatively lower motivations levels to utilize local elections to achieve political objectives.[4] However, to avoid an "ecological fallacy" (Guerra 1977), further research is needed to confirm this inference, including on the 2018

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4 Blais (2006) pointed out how different articles have shown how division of power between the central government and subnational impact turnout. Our article agrees with such conclusion and we say that the perception of power and functions depends on different social characteristics.

presidential elections, to see if this pattern indeed repeats or if it was an anomaly of 2016.

The second hypothesis was tested as outlined in Tables 3 and 4 below. Table 3 analyzes the relationship between the difference in votes between first and second place candidates with (1) territorial size and (2) proportion of voters of the *cantón* concerning the size of its total population. Table 4 illustrates possible links between the same independent variables with concentration of votes as the dependent variable.

The regression uses independent variables previously proposed in the article and control variables already pre-established in the literature to define the level of abstentionism in the election. In addition, it removes local bias through the dummies of the provinces.

Table 4 tests our second hypothesis, the electoral competitiveness would be influenced positively both by the territorial size and the size of the electorate. We found here again that electorate size had a statistically insignificant impact on electoral competitiveness, negating that part of our hypothesis. On the other hand, territorial size is a statistically significant predictor the proportion of candidates in this sample: if we increase the territory by 1 %, the difference in votes from the first to the second-place increases, on average, by 14.51 votes, with a very strong level of statistical confidence. This regression suggests that for the *cantones* of Costa Rica, electorate size (the demographic factor) does not predict electoral competitiveness, but territorial size does so indeed, with significant influence. As we have stated before, representation is intrinsically territorial.

There is also a direct linear relationship between the educational rate the difference in votes between first and second place candidates (1 % increase in educational rate generates an increase of 528 votes in the vote difference). This number is higher than the one discussed for our main independent variable. Another important finding is about demographic density: an increase of one unit of demographic density generates 1.039 votes of difference between the first and second candidate. However, we must note that these are both control variables in this regression, i.e. these coefficients could carry many biases and problems, because they are not our main focus.

Finally, Table 4 shows the percentage of the winner's share of votes, central data to confirm our last finding:

Table 4. Regression of the Votes Level Predicted Winner

Dependent variable: Winner's Share of Votes				
	No control variables		With control variables	
	Coef.	Std. Dev.	Coef.	Std. Dev.
Ln (Territorial Size)	0.325	0.402	-3.250	0.915
Electorate	-33.870	15.512	-27.939	15.373
(Electorate)^2	0.529	0.250	0.435	0.250
(Electorate)^3	-0.003	0.001	-0.002	0.001
HDI			16.242	23.608
Educational Rate			-1.925	0.659
Demographic Density			-0.004	0.001
g1 (Alajuela)			-1.738	3.020
g2 (Cartago)			-3.137	2.532
g3 (Guanacaste)			1.476	2.800
g4 (Heredia)			-3.936	2.373
g5 (Limón)			-1.423	3.348
g6 (Puntarenas)			-3.115	3.325
Constant	726.057	316.765	803.378	304.337
R Squared	0.0501		0.3087	
Number of observations	81		81	

Note: the levels of significance are *** 1 %, ** 5 %, * 10 %.

The regression below uses independent variables previously proposed in the article and control variables already pre-established in the literature to define the level of abstentionism in the election. In addition, it removes local bias through the dummies of the provinces.

Once more, important relationships are evident, especially regarding the influence of territorial size. The table shows, for our sample, that if we increase the territory by 1 %, the percentage of the winner's votes decrease by 0.03250 %, with a very strong level of statistical confidence, confirming what we found in Table 3. In Appendix B, we have used the amount of parties or coalitions as another robustness check.[5]

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5   The full table of results can be found in Appendix B in supporting information. To verify robustness, we also ran another

Again, and contrary to all literature on the subject, electorate size (represented in our analysis by the number of voters) does not have a statistically significant influence on the percentage of votes received by the winner. The only point where we did find a relationship was at except at the 10 % significance level, but this does not hold true for all three factors of the cubic relation. Places with fewer voters may have the same competitiveness as places with more voters, although the nature of the conflict is different. For specific Costa Rican cases, future qualitative research is needed.

Absolute population aside, when we consider demographic density, we did find a small but noteworthy relationship in our regression: an increase of one unit of demographic density generates a decrease, on average, of 0.004 % in the percentage of votes for the winner. Competitiveness can thus increase when there is a greater concentration of population in the territory and not by the proportional number of voters.

Finally, the regression established a direct linear relationship between the schooling rate and the voter concentration in the winner. With each increase of 1 % in the schooling rate, there is, on average, a decrease of 1.925 % in the concentration of votes in our sample. This suggests that competitiveness increases when citizens of Costa Rica have more years of study. Although it is not part of our research objective, these results align with previous studies (Dahl and Tufte 1970).

Conclusions

This article examined the possible relationship between territorial/electorate size and participation/competitiveness. Empirically, we used a country that is an example of a consolidated democracy, but is seeking new strategies to avoid its weakening in the face of the current crisis of electoral participation in the Western Hemisphere. Costa Rica, a small country in Central America, represents those characteristics well, and it is an important exception of democratic vitality in the region where it is located.

Using a quantitative methodology, our evidence points out that there are important relationships between territorial size and electoral participation in the *cantones* of Costa Rica, confirming part of our first hypothesis. On

the other hand, we did not find any statistically relevant relationship between electorate size and participation, which differs from most of the literature (see table 1).

The second hypothesis has also been partially confirmed. We can state with a reasonable statistical margin, our evidence insinuates that larger *cantones* have a higher competitiveness (smaller difference of votes received between the first and the second placed candidates), while territorially small *cantones* have larger differences of votes. Robustness check data (concentration of votes for the winner in the main text and number of parties/coalitions in the election in Appendix B) corroborated our findings. However, regarding the size of the electorate, again, no statistical relationship was detected (see tables 3 and 4).

Such inconsistency with the literature can be reconciled by using demographic density as a control variable. Despite a smaller statistical relationship than when considering only the territory, the number of citizens is important when considered in the context of their spatial distribution. We believe Costa Rica's case could help us to improve the existing theories regarding the possible influence of electoral size on voting behavior. We found out in this case that spatial distribution is more pertinent to explain participation and electoral competitiveness than the total number of citizens.

This analysis sought to demonstrate how it is fundamental to consider geographic elements when developing an effective democratic political system. With a markedly different territory, it is necessary to create distinct rules that are needed for geographically different political units. Moreover, in the interconnected world of the twenty-first century, it is urgent to devise strategies that move in both directions: create political-democratic systems for larger agglomerations (such as metropolitan regions —see Silva and Azevedo 2020—) and smaller agglomerations (such as tiny municipalities). The geographical complexity of the twenty-first century imposes a political-institutional complexity for improving the democratic system.

Mirroring Blais (2006), we remain "impressed by the gaps in our knowledge" (Blais 2006, 122) and acknowledge that different issues still need to be investigated. We think this article can help understand more about electoral democracy. Future research needs to incorporate other characteristics to understand the different degrees of participation and competitiveness, as levels of urbanization and differentiation between center and periphery (Jakobsen and Kjaer 2016), opening up a

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regression using the amount of parties/coalitions in the election. Although changing the magnitude of the numbers, we confirmed the results of the main regression.

fascinating avenue of research. Moreover, as previously mentioned, internal and international comparisons may offer sources of other interesting questions.

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Daniel A. de Azevedo

Geographer and master in Political Geography at Universidade Federal do Rio de Janeiro (2010, 2012), Ph. D. in Political Geography at Universidade Federal do Rio de Janeiro with one-year Ph.D. scholarship at American University (2016). In 2018, he finished his post-doctoral research at Universidad Nacional Autónoma de México. He is a professor in the Geography Department at Universidade de Brasília, where his research interests include democracy, political spaces, and electoral geography using quantitative and qualitative methodology.

Bruno Lessa Meireles

Ph. D. candidate in Business Administration with an emphasis in Finance at the Universidade de São Paulo (USP), Master in Business Administration with an emphasis in Finance from the Pontifical Catholic University of Rio de Janeiro (IAG PUC-Rio). Specialist in Corporate Finance from the Institute of Economics (IE) of the Universidade Federal do Rio de Janeiro (UFRJ) and a BA in Business Administration from UFRJ. He also has professional experience in the field of Financial Administration.