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SIZE MATTERS: WHY NOT FOR CONTEMPORARY
EMPIRICAL DEMOCRATIC THEORY?

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Why not for Contemporary Empirical Democratic Theory?

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Abstract

The question of how the size of a polity and the functioning of its democracy is curiously understudied, especially in a cross-national, empirical fashion. After introducing the issue, this survey offers an overview of the various lines of research related to this topic including that on: legislatures, political participation, free-riding, and complexity and heterogeneity. After a review of the extant literature, several potential reasons for the widespread neglect of such an important topic are offered. In the final section I put forth three methodological frameworks that should prove useful for advancing our knowledge on this topic, which include an “economic” approach, logical-quantitative modeling and agent-based simulation.

Keywords

Size, democracy, comparative politics, agent-based modeling

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1. Introduction: The Role of Size in Democratic Theory

The quest to uncover the features of an optimal democratic polity is as old as the idea of democracy itself. In classical political inquiry one of the features which generated the most commentary was size—of both the population (e.g., the electorate or polis) and of the republic itself (geographic size). Plato was concerned that larger republics would be too fractious to be viable (Anckar, 1999). In his *Politics*, Aristotle held that a proper republic must be small enough that each citizen can survey its entirety and the population restricted such that each can know the others' characters. Rousseau also claimed that a good society can only have a small number of inhabitants, in order to better ensure compliance with the general will (Cress, 1987).

In fact from Plato through Rousseau, the presumption by democratic theorists was that a democratic polity must be very small—indeed on the scale of a city-state. Famously, James Madison, in the *Federalist* 10, turns these classical arguments in favor of small, homogenous republics on their head. Madison claims that the “factions” inherent in a larger republic are a virtue rather than a vice. The existence of numerous, overlapping factions would make it difficult, as the Madisonian argument runs, for any single one to gain a dominant position and rule tyrannically over the “losing” factions. It is not coincidental that theoretic inquiry into democracy was, prior to Madison, focused almost exclusively on direct democracy. Of course, in a direct democracy, a small polis is essential because every citizen must participate directly. However, Madison's construal of the benefits of pluralism stemming from a large, geographically dispersed and diverse population, combined with the apparent success of the United States as a viable republic, shifted the focus of democratic theorists increasingly toward democracy of the representative, rather than the direct, type.¹

In this paper, I argue that since, and in part because of, this shift in emphasis from direct to representative democracy, the importance of the problem of scale—especially the problem of size and democracy at the level of the nation-state—has been largely neglected by contemporary empirical democratic theorists, though there are a few important exceptions. Below, after an enumeration and analysis of these exceptions, I summarize the state of our knowledge with respect to this ancient and important, yet neglected problem. I then consider several potential causes of this neglect of the problem of scale and democracy, and, based on this analysis, suggest a few potential methodological frameworks which I believe can be (and have been) useful to tackle the variable of size in cross-national empirical democratic theory.

2. Extant Cross-National Research

Among the most erudite and concerted attempts to address the problem of size and democracy in a cross-national setting (and more generally) is Robert Dahl and Edward Tufte's brilliant, but slim, book, aptly titled *Size and Democracy*. Still, the book raises more questions than it answers. Those which it does answer, it does so only tentatively; in many cases the authors state that no definitive conclusion can be reached due to a lack of data. Essentially, this neglected classic by Dahl and Tufte serves as a call to action—they use the book to encourage further thought and reflection on issues, both theoretical and empirical, of size and democracy. Though data on population and area must surely be among the most reliable and easily attainable in the social sciences, there has been relatively little action on this front since the publication of *Size and Democracy* 35 years ago.

Among the few studies of the interaction between size and democracy at the level of the nation-state that do exist, there is a fair amount of variation in the topics which are treated. Anckar (2000), in a study of 77 countries, finds that size (as measured by both population and area) is the variable which is most strongly (positively) associated with the effective number of parties and party system fragmentation. These results hold even after controlling for urbanization and ethnic and

¹ A notable exception to this has been the relatively recent increase in scholarship, likely resulting from increasing use of direct democratic instruments in the real world, regarding direct democracy (e.g. referenda or initiatives) at the sub-national level or for constitutional matters at the national level (see Bowler and Glazer, 2008). But given that modern direct democracy is always embedded within a representative framework at the national or sub-national levels, the recent treatment of direct democracy is qualitatively different to ancient, medieval and early modern treatments of the “same” subject.

religious fragmentation, two variables which are themselves highly correlated with population. Anckar (1999), in an analysis which focuses on island microstates, finds that while attitudinal diversity is much greater in larger democracies, there is much less difference between micro- and large states in terms of categorical diversity. This finding suggests that the categorical differences in a large polity are somehow transformed into greater attitudinal diversity. This finding also lends support to my claim, discussed in detail later in the paper, that size in and of itself is important, due to the inevitable growth in complexity which accompanies size increases.

Matsubayashi (2007) finds that higher citizen satisfaction with government is strongly associated with smaller nations, though the negative effects of large populations on citizen satisfaction can be mitigated through decentralization. In sum, Matsubayashi finds that citizens are more content in smaller democracies with government institutions closer to the people. Matsubayashi's work raises an interesting point: to what extent can the (negative) effects of population size on democratic functioning be attenuated by federalism and decentralization? Although federalism is an interesting and clearly related topic, it is one which merits its own review, and thus will be only addressed in passing in this piece.² Geys (2006), in a meta-analysis of 83 previously published studies, concludes that population size should be included in the "core" model of voter turnout (this issue will be addressed in more detail in the following section). Weldon (2006), in another study dealing with the effects of size on political participation, finds that the increasing population of a polity, at the macro level, reduces overall party membership, and, at the micro level, reduces the active participation of party members.

In addition to Robert Dahl, another political scientist who has been consistently concerned with size and democracy (as well as size more generally) is Rein Taagepera. Most importantly from the standpoint of this discussion of cross-national results, Taagepera (1972) originates, and Taagepera and Shugart (1989) refine and extend, the "cube root law of assembly sizes." This law is proven to minimize communications costs, both extra- and intra-legislative (at least in the context of single-member districts). The law, which the authors claim to be among the strongest in political science, predicts that the size of the (lower) assembly will be the cube root of a country's population. Empirically, this law holds very well, with nearly all countries falling within a factor of two of this prediction. Many of the outliers are small island states, which if Anckar (1999) is correct, may perhaps have less attitudinal diversity, and thus less need for a larger assembly to represent the range of interests in the population.

Taagepera and Recchia (2002) develop a model for the number of seats in second legislative chambers, and find that the size of second chambers are affected only indirectly, through the size of the first chamber, by population size. Moreover, when second chamber seats are allocated on the basis of territorial sub-units, then the number of seats tends to be the geometric mean of the number of seats in the first chamber and the number of sub-units. Taagepera has written extensively on many aspects of size and politics³—from the size of empires (Taagepera 1979) to the size of cities (Taagepera and Kaskla 2001)—and a more thorough discussion of his approach and methodology is presented in Section 5. However, a final contribution to this small but important collection of cross-national research is worth mentioning. Taagepera (2007) devotes a chapter to "Size and Politics." Here, he discusses his and others' results regarding, *inter alia*, the effect of population size on assembly size, cabinet duration, party membership, and the number of registered and electoral parties.

Finally, Lijphart (1977, especially chapter 3) in his initial formulation of consociationalism, claims that the size of a polity has both direct and indirect effects on its potential for consociationalism. Size directly affects the prospects of consociationalism by decreasing the likelihood that political elites in small nations will view politics as a zero-sum game. This is, according to Lijphart, due to the fact that they are more likely to know each other personally and interact frequently. Moreover, Lijphart claims that smaller polities are less complex and are thus easier to govern (leading to less conflict among the governing elites). Additionally, there are external

² For a recent review of the current state of federalist scholarship, see Wibbels (2006). For arguments relating specifically to size and federalism, see Dahl and Tufte (1973, pp. 36-7, 79, 140-41) as well as Alesina and Spoloare (2003, pp. 138-41).

³ As well as size more generally. See Taagepera (2002) and Taagepera and Grofman (1972).

effects of smallness. Small states are less likely to have “active” foreign policies and their vulnerability on the international scene instills elites with a sense of urgency to cooperate on matters of national security.

Initially Lijphart found consociationalism exclusively in smaller countries. As larger countries such as South Africa (Lijphart, 1985), and even the largest democracy, India (Lijphart, 1996), came to be regarded as at least somewhat consociational, size, which clearly was no longer a crucial component of consociationalism, came to be studied even more infrequently in this line of literature. In a recent review of the literature on consociational democracy (Andeweg, 2000) there is not a single mention of Lijphart’s (or others’) claims regarding the relationship between size and consociationalism. Thus, it would appear that as the causes and pre-conditions for consociationalism became more numerous as the theory was extended by Lijphart and others, the salience of size as an explanatory factor diminished. The subsequent development of the theory notwithstanding, one salient, even obvious, common feature of the countries initially regarded as consociational by Lijphart was their small size.

3. What Do We Know about Size and Democracy?

While our state of knowledge regarding the interaction of size and democracy at the cross-national level is still surprisingly low, in addition to the literature in the previous section, there is other literature, chiefly found in the area of urban and municipal politics, which has focused on the “size” problem.

3.1 Size and Legislatures and Sizes of Legislatures

As mentioned above, perhaps since theoretical interest in democratic theory shifted to representative democracy, the salience of the issue of size was considered to be relatively unimportant when compared to the importance of size in the context of direct democracy. On this view, for representative democracy, the only real problem of increasing population is that the size of the legislature also has to increase.

In other words, we must increase the number of representatives as we increase the number of citizens. But, how many more representatives? Should the number of representatives increase linearly with population? Exponentially? Taagepera (1972) and Taagepera and Shugart (1989), provide us with predictive models, described in the previous section, which can answer such questions quite well. In addition, Taagepera and Recchia (2002) develop a model of the number of seats in second legislative chambers, which is indirectly a function of population size. Moreover, we know from real-world experience that countries of vastly disparate sizes can be democratic—from India with a population of over 1 billion to Iceland, with a population of less than one-half million. This may be why one of the most thorough analyses of the “size” problem has come from electoral systems specialists.

Weingast et al (1981) derive the “law of $1/n$ ”, which posits that pork-barrel spending increases with the number of elected representatives (which defines the size of the legislature). The law operates on the notion that, in the model, incentives to create large “logrolling” coalitional spending bills increase as the size of the legislature increases. This “law”, through its emphasis on the size of the legislature, relates indirectly to population size, through the cube-root law discussed above. Its empirical validity is, however, not entirely established. Bradbury and Crain’s (2001), findings are generally consistent with the law, though they find that bicameralism diminishes the effect of increased legislative size on incentives to logroll. Gilligan and Matsusaka (2006), offer an alternative explanation, related to redistricting, to explain the positive relationship between spending levels and the number of legislators.

3.2 Size and Political Participation

The issue of the size of the legislature is only part of the story. In a democracy, quite apart from any issues related directly to the size of its legislature, citizens are constrained and enabled by the size of their polity.

There is a fairly substantial body of theoretical and empirical work indicating that political participation is affected by polity size. In particular, many studies have indicated that voting (electoral

turnout) is inversely related to the size of a polity. The theory asserts that given one's probability of casting the decisive vote in an election decreases as the size of the electorate increases, a rational voter will be less likely to vote, *ceteris paribus*, in a larger polity. Though a recent review (Blais, 2006) makes no mention of these findings, previously Blais (2000) devotes substantial attention to this claim. This hypothesis has been tested on numerous occasions, at various levels of analysis. From a meta-analysis of these studies⁴, Blais concludes that the evidence is mixed. Of the thirteen studies which examined the effect of the size of the electoral unit on voter turnout, eight corroborated this fundamental tenet of rational voting theory, while five disconfirmed the hypothesis.

Geys (2006a), after a review of the relevant literature, concludes that population size belongs in the "core" model of voter turnout. While his work (and some of Blais' as was indicated) is cross-national, there is also some work on the effect of size on local turnout. Aside from the studies reviewed by Blais (see footnote 4), in which size is of only secondary interest, there are relatively few which primarily consider the effect of size on local turnout. Oliver (2000), in a study of suburban communities in the United States, finds that citizens in smaller cities are significantly more likely to vote, contact officials and attend community meetings. Kaniovski and Mueller (2006), while accepting much of the empirical support of the rational voting hypothesis' claims about size, find that the effect of size on turnout may be epiphenomenal. They show that the effect of size, using data from Norwegian school language referenda, is largely absent once the effect of heterogeneity (with respect to preferences) is accounted for.

Alesina and La Ferrara (2000) show that participation is lower in more heterogeneous communities. Since population heterogeneity (measured in any number of ways) is generally considered to be (weakly) monotonically increasing in population size, perhaps much of the observed decrease in turnout in larger polities is not attributable to size *per se*, but rather to the effect of population heterogeneity—a variable which is also positively correlated with size. This view is corroborated by the findings of Kaniovski and Mueller, but it is not, in the view of this author, correct. The issue of the epiphenomenalism of size is revisited in Section 4.

There has been some recent formal-theoretic work done in this area as well. Castanheira (2003) shows that under certain⁵ assumptions, turnout decreases in the cubic root of population size. While being qualitatively similar to the traditional tenet of rational voting, this model gives a more specific prediction regarding the effect of electorate size on voter turnout.

Focusing on the macrolevel, and especially the overall size of the eligible electorate, Franklin (2004, pp. 26-27 and 83-89) analyzes the turnout effects of changes in the electorate. Franklin points out that "changes in electorate size must have immediate effects on turnout, unless new voters vote at the same rate as existing voters" (p. 27). His more nuanced argument focuses on habituation in voting, and because newly enfranchised voters—by force of their previous disenfranchisement—have not been habituated to voting, and therefore, in the first election in which they are eligible to vote, will vote at a rate lower than that of the general electorate. However, younger cohorts in the recently enfranchised groups will be more susceptible to the habit of voting and thus will, in the medium term, attenuate the decline in overall turnout that we would otherwise expect.

Weldon (2006) focuses on the effect of size on party activism and party membership. He shows that increasing size decreases the proportion of the population with membership in a political party. In addition, he shows that larger parties have fewer active members. Importantly, Weldon enumerates three pathways through which size affects political participation. Consistent with Mancur Olson's (1971) foundational work on the problem of collective action, increasing group size directly affects incentives for free-riding in collective action—a category in which nearly all political action resides. Indirectly, size affects organizational complexity, thus creating decreasing returns to

⁴ These include: Powell (1982), Capron and Kruseman (1988), Blais and Carty (1990), Blais and Dobrzynska (1998), Barzel and Silberberg (1973), Silberman and Durden (1975), Tollison et al. (1975), Kau and Rubin (1976), Hansen et al. (1987), Kirchgassner and Schimmelpfennig (1992), Birsch (1993), and, finally, Matsusaka and Palda (1993). The first four listed here are cross-national studies.

⁵ These assumptions are: first past the post elections, strictly positive voting costs for all individuals, and uncertainty about the distribution of preferences in the electorate.

participation in a larger organization (be that a nation-state or a political party). Also indirectly, group heterogeneity, all things equal, increases with population. Participation, in various forms, has been found to be decreasing in population heterogeneity. These results are discussed further below.

Finally, there are several studies which examine size and citizen satisfaction and/or feelings of efficacy at the local level. Denters (2002), finds that citizens place more trust in local rather than national elected officials. Finifter and Abramson (1975) find that citizens in smaller cities fancy themselves more politically efficacious. Larsen (2002) finds lower participation in larger communities, but he also finds that the size of the municipality does not affect citizen's knowledge of politics, or its trust in local politicians and local political decisions. Previously, however, Mouritzen (1989) finds that citizens in smaller political units have attitudes which are more favorably disposed toward democratic participation. Moreover, he found that, because smaller communities tend to be more homogeneous, provision of public services in them is more efficient. Conversely, Newton (1982) finds that larger municipalities can more efficiently and because of economies of scale, more effectively deliver public goods. At the same time, according to Newton, larger communities are not significantly less "democratic" than smaller ones. Finally, Dahl (1967), based mostly in this tradeoff between system capacity and citizen effectiveness stressed in the previously mentioned studies, attempts to define an ideal size for a city, which he concludes is less the 100,000 inhabitants.

3.3 Size and Free-Riders

Just as the "law of 1/n" highlights some of the negative externalities that are related to increasing size, so does the issue of free-riding. Olson (1971, especially ch. 2) shows that incentives to free-ride in the production of collective goods (e.g. any policymaking process) increase as group-size increases. This is partly because detection of free-riding becomes more difficult as group-size increases. In addition, and analogous to size as it relates to the rational voter hypothesis, as group size increases, any individual's probability of determining the outcome of any process is decreasing exponentially. Empirical verifications of this compelling hypothesis are harder to find. Schram (2003) claims that though the experimental evidence is mixed, it is nonetheless heavily indicative of the converse of Olson's claim; he finds that, on balance, public goods contributions increase with increasing population. However, it may be the case that the fairly "small N" studies reviewed by Schram do not allow the population to be large enough for the negative effects of population size to set in. That is, perhaps there is a (population) threshold which, once reached, allows certain behavioral effects to become manifest. We will return to the issue of threshold effects in the next section.

3.4 Complexity and Heterogeneity

Early on in their book, Dahl and Tufte (1973, p. 30), state: "A political system might be said to be more complex (1) the greater the number of categories of actors whose attitudes, interests, wants, preferences, demands and goals have to be taken into account, and (2) the greater the variation in their attitudes."

The first criterion above represents a direct effect of size. The second only relates to size to the extent that population size is positively correlated with population heterogeneity. Thus complexity, by this criterion, is theoretically related to size only epiphenomenally. I argue that, though size is partly epiphenomenal with respect to complexity (through increasing heterogeneity), the study of heterogeneity is nonetheless indispensable in furthering our understanding of the effects of size on democracy.

From this quote, we can see, then, that heterogeneity implies complexity, as heterogeneous groups contain more "categories of actors" whose preferences need to be taken into account by the relevant political actors. Thus complexity and heterogeneity are linked, but with an important difference. Size may be thought of as being epiphenomenal to the extent that group heterogeneity is taken into account. With respect to complexity, however, size cannot be thought of as epiphenomenal. Increasing size implies increasing complexity, at least with respect to certain dimensions (such as the number of territorial sub-units or organizations, see Dahl and Tufte, 1973, especially pp. 36-7). Of course, we must also specify what sort of heterogeneity we are considering because certain types, such as racial, ethnic, etc., are more indirectly linked to size, while other types, such as socioeconomic

diversity due to increasing specialization, are more closely linked to size per se (Dahl and Tufte, 1973).

One instance of the effect of size on labor specialization (the result of which is socio-economic, as well as other types of, diversity) is an idea which Dahl and Tufte capture in their “plumber’s law.” They state the law as such: “The larger the size of a political system (whether size is measured by population or by area), the greater the number of organized interests or interest groups.” (p. 39) For example, suppose that the services of one plumber are needed for each 1,000 people. In a town of one-thousand, there will be one plumber and no organized plumber interest. At some point the population includes a sufficient number of plumbers such that there will be an organized plumber’s interest. Thus, this general idea is quite similar to Madison’s arguments in Federalist 10. This argument posits that size, in and of itself, is a significant variable, as it directly affects the composition, structure and proportion of “interests” within a democracy.

3.4.1 Size and interest group intermediation

If the plumber’s law and its variants are true, then certainly the size of a democracy has an effect on the way in which its interest groups are represented in a democracy. In the literature on interest group intermediation, there are essentially two ideal types of intermediation. A pluralist system, associated with the Madisonian hypothesis advanced previously, consists of multiple, often overlapping and intersecting, interest groups competing to have their interests served by the governmental apparatus. In contrast, a corporatist system of interest intermediation includes broad, umbrella organizations which represent large sectors of the society, such as labor unions and employer groups. (see Schmitter, 1974 for a discussion of this distinction).

Though his work is infrequently cited in this regard, Olson (1982, especially pp. 47-53) develops the idea of an “encompassing organization”, which because of its broad-based support within a polity, is less likely to advocate policies which, while beneficial to the group, impose costs on non-members comprising the remainder of the society. The “rest of society” becomes smaller and smaller as the encompassing organization encompasses a larger proportion of the citizenry. It is by this logic that Olson argues for the social welfare benefits of encompassing organizations, as they are less likely to cause negative externalities for society.

Larger polities will, in general, have more numerous and diverse configurations of interests. Even if one were to assume that the number of groups could be reduced through policy and/or legislation, the diversity of the interests involved would make the resulting corporatist (encompassing) organizations unmanageable. In consociationalism, corporatist institutions are thought to be superior to pluralist institutions in terms of their ability to reduce conflict. However, their ability to do so is partly rooted in the homogeneity of the interests advanced by the collective membership. Thus, it seems likely to be the case that the type of interest group intermediation found within a country will have ramifications for the way in which size and democracy interact.

3.4.2 Size and Heterogeneity

As has been indicated previously, though size is somewhat epiphenomenal from the standpoint of population heterogeneity, it is reasonable to assume that heterogeneity is generally increasing in population size. Therefore, it is useful to examine a few prominent pieces of the literature which deal explicitly with population heterogeneity. Alesina and La Ferrara (2000), demonstrate, through the use of an economic model, that more population diversity, both socio-economic and racial/ethnic, should lead to decreased participation within the population. Using data on group membership and U.S. communities, they find support for their model. Leigh (2006) finds that trust is also lower in more ethnically and linguistically diverse communities. Glaeser et al (2000) find that in experimental “trust” and “drop the envelope” games, heterogeneous pairs (in terms of race and nationality), are less trusting, suggesting that heterogeneous societies might develop less social capital than their more homogeneous counterparts.

Alesina and La Ferrara’s results beg for further experimental research on racial/ethnic group heterogeneity and the effect on participation and public goods provision (which is itself a type of participation). Several studies suggest that such an experimental study would show that people are less

willing to contribute to public goods as racial group heterogeneity increases. Luttmer (2001) finds, through the use of survey data, that individuals tend to increase their support for welfare spending as the proportion of the potential recipients from their own racial group increases. Hero and Tolbert (1996), using data from U.S. communities, find that policies for minorities are particularly poor in (relatively) homogeneous states, and that minorities fare better in the presence of more diverse minority communities.

Having reviewed the scant literature on the effects of size on democracy, two questions remain. First, why has there been so little cross-national research in this regard? Second, what is the best way in which to enhance our understanding of the interaction between size and democracy? These questions are answered in the following two sections.

4. Size and Democracy in the Cross-National Setting: Reasons for Neglect?

The dearth of research on this topic seems particularly odd, given that variables regarding the size of nations (as measured in any of the traditional ways) are, by any standard in social science, both widely available and exceptionally reliable. Moreover, as the review above demonstrates, size is an important variable in the study of democracy. Why, then, is size not more often at the forefront of research in cross-national democracy and democratization? In this section I attempt to offer several potential answers to this important question, in the hopes that by understanding the reasons for this neglect, we can remedy such disregard in the future.

Because the observed range of representative democracies—at least on the dimension of population size—is much greater than the range of population exhibited by historical examples of polities which employed some notion of direct democracy, one may be tempted to conclude that, apart from issues of representation, size could, and for the sake of parsimony should, be ignored when building and testing theories of the existence and functioning of democratic polities.

There may, however, be other reasons which lead researchers to conclude that size may not be such an important factor in cross-national variations in democratic institutions, practice and outcomes. There is some evidence to suggest that size plays a significant role (in several ways) only at relatively low levels of population, and most, if not all, modern nation-states have populations that far exceed the range in which size is a significant explanatory factor. Even if we accept this evidence, it does not warrant the conclusion that size effects in large populations are non-existent. Rather, it should merely serve as a reminder to researchers that they should combine more careful theorizing with rigorous empirical testing in order to determine in what domains size, even at very high levels, remains important.

One may also conclude that by using the larger amount of scholarship that has focused on municipal size and democracy, we may be able to isomorphically transform those results to the level of the nation-state. However, as sovereigns, democracy at the level of the nation-state displays fundamentally different characteristics than it does at the sub-national level.

Lastly, while size may be merely a stand-in for population heterogeneity in some contexts, as several authors make clear (Matsubayashi, 2007; Rose, 2002 among others) even after controlling for diversity, size is still a significant factor in many cases. Thus, the conclusion that size is merely a proxy for other phenomena is not warranted. As discussed above, size *qua* size is important, quite apart from its indirect relation to other important variables.

In the remainder of this section, I discuss in more detail each of these three potential reasons for neglect outlined above: threshold effects, isomorphisms and epiphenomenality.

4.1 Size and Threshold Effects

Scholars have uncovered a fair bit of evidence in favor of the notion that there exists some size threshold—often quite small—under which size matters, and above which, the effects of size essentially wash out. If such a threshold exists and is sufficiently low—such that nearly all nation-states contain populations significantly above the threshold value—then perhaps this could explain the relative lack of interest in cross-national research on size and democracy.

In some cases, the proposed thresholds are extremely low. Dougherty and Edward (2001), through the use of computer simulations, show that the Pareto criterion⁶, the most widely used concept for making comparative welfare judgments in social science, is nearly always indeterminate in populations of 50 or more. Thus, using the Pareto criterion under the assumption of large or infinite populations (as is often done) is likely to be problematic. Anckar (1997) claims that “when one moves from small island systems to very small island systems with populations of about 100,000 or less, relevant differences appear to emerge that suggest a link between miniaturism and party system characteristics.” Very small island states, due to their homogeneity (and reinforced by their insularity), have fewer political parties than larger nations.

Similarly, Blais (2006) claims that the “real difference” in turnout among countries is between the very small countries and the rest (with very small countries having a significantly higher turnout). Weldon (2006) reinforces this idea, claiming that participation decreases as size increases, but at a decreasing rate. To model this, Weldon suggests the use of a logarithmic functional form, a form which can easily capture—even estimate—threshold levels similar to those under discussion here. The major difficulty in doing so would lie in deciding on the proper parameterization, which in turn would determine the threshold levels.

Even Dahl and Tufte (1973, pp. 93-97), among the staunchest proponents of increased cross-national research in size and democracy, admit that, at least in terms of the intensity and frequency of conflict, significant differences between small and large polities exist only to the extent that the small polities are extremely small, perhaps with 10,000 inhabitants or less. Thus, cross-national differences, while perhaps interesting in principle, are in practice, non-existent. In addition, Dahl and Tufte (1973, p. 52) point out that if citizens routinely report higher degrees of efficacy in their dealings with local, as opposed to national, governments, then it should be the case that citizens in smaller democratic countries feel more efficacious than those in larger countries. They conclude that it may be the case that nearly all countries are sufficiently large as to exceed a threshold under which cross-national differences in the perception of citizen efficacy can be observed.

Even if we accept unconditionally all of these results—which would seem to suggest the existence of a threshold effect in certain contexts—it may be the case that no such effect exists in some domains. Even if such thresholds do exist, a better understanding of the nature and consequences of them would aid our understanding of the interaction between size and democracy. In any case, further research is necessary in order to determine the levels, scope and relevant domains of these thresholds. Moreover, according to Anckar (1997) the post-World War II world is characterized by small, and even miniature, states to an extent that has not been seen since the advent of modern representative democracy. Thus, even if we as researchers are faced with very low thresholds, “the prospects for investigating the validity of the thoughts of Dahl and Tufte on a cross-national basis are therefore, one would assume, much better and more promising than before.”

4.2 (Non) Isomorphism of Results across Levels of Analysis

As mentioned in Section 3, there have been many studies of the effects of size on democratic functioning at the sub-national level, at least in comparison to those done at the cross-national level. Thus, perhaps scholars assume that we can merely transform, isomorphically, the results regarding democracy at various sub-national levels to the level of the nation-state. If this is true, then the dearth of cross-national empirical and theoretical research on size is possibly less problematic than would seem to be indicated by our discussion above.

Because theorizing regarding the nature of direct democracy could not be isomorphically transformed to become applicable to representative democracy, scholars of democracy were forced to re-focus their theoretical endeavors—to issues of representation, party competition, etc. If theories regarding democratic functioning at the municipal level could be transferred whole-cloth to the study of democracy at the level of the nation-state, then our current level of knowledge would be much

⁶ Though there are many versions of the Pareto criterion, the definitional component is that a Pareto improvement can be obtained if at least one member of the population can be made better off without making any of the others worse off.

improved. However, this is not the case, as the following, from the economist Enrico Spoloare (2006, p. 780), makes clear:

There are many points of contact between the literature on clubs and local public good and the literature on nations: in a way nations, from a global perspective, do provide “local” public goods. However, national public goods—unlike local public goods—have high economies of scale from sharing the costs with a large population. Moreover, in the traditional theory of local public goods local jurisdictions are not completely autonomous, while the analysis of nations explicitly focuses on sovereign states that can impose direct barriers to economic exchange and/or use force in settling disputes with their neighbors.

We must, however, confront this literature on the size effects of municipalities as it relates to feelings of efficacy and related matters. The question becomes, then, in the absence of similar research in a cross-national setting, can we isomorphically transform the results from the municipal level to the national level? Spoloare’s quote above should give us pause in doing so for reasons which have to do with the sovereignty of the nation-state, as well as with economies of scale (which are directly related to size). Additionally, however, with at least geometric but probably exponential increases in the degree of complexity accompanying increases in population size, results from municipalities (apart, perhaps from a few very large ones) are unlikely to hold at the level of the nation-state.

Thus, we cannot expect that results of studies which relate to size and democracy at the municipal level to be isomorphically transformed to the analysis at the level of the nation-state for two main reasons. First, because the level of complexity, generally speaking, is much higher in a nation-state than in a municipality, problems of size are likely to be increasing at an increasing rate (up to some point). Second, the policy purview for any nation-state will include policy choices, such as those which must be made for the purposes of national security, and internal administration, which never have to be made at the sub-national or municipal level.

4.3 Is the Effect of Size Epiphenomenal?

The fact that Dahl devotes so much research effort toward issues of size per se—as apart from heterogeneity (or in Dahl’s words pluralism)—gives credence to the idea that size is not epiphenomenal. Because significant parts of Section 3 were dedicated to the question of the epiphenomenalism of size, rather than recapitulate, in toto, the argument in that section, this subsection is brief.

The reason one may conclude that the effect of size on democratic functioning is epiphenomenal stems from the fact that many of the claims in this regard rely on the (positive) correlation between population heterogeneity and population size. In order for this conclusion to hold, however, it must be the case that there is an effect of size on democracy only to the extent that this correlation holds, because it is in fact heterogeneity, rather than size, which is the causal force. Arguing against this view, Rose (2002) states that, “the effect of size...is not merely a byproduct of the compositional characteristics of the individuals living in different sized municipalities, as is sometimes suggested.”

It is possible that population heterogeneity explains some of the purported effect of size on democracy (larger populations tend to be more diverse). Nonetheless, population size in some ways causes increased population heterogeneity. Greater size allows a greater degree of specialization of labor, which will lead to increased population heterogeneity, at least occupation-wise. Additionally, an increased population makes it more likely that the requisite “threshold of dissent” is reached. According to Dahl and Tufte (1973), potential dissidents will have an easier time identifying other like-minded individuals in a larger society. Thus, the effect on political dissent and the nature and size of opposition groups is also affected by size per se. As Dahl and Tufte (p. 91) put it, “with increasing size, then, persistent and overt differences in political outlooks, interests and demands are likely to appear.” This logic implies that size qua size is an important and effectual concept in empirical democratic theory.

Perhaps if one could uncover all of the variables which are related to size one may be able to legitimately claim that size is, in general terms, epiphenomenal. However, the current state of the

theory in this regard would not allow one to make such a claim. Thus, we must at this point assume that size is theoretically interesting in its own right (an assumption which this author believes to be correct in any case). Especially if we consider the argument for (theoretically unbounded) complexity derived from the “plumber’s law”, it would seem that size could never be reduced to a collection of more fundamental, atomistic concepts.

After this treatment of the potential reasons for the neglect of the important topic of size and democracy in the cross-national setting, the next section contains a discussion of several methodological approaches which seem, at least to this author, to be promising, non-mutually exclusive candidates for reversing this neglect.

5. Theoretical and Methodological Frameworks

Size, given its relative conceptual clarity and the general reliability of its measurement, lends itself well to the use of quantitative social scientific techniques. I limit the discussion here mostly to quantitative theory building because there is no scarcity of papers dealing with quantitative empirical issues in the comparative study of democracy, and the last thing empirical democratic theory needs more of is mindless statistical analysis (though mindful statistical analysis, based soundly in solid theorizing, is often in surprisingly short supply). If I am correct in arguing as I did above, that size is not merely epiphenomenal—that we must still take it into account even after controlling for increasing heterogeneity of preferences—we must then make more theoretical advances in determining the effects of size and all of its consequences, *per se*.

With this goal in mind, there are three theoretical and methodological approaches in the mathematical social sciences which are particularly promising for making exactly these necessary theoretical advances in understanding the relationship between size and democracy. These include what I will call an economic approach, logical-quantitative modeling, and complexity theory (especially its principal tool, agent-based modeling). I consider each in turn.

5.1 The Economic Approach

An economic approach to theorizing about the causes and effects of the size of nations⁷ has been employed in several studies. Friedman (1977) argues that the size of nations is largely determined by the drive for revenue maximization. He concludes that trade should imply large nations and rent small nations. Wittman (1991), using a similar wealth-maximizing logic, discusses the issues involved in the merger and dissolution of nations. Bolton and Roland (1997) show that as economic integration increases, incentives for political integration decrease. This is because, in an autarkic world, nation size is equivalent to market size, but in a world of free trade, a nation’s market size is not at all dependent on its actual size as a nation. Wittman (2000), in an analysis of the “wealth and size of nations”, reaches similar conclusions. In addition to showing that free trade increases the number of small states, he also shows that countries which can accommodate more diverse preferences will be correspondingly more wealthy.

Finally, the most significant contribution to the study of the size of nations from an economic point of view is found in Alesina and Spoloare (2003). In this seminal work (which like Dahl and Tufté probably raises more questions than it answers) the authors focus on the tradeoff, already noted in this paper, between heterogeneity of preferences and economies of scale in the provision of public goods. In their model, citizens can vote to decide their borders (thus their population, as population density is assumed to be uniformly distributed). In doing so, they attempt to calculate the optimal number of countries (and thus the optimal size of the countries) such that aggregate social welfare is maximized. They conclude that the actual size of countries may not be optimal in this sense because their model relies on costless and de-politicized inter-regional transfers in order to compensate those regions which would otherwise vote to secede; but regions which nonetheless generate positive externalities for the regions which would be doing the compensating. In

⁷ I here use the term nations, rather than democracies, because economists are often not concerned solely with democracies. They often assume that policy is decided by a benevolent, and often omniscient, social planner. Nonetheless, economists, including some of those discussed herein, have addressed the prospect of voting on borders as well.

reality such transfers are often quite costly and almost always politically controversial. In many ways, Alesina and Spoloare pick up where Dahl and Tufte left off—e.g. the focus of both sets of authors is in this heterogeneity/economies of scale tradeoff—but more work remains to be done.

There are two important things to note about the economic approach. First, nearly all of the studies treat size as an endogenous variable (i.e. a variable whose value is determined by the model). This is important because, although the location of borders is not a variable which can be easily manipulated, understanding how and why it could be manipulated provides us with insight into the effect of the variable in actually existing countries. Second, those studies in which the borders are decided through majority voting emphasize the tradeoff between economies of scale (in the production and provision of public goods) and the heterogeneity of preferences (which in some cases, such as the work by Alesina and Spoloare, is also determined by size, as preferences are spatially based and increase monotonically based on the citizen's distance from the "capital city"). These aspects of the economic-modeling approach to the size problem are among the most promising for future progress in this area. Wittman (2000, p. 883) similarly acknowledges the potential utility of this approach, "the theoretical synthesis of the spatial political model with an economic production function can serve as the foundation of future research in numerous other areas, including the theory of the firm, federalism, and the nature of economic development."

5.2 The Logical-Quantitative Approach

Although Rein Taagepera is responsible for the term logical-quantitative (L-Q) model, one can find many examples, which are similar at least in spirit to Taageperian models, in Dahl and Tufte's *Size and Democracy*. Democracy, at least in theory, operates on the principle of "one man, one vote."⁸ This simple logic can easily be extended to deal with many aspects of procedural democracy. Thus, the Taageperian methodological approach—that of logical-quantitative modeling⁹—is in some important ways uniquely suited to the size problem. In fact, many of the insights common to the economic studies considered above¹⁰ can also be found in Dahl and Tufte, where they are often called "axioms".

As noted above, the L-Q approach has already proved quite useful in the study of legislature size and other important issues in democratic theory. Taagepera (2007) sums up the current state of knowledge of the interaction between size and electoral systems from the perspective of L-Q modeling. In addition to the cube root law of assembly size, Taagepera cites the finding, due to Weldon (2006), that smaller countries have fewer (seat-winning) parties, but more party members as a proportion of population. Finally, he presents some evidence that smaller countries have more durable cabinets (due, mostly, to their fewer effective number of parties).

Despite these successes, given the suitability of this approach it would seem that it could further prove useful in examining size and heterogeneity. One example is "largest component" estimation. This approach employs the geometric mean to estimate what the largest component of a system of a given size should be, on average. The only information required is the size of the total system and the number of subunits. Taagepera (1999, 2008) has applied this approach, with a high degree of predictive accuracy, to estimate the populations of the largest regions or states within nations. The approach, however, could be used for an estimation of the largest components in other contexts as well.

In addition, the L-Q approach can work well when dealing with group sizes in more general terms. Dahl and Tufte (1973, p.31) state, "a political system might be considered more diverse or heterogeneous (1) the greater the number of subsets into which the population is divided, or (2) the

⁸ In fact, Taagepera has been at the forefront of research into the extent to which this aphorism is actually true in practice. Given the mechanical way, mediated through the electoral system, in which votes are translated into seats, this is another fruitful area of research for L-Q models. For seminal work on this topic see Taagepera and Shugart (1989) and Taagepera (2007).

⁹ For a more detailed examination of this approach, see Grofman (2004) and Taagepera (1999) and (2008).

¹⁰ These include noting the fundamental tradeoff between heterogeneity of preferences and economies of scale, positing that free-trade would allow for smaller nations, and predicting that in a more peaceful world there could also be smaller and more numerous nations.

more nearly the subsets approach each other in size, or both.” The first criterion is, at least in theory, relatively easy to measure. No difficulties in computation should arise. However, the problem of exactly how to weight the groups is an interesting one, and the L-Q approach again provides some answers. Laakso and Taagepera (1979) develop a measure for the “effective number of parties” (ENP) in which each party’s seat (or vote) share is squared then they are summed and the inverse is taken. Others (Grofman, 2006; Dumont and Caulier, 2003; Kline 2008) have examined the possibility of using power-index scores (either Banzhaf or Shapley-Shubik) to weight the parties. Despite this ongoing debate, the ENP approach has proven useful in the electoral systems literature, and could be applied to “count” other groups as well. Problems would arise only in deciding on a proper definition of “group”, and in collecting the actual data. Theil (1969) provides us with a way to measure the second criterion: political entropy. In line with the quote from Dahl and Tufte above, maximum entropy occurs when all groups are of the same size. For example, maximum entropy for a legislative system would occur when each of N seats was occupied by a member of a different party. Thus, the size of each “group” is $1/N$. Although Theil applied his approach to party sizes, it is clear that it can be extended, with the same provisos with regard to properly defining the group as when using the ENP approach.

5.3 Complexity and Agent-Based Modeling

Given that much of the preceding discussion focused on issues arising from the increased complexity involved in larger societies, it seems that complexity theory, and its chief tool in the social sciences, agent based modeling (ABM), may also be useful in increasing our understanding of the size problem. Although what goes by the name complexity theory in the social sciences comes under many guises, I will follow Axelrod (1997) in his conception of complexity theory. He states (p. 4):

Complexity theory involves the study of many actors and their interactions. The actors may be atoms, fish, people, organizations, or nations. Their interactions may consist of attraction, combat, mating, communication, trade, partnership, or rivalry. Because the study of large numbers of actors with changing patterns of interactions often gets too difficult for a mathematical solution, a primary research tool of complexity theory is computer simulation. The trick is to specify how the agents interact, and then observe properties that occur at the level of the whole society.

Complexity theory, then, involves studying the interactions of “many actors.” But, how many is “many”? Can complexity theory allow us investigate “changing patterns of action” as a function of the population size? Cioffi-Revilla (2002), writing about the challenges faced by agent based modelers in the social sciences, claims that while simulations often differ in the number of (finite¹¹) agents they rarely differ within a given model run. He also encourages sensitivity analysis to ensure that “simulated results are not purely local for a given system size.” Although this is a concern for ABM in general, it is indicative of the fact that, through the use of this approach, size-specific inferences regarding aggregate social phenomena can be drawn. This is good news for the prospects of future research on the size problem.

Another related area of research is in “threshold models” Originally developed by Granovetter (1978) and Schelling (1971 and 1978). The basic intuition behind these models is that individuals, in order to engage in a given behavior, may require a certain threshold, which may be defined as a proportion of the population, an absolute number, or a combination of the two. Moreover, these thresholds can differ across individuals, and in many cases individuals in the model are indexed by their threshold. Schelling (1971 and 1978) demonstrates that segregative behavior can emerge based only on the assumption that people prefer to live in a neighborhood in which they are in the majority (or at least above some other, lower threshold). Ehrlich and Levin (2005) show that for an intermediate range of thresholds distinct groups of ideologically-linked agents (e.g. political parties) can form. Though these issues are indirectly related, through group heterogeneity, to size per se, combining such an approach while varying the population size in the simulations would likely yield interesting results.

¹¹ In the case of a particular theory of dynamical processes, replicator dynamics, an infinite population is often assumed

Finally, Mark (1998), based on a simulation of initially homogeneous agents, concludes that group heterogeneity (i.e. the number of viable “subcultures”) increases as population increases. This is consistent with much of the evidence reviewed previously. On the other hand, Axelrod (1997) finds a non-linear relationship between population size and group heterogeneity. Up to a point heterogeneity is increasing in population, when it then begins to decrease. The reasons for the divergence in results are easy to identify in ABM, because the agents behave according to predetermined algorithms.¹² In any case, more simulations, with differing population sizes and parametric specifications could shed more light on this interesting subject.

Axelrod (1997) makes very bold claims for computer-based simulations of complex adaptive systems. He calls it a “third way of doing science”—one which splits the difference between induction and deduction. While Axelrod’s claim has not yet been completely fulfilled, research employing ABM continues apace and represents a promising methodological tool for understanding large-scale social systems, such as democracies at the level of the nation state.

To summarize, the economic approach is both theoretically important and actually and potentially useful because its chief tool is optimization. From the individual’s perspective, at the core of the size problem is an optimization of the tradeoff between heterogeneity and economies of scale. The L-Q approach is also actually and potentially useful because its emphasis on logically quantifiable variables, such as population size (and area), is particularly suited to the concept of voting and the logic of simple electoral systems. Because one of the important characteristics of size is its effect on complexity, the use of agent-based modeling is valuable because it can aid in estimating the functional form of the relationship between size and democracy or heterogeneity (at least along a specific dimension). Also, agent based modeling combines some of the benefits of both the economic and the L-Q approaches. It allows one to specify individual behavioral algorithms as well as some parameters at the system level. One can then observe the emergent properties of the system based on repeated individual interaction.

6. Conclusion and Discussion

One thing that has been consistently found in research at all levels of democratic functioning is that citizens feel a greater sense of efficacy in smaller jurisdictions. However, larger polities have greater resources, and thus have a greater capacity to respond to citizen demands. This fundamental problem is at the heart of the complicated and interesting relationship between size and democracy.

The fundamental conclusion of Dahl and Tufte, according to Larsen (2002), is that, “due to a tradeoff between proximity and capacity, it is impossible to determine one optimal size for democracy.” Alesina and Spoloare (2003), employing an economic approach, attempted to do just that. Moreover, the cube-root law relies on a similar logic because minimizing communication channels for legislators allows them to optimize in their tradeoff between responsiveness (citizen effectiveness) and legislative efficacy (system capacity). Therefore, this tradeoff is inherent in essentially any meaningful analysis of the interaction between size and democracy.

In addition to recognizing this as the crux of the issue, what is needed are more testable hypotheses—such as the hypothesis that turnout is increasing in size. In this case, the hypothesis has been tested on numerous occasions, though the results are, as yet, mixed. The fact that many of the results of the empirical tests of existing theories is mixed, does not mean that we should conclude that size is unimportant. I hope that this review demonstrates that size is of fundamental importance to the study of democratic functioning. Thus, what we need is better theorizing regarding the nature of the relationship between size and democracy across multiple domains, followed by rigorous empirical testing of the newly minted theories. It is my hope that the three methodological approaches that I suggest above will allow scholars of empirical democratic theory to do just that.

¹² Though “randomness”, especially with respect to interactions, is often present in these types of models, most simulations involve hundreds, if not thousands, of iterations, allowing the researcher to get a fairly accurate picture of the distribution after these repeated runs.

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