

Stitching a Patchwork Quilt: Democracy, Social Heterogeneity, and Development Outcomes

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Abstract

This article investigates the manner in which the characteristics of selection institutions interact with country social context to affect development outcomes. Previous work has established that higher levels of social heterogeneity are associated with lower levels of public goods provision (Easterly and Levine, 1997; Alesina et al., 1999). Democracy tends to ameliorate these negative effects (Collier, 2000). Since democracy is a multidimensional concept, however, identifying which characteristics of democracy produce better development outcomes in diverse social contexts is important. Building upon models of probabilistic voting, this paper considers two such dimensions: contestation and inclusiveness (Dahl, 1971; Coppedge et al., 2008). Empirical tests using a time-series-cross-sectional dataset covering 146 countries indicate that political contestation matters more than inclusiveness for reducing rates of infant mortality in countries with high levels of social heterogeneity. Conversely, where levels of social heterogeneity are low, greater inclusiveness appears to reduce infant mortality.

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There is great normative appeal in Sen's (1999) argument that political liberty and civil freedoms are themselves developmental ends, and not merely means. It justifies the furtherance of democracy even though its effectiveness in improving human conditions is sometimes questioned. Yet, the intrinsic value of democracy aside, when we consider that the infant mortality rate in India is three times that in China, and ten times that in Cuba, it should be clear that learning how to maximize the instrumental role of democracy in improving human conditions is a matter of significant consequence.

In the empirical literature, democracy's record as an agent of development is a matter of dispute. The level of democracy is not a significant determinant of the rate of economic growth, at least not directly, and evidence on the effects of democracy for provision of public goods is mixed. In one study, Ross (2006) asks "Is Democracy Good for the Poor?" and concludes that we know very little about the government's role in reducing poverty in the developing world. Democracy does not guarantee that rulers will be responsive to the interests of the poor or will otherwise pursue broad-based developmental policies.

A much clearer understanding of the relationship between democracy and development can be obtained by constructing a theory upon two central premises. First, since democracy is a multidimensional concept, we should pay attention to how these different dimensions matter for policies that affect developmental outcomes. This article treats Dahl's (1971) dimensions of contestation and inclusiveness separately. Second, since political institutions are embedded in a social context, we should consider how the dimensions of democracy interact with this context. This article focuses on how the degree of social heterogeneity in the polity mediates the effects of contestation and inclusiveness on development outcomes.

Diverse social circumstances can pose a particular challenge to governing institutions, creating divergence of preferences, collective action problems, and reduced state legitimacy. The extent to which institutions for selecting rulers can stitch together these diverse interests into a coherent polity matters for developmental outcomes. For example, empirical evidence has mounted that ethnic diversity adversely affects economic growth and a range of other development indicators (Easterly and Levine, 1997; Alesina et al., 1999; La Porta et al., 1999). Democracies, however, appear to be less susceptible to these negative effects on average. With respect to economic growth, Collier finds, "democracy massively reduces the problem posed by ethnic diversity" (2000: 233).

This raises an important question: do institutions for selecting rulers ameliorate the effects of social heterogeneity when they make the polity more inclusive, when they create political contestation, or both?

Drawing upon models of probabilistic voting, this article constructs a formal model of the polity in which the levels of contestation and inclusiveness enter separately. The model illustrates that, when the level of social heterogeneity is high, the level of public goods provision is strongly connected to the degree of contestation, while the degree of inclusiveness matters to a lesser extent. Conversely, in more homogeneous societies, greater inclusiveness creates stronger incentives for rulers to shift their allocation of spending toward public goods. The model thus provides a much richer range of outcomes than that in Bueno de Mesquita et al. (2003).

Predictions from this model are tested using a cross-national dataset covering up to 146 countries, drawing upon data from Vanhanen (2000) and Coppedge et al. (2008) to measure contestation and inclusiveness. Infant mortality is employed as the primary indicator of the extent of public service provision. The empirical tests find that political contestation matters more than inclusiveness for reducing rates of infant mortality in countries with high levels of ethnic diversity and cultural divisions. Conversely, where levels of social heterogeneity are low, greater inclusiveness tends to reduce infant mortality and contestation has little impact.

The next section has two objectives. First, it fleshes out the argument that focusing on individual dimensions of democracy is a necessary step, and it describes the dimensions of contestation and inclusiveness more fully. Second, it builds the case that our theories should incorporate the interaction of selection institutions with social context, since preference heterogeneity driven by social diversity conditions the effects of the two dimensions of democracy. Section 2 develops a formal model of selection institutions to generate two specific hypotheses that are presented in Section 3 and tested in Section 4. Section 5 concludes.

1 Democracy, its Dimensions, and Social Context

The empirical evidence regarding the effect of democracy on development outcomes is mixed. Reviews of the many studies of the direct relationship between the rate of economic growth and democracy, measured various ways, describe a lack of conclusive findings (Sirowy and Inkeles,

1990; Przeworski and Limongi, 1993; Almeida and Ferreira, 2002). Similarly, there are contradictory conclusions regarding the effects of democracy on various indicators of public service provision and human development, though most studies find a positive relationship. On the one hand, democracy is linked to higher levels of spending on public services (Moon and Dixon, 1985; Lake and Baum, 2001; Ghobarah et al., 2004; Avelino et al., 2005; Deacon, 2009) and lower levels of infant mortality (Zweifel and Navia, 2000; Navia and Zweifel, 2003). On the other hand, with a larger dataset that does not exclude high-performing autocracies, Ross (2006) finds that democracy has no effect on child mortality rates. Overall, concludes Keefer (2004), the range of developmental outcomes is wide even among countries that exhibit characteristics of democracy.

This outcome is driven, at least in part, by the fact that democracy is a multi-dimensional concept but that we often treat these dimensions haphazardly at both the theoretical and empirical levels (Coppedge et al., 2008). In terms of theory, researchers frequently offer only a rough sketch of the mechanisms through which democracy is expected to improve development outcomes, and the level of consistency across studies is low. Furthermore, even when identified, these mechanisms often have only tenuous connections to the available empirical measurements of the concept. Treier and Jackman remind us that “a country’s level of democracy is a fiction of sorts, a manufactured construct, an abstraction rendered in a form amenable for data analysis” (2008: 214). Yet, with few viable alternatives, studies often draw upon the same empirical indicators and measure democracy in terms of its level.

For purposes of illustration, consider the composite Polity index (Marshall and Jaggers, 2009b), which is used as the measure of democracy by Lake and Baum (2001), Ghobarah et al. (2004), Ross (2006), and Deacon (2009) among others.¹ The index is constructed from components relating to the openness and competitiveness of executive recruitment, openness and competitiveness of participation, and constraints on the chief executive. For Lake and Baum (2001), the index is intended as a proxy for the contestability of political markets. For Ross (2006), the index is used to proxy for various reasons that the theoretical literature suggests democracy should raise the living standards of the poor: greater accountability of rulers, better transmission of information, and the greater scope of suffrage. Ghobarah et al. (2004) cite convention as motivation for use of

¹Ghobarah et al. (2004) impute missing values using scores from Freedom House.

the measure.

Although none of these studies identifies constraints on the executive as a key explanatory factor, an assessment of the Polity index by Gleditsch and Ward (1997) finds that the constraints component is the key determinant of Polity scores and that components related to executive recruitment and competitiveness of participation have little weight. Likewise, Treier and Jackman (2008) find that the various components of the index tap an underlying, latent variable of democracy only with considerable error.

That the level of democracy, however measured, would produce amorphous results in quantitative analysis is supported by work that focuses on variation in institutional forms across established democracies. Persson et al. (2000) find that parliamentary systems redistribute more and provide higher levels of public goods spending than do presidential systems. Likewise, majoritarian systems have smaller governments and lower levels of welfare spending than proportional representation systems (Austen-Smith, 2000; Persson and Tabellini, 2004). Iversen and Soskice (2006) and Jusko (2008) develop this line of inquiry further, finding that the variation in levels of redistribution across democracies is a function of these electoral rules, the class coalitions that they create, and the geographical distribution of the poor.

This research captures variation across countries in features of selection institutions that the usual measures of democracy do not capture. Differences in democratic forms define the scope of the constituencies to which politicians are responsive, and they create differences in the strength of the incentives for politicians to respond to the demands of these constituencies, leading to variation in the extent of redistribution. By focusing on these aspects of selection institutions, we can pursue a more general analysis that applies to regimes of various stripes. In spirit, this approach is similar to that taken in Bueno de Mesquita et al. (2003), but significant advancements come from accounting for differences in social context.

1.1 Contestation and Inclusiveness

Dahl (1971) identifies eight institutional guarantees that are required for democracy, and he argues that these guarantees can be interpreted along two main dimensions: contestation and inclusiveness. Contestation involves opportunities to oppose the government without reprisal, express

political views, participate in political organizations, vote in fair elections involving candidates from competing parties, and the transfer of power to the winning candidates (1971: 20). In short, it reflects the extent to which there is competition over policies and the right to rule. Inclusiveness, on the other hand, pertains to the proportion of the population to which the rights of participation extend. Although these two dimensions are not completely independent of each other, as contestation cannot truly be full without inclusiveness, they are analytically distinct.

With respect to their effects on development outcomes, the two dimensions appear to operate through different mechanisms. In general, political contestation affects the level of accountability of rulers to those who can participate in the process of selecting rulers. Contestation thus determines the degrees of freedom that rulers enjoy when governing. As the level of competition increases, rulers are induced more strongly to be responsive to those that help them win and retain office. Inclusiveness, on the other hand, helps define the parameters of the population to which rulers may be held accountable. As inclusiveness increases, rulers potentially become accountable to a broader proportion of the members of the polity. Since the preferences of those to whom rulers are accountable matter, differences in the level of inclusiveness have important effects on policy outcomes.

Theories about the relationship between democracy and development outcomes typically make reference to one or both of these dimensions, but the two dimensions are rarely dealt with independently. Instead, it is just assumed that democratic political competition makes rulers accountable to a broader spectrum of citizens, thus inducing them to expend resources on public services. Additionally, different theories may define democracy in different ways but end up using the same empirical measures when conducting statistical analyses. The result is lack of clarity about which aspects of democracy matter, why they matter, and the contexts in which they can matter the most.

Sen (1999), for example, speaks about the importance of factors related to inclusiveness, such as the freedom to participate in politics through free speech and democratic choice, and those that have to do with contestation, such as the role of opposition parties. Likewise, Lake and Baum (2001) develop a theory of contestable political markets in which a ready supply of alternative rulers (i.e. contestation), and low participation costs for citizens to replace rulers (i.e. inclusiveness), should induce rulers to supply close to the optimal level of public goods. Neither work considers the effect of these dimensions individually and each assumes that some combination

of contestation and inclusiveness will make rulers broadly accountable to social needs. Sen, in particular, argues that the poor will benefit when both factors are present.

Inclusiveness is the key factor in Ghobarah et al. (2004) and Deacon (2009), who argue that democracy is expected to lead to higher expenditures on public services because democratic leaders are accountable to a broader class of supporters than dictators. This argument is consistent with the median voter logic in Meltzer and Richard (1981) in which redistribution is predicted to increase with the extension of franchise. In these works, contestation is simply assumed. In Przeworski et al. (2000), by contrast, the aspect of democracy that matters most is contestation, and the extent of participation is explicitly excluded as an indicator of democracy due to the expectation that divergent interests can still be represented even when suffrage is limited. Zweifel and Navia (2000) and Navia and Zweifel (2003) also focus on contestation as the key dimension.

By contrast, in what has become known as selectorate theory, Bueno de Mesquita et al. (2003) treat two key characteristics of a country's selection institutions individually. The first characteristic is the size of the selectorate (S), which is the subset of the population endowed with the power to participate in selecting the ruler. S thus reflects the dimension of inclusiveness. The second characteristic is the size of the winning coalition (W), a group within S whose support the ruler must have in order to gain and maintain power. The ratio of W to S can be treated as representing contestation. This parsimonious way to represent a wide variety of institutional forms is the theory's key innovation. For Bueno de Mesquita et al. (2003), the size of W is critical. It is the fact that democracies tend to have large winning coalitions, rather than other features, that explains why they tend to allocate more to public goods.

Yet, there are two important weaknesses in this work – one theoretical and the second empirical – that render these claims suspect. The theoretical shortcoming is that the model's key result depends upon the assumption that members of the selectorate are homogenous in their preferences. No member of the selectorate wants anything different from any other member, and each carries equal political power. The model thus appears inapplicable to heterogeneous selectorates where constituencies may differ in their preferences and their degree of sensitivity to policy changes. When everyone wants the same thing, the size of the winning coalition can be the only factor that determines public goods spending.

The empirical weakness is that the operationalization of W and S is crude, as the authors them-

selves state. Specifically, W is an index that increases in equal proportion for each of four items: if the regime is a civilian regime, if the executive is competitively elected, if recruitment of the executive is open (i.e. all members of the politically active population are eligible for selection), and whether there are stable and enduring political groups that compete for power.² In other words, as operationalized W appears to be quite a good proxy for Dahl's dimension of contestation. There is, accordingly, strong reason to believe that the empirical tests in Bueno de Mesquita et al. (2003) reveal the effects of political contestation rather than winning coalition size.³

Despite these flaws, the selectorate theory provides some evidence that treating the dimensions of contestation and inclusiveness separately will give us more analytical power to explain variation in the extent to which public services are provided and directed toward where they are needed the most. Whereas most theories about the relationship between democracy and development assume that political competition makes rulers accountable to a broad range of citizens, the approach here recognizes that competition can make rulers more accountable to narrow and particularistic interests. The extent to which such outcomes emerge depends not only on the nature of political institutions but the social context in which they operate.

1.2 Social Context and Preference Heterogeneity

The effects of contestation and inclusiveness on development outcomes surely depend upon social context, but the nature of this interaction is complex. Since contestation makes rulers more accountable to the coalition that keeps them in power, they will shift policies toward the constellation of policy preferences within that coalition as contestation increases. The extent to which these preferences are representative of the overall polity depends upon both the level of inclusiveness and the degree of social heterogeneity, by which I mean diversity in society that creates heterogeneous preferences over policy. At the same time, the effects of expanding the level of inclusiveness depend upon both the level of contestation and the degree of social heterogeneity.

²The data for these components come from Banks (2002) and components of the Polity index.

³Additionally, there are significant statistical concerns arising from empirical efforts to distinguish W from "democracy" as measured by the Polity index (Clarke and Stone, 2008). See the authors' response in Morrow et al. (2008).

Specifically, compared to a scenario in which social heterogeneity is low, raising the level of inclusiveness when social heterogeneity is high will produce a slower shift toward encompassing policies since rulers can continue to employ policies targeted toward particular groups as the selectorate expands.⁴ Where social heterogeneity is very low, however, the ability rulers to use particularistic benefits is reduced, and their policy outputs become more encompassing as they seek to expand their base of support. Thus, the effect of inclusiveness depends upon the level of social heterogeneity.

The magnitude of any such effects, however, is influenced by the level of contestation. Where contestation is very low, rulers face little pressure to respond to those with participation rights, regardless of whether they have homogeneous or heterogeneous preferences. As the level of contestation grows, rulers must do more to win support, but the way in which they gain support depends upon the heterogeneity of the coalition they must construct. On the one hand, greater contestation may induce rulers to reach out with encompassing policies in order to attract broader support across groups. On the other hand, contestation may induce rulers to exploit differences between groups, delivering policies that benefit some at the expense of others. In this scenario, more sensitive constituencies are targeted with policies directed at their preferences, while less sensitive constituencies pay the costs of these policies.

As argued in Huber et al. (2011), targeted distribution of resources is more efficient for garnering political support than are generalized transfers, and ethnicity “provides an obvious mechanism” for such targeting. To the extent that resources are distributed in a targeted way, we have an explanation for why democracy has had disappointing result in terms of improving outcomes for the poor. Collier (2000), on the other hand, theorizes that these problems would be worse in dictatorships, arguing that dictators must redistribute toward their own coalition or face ouster from a competitor within it. The greater inclusiveness of democracy, by contrast, inhibits rulers from discriminating in the provision of social services. Collier’s findings are consistent with the predictions of his model. The combination of high levels of ethnic diversity and low levels of political rights, as measured by the Gastil index, was found to be “economically ruinous” (2000: 233).

⁴This logic differs from that in Przeworski et al. (2000) in that expanding participation has little impact if it does not change the overall constellation of preferences in the selectorate

Bluedorn (2001) partially confirms these findings.

In other work, Deacon (2009) presents an alternative to selectorate theory by applying a model of probabilistic voting across regime types. This approach improves upon Bueno de Mesquita et al. (2003) by permitting the selectorate to be heterogeneous, thus creating incentives for rulers and challengers to target some constituencies rather than others. Specifically, groups in the selectorate differ in terms of their effective political influence. In the model, effective political influence is a combination of two factors. First, groups in the selectorate vary in their degree of sensitivity to shifts in the levels of public and private goods that they receive. Second, groups vary in terms of their raw political power.

Deacon (2009) states that democracy is represented in the model by the equality of effective political influence across groups. In other words, all groups are equal both in terms of their sensitivity to policy shifts and in terms of their political power. Where there are disparities in group influence (i.e. in non-democracies), the model predicts higher levels of targeted transfers to the more influential groups and lower levels of public goods provision overall compared with democracies. Yet, defining democracy in this way is problematic, as it appears to rule out heterogeneous democracies and homogeneous dictatorships. This problem arises because one of the two factors that compose effective political influence – differences across groups in sensitivity to policy changes – is a feature of society, not the political system. Heterogeneity of preferences is perfectly consistent with democracy and vice-versa. Additionally, the degree of contestation is not a factor in the model. Challengers and incumbents are on a level playing field.

Nevertheless, the probabilistic voting model shows promise as a way to think about differences in key dimensions of selection institutions across politics. This article takes a similar approach but seeks to model two important dimensions of democracy explicitly: the level of political contestation and the level of inclusiveness. Additionally, it permits these characteristics to interact with the level of social heterogeneity. The predictions derived from the model are then tested empirically using data that measures these dimensions of democracy.

In summary, there is a broad range of work examining the relationship between democracy and development outcomes, but this work has not produced consistent findings. Thinking about the dimensions of inclusiveness and contestation separately can help bring greater clarity. First, we can better ascertain which aspects of democracy are responsible for achieving developmental

gains, if any. Second, we can gain some interesting insight about the context-dependent effects of these dimensions, a factor that the literature has not investigated in great detail. In this work the level of social heterogeneity is the chief way to define context.

2 Model of the Polity

This article draws upon common elements of previous theoretical work to develop a model of the relationships between inclusiveness, contestation, and social heterogeneity. These elements have their origins in North (1981), Olson (1993), Lake and Baum (2001), and Bueno de Mesquita et al. (2003). The model generates predictions about the overall level of spending, and the proportion of spending devoted to public goods, as functions of the interaction these two dimensions of democracy with social heterogeneity.

I make two assumptions. First, the preferences of different individuals or groups in the polity align with respect to some policy outcomes (e.g. peace and general prosperity) but differ with respect to others according to the degree of social heterogeneity, such as ethnic and religious diversity. If social heterogeneity is not linked to at least some preference heterogeneity, then it is an empty concept. Second, I assume that social heterogeneity gives politicians greater ability to target particular constituencies with policies intended to satisfy their interests. Together, these assumptions imply that politicians build their coalition using a combination of encompassing and particularistic policies that varies according to the preference heterogeneity of coalition members.

The basic model includes contestation and inclusiveness as two key characteristics of the selection institutions of the polity. Inclusiveness describes the breadth of the portion of polity that has a role in choosing the ruler: the selectorate (Roeder, 1993; Shirk, 1993; Bueno de Mesquita et al., 2003). Contestation describes the extent to which the polity's selection institutions create free and fair opportunities for the selectorate to choose between aspirants for the position of ruler. It is assumed that selection institutions that provide high levels of contestation also provide mechanisms for the transfer of power.

This model provides the central theoretical claim of this paper: in socially heterogeneous societies, contestation matters more than inclusiveness for fostering better development outcomes. Where the selectorate is more easily divisible into identifiable groups, broad participation in the

selection process does not guarantee the responsiveness of ruling coalitions beyond their core constituencies. Greater inclusiveness, by itself, does not create encompassing incentives for rulers. The presence of political contestation, however, does raise the political importance of supplying public goods broadly. Challengers are more likely to capitalize upon the failure of incumbents to deliver better outcomes, and greater uncertainty induces rulers supply goods more broadly in order to retain office.

2.1 Features of the Model

Members of the selectorate gain utility from either public goods spending or distributive spending. Unlike Bueno de Mesquita et al. (2003), however, there is no assumption that members of the selectorate are equally responsive to offers of these goods. Members of the selectorate can differ in their ideological stance with respect to the ruler and challenger. Additionally, the selectorate may be composed of multiple groups, some of which are more responsive to offers of goods than others. This heterogeneity means that some groups receive more attention from rulers and challengers than other groups.

Public goods are assumed to be developmental in nature; they foster better social outcomes, such as in health or education. Distributive spending, on the other hand, reallocates resources from some members of the polity to others with no developmental gains.

The ruler gains utility from rents: revenues retained after delivering a tax and spending package of the size and composition necessary to maintain the support of her coalition. Rulers place a non-zero probability on the possibility that they will lose office. This probability rises in the level of contestation. Where selection institutions create opportunities for the selectorate to choose between the policy platforms presented by the ruler and challenger(s) on an even basis, the uncertainty of the ruler is high. Competitive pressure induces the ruler to spend a greater portion of revenues to maintain her coalition, with particular attention to groups that are especially sensitive to policy change. The composition of her policies may also shift to include more public goods that are broadly appealing. Where selection institutions favor the incumbent, uncertainty is lower. Rulers spend less and earn higher rents.

The formal representation of this polity is based upon a model of probabilistic voting applied

to the issue of how spending is allocated to public goods, redistribution, and rents for the ruler. These models were developed in work by Lindbeck and Weibull (1987), as developed further in Dixit and Longregan (1996), Persson and Tabellini (2000), and Lizzeri and Persico (2004). Deacon (2009) applies a model of probabilistic voting to the question of public goods provision across regime types in a manner similar to that in this article.

The country is of size N , normalized to equal 1, composed of J groups of equal size. Each individual has taxable wealth w_i , and society's level of taxable wealth per capita is $w = \frac{1}{N}\sum w_i$. As in Lizzeri and Perisco, this wealth is assumed to be taxed away. The ruler allocates these revenues according to the policy vector $\mathbf{q}_a = [g, \{c_j\}, r]$. The elements of this vector are public goods (g) per capita, group-specific transfers (c_j), and per-capita rents (r) accruing to the ruler. A member of group j receives a transfer of c_j . A challenger presents a corresponding policy vector $\mathbf{q}_b = [g, \{c_j\}, r]$. All revenues not spent on public goods and transfers are retained by the ruler as rents. The ruler's budget constraint, measured in per capita terms, is:

$$w = \frac{1}{J} \sum_{j=1}^J c_j + g + r \quad (1)$$

Each individual has the following additively separable utility function with respect to these economic policies.

$$W(\mathbf{q}) = U(c_j) + H(g) \quad (2)$$

$U(c_j)$ represents the level of consumption and is concave and monotonically increasing in c . The function $H(g)$ represents utility from public goods provision given g in spending, and $H(g)$ is likewise concave and monotonically increasing in g .

In addition to these promised policy packages, individuals evaluate the positions of rulers and challengers on other ideological dimensions. In utility terms, the net result of this evaluation is represented as σ_{ij} , the utility received by individual i in group j should the challenger win. If the citizen has no personal preference in favor of either the ruler or the challenger on other dimensions, then $\sigma_{ji} = 0$. If the citizen favors the challenger on the other dimensions, $\sigma_{ji} > 0$, and if the citizen prefers the incumbent, $\sigma_{ji} < 0$. As in Persson and Tabellini (2000), it is assumed that

σ_{ji} comes from a group-specific uniform distribution in the range:

$$\sigma_{ij} \sim \left[-\frac{1}{2\phi_j}, \frac{1}{2\phi_j} \right] \quad (3)$$

The dispersion of this distribution decreases as ϕ_j increases, reflecting the ideological range of the individuals inside each group. Different groups exhibit different degrees of dispersion, and we can think of ϕ_j as an indicator of the sensitivity of a group to changes in a candidate's positions.

Finally, there is uncertainty regarding the overall political environment in a given period. This uncertainty is captured by the parameter δ , a county-wide indicator of the extent to which the political environment favors the challenger that is drawn from a uniform distribution on the following range:

$$\delta \sim \left[-\frac{1}{2\psi}, \frac{1}{2\psi} \right] \quad (4)$$

The ruler and challenger do not know the realization of δ when making their policy proposals, but they know its distribution. The dispersion of this distribution decreases as ψ increases. Substantively, a wider dispersion means that rivals will have greater uncertainty regarding the favorability of the political environment. When $\delta < 0$, the political environment favors the incumbent.

Combining these factors, an individual will support the ruler if the following holds:

$$W(\mathbf{q}_a) \geq W(\mathbf{q}_b) + \sigma_{ji} + \delta \quad (5)$$

Individual decisions, in other words, depend upon the policy proposals offered by both rivals, individual ideological preferences on other dimensions, and the overall tilt in the polity toward the ruler or challenger.

Within each group j , the point at which an individual is indifferent between the ruler and the challenger is given by:

$$\bar{\sigma}_j = W(\mathbf{q}_a) - W(\mathbf{q}_b) - \delta \quad (6)$$

All individuals with $\sigma_{ji} \leq \bar{\sigma}_j$ support the ruler. Accordingly, by the properties of the uniform

distribution, the share of support for the ruler within group j is a function of ϕ_j as such:

$$\pi_{aj} = \phi_j \left(\bar{\sigma}_j + \frac{1}{2\phi_j} \right) \quad (7)$$

The parameter ϕ_j indicates the degree of responsiveness of members of group j toward changes in the allocation of goods. Groups where ϕ_j is higher are more sensitive to changes in the policy package than are other groups.

Suppose now that $S \subset J$ groups are members of a selectorate, the portion of citizens that can participate in choosing the ruler. Some of the J groups, in other words, may not be part of S . We can interpret the ratio of S/J as representing the inclusiveness of the polity. The predictions of the model do not depend upon which groups in J are also in S . Without loss of generality, we can order these groups in the selectorate such that groups with higher values of ϕ_j come before those with lower values: $\phi_1 \geq \phi_2 \geq \dots \geq \phi_S$. Overall support for the ruler across all groups within the selectorate is given by:

$$\pi_a = \frac{1}{S} \sum_{j=1}^S \phi_j \left(\bar{\sigma}_j + \frac{1}{2\phi_j} \right) \quad (8)$$

We assume that the ruler needs to gain the support of a share of the selectorate equal to at least one-half.⁵ This threshold is arbitrary and does not affect the main findings of the model. Additionally, we can represent the average responsiveness of the selectorate to changes in policy proposals as ϕ , where $\phi = \frac{1}{S} \sum_{j=1}^S \phi_j$. Applying the properties of the uniform distribution, the probability that the ruler's share of the selectorate fails to reach this threshold can then be expressed as follows:

$$\text{Prob} \left[\pi_a < \frac{1}{2} \right] = \frac{1}{2} - \frac{\psi}{S\phi} \sum_{j=1}^S \phi_j [W(\mathbf{q}_a) - W(\mathbf{q}_b)] \quad (9)$$

Equation 9 assumes that the selection system permits full contestation, so that preferences are translated directly into a decision on whether the ruler or the challenger is the victor. When con-

⁵We can think of this process as involving voting in the one-person-one-vote sense or as involving the accumulation of political support as does Deacon (2009). The latter approach is more general, as it applies to systems where the selection process does not involve elections.

testation is less than full, the ruler gains an advantage, thus reducing the probability that she will lose. The level of contestation is represented by the parameter α , where $0 < \alpha \leq 1$. Accordingly rulers always feel at least some competitive threat. The probability that the ruler wins (p_a) is thus expressed as:

$$\begin{aligned} p_a &= 1 - \alpha \text{Prob} \left[\pi_a < \frac{1}{2} \right] \\ &= 1 - \alpha \left(\frac{1}{2} - \frac{\psi}{S\phi} \sum_{j=1}^S \phi_j [W(\mathbf{q}_a) - W(\mathbf{q}_b)] \right) \end{aligned} \quad (10)$$

The effect of contestation in Equation 10 is twofold. First, as contestation rises, there is a direct negative effect on the probability that the ruler will maintain power. Rulers become more vulnerable to changes in the political environment. Second, contestation affects the degree to which differences in the policy packages offered by the ruler and challenger translate into changes in the probability that the ruler retains office. In general, if the ruler and challenger were to offer identical policy packages, and there is high political contestation ($\alpha = 1$), the probability that the ruler wins is equal to one-half. This probability increases toward 1 as α approaches 0.

The ruler gains utility from expected rents (rp_a), and thus has the following objective function:

$$\mathcal{L} = \left[w - \frac{1}{J} \sum_{j=1}^S c_j - g \right] \left[1 - \alpha \left(\frac{1}{2} - \frac{\psi}{S\phi} \sum_{j=1}^S \phi_j [U(c_j) + H(g) - W^j(\mathbf{q}_b)] \right) \right]$$

The expressions for the levels g and c_j that maximize this equation are derived in Appendix A. Two key findings arise. First, higher levels of contestation decrease the level of rents that rulers are able to collect. In other words, as α increases, rents decrease. When rulers face a greater competitive threat from challengers, they must spend a greater portion of revenues on some mixture of public and private goods rather than retain these revenues as rents.

Second, concerning the distribution of spending between public goods and transfers, the central finding of the model is that greater heterogeneity in the selectorate shifts the allocation of spending toward group-specific transfers at the expense of public goods, and this effect is intensified when inclusiveness is low. This finding is given in Equation 22, which describes the ruler's optimal trade-off between public goods spending and transfers to group j :

$$g^* = H_g^{-1} \left[\frac{J}{S} U_c(c_j) \frac{\phi_j}{\phi} \right] \quad (11)$$

In this equation, the optimal level of public goods provision, g^* , declines as the product inside the brackets increases. Accordingly, as the sensitivity of group j increases relative to the mean sensitivity of the selectorate overall (ϕ_j/ϕ) the optimal level of public goods provision decreases. In other words, greater heterogeneity across groups induces both rulers and challengers to focus on supplying transfers to the groups that are most sensitive. Consider the trade-off between public goods and transfers by comparing the level of public goods provision as a function of the most-responsive group ϕ_1 . The intuition is that rulers respond with transfers to the most swayable groups before providing general public goods.⁶ Group-specific transfers are provided to the extent that the marginal gain in political support from these transfers exceeds the marginal gain from providing public goods. Heterogeneity in the selectorate, in other words, translates into lower levels of public goods provision.

Crucially, this effect is accentuated as the level of inclusiveness (S/J) decreases. The lower the level of inclusiveness, the more that the optimal trade-off between public goods and transfers shifts to the latter. The value of per capita spending on public goods declines when the selectorate is a smaller portion of the overall polity. Interpreted differently, increasing the level of inclusiveness increases the optimal level of public goods provision, but this effect is attenuated when heterogeneity across groups in terms of their responsiveness is high.

Combining these two findings, we see that social heterogeneity is most harmful when levels of contestation are low. In this context, rulers are not induced to spend significant resources, and what little spending there is tends to be highly focused on group-specific transfers to the most responsive groups. As contestation increases, rulers must respond to challengers by spending a greater share of revenues, leading to higher levels of public goods provision after transfers to the most sensitive groups have occurred.

⁶Any group for which $\phi_j > \phi$ will get transfers before public goods are provided.

3 Hypotheses

This model helps define expectations for what kinds of policies will be produced at varying levels of contestation, inclusiveness, and social heterogeneity. First, consider a selectorate that is largely homogeneous in preferences. When selection institutions have low inclusiveness (i.e. the selectorate is small), rulers and challengers compete for the support of a narrow constituency. The incentives to minimize the cost of this political coalition lead them to offer packages that are as small as possible, and the packages are thus composed of distributive spending. The higher the level of contestation, however, the greater the level of spending that is required to win the coalition's support, and the composition of this spending will be more strongly weighted toward transfers that lower the level of inclusiveness.

Raising the level of inclusiveness, however, requires rulers and challengers to expand the size of their coalition. Since this selectorate, though broader, remains homogeneous, politicians have low ability to target tax and spending policies, and the greater homogeneity of preferences means that there is little benefit from targeting certain groups at the expense of others. As a result, spending packages become more evenly balanced between public goods and transfers.⁷ This logic produces the following hypothesis:

Hypothesis 1 *When levels of social heterogeneity are low, raising the inclusiveness of selection institutions increases the proportion of spending devoted to public goods.*

When social heterogeneity is high, however, rulers and challengers continue to focus spending on group-specific transfers to the most sensitive groups before providing public goods. Expanding the size of the selectorate does not change these incentives. The effect of increasing the inclusiveness of selection institutions on provision of public goods is thus weaker when social heterogeneity is high.

When contestation and inclusiveness are low, but social heterogeneity is high, rulers construct smaller coalitions by targeting distributive spending to particular groups. When the level of contestation increases, rulers must increase their overall level of spending to counteract the stronger

⁷Essentially, this is the prediction of Bueno de Mesquita et al. (2003).

threat from the challenger. With greater overall spending, additional transfers to the most sensitive groups yield declining marginal gains in support. As these groups become relatively satiated from transfers, policies will shift toward the provision of public goods and transfers to a broader number of groups in the selectorate.

Hypothesis 2 *When levels of social heterogeneity are high, raising the level of contestation leads to a higher level of public goods spending.*

These two hypotheses differ from those offered in Collier (2000). In this case, it is not the expansion of political rights (inclusiveness) that ameliorates the effect of ethnic diversity but the increase of contestation. As it turns out, the Political Rights index employed by Collier in empirical tests loads on the contestation dimension used here (discussed in the next section), so his empirical findings are consistent with Hypothesis 2.

In summary, this model of the political system predicts that inclusiveness and contestation have different effects at different levels of social heterogeneity. When heterogeneity is high, contestation leads to higher levels of public goods provision. When heterogeneity is low, inclusiveness has this role.

4 Empirical Analysis

To test these hypotheses, I compiled data from a variety of sources, covering 146 countries in total. The outcome of interest in all statistical tests is the level of infant mortality (*InfMort*). As argued by Ross (2006) and Navia and Zweifel (2003), infant mortality is an excellent composite indicator of development since it is affected by a range of factors related to public goods provision: access to health care, nutrition, clean water, air pollution, immunizations, and female education. Data on infant mortality rates come from the Interagency Group for Child Mortality Estimation, a joint effort of UNICEF, the WHO, the World Bank, and the United Nations Population Division.⁸

I follow two approaches to measure the democratic dimensions of contestation and inclusiveness. The first approach employs the measures of *Competition* and *Participation* from the Polyarchy dataset (Vanhanen, 2000). Competition is measured by subtracting the vote percentage of the

⁸These data are available at <http://www.childinfo.org/mortality.html>

largest party from 100, thus measuring the percentage of the vote won by smaller parties. Participation is calculated as the percentage of the country's total population that voted in these elections. These data were extended to the year 2002 by Wilhelmsen (2006), and I rescale them to run from 0 to 1.

Second, Coppedge, Alvarez and Maldonado (2008), develop measures of contestation and inclusiveness by conducting a principal components analysis of 13-15 different indicators from a variety of sources (depending on time period), including data from the commonly-used Freedom House and Polity indices. The analysis found that two components accounted for approximately 75% of the covariance among the different indicators, and these two components are strongly aligned with indicators that capture contestation and inclusiveness. These indicators are referred to as the CAM measures.

The first of these components, which Coppedge et al. (2008) label *Contestation*, accounts for about 62% of the covariance between the various indicators of democracy. Indicators that loaded heavily on this dimension relate to selection institutions that provide for political contestation. They include the following: the Freedom House indices of Political Rights and Civil Liberties (Gastil); the Polity indicators of competitiveness of participation, competitiveness of recruitment, and executive constraints (Marshall and Jaggers, 2009a); Cheibub and Gandhi's (2004) Regime Type classification; Vanhanen's (2000) Index of Competition; and Banks' (1979) data on Party Legitimacy and Legislative Effectiveness. The second component identified in the analysis, *Inclusiveness*, accounted for 11-13% of the covariance across the democracy indicators. The indicators that loaded the most heavily were Adult Suffrage (Bollen et al., 1996), Legislative Selection (Banks, 1979), and the Index of Participation (Vanhanen, 2000). In each of these cases, the indicators capture the extent to which selection institutions encompass the population of the polity. Both democracy measures are normalized to have mean 0 and standard deviation of 1.

Likewise, two measures are employed to capture social heterogeneity: *EthnicFrac*, the level of ethnic fractionalization (Alesina et al., 2003) and *CulturalDiv*, a measure of cultural divisions from Fearon (2003). The ethnic fractionalization data from Alesina et al. are constructed to measure a country's ethnic structure using a combination of racial and language characteristics. In some countries, such as those in Latin America, ethnicity is marked by racial differences more than language differences. In Switzerland or Belgium, language differences are more distinguishing.

The source data come from the *Encyclopedia Britannica* (2001), the CIA, and the Minority Rights Group International (1997).

The cultural divisions measure from Fearon (2003) is a linguistic fractionalization measure that is adjusted to account for the proximity of different languages on a language tree. The rationale is that greater cultural differences between groups are present when the groups speak languages that are more distant from each other. Thus, fractionalization scores should be adjusted downward when the languages involved are from the same language family compared to cases when the languages are more distantly related.

Other variables are used to control for other factors that could affect the ability of states to deliver public goods and/or the level of infant mortality. The log of population density (*PopDensity*) serves as an indicator of the public service delivery burden. In countries with low population density, for example, it is assumed to be more difficult to make health services available to all citizens. These data come from the World Bank (2011). Data on the level and growth rate of expenditure-side real GDP per capita (*GDP/cap*) come from the *Penn World Tables* version 8.0 (Feenstra et al., 2013).

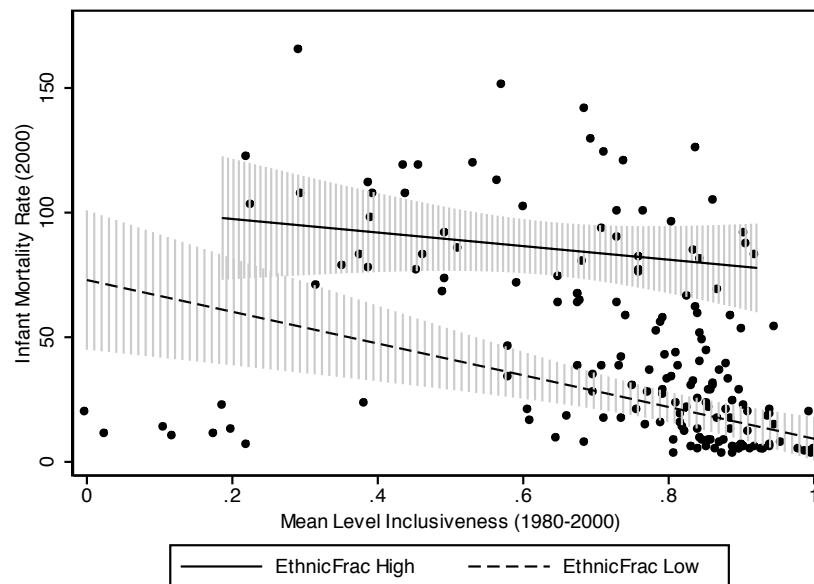
I first turn to a simple, bivariate analysis that examines whether the level of infant mortality in the year 2000 can be explained by the long-term levels of Contestation and Inclusiveness given different levels of ethnic diversity. Then, I convert the annual data into five-year periods in order to test multivariate models that capture shorter-term changes in infant mortality as a function of temporally-proximate changes in political institutions.

4.1 Bivariate Analysis

Figure 1 depicts a scatterplot of the year 2000 infant mortality rate on the mean level of Inclusiveness during the period 1980-2000. Superimposed on these points are lines representing the best linear fit for the subsamples with high and low levels of EthnicFrac. Countries are classified as high if their score on EthnicFrac is at the 75th percentile or above (.668); countries are classified as low if their score on EthnicFrac is at the 25th percentile or below (.205). The shading around each linear prediction represents its 95% confidence interval. For countries with low levels of ethnic fractionalization, greater Inclusiveness is associated with lower levels of infant mortality in

2000. For countries with high levels of EthnicFrac, however, the predicted year 2000 level of infant mortality does not change as Inclusiveness increases.⁹

Figure 1: Relationship of Infant Mortality to Inclusiveness



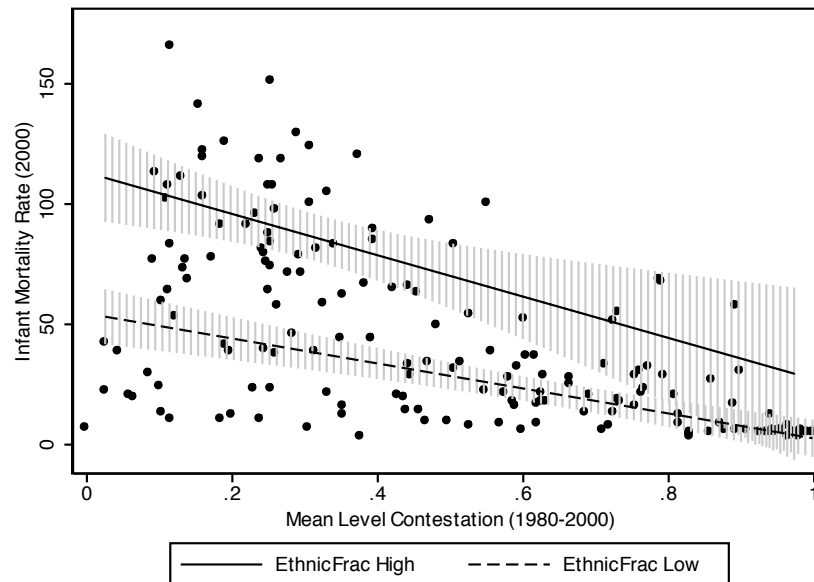
In contrast, Figure 2 indicates that high Contestation is associated with lower levels of year 2000 infant mortality whether ethnic diversity is high or low. This effect, however, is stronger among the countries with high levels of EthnicFrac. These data are consistent with the expectations outlined in Hypothesis 2.

4.2 Multivariate Analysis

For the multivariate analysis, each observation in the dataset represents a five-year period during the 1961-2005 time frame covering up to 146 countries (data availability varies across variables). The specification of the model is similar to that of an error-correction model, with the change in the log infant mortality rate from the previous to the current period regressed on the lagged level of infant mortality, the lagged change in infant mortality, and the lagged levels and/or changes

⁹Using other cutoffs to demarcate high and low EthnicFrac, such as .5 or the mean, does not change the substance of these findings.

Figure 2: Relationship of Infant Mortality to Contestation



in a set of other predictors. The mean value of the dependent variable is 16, which corresponds roughly to a 16% reduction in infant mortality over five years. The standard deviation is .11. The main independent variables of interest are the lagged levels of the measures of contestation and inclusiveness, the measures of social heterogeneity, and their interactions.

All models were estimated using Ordinary Least Squares with random effects and standard errors clustered at the country level.¹⁰ Table 1 presents the results for tests when EthnicFrac is used to measure social heterogeneity. Four models are presented in all. Models 1 and 2 use the *Polyarchy* indicators of Competition and Participation to represent contestation and inclusiveness, while Models 3 and 4 use the CAM Contestation and Inclusiveness measures. The first model in each set, Models 1 and 3, includes the democracy indicators as standalone predictors of changes in the infant mortality rate, and the latter two models include their interactions with EthnicFrac. Proper interpretation of these interactive effects is central to testing the hypotheses of interest.

Across all four models, there is a strong association between ethnic diversity and comparatively worse outcomes on infant mortality. For example, according to the estimates in Model 1,

¹⁰Due to the fact that measures of ethnic fractionalization are constant through the time period, fixed-effects models are not viable for testing the key propositions of interest.

Table 1: Dimensions of Democracy, Ethnic Heterogeneity, and Infant Mortality

	(1)	(2)	(3)	(4)
Contestation _{t-1}	-0.03* (0.01)	-0.02 (0.02)	-0.01 [^] (0.00)	0.00 (0.01)
Contestation _{t-1} ·EthnicFrac		-0.02 (0.04)		-0.03* (0.01)
Inclusiveness _{t-1}	-0.02 (0.02)	-0.00 (0.03)	-0.00 (0.00)	-0.01 (0.01)
Inclusiveness _{t-1} ·EthnicFrac		-0.05 (0.06)		0.02 (0.01)
EthnicFrac	0.07** (0.01)	0.09** (0.02)	0.07** (0.02)	0.07** (0.02)
GDP/cap _{t-1}	-0.02** (0.01)	-0.02** (0.01)	-0.02** (0.01)	-0.02** (0.01)
ΔGDP/cap	-0.05** (0.02)	-0.05** (0.02)	-0.05** (0.02)	-0.05** (0.02)
PopDensity _{t-1}	-0.00 (0.00)	-0.00 (0.00)	-0.00 [^] (0.00)	-0.00 (0.00)
InfMort _{t-1}	-0.03** (0.01)	-0.03** (0.01)	-0.03** (0.01)	-0.03** (0.01)
ΔInfMort _{t-1}	0.50** (0.05)	0.49** (0.05)	0.50** (0.05)	0.49** (0.05)
Constant	0.24** (0.07)	0.21** (0.07)	0.23** (0.07)	0.21** (0.07)
N	1065	1065	937	937
Countries	145	145	146	146
R ²	0.42	0.42	0.43	0.43
Democracy Measures	Polyarchy	Polyarchy	CAM	CAM

[^] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Table 1. Random-effects OLS model with panel-clustered standard errors. The dependent variable is $\Delta \text{InfMort}_t$: the change in the log infant mortality rate from the previous period to the current period. All models include time-period dummy variables to capture worldwide trends.

the rate of change in the infant mortality rate is predicted to shift 1.8 percentage points in a positive direction when EthnicFrac is one standard deviation (.26) higher. Given the general context of declining infant mortality rates, this means infant mortality declines more slowly where ethnic diversity is greater. This estimate aligns with the typical findings in the literature, and it is consistent across all four models.

The control variables likewise perform as expected. The infant mortality rate falls more quickly where the level of country wealth and its growth rate are higher. Greater population density appears to have a weak association with faster declines in infant mortality. These findings are also consistent across all four models.

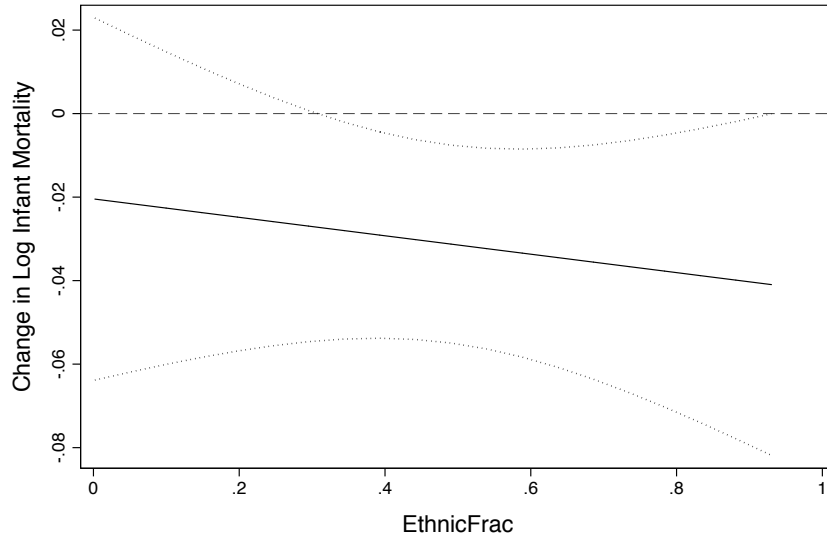
In Models 1 and 3, higher levels of contestation, measured in both ways, are linked with faster declines in infant mortality on average. When the *Polyarchy* Competition score is one standard deviation (.36) higher, which corresponds to the aggregate vote total of the smaller parties being about 36 percentage points greater, the expected rate of decline in infant mortality is 1.1 percentage points faster. With the CAM Contestation measure, the corresponding estimate is that infant mortality will decline 0.9 percentage points faster. In contrast, neither measure of inclusiveness is found to have a significant statistical association with the change in infant mortality rates on average.

The tests of Hypotheses 1 and 2 come with the introduction of the interaction terms in Models 2 and 4. According to Hypothesis 2, higher levels of political contestation should be associated more strongly with public goods provision when social diversity is high. The findings in both models are consistent with this prediction. According to Model 2, for example, when EthnicFrac is zero, the effect of raising Competition from 0 to 1 is that the infant mortality rate will decline 2 percentage points more quickly, but this prediction is not different from zero with high confidence. As EthnicFrac increases, however, this effect becomes stronger and statistically significant when EthnicFrac reaches about 0.4, the level of Bulgaria. An illustration of this marginal effect, with the dotted lines depicting the 95% confidence interval, is presented in Figure 3.

The corresponding results from Model 4, which uses the CAM measure of Contestation are consistent with those of Model 2. See Figure 4. The effect of political contestation on reducing the rate of infant mortality is greater when ethnic diversity is higher.

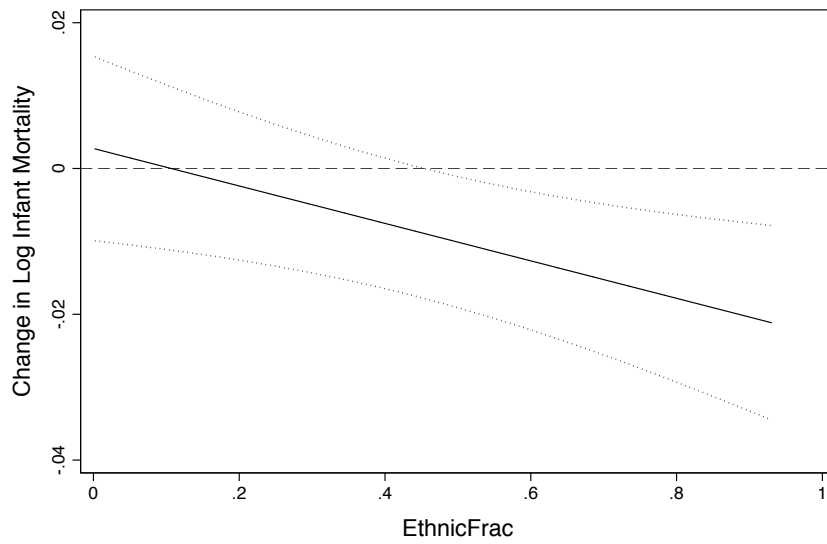
According to Hypothesis 1, inclusiveness should have a positive effect on public goods provi-

Figure 3: Effect of Competition on Infant Mortality as a Function of EthnicFrac



Constructed using estimates from Table 1, Model 2

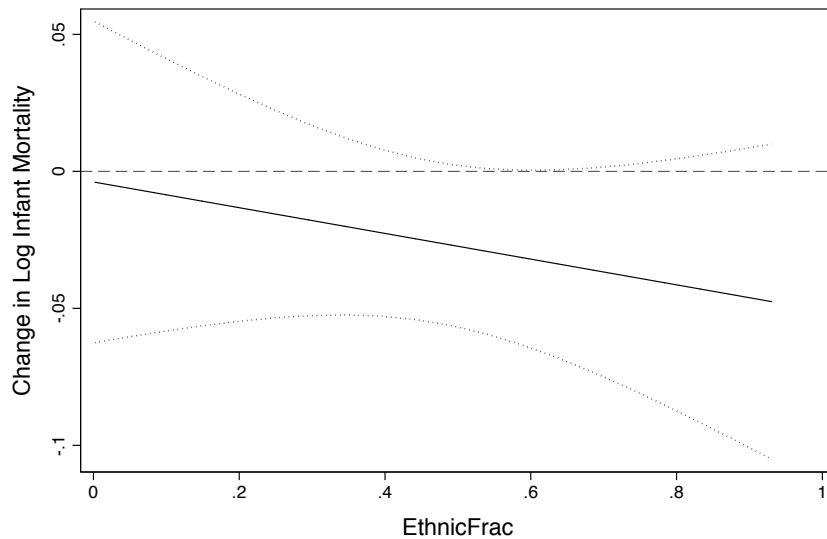
Figure 4: Effect of Contestation on Infant Mortality as a Function of EthnicFrac



Constructed using estimates from Table 1, Model 4

sion when ethnic diversity is low. This effect should be attenuated as ethnic diversity increases. Neither model provides evidence that is strongly consistent with this hypothesis. The estimated effects of the two measures of inclusiveness are not distinguishable from zero with high confidence for any value of EthnicFrac, as can be seen in Figures 5 and 6. These results suggest that the measures of inclusiveness have opposite signs in their interaction with EthnicFrac, but since the level of statistical precision is low, no firm conclusions are possible.

Figure 5: Effect of Participation on Infant Mortality as a Function of EthnicFrac



Constructed using estimates from Table 1, Model 2

Table 2 presents the same set of tests using the Fearon (2003) measure of cultural divisions as the measure of social heterogeneity. Overall, the results are more strongly consistent with Hypotheses 1 and 2. As expected, the effect of political contestation in reducing the rate of infant mortality is stronger when cultural divisions are higher, regardless of which measure of contestation is employed. Additionally, for both measures of inclusiveness, the effect on reducing infant mortality is stronger when cultural divisions are lower. Finally, the coefficients on the control variables are consistent with those in Table 1.

Where cultural divisions are greater, as all four models establish, the predicted change in infant mortality rate shifts in a positive direction, meaning that infant mortality will fall more slowly (or perhaps will increase) where cultural divisions are high. Political contestation serves to mitigate these effects, however. As is shown in Model 2, higher values of Competition have a negative

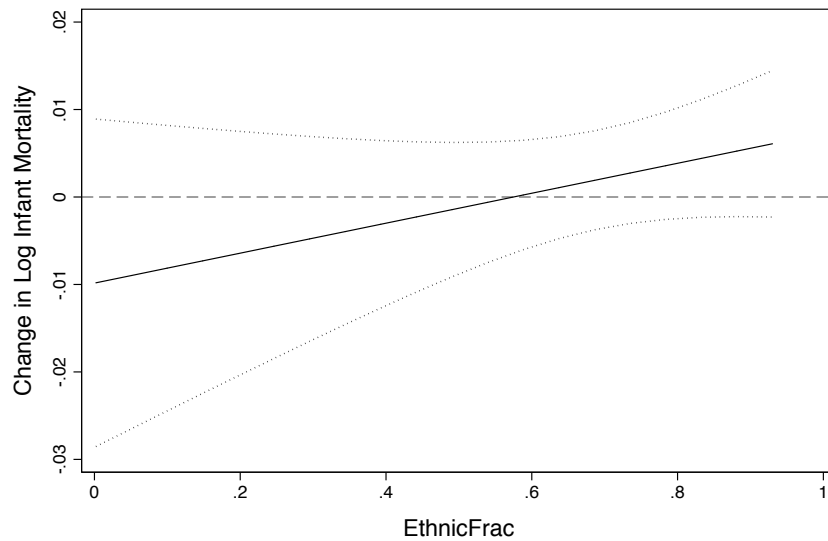
Table 2: Dimensions of Democracy, Cultural Divisions, and Infant Mortality

	(1)	(2)	(3)	(4)
Contestation _{t-1}	-0.02 (0.01)	0.01 (0.02)	-0.01 [^] (0.00)	0.00 (0.01)
Contestation _{t-1} ·CulturalDiv		-0.09 [^] (0.05)		-0.04* (0.02)
Inclusiveness _{t-1}	-0.04** (0.01)	-0.05* (0.02)	-0.00 (0.00)	-0.01 (0.01)
Inclusiveness _{t-1} ·CulturalDiv		0.02 (0.06)		0.02 (0.02)
CulturalDiv	0.05** (0.01)	0.07** (0.02)	0.04** (0.02)	0.04** (0.02)
GDP/cap _{t-1}	-0.02** (0.01)	-0.02** (0.01)	-0.03** (0.01)	-0.02** (0.01)
ΔGDP/cap	-0.06** (0.02)	-0.06** (0.02)	-0.06** (0.02)	-0.06** (0.02)
PopDensity _{t-1}	-0.01* (0.00)	-0.00* (0.00)	-0.01** (0.00)	-0.01** (0.00)
InfMort _{t-1}	-0.03** (0.01)	-0.03** (0.01)	-0.03** (0.01)	-0.03** (0.01)
ΔInfMort _{t-1}	0.51** (0.05)	0.51** (0.05)	0.51** (0.05)	0.51** (0.05)
Constant	0.25** (0.08)	0.23** (0.08)	0.25** (0.08)	0.24** (0.08)
N	1009	1009	887	887
Countries	137	137	137	137
R ²	0.43	0.43	0.43	0.43
Democracy Measures	Polyarchy	Polyarchy	CAM	CAM

[^] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Table 2. Random-effects OLS model with panel-clustered standard errors. The dependent variable is $\Delta \text{InfMort}_t$: the change in the log infant mortality rate from the previous period to the current period. All models include time-period dummy variables to capture worldwide trends.

Figure 6: Effect of Inclusiveness on Infant Mortality as a Function of EthnicFrac

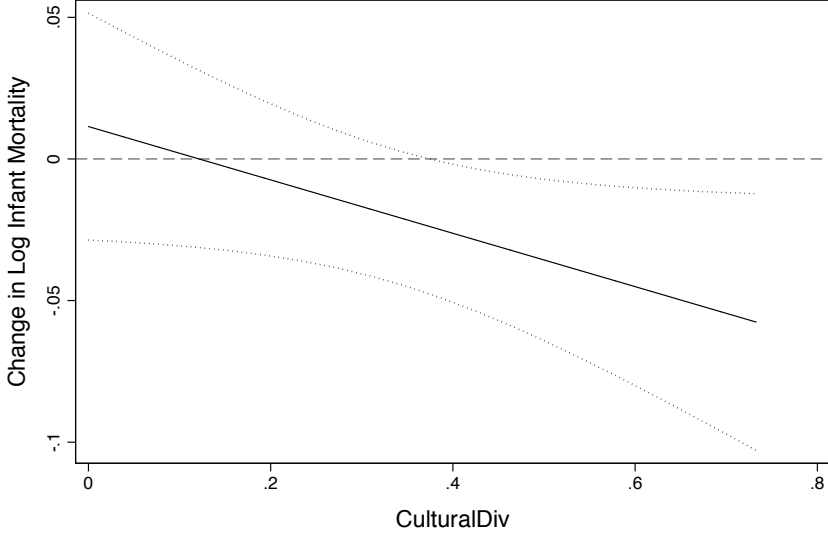


Constructed using estimates from Table 1, Model 4

impact on the infant mortality rate when CulturalDiv is high. The predicted effect from increasing Competition by one standard deviation is essentially zero when CulturalDiv is zero. When CulturalDiv is at its maximum value of .73, however, the same increase in Competition would lead to a rate of decrease in infant mortality that is about 2 percentage points faster over five years. Figure 7 depicts the marginal effect of Competition, and the associated 95% confidence interval, across the range of CulturalDiv. The corresponding results in Model 4, which uses the Contestation measure from Coppedge et al. (2008), are very similar (marginal effect graph not presented).

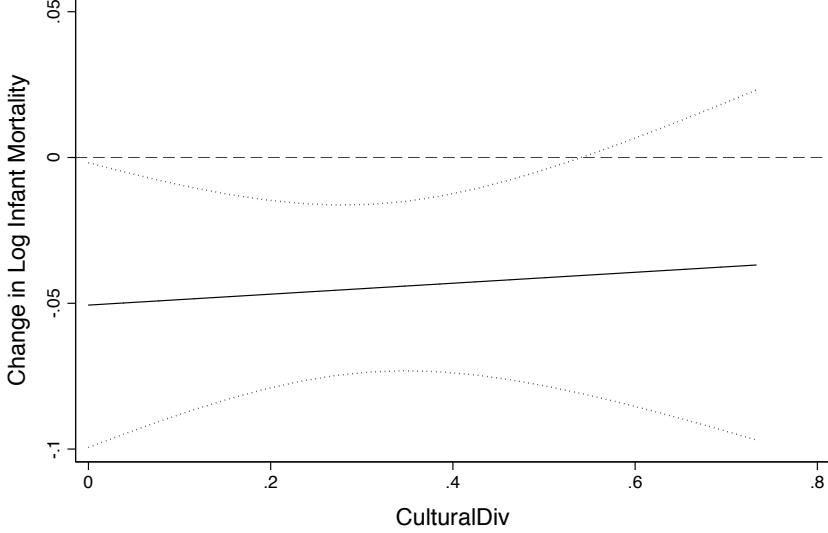
The findings with respect to inclusiveness of the polity are less consistent across the two measures. Model 2, which uses the Participation indicator from the *Polyarchy* dataset, indicates that a one-standard deviation increase in Participation, which corresponds to a 28 point increase in the percentage of the population that votes, is expected to increase the rate at which infant mortality declines by about 1.4 percentage points. The magnitude of this effect lessens to about one percentage point when CulturalDiv is at its highest value (.73), and it is not distinguishable from zero at that point with high confidence. Model 4 likewise predicts that Inclusiveness has a more strongly negative effect on infant mortality when CulturalDiv is low, but this effect has very low statistical precision (see Figure 9).

Figure 7: Effect of Competition on Infant Mortality as a Function of Cultural Divisions



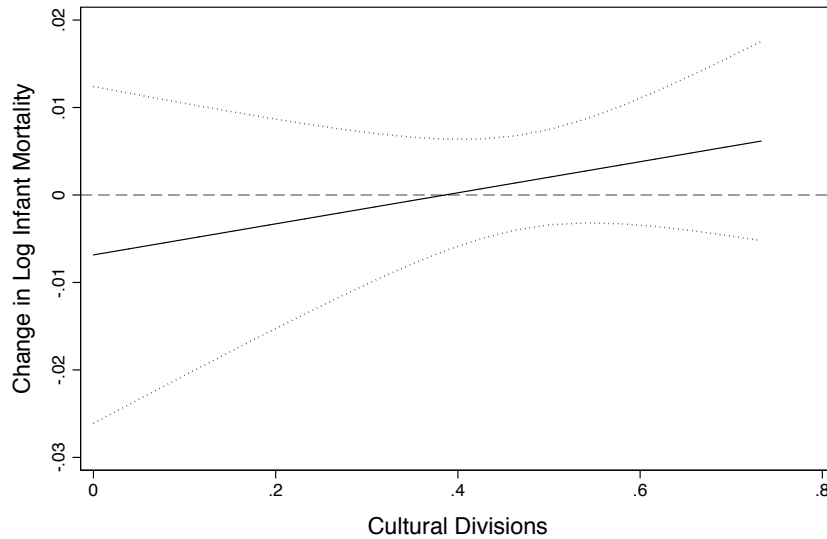
Constructed using estimates from Table 2, Model 2

Figure 8: Effect of Participation on Infant Mortality as a Function of Cultural Divisions



Constructed using estimates from Table 2, Model 2

Figure 9: Effect of Inclusiveness on Infant Mortality as a Function of Cultural Divisions



Constructed using estimates from Table 2, Model 4

4.3 Discussion

Considering all of these statistical results in their totality, there is some weak evidence that is generally consistent with Hypothesis 1 and strong evidence consistent with Hypothesis 2. The relationship between inclusiveness as measured and the rate of infant mortality is estimated to be more strongly negative when social heterogeneity is low in three out of the four multivariate tests presented. Yet, in only one of these tests (Table 2, Model 2) is greater inclusiveness associated with a statistically significant decline in infant mortality. By contrast, when social heterogeneity is high, political contestation is associated with faster declines in infant mortality with high statistical confidence in every test.

A possible inference from these results is that, in situations of high social diversity, competitiveness is generally more important than inclusiveness when it comes to creating incentives for public goods that are associated with reducing infant mortality. If the logic of the model presented in this article is correct, the causal mechanism leading to this outcome is that competition induces political rivals to expend greater resources in their quest to win office, and at least some of this spending comes in the form of public goods. If the members of the selectorate, however narrow it may be, gain utility from public goods, then high levels of contestation will create incentives for

these goods to be provided.

None of the empirical tests in this article explore this causal mechanism in detail, so the correlations uncovered in the analysis above may result from some other causal process. Yet, it is at least plausible that contestation in an environment of high social heterogeneity creates incentives to deliver policies that can encompass multiple constituencies. Moreover, public policies that expand the number of health clinics, improve water sources, and increase immunizations are not easily restricted to narrow groups when societies are very diverse at the local level. Additional research may shed light on whether this interpretation has merit.

Finally, the results presented above do not explore how inclusiveness and contestation interact with each other as social diversity varies. The combination of high inclusiveness and contestation together should produce strong incentives for supplying public goods than either high inclusiveness or contestation individually. These incentives should be strongest when social heterogeneity is low, since in this scenario there are not specific groups in the selectorate that get targeted first with private transfers. Exploring this question will be the subject of future work.

5 Conclusion

This study provides considerable evidence that research in the area of democracy and development should take democracy's multidimensional nature into account. Treating contestation and inclusiveness as separate parameters can help identify distinct mechanisms through which they may affect a ruler's policy incentives. Even if the specific causal pathways described in this article are not correct, the usual measures of democracy are most likely too broad.

The importance of political contestation in facilitating faster declines of infant mortality when social heterogeneity is high suggests that building the capacity of opposition parties to compete effectively in national elections should be an important component of reform strategies and efforts to improve governance. Competition creates stronger accountability. At the same time, it is important to be cognizant of the nature of the constituencies to which rulers are accountable. On average, it appears to be the case that greater contestation has some effect at creating more encompassing policies, but in specific cases this may not be true. In these situations, promoting broader inclusiveness of the selectorate may be essential.

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Appendix A

The first-order conditions for Equation 2.1 follow:

$$\frac{\partial \mathcal{L}}{\partial c_j} = r\alpha\psi \frac{1}{S} \frac{\phi_j}{\phi} U_c(c_j) - \frac{1}{J} p_a = 0 \quad \forall j \in S \quad (12)$$

$$\begin{aligned} \frac{\partial \mathcal{L}}{\partial g} &= \frac{r\alpha\psi}{S\phi} \sum_{j=1}^S \phi_j H_g(g) - p_a = 0 \\ &= r\alpha\psi H_g(g) - p_a = 0 \end{aligned} \quad (13)$$

In the above, since public goods flow to all groups, the sum of the group-specific effects is equivalent to the average effect across all groups. Specifically, note that: $\sum_{j=1}^S \phi_j = S\phi$.

To simplify notation, let $\Omega_j = \frac{\phi_j}{\phi}$. This parameter thus constitutes a measure sensitivity of group j relative to the total sensitivity in the selectorate caused by heterogeneity of preferences. The ordering of the groups in terms of the value of ϕ_j produces the same ordering in terms of Ω_j .

Equation 12 then indicates that:

$$p_a = r\alpha\psi \frac{J}{S} \Omega_j U_c(c_j) \quad (14)$$

Next, using Equations 13 and 14, we see the optimal level of public goods provision depends upon group heterogeneity and the marginal utility of consumption of each group j :

$$H_g(g^*) = \frac{J}{S} \Omega_j U_c(c_j) \quad (15)$$

Equation 15 represents the ruler's optimal trade-off between public goods and transfers to group j . Note that public goods provision (g^*) is higher where $H_g(g_j^*)$ is lower, since marginal utility declines as goods are provided. Additionally, note that J/S is the reciprocal of the level of inclusiveness. As inclusiveness increases, it is optimal to shift spending from transfers to public goods.

Transfers flow disproportionately to the most responsive groups (i.e. those with higher values of Ω_j). For each amount spent, resources are allocated to public goods and transfers in accordance

with relative electoral sensitivity, equating the marginal gains to the ruler from all types of spending. The ruler's optimal level of public good can be expressed as function of transfers to each group j :

$$g^* = H_g^{-1} \left[\frac{J}{S} \Omega_j U_c(c_j) \right] \quad (16)$$

More generally, the marginal benefit to the ruler of transfers can be represented as the weighted average of the marginal utilities of transfers to each group j :

$$U_c(c) = \frac{J}{S} \cdot \frac{1}{S} \sum_{i=1}^S \Omega_j U_c(c_j) \quad (17)$$

Equation 17 thus provides an alternative expression for the ruler's optimal level of public goods with respect to transfers:

$$g^* = H_g^{-1} \left[\frac{J}{S} \cdot \frac{1}{S} \sum_{i=1}^S \Omega_j U_c(c_j) \right] \quad (18)$$

At the optimum, the marginal gains to the ruler of public goods spending and transfers to each group are equal, and the same is therefore true with respect to spending on public goods versus aggregate transfers overall.

Inclusiveness and group heterogeneity both affect the proportion of spending devoted to public goods. Substantively, if J and S are equal, and if $\Omega_j = 1$, it is optimal for the ruler to supply public goods and transfers in a manner that equates their marginal utilities for each group j . When groups differ in their sensitivity to offers of goods, however, the more sensitive groups get larger transfers. These effects are accentuated when the level of inclusiveness in the polity is very low. The result is that the proportion of spending on public goods declines in the heterogeneity of the selectorate and increases in the level of inclusiveness.

The analysis above helps explain the proportion of spending devoted to public goods, but it tells us nothing about the overall level of spending, which is also an important factor for determining the extent of public goods provision. When levels of contestation are low, a greater proportion of revenues will be retained in the form of rents, thus reducing overall spending on either transfers or public goods. From Equations 13 and 14, we see that:

$$r_a^* = \frac{p_a}{\alpha\psi H_g(g)} = \frac{p_a}{\alpha\psi \frac{J}{S} \Omega_j U_c(c_j)}$$

This implies that the optimal level of rents for the ruler decreases in the level of contestation, decreases where uncertainty about the outcome is smaller (i.e. ψ is greater), increases in the level of inclusiveness, and decreases in the degree of heterogeneity across groups. As the level of contestation approaches zero, rents rise to the point where the incumbent retains the entire budget.

Note that this formula should for expected rents, but it does not seem to always:

$$\begin{aligned} E(r) &= \frac{H_g(g^a)p_a^2 + H_g(g^b)p_b^2}{\alpha\psi H_g(g^a)H_g(g^b)} \\ &= \frac{\frac{J}{S}\Omega_j U_c(c_j^a)p_a^2 + \frac{J}{S}\Omega_j U_c(c_j^b)p_b^2}{\alpha\psi \frac{J}{S}\Omega_j U_c(c_j^a)\frac{J}{S}\Omega_j U_c(c_j^b)} \\ &= \frac{U_c(c_j^a)p_a^2 + U_c(c_j^b)p_b^2}{\alpha\psi \frac{J}{S}\Omega_j U_c(c_j^a)U_c(c_j^b)} \end{aligned}$$

Note also the following helpful fact for any two groups j and i :

$$\begin{aligned} U_c(c_j^*) &= \frac{S}{J} H_g(g^*) \frac{\phi}{\phi_j} \\ &= \frac{S}{J} H_g \left(H_g^{-1} \left[\frac{J}{S} \frac{\phi_i}{\phi} U_c(c_i^*) \right] \right) \frac{\phi}{\phi_j} \\ &= \frac{S}{J} \left[\frac{J}{S} \frac{\phi_i}{\phi} U_c(c_i^*) \right] \frac{\phi}{\phi_j} \\ &= \frac{\phi_i}{\phi_j} U_c(c_i^*) \end{aligned} \tag{19}$$

Which means that the marginal utility for group j at the optimum is a function of the marginal utility for the other groups. The function is the based on the ratio of ϕ_j for each group.

This implies that, for each amount spent, benefits are distributed across public goods and transfers according to the ratios given in Equations 15 and 19. If we assume that $H(g) = \sqrt{g}$ and $U(c_j) = \sqrt{c_j}$, then we can derive a following formula for the allocation of public goods based upon any level of spending s . Since,

$$\begin{aligned}
U_c(c_j^*) &= \frac{S}{J} H_g(g^*) \frac{\phi}{\phi_j} \\
c_j^* &= U_c^{-1} \left[\frac{S}{J} H_g(g^*) \frac{\phi}{\phi_j} \right] \\
&= \left[2 \frac{S}{J} [.5g^{-.5}] \frac{\phi}{\phi_j} \right]^{-2} \\
&= \left(\frac{S}{J} \right)^{-2} [g^{*-.5}]^{-2} \left(\frac{\phi}{\phi_j} \right)^{-2} \\
&= g^* \left(\frac{J}{S} \right)^2 \left(\frac{\phi_j}{\phi} \right)^2 \\
&= g^* \left(\frac{J}{S} \cdot \frac{\phi_j}{\phi} \right)^2 \\
&= g^* \left(\frac{J}{S} \Omega_j \right)^2
\end{aligned} \tag{20}$$

We now have the optimal level of transfers to each group as a function of g . Then, use the formula for total spending to find spending as a function of g :

$$\begin{aligned}
s &= g + \frac{1}{J} \sum_{j=1}^S c_j \\
&= g + \frac{1}{J} \sum_{j=1}^S g \left(\frac{J}{S} \Omega_j \right)^2 \\
&= g + g \cdot \frac{J}{S^2} \sum_{j=1}^S \Omega_j^2 \\
&= g \left(1 + \frac{J}{S^2} \sum_{j=1}^S \Omega_j^2 \right)
\end{aligned} \tag{21}$$

This permits the calculation of the optimal level of g for any given level of spending, based only on the parameters S , J , and the relative sensitivities of each group. Note that g^* increases in S and decreases in heterogeneity. Let $\sigma_\Omega = \frac{1}{S} \sum_{j=1}^S \Omega_j^2$, which represents, in essence, the mean of the squared group sensitivity parameter. This value gets larger when there is greater dispersion between the most and least sensitive groups. More dispersion means lower public goods.

$$\begin{aligned}
g^* &= s / \left(1 + \frac{J}{S^2} \sum_{j=1}^S \Omega_j^2 \right) \\
g^* &= s / \left(1 + \frac{J}{S} \sigma_\Omega \right)
\end{aligned} \tag{22}$$

We can then use equations 20 and 22 to obtain the optimal level of transfers to group j as a function of the level of spending and the other parameters:

$$\begin{aligned}
c_j^* &= g^* \left(\frac{J}{S} \Omega_j \right)^2 \\
&= \left[s / \left(1 + \frac{J}{S} \sigma_\Omega \right) \right] \left(\frac{J}{S} \Omega_j \right)^2
\end{aligned} \tag{23}$$