The Countervailing Effects of Competition on Public Goods Provision: When Bargaining Inefficiencies Lead to Bad Outcomes *

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Abstract

Political competition is widely recognized as a mediator of public goods provision through its salutary effect on incumbents' electoral incentives. We argue that political competition *additionally* mediates public goods provision by increasing the inefficiency of legislative bargaining. These countervailing forces may produce a net negative effect in places with weak parties and low transparency – typical of many young democracies. We provide evidence of a robust negative relationship between competition and local public goods using panel data from Mali. Tests of mechanisms corroborate our interpretation of this relationship as evidence of legislative bargaining inefficiencies. To explore the generalizability of these findings, we analyze cross-country panel data and show that political competition leads to better (worse) public goods provision under high (low) levels of party system institutionalization. The paper sheds light on why political competition is only selectively beneficial, and underscores the importance of considering both the electoral and legislative arenas.

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Political competition is most commonly considered a mediator of public goods[1] provision through its disciplining effect on incumbent politicians attempting to maximize prospects for re-election—and most empirical studies uncover a positive relationship. We argue that political competition, in a legislative context, can also mediate the provision of public goods by affecting the policy-making process in between elections. Specifically, competitive or fractionalized parties can render coalition formation and legislative bargaining more difficult, thus hindering the efficiency of policymaking. A formalization of this argument illustrates how these countervailing effects of political competition can lead to a net positive or net negative effect on public goods provision in different settings. Theories that do not take both mechanisms into account accordingly fail to accurately capture the impacts of political competition on public goods provision in some contexts. We argue that in places where legislative bargaining is more challenging and electoral accountability weak, we should observe a net negative relationship between political competition and public goods provision. New democracies with weak party systems and low levels of transparency fit this description, and are also contexts that have been under-studied empirically—possibly explaining the often positive findings to date.

Contrary to much of the existing empirical literature, we present evidence from both within and across countries that confirms a net negative relationship between political competition and public goods provision in settings of weak party institutionalization and low transparency. In particular, we provide rigorous empirical evidence from Mali showing that the negative effect of competition on public goods via legislative bargaining inefficiencies can dominate the expected positive effects stemming from electoral incentives. Examining whether our theory holds more generally, we present evidence from cross-country panel data that the relationship between political competition and public goods hinges critically on the level of party system institutionalization, with political competition leading to better (worse) public goods provision under higher (lower) levels of party system institutionalization.

[1]This article loosely refers to public and publicly-provided private goods government supplies as "public goods"—though many do not fit the definition of being non-excludable and non-rival.

To understand the intuition of our theory of political competition, consider an elected legislature comprised of politicians who are office-motivated, and thus have electoral incentives to deliver public goods, but simultaneously have incentives to misappropriate funds and shirk. When the legislature is comprised of multiple parties, they must work together through coalitions or bargains to produce public goods. Increases in political competition should dampen misappropriation and shirking, thus improving public goods outcomes. But they simultaneously complicate the bargaining process—such as by increasing the time and resources required to take decisions, reducing the total budget that can be extracted from the central government, or inducing temporary or permanent stoppages on on-going projects—thus worsening public goods outcomes. The key insight of our theory is: how political competition ultimately affects public goods provision depends on the relative sizes of these positive and negative effects.

This theoretical insight additionally delivers predictions about the conditions under which political competition is more likely to exert a net negative effect on public goods provision. First, legislative inefficiencies should only emerge where bargaining is required for policy-making due to differences in preferences or priorities; the negative relationship should not apply in places where there is already a policy consensus. Policy consensus may become more likely due to either supply-side factors or demand-side factors. On the supply side, if there is a clear majority coalition, consensus is more likely. On the demand side, it is more likely if there is broad agreement among voters over policy priorities. Second, bargaining becomes increasingly difficult when goods are more excludable or particularistic, and thus harder for citizens to share. Third, at an institutional level, legislative bargaining is more difficult in weak party systems where bargaining partners are more volatile across elections and are less able to make credible commitments. We test the first of these two implications in Mali—a young, low-income democracy. We test the third using cross-country panel data spanning various institutional contexts.

Mali is an ideal setting in which to test our theory since its political decentralization

to the commune level allows us to exploit within-country variation in party systems and legislative policy-making while holding constant other aspects of the institutional context – namely, that parties are weak and transparency low. Using a panel dataset of local electoral outcomes for each rural, commune government (from the 2004 and 2009 elections) and local public goods provision (specifically, the numbers of water boreholes, clinics, schools, and kilometers of rural roads four years after each election, in 2008 and in 2013, respectively) along with a difference-in-differences framework, we first present evidence of a strong and robust negative effect of political competition on public goods provision. Our first differences model mitigates important endogeneity concerns that arise from both omitted variables and the possibility of reverse causality. We then use both quantitative and qualitative data to test whether the mechanism responsible for this negative relationship is indeed increased difficulty in legislative bargaining. To test whether our theory offers general insights beyond the Mali case, we construct a panel dataset of 164 countries spanning 1975–2015 and find that increasing political competition leads to better (worse) public goods provision under high (low) levels of party system institutionalization, in accordance with our theory. Further, the salutary effects of political competition on public goods provision in settings of high party system institutionalization are more pronounced in settings of high transparency.

This paper contributes to the literature on democratic accountability by exposing a new, previously ignored relationship between electoral competition and the ability of legislative bodies to effectively govern in between elections. While it has long been recognized that political competition exerts dual effects in the electoral and legislative arenas (Sartori 1976), Laver (1989) raises the dilemma that electoral competition and legislative bargaining are often considered independently. In concluding, he speculates that there might be "a systematic tendency for party-induced change in one part of the system to have contradictory effects in another" (Laver 1989, p. 323). We apply these insights to the outcome of public goods provision for the first time. In doing so, we bring together two literatures that, while linked by similar theoretical roots in rational choice theory, have generally remained separate.

These are the democratic accountability literature (e.g., (Fearon 1999; Besley 2006)) that examines the strategic incentives elections impose on politicians and the legislative bargaining literature (e.g., (Riker and Brams 1973; Weingast and Marshall 1988; Williams 2017)) that examines how institutional contexts condition the ability of coalition partners to sustain credible commitments. We show how the same forces that incentivize politicians to behave accountably once in office can simultaneously make their job of legislative policy-making harder and less efficient.

We further contribute to the literature on democratic development in poor countries with our insights about the conditions under which a net negative effect of competition is most likely to obtain—namely, in countries with weak parties and low transparency. A systematic review of the evidence on the relationship between political competition and public goods provision[2] uncovers mostly positive findings across Western countries, but a more mixed picture emerges for the developing world. The majority of cross-country studies demonstrate the benefits brought about by democratic transition or consolidation[3], but two studies tellingly find that these benefits do not accrue to low-income countries or benefit the poor (Boix 2001; Ross 2006). Among single-country studies, the bulk of the support for a positive relationship comes from Western democracies[4], and some from middle-income democracies such as Mexico, India, Brazil, and Pakistan[5]. But all of those latter countries also have studies showing the opposite (or no) trend.[6] Few studies have examined this relationship in low-income democracies like Mali, adding to the novelty of our study.

Our theory and evidence provide one explanation for these mixed findings in the existing literature. Younger, lower-income democracies face the dual burdens of exhibiting weaker electoral accountability, due in part to poor access to information, and more ineffi-

[2]Appendix A.1 describes the parameters guiding this systematic review and lists the studies in tabular form, noting the main dependent variables (DV), independent variables (IV), and direction of effects found.

[3](Lake and Baum 2001; Stasavage 2005; Besley and Kudamatsu 2006; Deacon 2009)

[4](Binzer Hobolt and Klemmensen 2008; Besley, Persson and Sturm 2010; Boyne et al. 2012; Ashworth et al. 2014)

[5](Arvate 2013; Crost and Kambhampati 2010; Hecock 2006; Kosec et al. 2018)

[6](Cleary 2007; Chatterjee 2018; Banerjee and Somanathan 2007; Boulding and Brown 2014)

cient legislative bargaining due to weak party systems and particularistic politics. Together, these features of developing democracies may mean that political competition leads to worse instead of better policy outcomes.

1 Political Competition and Public Goods Provision

In an elected legislature, policy outcomes are determined both by the *size of the budget* for public goods (i.e. the amount actually spent) and the *production function* that turns inputs (expenditures) into outputs (public goods). Corruption or misappropriation of public funds is a key predictor of the actual size of the public budget. The efficiency of legislative bargaining is a key determinant of the productivity of policy-making. Bandiera, Prat and Valletti (2009) would call the former constraint on public outputs active waste, and the latter passive waste. While active waste provides utility to the politician, e.g. through rent-seeking, the latter provides none. By creating strong electoral incentives, political competition is likely to curb active waste—for example, by inducing a greater fear of sanctions among politicians or improved preference alignment between voters and politicians—and could even reduce passive waste. But, since more competitive parties are more fractionalized and less able to compromise, resulting in more time and resources being required to take decisions and/or recurring stoppages on on-going projects, we additionally expect increased political competition to exacerbate passive waste. We discuss the logic for each of the countervailing effects, in turn. We then consider when we should expect to see a net negative effect.

Political competition and electoral accountability

Standard models of electoral accountability suggest that increasing political competition leads to superior public goods provision through either a sanctioning or selection mechanism (e.g., (Besley 2006; Fearon 1999)). A credible threat from the opposition disciplines incumbent behavior in office, and a greater choice from among which voters can select a

politician more generally increases the likelihood of preference alignment. Empirically, this should mean that increases in competition result in greater public goods provision, assuming such is preferred by the electorate. For example, Hatfield (2015) provides a model where local governments' competition for capital drives up the provision of productive public goods. Similarly, Brueckner (2006) models political competition enhancing incentives to invest in human capital. Weingast (1995) and Hatfield and Padró i Miquel (2012) argue more generally that political competition can enhance incentives for long-term productive investments.

Political competition and legislative bargaining

While voters may be better able to extract public goods in more competitive elections, we assert that greater electoral competition should simultaneously make legislative bargaining more difficult in contexts where legislative bodies control public goods policy, thus worsening public goods provision. Competition can impede the efficiency of legislative bargaining in two distinct ways. First, political competition in the form of a more fractionalized party system multiplies the possibilities of coalition formation, thus increasing bargaining complexity. For example, as Laver (1989) shows for a majority rule system, moving from three to seven parties (the average in our empirical case) moves the system from seven to 127 possible coalitions, from four to 5,040 different ways of forming a coalition (allowing for different orders of formation), and from three to 35 different minimum winning coalitions.[7]

Second, political competition in the form of more equally weighted parties, e.g. parties with similar vote or seat shares, can make bargaining agreements harder to sustain because it is easier for parties with similar weights (or seat shares) to find alternative coalitions and thus renege on agreements. At one extreme, in a majority-rule system, a majority party will form the most durable government because it does not need a coalition in order to pass legislation. At the other extreme, equally sized parties may find it difficult to negotiate

[7]Ideological distinctions can reduce the number of plausible coalitions, but this is less likely in our empirical case where, as in many African democracies, parties do not differentiate themselves along ideological lines (Conroy-Krutz and Lewis 2011).

because each will have the same expectation of being able to form, and dominate, a majority coalition. In particular, the less dominant is the plurality party, the more likely it is that the second largest party will be able to form a winning coalition with a smaller party or otherwise undermine the attempts at coalition formation of the largest party. Furthermore, the greater the dispersion of the party power, the greater the number of available small parties with which a larger party can form a coalition. Together, these forces may contribute to more time and resources being required to take decisions and/or recurring stoppages on on-going projects.

Legislative bargaining and public goods provision

Legislative bargains are critical to policymaking. Legislative bodies must bargain over both the preferred *type* of public good and its *location*. Especially when representatives are accountable to geographically distinct constituencies, as in our empirical case,[8] there may be considerable preference fractionalization on both dimensions. Failure to form or sustain a legislative bargain can result in a prolonged decision-making process (which could potentially even stem the flow of inter-governmental transfers), stalled provision of services, or outright conflict and non-provision of services. Examining the effect of ease of legislative bargaining on a related outcome, budget stability, Huber, Kocher and Sutter (2003) show that majority coalitions with greater strength and higher power dispersion have lower deficits because a strong party can better put pressure on relatively weaker ones to stabilize the budget. Edin and Ohlsson (1991) similarly find that minority governments—formed by plurality parties that do not attain majority status and thus need to form coalitions with other parties—produce less efficient fiscal policy because bargaining within parliament is more difficult than within a majority party coalition. Roubini and Sachs (1989) attribute this to the intertemporally inefficient policy that results when power is heavily dispersed. And, Alesina

[8]Half of politicians surveyed are from villages other than the commune seat. Only 10% say they just represent the interests of the commune, while the rest say they mostly or sometimes represent the interests of their own village.

and Drazen (1991) similarly argue that delayed fiscal reforms can be attributed to preference dispersion.

The long-standing American politics literature on vote trading or log-rolling in Congress provides intuition for how legislative bargaining can affect public goods outcomes (Buchanan and Tullock 1962). Notably, Williams (2017) has applied insights from this older literature to explain a more recently observed phenomenon of project non-completion, particularly prevalent in developing countries. The intuition with respect to public policy is that while legislators representing different groups can pass projects with narrow interest groups by trading votes, making credible commitments is challenging due to noncontemporaneous benefit flows to each party and nonsimultaneous voting opportunities. In short, those benefiting early have incentives to renege on agreements, preventing potential coalitions from forming in the first place (Weingast and Marshall 1988). While the nature of politics as a repeated game can help parties solve commitment problems, this mechanism is less useful in weaker party systems where there is less party discipline, more personalistic politics, and more frequent party switching by politicians.

In our empirical case, local public goods need broad-based support among commune councilmembers for successful planning, production, and completion. When councils are fractionalized as a result of competitive races, intra-council bargaining may suffer from similar problems faced by vote-traders in Congress. The particular nature of local public goods provision, with its many steps from policy decision to fund transfer to procurement to construction, increases the likelihood that bargaining failures stymie successful policy implementation.[9] So even if coalitions do get formed, additional inefficiencies from their instability and unwieldiness might manifest as more frequent and less productive meetings to decide on infrastructure projects or aspects of service provision, or as partially-constructed (and thus useless) infrastructure projects. Our predictions and empirical tests are consistent with

[9]For instance, in Ghana, competitive electoral pressures induced local assemblies to be more likely to start projects (visible investments with immediate electoral rewards for the associated assembly member) than finish them (Williams 2017). In this case, the decision points stymied the production of completed public infrastructure.

either mechanism: competition impeding coalition formation or inefficient decision-making by a weak coalition.

When Competition Will Lead to Bad Outcomes

The net effect of political competition on public goods provision ultimately depends on the relative degree to which it dampens misappropriation and shirking via electoral incentives versus dampens bargaining efficiency (Appendix E presents this more formally). We argue that it is likely to be net negative where parties are weaker – and thus legislative bargaining is harder – and where transparency is low, making it more difficult for voters to hold politicians accountable (Besley 2006). These are both common features of young, low-income democracies.

The dampening effect of political competition on legislative bargaining efficiency is likely to be strongest where politics is particularistic and party systems are weak—features which exacerbate the complexity of coalition formation and undermine coalition durability. The natural complexity of coalition formation can be mediated by party strategies that make the problem more tractable. For instance, parties can align with their ideological neighbors or rely on historical relationships with other parties (Laver 1989). While these insights may be true for established democracies, we argue that parties in the young and often weak party systems found in most democracies of the developing world have less access to such strategies; they are less likely to have distinct ideological attachments (Conroy-Krutz and Lewis 2011), are newer and frequently split, or enter or exit the system (Gottlieb and Larreguy 2016), making historical coalitions a weaker predictor of future coalition formation.

Testable Implications of Theory

Hypothesis 1 *In places with weak political accountability and weak party systems, there should be a net negative relationship between political competition and public goods provision.*

We first test this in our quantitative data from Mali. We additionally test whether local actors *perceive* this negative relationship in our qualitative data from Mali. We finally test it using cross-country panel data from 164 countries spanning 1975–2015, regressing public expenditures on legislative competition, and taking party system institutionalization and government transparency as moderators.

Hypothesis 2 *The negative relationship between competition and public goods provision should be most apparent where bargaining or coalitions are required to make policy due to fractionalized preferences on the supply- or demand-side.*

We test this implication in two ways. First, we examine whether the effect is more pronounced in places with greater preference fractionalization on the supply-side, namely in places *without* a majority party on the council. Majority parties can easily achieve policy consensus as they have latitude to make policy without bargaining with other parties or councilmembers. Second, we examine whether the effect is more pronounced in places with greater prefrence fractionalization on the demand-side, or where there is less consensus among voters about what the priorities of the council should be.

Hypothesis 3 *The negative relationship between competition and public goods provision should be most apparent for more excludable goods.*

We test this implication by examining whether the effect is more pronounced for the local public goods in our data that are by their nature more excludable and thus more difficult to share.

Hypothesis 4 *Where bargaining efficiencies are indeed driving the negative relationship, we should see evidence of weak parties.*

We examine this implication in our qualitative data where we provide evidence of personalistic politics and party disloyalty.

2 Political Context

Our empirical context of Mali is a country with weak parties and low transparency. Democratic since 1991, this status faltered following a military coup and the loss of the North to Islamist forces in 2012 and until presidential elections in 2013. Our analysis, however, evaluates political competition in earlier local elections (2004 and 2009) when political stability was considered among the highest in the region. In spite of its stability, Mali's party system is considered among the weakest in Africa (Riedl 2014) (we discuss additional qualitative evidence for this below). Transparency is also low as Malian voters have exceedingly little information about local politics and hold politicians to quite low standards (Gottlieb 2016). Not only is civic education inaccessible to most, but the vast majority of adults are illiterate. Furthermore, there is evidence that commune councilmembers collude to withhold information about rent-seeking from voters Gottlieb (2015).

Our empirical tests exploit the fact that, in 1996, the country was divided into 703 new locally-governed "communes", bringing democratic governance closer to the people. These administrative units are salient because they have both the right to tax and the responsibility to provide local public goods. Below, we describe how Mali's local governments are elected and how they raise and spend resources on local public goods.

Electoral Context

Public policy in each commune is made by a commune council. Since 1999, commune councilors have been elected with five-year mandates with subsequent elections in 2004, 2009, and 2016.[10] In each election, parties submit closed candidate lists and seats are accorded to parties based on proportional representation. The number of seats on the council ranges from eleven to 45, based on population, and an average of six parties compete for seats. For the first three of these elections, the mayor and her bureau (several adjunct positions) were

[10]The 2014 elections were postponed several times due to continued insecurity and finally took place in November 2016; these data are not yet available.

elected indirectly from among the commune councilors.[11]

There are a few regularities of Mali's local elections that are worth noting. First, as evidence of the importance of coalition politics, when the largest party has a plurality of seats rather than a majority, the mayor is more likely to come from one of the smaller parties. The typical rationale is that the plurality party prefers to buy off support of the smallest party necessary to form a minimum winning coalition, and offering the mayorship is a credible way to secure a committed ally. Second, incumbent mayors won in only 29% of communes in 2009 (though there are no term limits)—one piece of evidence of Mali's high electoral volatility. Another is rampant party-switching—not only by voters, but also by politicians. In a survey we carried out of more than 600 local politicians just before the 2016 elections, about a quarter said they had switched parties at least once in their career.

Local Policy-making

The mayor and several also indirectly-elected members of an executive bureau manage the day-to-day affairs of the commune; other councilmembers are only required to participate in regular council meetings. While the mayor and bureau members can set the agenda, policy decisions are subject to a full vote by the council. In the more than half of communes where no party won a clear majority, this means that coalitions among councilors and parties are required to make and implement policy, including deciding on the composition of the commune bureau. Because of the politicking required to indirectly elect the mayor among communes without a majority party, the mayor is often beholden to other parties and does not have the clout to railroad through policy decisions.

Communes have full control over administration of their budgets and are solely responsible for providing primary health care, sanitation, primary education, and security.[12]. As a result of meager tax revenues, rural councils receive about $30,000 per annum for use on

[11] The 2016 elections, which are not studied here, instituted direct mayoral elections for the first time.

[12] L'Assemble Nationale du Mali. 1995. "Loi 95-034AN-RM du 12 avril 1995. Code des collectivités territoriales."

community development projects from a government agency established in 2001 to alleviate capacity problems: the Agence Nationale d'Investissement des Collectivités Territoriales, or ANICT. This represents on average about two-thirds of their budget and is the largest source of revenue (in addition to government subsidies, a small amount of tax revenue, and donor aid). These project funds typically allow communes to select one village per annum (among an average of 18) in which to build a community development project. Our primary measure of public goods provision considers the aggregated number of these local public infrastructure projects within the commune in 2009 and in 2013—i.e. 4 years after the two elections we study. As project funds are distributed annually, the four-year lag between should be sufficient to capture real changes in public goods.

Public financing of urban communes differs substantially from that of rural communes, motivating us to limit our sample to Mali's 666 rural communes. For example, urban communes can raise taxes on businesses and profit from the use of local land by private companies. In addition, demand for public services is likely to vary substantially across rural and urban areas, posing non-trivial challenges for measurement and modeling. By focusing on rural communes, we consider institutionally similar and thus comparable units.

3 Empirical Strategy and Data

In this section, we first describe our data and empirical strategy for the quantitative analysis of how political competition affects public goods. We then describe our qualitative data collection strategy.

Quantitative Analysis

We employ a first differences estimation strategy, using panel data on local elections (2004, 2009) and provision of local public goods (2008, 2013) to test the effect of changes in electoral

competitiveness on public goods provision. We estimate the following empirical specification:

$$\Delta PG_{i,2013-2008} = \beta_0 + \beta_1 \Delta Competition_{i,2009-2004} + \theta_2 PG_{i,2008} + \gamma \mathbf{X}_i + \epsilon_i \quad (1)$$

where i indexes communes, $\Delta PG_{i,2013-2008}$ is a measure of the change in a public goods outcome in commune i between 2008 and 2013, $\Delta Competition_{i,2009-2004}$ is a measure of the change in the competitiveness of electoral races in commune i between 2004 and 2009, $PG_{i,2008}$ is the public goods outcome in 2008, and $\mathbf{X}_i$ is a vector of control variables, described below. Standard errors are clustered at the cercle level (administrative unit between the region and commune) to allow for arbitrary autocorrelation of errors among communes within a cercle as cross-commune development projects and donor investments vary at this level.

By observing changes between the 2004 and 2009 elections, we can examine how political competition influences public goods outcomes four years later, in 2008 and 2013, respectively (i.e. well into the administration).[13] Use of panel data helps mitigate some endogeneity concerns; we can account for all time-invariant, commune-specific factors that affect both political competition and the provision of public goods. Having panel data also allows us to include $PG_{i,2008}$—the public goods outcome in 2008—in our model. Imbens and Wooldridge (2009) argue, in the context of panel data and a first differences model, that including a lagged dependent variable is a relatively attractive approach compared to a model that omits this control since it makes observations with different changes in political competition during 2004-2009 comparable on lagged outcomes.[14] By including it, we can increase the precision of our estimates and flexibly allow different communes to be on different trends according to

[13]While no elections were held in 2014, at the start of 2013 (the latter of the two years in which we measure public goods), it was planned and widely anticipated that there would be elections in 2014, thus ensuring a five-year mandate for local councils in accordance with electoral law. As indicated in the Ministerial Council Communiqué of 26 February 2014, the date of the elections was originally only postponed by six months, from April 2014 to November 2014, due to the security crisis (`http://malijet.com/actualite-politique-au-mali/conseil_des_ministres_du_mali/94553-communique-du-conseil-des-ministres-du-mercredi-26-fevrier-2014.html`).

[14]Imbens and Wooldridge (2009) refer to this as the unconfoundedness-based approach, and argue that even if the lagged dependent variable is correlated with the error term, its inclusion is appropriate in a panel data setting (p. 70). By including it, we impose less structure on the model; while our specification flexibly allows for these trends to be the same, it does not impose this assumption.

initial levels of public goods provision. For example, communes that recently built schools (i.e. classrooms) may instead invest in equipment such as desks, tables, or chalkboards in subsequent years—consistent with the marginal utility of investment in schools decreasing in the number of schools previously built.[15] We show that our results are additionally robust to inclusion or exclusion of several controls, added incrementally.

Independent Variables

We measure electoral competitiveness in two ways: with a Herfindahl-Hirschman index (HHI) and the winning party's margin of victory. The first captures the idea that increasing political competitiveness exacerbates bargaining complexity. The second corresponds to the idea that the relative strength of the plurality party matters for its ability to form durable coalitions.[16] Because of the way each measure is constructed, larger values indicate less political competitiveness.

We operationalize *HHI*—a common measure of concentration or fractionalization employed in both the political science and economics literatures—in the standard way. For each commune i and for each of the two election years we consider, the HHI is constructed by summing the squared seat shares (s_p) of all parties $p \in \{1, ..., n\}$ that competed in the commune council elections:

$$HHI_i = \sum_{p=1}^{n} s_p^2 \tag{2}$$

Since $s_p \in [0,1] \forall p$, $HHI_i \in [0,1]$. In two communes with the same number of parties competing, the commune with the closest to an even distribution of votes across parties would have the lowest HHI_i of the two.

We operationalize the relative strength of the largest opposition party by measuring its *Margin of Victory* with respect to the winning party. If the margin is large, then the

[15] A review of the actual projects constructed with ANICT funds over the period is consistent with this pattern of spending.

[16] The plurality party, Austen-Smith and Banks (1988) show in in a three-party system, drives coalition formation by always forming the winning coalition with the smallest party

dominant party should be better able to railroad through policy-making decisions or form a winning coalition with a smaller party; if it is small, the plurality party will be more likely to be held hostage by the second largest party.

Dependent Variables

We measure the change in public goods provision between 2008 and 2013, our dependent variable, using commune-level data on the number (stock, not flow) of water boreholes, clinics, and schools and on the number of kilometers of rural roads (often unpaved) (Government of Mali 2008, 2013). These are the only four locally-constructed infrastructure outcomes available for all communes and both years, and they comprise the most important and high-cost infrastructure built with community development funds provided by the ANICT.[17] Our focus on quantities rather than expenditures is an important one given potential variation in the efficiency with which commune governments turn expenditures into useful infrastructure—something we explore with further analyses that consider expenditures as our outcomes. Focusing on small project-based infrastructural investments also makes it feasible to observe change over the five-year time period; ANICT project funds are granted on an annual basis and investments are expected to be invested quickly.

To construct our primary outcome variable, we combine data on the number of each type of infrastructure into a summary index, or Anderson Index, using methods described by (Anderson 2008). The index standardizes and mean-centers each of the four composite variables and then combines them into a single index using an inverse covariate weighted average. We call this our public goods index. As a robustness check, we additionally consider an alternate public goods index: one that uses the same four composite variables and carries out a principal components analysis (PCA). We take the first principal component emerging from this analysis as our PCA public goods index.

[17] We have data from 2006, 2008, and 2013 on all four goods, and from 2003 on two goods: boreholes and clinics. During 2006–2008, 41 percent of commune expenditures supported the construction of schools, clinics, and boreholes (we lack data on total commune expenditures on roads).

By combining multiple measures to construct an index, we reduce the total number of hypothesis tests conducted, thus helping us avoid over-rejection of the null hypothesis due to multiple inference (Anderson 2008). However, we additionally examine each of the four individual goods; when we do so, we normalize each variable by subtracting its mean and dividing by its standard deviation so that effect sizes can be easily compared across goods.

Control Variables

We include a number of control variables which we iteratively add to ensure that our results are robust and not sensitive to the particular control set used. First, we control for a measure of change in electoral volatility, which we capture using a Pederson Index (PI). Given the high volatility of Mali's political system caused, in part, by frequent party switching by candidates, we worried that our measures of competitiveness might be capturing volatility in addition to partisan pressures. In theory, these constructs could have opposite effects on governance, e.g. partisan pressures in a competitive system may lose force when party attachments are unstable. For each commune i and for each of the two elections t on which we focus (2004 and 2009), we thus construct $PI_{i,t}$ by summing the absolute value of the difference in the seat shares (s_p) in the election of period t and that of period $t-1$ (the previous election)[18] of all parties $p \in \{1, ..., n\}$ that competed in either election, and then dividing by two:

$$PI_{i,t} = \frac{\sum_{p=1}^{n} |s_{p,t} - s_{p,t-1}|}{2} \tag{3}$$

Second, we control for the change in logged population between 1998 and 2009. Doing so explicitly allows communes with different population trends leading up to the 2009 elections to have different public goods outcomes four years after the election. For example, communes that were already growing rapidly leading up to the 2009 elections may be experiencing an upward trend in development. To the extent that such trends are correlated with changes in electoral competition between the 2004 and 2009 elections, we might be worried about

[18] When t =2004, the previous election is the 1999 election. When t =2009, it is the 2004 election.

omitted variable bias if we fail to include these controls.

Finally, we control for the overall level of (or growth in) development in a commune by including measures of the state of public goods provision by the central government and by NGOs and other non-state actors. The central government provides two types of infrastructure for which we have consistent commune-level data over time: kilometers of paved roads built by the central government and the number of national sources of electricity. To capture goods provided by NGOs, we control for the number of NGOs operating in the commune and development projects run by other non-state actors. We control for access to these goods in two ways: their 2008 levels, and changes in levels between 2008 and 2013. We generally show that results are invariant to whether we control for levels or changes.

Qualitative Analysis

To better understand the mechanisms that produced the relatively surprising finding in the quantitative data, we collected rich narrative data from local politicians in a targeted sample of communes. In summer 2016, we interviewed 111 locally elected councilors from 24 communes in Mali. These communes were randomly sampled from 16 different commune types to provide maximum variability in responses on our constructs of interest. First, we created quartiles for measures of change in electoral volatility and competitiveness (using the HHI). Then, we selected one or two communes at random from the 16 unique combinations of our two categorical variables. In each of the 24 sampled communes, we used prior (2004 and 2009) election and councilmember data to identify parties and politicians to interview.

We targeted at least one current or former commune councilor from each of the following party types: a dominant party that won the most votes in either year; an opposition party that won the second most votes in either year; and a marginal party that was not one of the top two parties in either year. In each party, we aimed to interview the politician that was highest on the party list, as they would presumably have the best information.

4 Effects of Competition on Public Goods Provision

Table 1, Panel A presents results from estimating Eq. (1), where we measure political competition with the HHI. We gradually add controls, starting with only the lagged value of public goods provision (column 1). We then add our difference in volatility measure (columns 2), finding that it is statistically insignificant and its inclusion has little effect on the coefficient on political competition. Third, we add controls for logged population, the initial (2008) levels of two public goods provided by the central government—kilometers of centrally-built paved roads and the number of sources of electricity—and the number of NGOs and other development projects operating in the commune (column 3). Column 4 then replicates column 3 but with differences rather than levels of the latter three controls (column 4).

We find a consistent story across all four specifications; a standard deviation increase in the HHI[19] between elections (a *decrease* in political competition) is associated with between a 0.065 and a 0.070 standard deviation increase in our public goods index.[20] We thus interpret our findings as a modest but robust decrease in the quantity of public goods provided by commune governments due to greater political competition. A similar story emerges when we instead measure political competition using the margin of victory of the winning party, as shown in Panel B of Table 1. Here, a standard deviation—or 23.4 percentage point—increase in the margin of victory between elections is associated with between a 0.082 and a 0.093 standard deviation increase in the public goods index. While the controls for central government infrastructure and NGO projects are positively-signed and at times

[19] A standard deviation increase in competition is a 0.156 unit increase (see Appendix B); multiplying this by the coefficient on the HHI difference gives the unit increase in the Anderson Index due to a standard deviation increase in competition. The standard deviation of the Anderson index is 0.508; dividing the unit increase by it, we can compute the improvement in public goods in terms of standard deviations.

[20] An example of a commune that experienced a S.D. increase in the HHI between 2004 and 2009 is Matomo, in Ségou region. In 2004, the commune council was comprised of five parties holding 4 (ADEMA), 3 (MPR), 2 (PARENA), 1 (URD), and 1 (independent) seats, representing a 0.36–0.27–0.18–0.09–0.09 split. By 2009, however, there were only three parties holding 6 (ADEMA), 4 (MPR), and 1 (PARENA) seats—a 0.55–0.36–0.09 split. Matomo's HHI thus rose by approximately one S.D. relative to the 2004 level of political competition, from 0.26 to 0.44.

statistically significant (see columns 3–4), their inclusion has little effect on the magnitude or statistical significance of the coefficient on political competition. This provides at least suggestive evidence that political competition is uncorrelated with unobservables simultaneously driving public goods provision by both the local and central governments, or by both local governments and NGOs.

Averaging the four coefficients we report here (0.065, 0.070, 0.082, and 0.093) gives an average effect size of 0.078. This is comparable in magnitude—though oppositely signed—to effect sizes reported in the literature from other settings. For example, Hatfield and Kosec (2013) and Arvate (2013) examine the effects of political competition on public goods provision in the United States and in Brazil, respectively. They estimate that a standard deviation increase in competition is on average associated with a 0.142 and a 0.050 standard deviation increase in public goods outcomes, respectively.

Our first difference specification effectively controls for all time-invariant, commune-specific differences which might potentially influence changes in the public goods index. However, we might expect different regions of Mali to be on different trends in public goods provision, which could conceivably themselves account for changes in the public goods index. To ensure that any such trends are not driving our results, Appendix Table A.2 adds region dummies to each of the specifications shown in Table 1. Different regions clearly exhibit differential trends over this period—with the three northern regions of Kidal, Gao, and Tombouctou generally exhibiting the largest downward trends—but these trends do not appear to be heavily correlated with changes in political competition over this period, as evidenced by little change in the magnitude or statistical significance of the coefficient on competition when region trends are included. This suggests that the increasing violence and instability of the North starting in 2012 does not influence our findings.

In contrast, we find evidence that not only are communes on differential trends with respect to the initial period (2008) levels of public goods production, but that these trends are correlated with changes in political competition during 2004 – 2009; consequently, when

we fail to control for the initial public goods index level, the coefficients on political competition decline in magnitude and become statistically insignificant (Appendix Table A.3). Communes with more public goods in 2008 (e.g., schools) systematically build fewer of these goods during 2008 – 2013, with similar patterns for other types of infrastructure; by explicitly modeling this, we increase the precision of our estimates.[21]

Table 1: Effect of Change in Political Competition (2004-2009) on Change in Public Goods Index (2008-2013)

	(1)	(2)	(3)	(4)	(5)
Panel A: HHI measure					
Difference in HHI (2009-2004)	0.211^{+}	0.229^{+}	0.211^{+}	0.215^{+}	0.477^{*}
	(0.110)	(0.115)	(0.113)	(0.115)	(0.193)
Public Goods Index (2008)	-0.213^{***}	-0.214^{***}	-0.233^{***}	-0.228^{***}	-0.246^{***}
	(0.045)	(0.045)	(0.050)	(0.048)	(0.051)
Difference in Volatility (2009-2004)		0.050	0.062	0.061	0.092
		(0.058)	(0.059)	(0.057)	(0.061)
Difference in Logged Population (2009-1998)			0.054	0.101	0.061
			(0.056)	(0.061)	(0.056)
Kilometers of Paved Roads 2008			0.000		0.000
			(0.000)		(0.000)
Number of Sources of National Electricity 2008			0.123^{*}		0.116^{*}
			(0.054)		(0.053)
NGO/Development Projects 2008			0.002		0.002
			(0.005)		(0.005)
Change in Km of Paved Roads (2013-2008)				0.001^{**}	
				(0.000)	
Change, Sources of Electricity (2013-2008)				0.153^{*}	
				(0.064)	
Change in NGO/Dev. Projects (2008-2013)				0.014^{**}	
				(0.005)	
Majority Party					-0.083^{+}
					(0.043)
Majority Party × Difference in HHI					-0.341
					(0.222)
Constant	0.007	0.015	-0.035	-0.057	0.010
	(0.030)	(0.032)	(0.052)	(0.043)	(0.056)

Table continued on next page...

[21] This is in keeping with investments coming in waves; for example, if a school is built in year t, expenditures in year $t+1$ may instead go to desks, tables, or chalkboards.

Panel B: Margin of victory measure

Difference in Margin (2009-2004)	0.189^{*}	0.201^{*}	0.196^{*}	0.179^{*}	0.379^{*}
	(0.075)	(0.077)	(0.075)	(0.076)	(0.147)
Public Goods Index (2008)	-0.213^{***}	-0.214^{***}	-0.233^{***}	-0.228^{***}	-0.244^{***}
	(0.045)	(0.045)	(0.050)	(0.047)	(0.051)
Difference in Volatility (2009-2004)		0.057	0.071	0.065	0.100
		(0.059)	(0.061)	(0.058)	(0.065)
Difference in Logged Population (2009-1998)			0.059	0.107^{+}	0.068
			(0.056)	(0.061)	(0.056)
Kilometers of Paved Roads 2008			0.000		0.000
			(0.000)		(0.000)
Number of Sources of National Electricity 2008			0.124^{*}		0.121^{*}
			(0.053)		(0.052)
NGO/Development Projects 2008			0.002		0.002
			(0.005)		(0.005)
Change in Km of Paved Roads (2013-2008)				0.000^{**}	
				(0.000)	
Change, Sources of Electricity (2013-2008)				0.154^{*}	
				(0.064)	
Change in NGO/Dev. Projects (2008-2013)				0.014^{**}	
				(0.005)	
Majority Party					-0.080^{+}
					(0.041)
Majority Party × Difference in Margin					−0.253
					(0.174)
Constant	0.006	0.015	−0.036	−0.058	0.004
	(0.030)	(0.032)	(0.051)	(0.042)	(0.057)
Observations	664	660	660	660	660

OLS models with standard errors clustered at the cercle level. $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

To examine whether our results are appreciably affected by omitted variable bias, we carry out sensitivity analysis suggested by Imbens (2003) and Harada (2012). This analysis is described in Appendix C.2; there we show that any omitted variable would need to be a lot more influential than our existing control sets to invalidate our findings. This supports our causal interpretation of the results.

Robustness Tests

To test the robustness of our findings, we examine both whether they hold up to different measures of political competition and to different measures of public goods provision. First, we consider alternate measures of political competition. While our independent variables are constructed using seat shares, the translation of seat shares into bargaining weights is not necessarily linear. Measures of bargaining power, such as Shapley-Shubik or Banzhaf indices (Banzhaf III 1964), take into account the extent to which a party is formative on any given coalition due to their ability to swing a vote by threatening exit. In Appendix C.3, we describe these indices further, and show in Appendix Tables A.4 – A.6 that our results are robust to using a party's Banzhaf power rather than seat share when calculating each independent variable. We additionally show that our results are robust to using as the independent variable a margin of victory measure that accounts for the number of parties competing (Appendix Table A.7) and the standard deviation of seat shares on the council (Appendix Table A.8).

In addition to being robust to alternate measures of political competition, these findings are also robust to alternate measures of the quantity of public goods provided. Appendix Table A.9 shows, for the HHI (Panel A) and margin of victory (Panel B) measures of political competition, respectively, that our main findings still hold when we instead use a public goods index constructed using a principal components analysis.

Placebo Tests

Electoral competition in a commune should influence local provision of goods, but not the provision of goods by the central government—suggesting a useful placebo test. If provision of goods by the central government were to change with levels of political competition, one might worry that an omitted variable driving both competitiveness and higher economic development in a commune explained our results. Appendix Table A.10, Panels A and B presents regressions of the number of kilometers of paved roads built by the central government between 2008 and 2013 on changes in competitiveness between 2004 and 2009 as measured by the HHI and margin of victory, respectively, while Panels C and D carry out the same two analyses for the number of sources of electricity provided by the national government. In no case does changes in political competition in a commune yield changes in access to these centrally-funded public goods.

Falsification Test

One might also worry that we had estimated a spurious relationship if communes which experienced a decrease in political competition during 2004–2009 were already on a trend toward higher levels of public goods provision. If this were the case, then the prior trend itself might partly explain realized public goods improvements during 2009–2013. We explore this possibility in Appendix Tables A.11 and A.12, where we estimate an econometric specification identical to that presented in Equation 1, but instead take as our outcome variable changes in a public goods index between 2003 and 2006—a period predating the 2009–2013 period used for our main outcomes. This is consistent with a test of unconfoundedness suggested by (Imbens and Wooldridge 2009) and implemented in other similar empirical settings (Aker 2010).[22] We form an index using data on the number of boreholes and health clinics, given that data on schools and roads are not available in the earlier year (2003). We estimate each of the five specifications shown in Table 1—our main results table. Whether we mea-

[22]These are the only available years of public goods data that pre-date 2008.

sure political competition using the HHI (Appendix Table A.11) or the margin of victory (Appendix Table A.12), changes in political competition during 2004–2009 do not predict higher or lower changes in public goods outcomes during 2003–2006. We thus fail to reject the null hypothesis of parallel trends. We conclude that pre-trends are unlikely to explain our results.

5 Evidence of Bargaining Inefficiencies

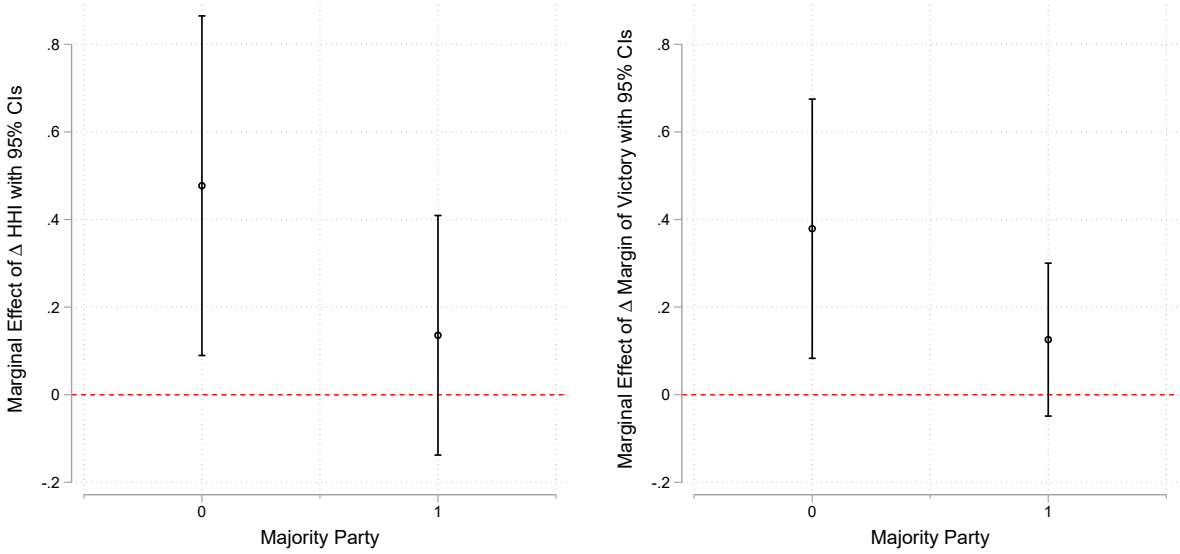
We test the argument that the negative effect of political competition on public goods is working through bargaining inefficiencies by examining several observable implications of such a mechanism, and then exploring several alternative explanations. As indicated by our theoretical discussion, we should only observe this positive relationship where councils must bargain to make policy (Hypothesis 2). We use indicators for the extent of the bargaining problem from both the supply- and demand-side.

First, we examine whether the negative effect of competition on public goods is more pronounced in places with greater preference fractionalization on the supply-side, namely in places without a majority party on the council. Where one party holds the majority of council seats—as is the case for 39 percent of rural commune councils—bargaining and coalition formation is unnecessary. In such cases, the majority party can simply appoint its own members to the executive bureau responsible for day-to-day commune operations and agenda setting since the support of only a simple majority of councilmembers is required for election to these posts.

Thus, we examine whether the negative relationship between political competition and our public goods index is conditional on there not being a majority party on the council. Figure 1 reports the results of an interaction equation comparing the effect of political competition in communes with versus without a majority party.[23] As predicted by the

[23]While a Wald test cannot reject the null that the marginal effect at each level of the moderator is the same, it is close to being statistically different ($p = 0.12$ for HHI; $p = 0.14$ for margin of victory).

Figure 1: Effect of Change in Political Competition (2004-2009) on Change in Public Goods Index (2008-2013), By Majority Party



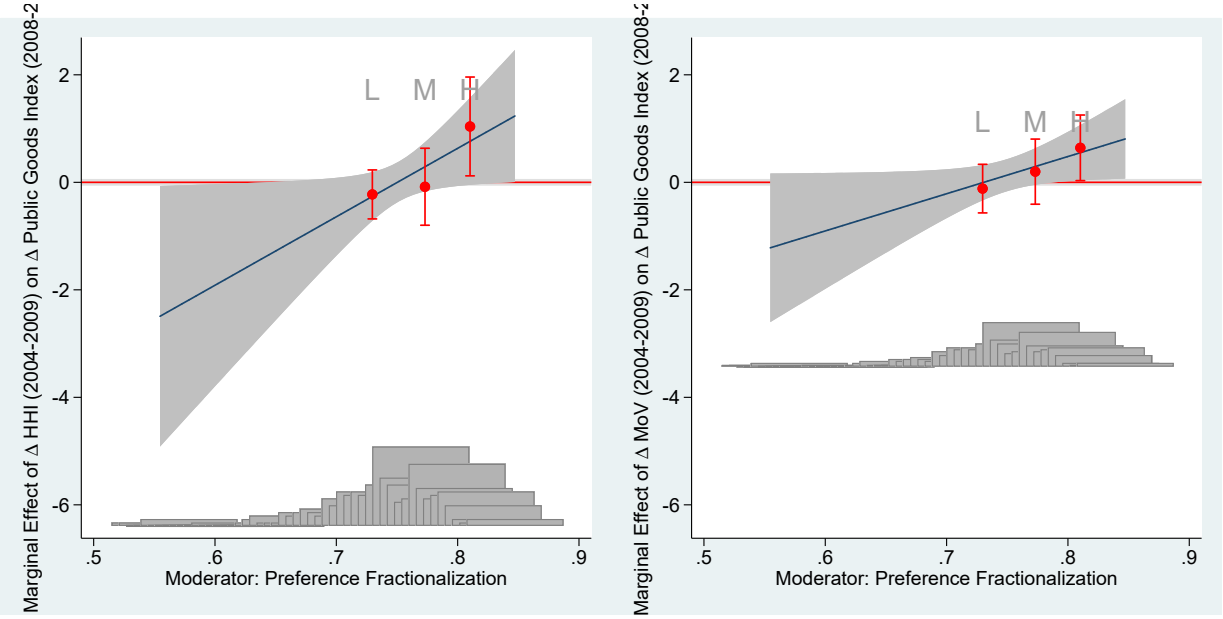
theory, the negative effect of political competition on public goods is being generated by localities without a majority party on the council; there is no relationship in communes with a majority party. Notably, the effect size among this subpopulation is now more than twice as large as it was among the full sample, and achieves a higher level of statistical significance.[24]

While the existence of a majority party on the council is a supply-side indicator of the existence of a political consensus that would reduce bargaining inefficiencies, a demand-side indicator would be the existence of a consensus among voters about policy priorities. We exploit the fact that communes vary in the extent to which residents agree upon priorities of the commune council. Using geo-coded Afrobarometer survey data (Afrobarometer 2002-2008; BenYishay et al. 2017) from 232 Malian communes,[25] we test the related observable implication that consensus among residents about priorities over public goods makes the negative

[24]Regression results are presented in column 5 of Table 1.

[25]To maximize the number of observations per commune, we use all available survey rounds prior to 2009 that include the question on preferences over public goods (Rounds 2, 3, and 4). The total number of respondents is 3,759 with a median of 8 respondents per commune. To match observations to communes, we joined the geo-coded survey data with a shapefile of Malian commune boundaries.

Figure 2: Effect of Change in Political Competition (2004-2009) on Change in Public Goods Index (2008-2013), By Preference Fractionalization



relationship between political competition and public goods provision less likely. Consistent with the theoretical expectation, a significant negative relationship only manifests in places where there is more preference fractionalization, or less consensus over public priorities (see Figure 2 and Appendix C.7). This suggests that bargaining among councilmembers may fail not only because of disagreement over placement of infrastructure but also over which type of infrastructure to build.

A second observable implication of bargaining inefficiencies explaining our findings is that political competition should differentially affect the provision of individual goods according to the level of coordination required for their provision (Hypothesis 3). Goods that are less excludable and easier to share should be easier for parties to coordinate on. In this case, the cost of forming coalitions should be lower and the benefits of forming them higher.

Water provision infrastructure—in the Malian context, usually boreholes—is likely to be particularly excludable (hard to share). Fetching water is a frequent, physically demanding, and often time-consuming activity. It is often performed by adult women who, in addition

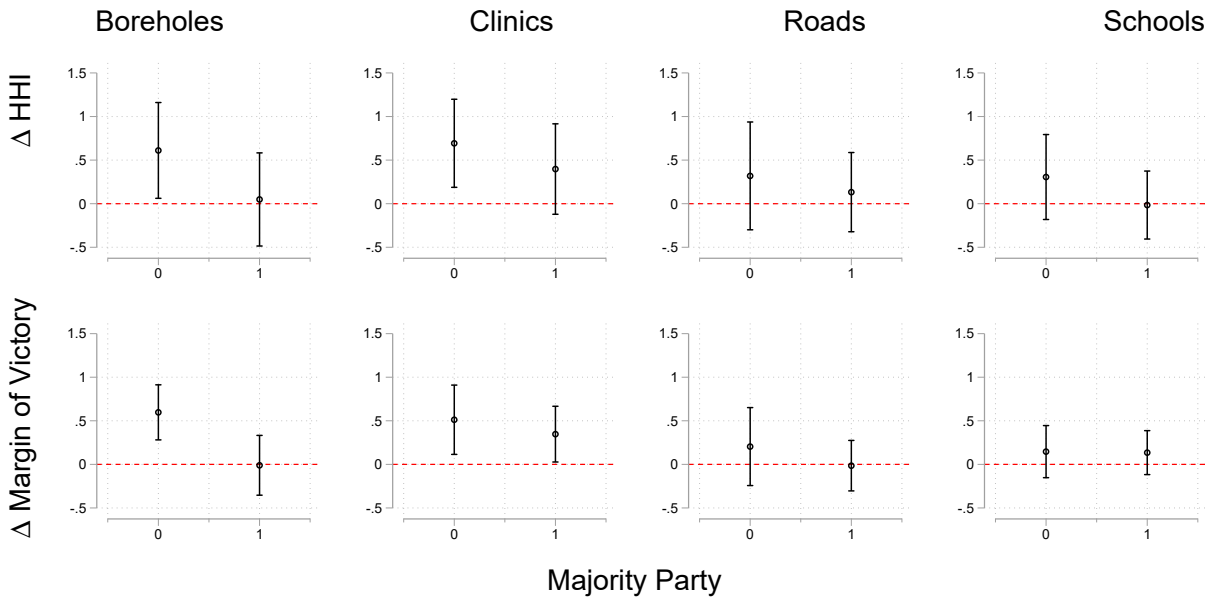
to providing 43 percent of agricultural labor in developing countries (Food and Agriculture Organization of the United Nations 2016), also contribute significantly to non-farm businesses and home work, and accordingly have a very high opportunity cost of their time. Adult women are also politically active. For these reasons, proximity to a clean water source is accordingly highly valued (Wright 2012), and there are likely to be intense debates on where to locate boreholes.

The next two goods in our index are either used by less economically and politically active individuals—schools—or are used less frequently in general—clinics—making debates over their location potentially less intense. Comparing the two, clinics are typically less numerous than schools: in our data, the median number of clinics per commune at baseline (2008) is just two, while the median number of primary schools per commune is ten. This could make clinics *more* difficult to bargain over. To see why, imagine that the median commune council decides to build a third clinic and an eleventh school, each in a new village. The choices of where to locate the new clinic will, by definition, be more numerous than the choices of where to locate the new school . This will complicate decision-making almost mechanically, making bargaining over the placement of the marginal clinic more challenging than bargaining over the placement of the marginal school. Finally, in many rural communities, the poor accept that children having a long walk to school is the norm—reducing contention about whether travel times to schools are acceptable.

In contrast, since roads are by their very nature a network that spans and connects multiple communities, they should be less excludable and easier to share—though there may be disagreement on the route if there is not a natural one already. As such, we would rank order these four goods, from most likely to generate bargaining difficulties to least: boreholes, clinics, and then finally roads and schools (how these latter two goods should be ranked is not entirely clear or beyond debate).

Using seemingly unrelated regression (SUR) to jointly test the effect of political competition on individual public goods provision outcomes in Appendix Table A.14, we find

Figure 3: Effect of Change in Political Competition (2004-2009) on Change in Public Goods (2008-2013), By Majority Party

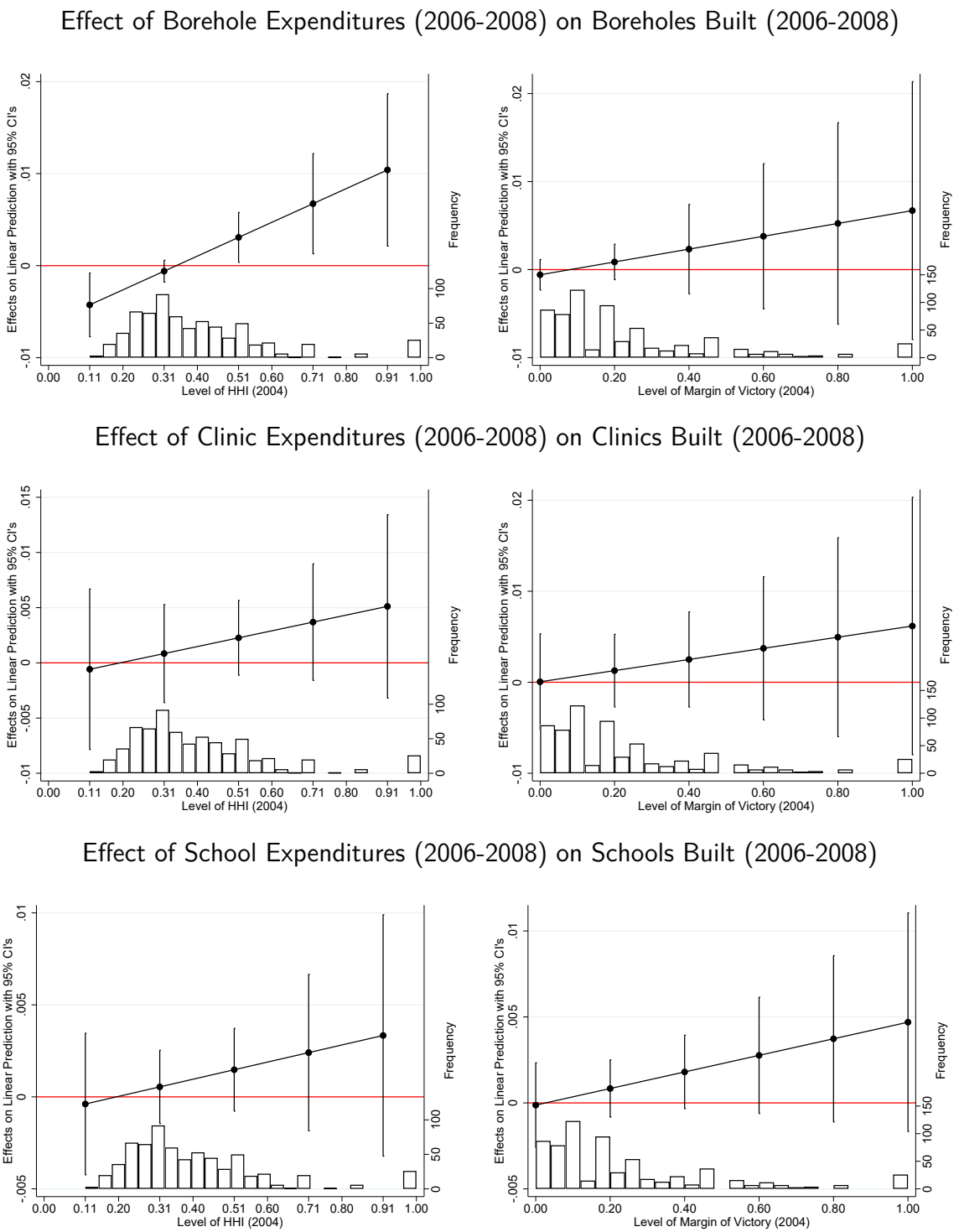


positive impacts on access to water and health clinics, especially among communes without a majority party on the council (depicted in Figure 3). Specifically, a one standard deviation decrease in political competition as measured by the HHI (margin of victory) predicts 0.63 (0.59) more boreholes and 0.21 (0.19) more clinics per commune, on average.[26] In communes without a majority party on the commune council, these effects are even larger; there, the same increase in the HHI (margin of victory) measure predicts 1.8 (1.7) more boreholes and 0.37 (0.27) more clinics per commune, on average, and these effects are always statistically significant at the 5 percent level or higher.[27] There is no significant effect on roads or schools. We can further reject the null hypothesis that the coefficient on change in political competition in each component public good regression is jointly equal to zero ($p = 0.08$ for HHI and $p = 0.00$ for Margin of Victory).

[26]The coefficient on the HHI measure of political competition is not statistically significant at conventional levels for the boreholes outcome.

[27]We obtain the effect sizes in terms of numbers of boreholes and clinics by running our same SUR specification but using non-normalized variants of the infrastructure variables.

Figure 4: Relationship between Public Expenditures and Outputs, Conditional on Competition



A third observable implication of legislative bargaining inefficiencies explaining the negative relationship between political competition and public goods is that the same amount of local public expenditures should yield fewer outputs in more competitive places. We explore this possibility using data on public expenditures by the commune during 2006-2008 on boreholes, clinics, and schools (we lack data on road expenditures), and combining this with data on the total numbers of boreholes, clinics, and schools constructed during the same period. We regress the number of each good built over the three-year period on the amount spent on it during that same period, the level of competition in the previous election (2004), and their interaction. These results appear in Appendix Tables A.15, A.16, and A.17, respectively—and are additionally depicted visually in Figure 4.

Our theory implies that public goods expenditures should have a less positive effect on outputs in more competitive places. We should thus observe a positive slope as the marginal effect of public expenditures goes from more to less competitive. For all three goods, we find evidence that the relationship is in the expected direction (see Figure 4), though the positive coefficient on the interaction term is only statistically significant in the case of boreholes.[28] We interpret this as suggestive—though certainly not definitive, given null results for two of the goods—evidence that bargaining inefficiencies are a mechanism through which political competition reduces the quantity of public goods provided.

Finally, we discuss another way in which inefficient bargaining can lead to fewer outputs. In contrast to the above case in which budgets are spent less efficiently in more competitive places, it is also possible that inefficient bargaining can lead to smaller budgets to start. Indeed, there is a weak negative relationship between competitiveness in 2004 and total spending on the three above goods between 2006-2008. One explanation for this could be the government withholding funds from inefficient places. ANICT transfers from the central

[28]Following Hainmueller, Mummolo and Xu (2016), we check whether our conclusions are being driven by assumptions of a linear interactive effect. Indeed, the effect of the moderating variable, competition, appears non-linear in the case of boreholes, but the conclusion that the effect of expenditures on outputs is smaller at higher levels of competitiveness still holds.

government are made in three tranches.[29] The first tranche, 45% of the total, is to be used as a deposit for project services. The second, 35% of the total, will only be transferred after 75% of the initial tranche has been justifiably spent;[30] indeed, the whole contract can be annulled if the first tranche of funds is not justified within 60 days or if the site or nature of the project changes.[31] In this way, some communes may remain with less than half of the potential project amount if they cannot effectively spend the initial funds due to disagreements within the council.

Qualitative Evidence

In this section we marshal evidence from our qualitative interviews with politicians in Mali to evaluate three observable implications of our argument: 1) that a negative relationship between competition and public goods provision should lead to a negative (positive) perception of political competition (concentration) (Hypothesis 1), 2) what drives increases in competition are empirically things that make bargaining harder, and 3) evidence of weak parties (Hypothesis 4).

First, politicians indeed have a negative (positive) perception of political competition (concentration). Interviewees were told that, according to our data, their commune had recently become much more, more, less, or much less competitive relative to other communes and asked to explain that trend. Many interpreted decreasing competitiveness as a "good" thing. For instance, one politician remarked that decreasing competitiveness was "the result of the population beginning to understand that politics is a competition that should be played out passively and not in disorder and aggressiveness."[32] To illustrate this trend more systematically, we coded whether explanations of the changing level of competition

[29]Manuel des Procédures de l'ANICT: Tome 2. ANICT. January 8, 2010. `https://www.local-uncdf.org/uploads/2/4/0/3/24030503/manuel_de_proce%CC%81dures_du_fnact_valide%CC%81_01-08-2010_anict.pdf`.

[30]Ibid, Article I.2.31.

[31]Ibid, Article II.1.5.1.

[32]Respondent 94.

Table 2: Perceptions of Changing Competitiveness among Interviewed Politicians

	Positive Response (Total responses) Representative Quotes	Negative Response (Total responses) Representative Quotes
Increasing Concentration	(29) Increased transparency People understand politics better Politicians respect each other Candidates get along	(14) Not enough intellectuals Candidates don't care Lack of public interest Lack of information
Increasing Competition	(18) Parties seek to develop the commune Public more interested in politics Gifts no longer work, people are motivated People understand elections better	(21) Personalistic politics Money engenders disputes People vote on affinity not conviction Leaders lack credibility

took on a positive or negative tone.[33] Table 2 reports the total counts in each category, and representative responses. There were twice as many positive answers among the decreasingly competitive communes, and slightly more negative answers in the increasingly competitive places. In several cases, remarks about decreased competitiveness were directly tied to increasing public goods provision, e.g., one commune's respondents suggested a long history of a dominant party is helpful for getting things, with even the opposition attributing increases in public goods to the mayor.[34]

Before being told about relative changes in competition, politicians were asked to explain the level of political competition in their commune. Three main drivers of competition emerged. First, competition can cleave along ethnic lines, e.g. some politicians[35] said the mayor directs most public works to co-ethnics. Second, competition can cleave along geographic lines. One politician[36] said that "voters did not want politicians from other villages to take the reins of the mayor's office" for fear of having benefits cut off, while another[37] explains that competition is driven by some villages breaking off and forming their own party.

[33]We exclude the 20% of responses that either took on a neutral tone, e.g., "because of the number of parties," or in which respondents disagreed with our data.

[34]Commune 13.

[35]Respondents 28 and 84.

[36]Respondent 19.

[37]Respondent 85.

Third, greater competition may also be a manifestation of personal conflicts among existing local politicians (we discuss evidence for this below).

Each of these features has the potential to exacerbate bargaining inefficiencies. When politics cleaves along non-programmatic lines, compromise is difficult; one ethnic group or village is likely to benefit at the expense of another. But, of the above three drivers of competition, the latter is most likely to change during our period of study, which is what we are capturing in our first differences quantitative analysis.[38] We thus turn our attention to how personalistic politics can exacerbate bargaining on a council.

What we observe as marginal increases in political fractionalization is often attributed to party reconfigurations resulting from personal ambitions and intra-party disputes. This highlights the very personalistic nature of politics, common among weak parties in new democracies. Politicians we interviewed suggested a key reason for personalism in politics: getting a seat on the council is a way to enrich oneself and get access to information. For instance, one politician left the party of the incumbent mayor when he heard the mayor was running again to have a better chance at winning the mayorship.[39] We also noticed that the word *trahison*, or "betrayal," was mentioned numerous times in our interviews – a word that might appear out of place in party politics in a less personalistic setting. In response to questions about party switching and electoral failures, politicians in 10 of the 24 sample communes mentioned betrayal, referring to fellow party members who either left their party for another or otherwise acted against prior party agreements.[40] These respondents were almost twice as likely to come from communes that experienced above-median increases in competitiveness. Such party system fractionalization and uncertainty can contribute to both greater complexity when forming coalitions and less credible commitments when trying to sustain them.

[38]Neither ethnic fractionalization (data from Gottlieb (2017)) nor population or villages dispersion is correlated with changes in competition, and they are also likely to be slow-changing variables differenced out by our econometric model.

[39]Respondent 19.

[40]Respondent 2, 4, 6, 7, 25, 28, 38, 50, 68, 77, 110.

Alternative Explanations

In one of the few empirical studies that similarly finds a negative relationship between political competition and public goods provision, Boulding and Brown (2014) attribute the relationship to an omitted variable – underdevelopment – driving both higher incumbent turnover and lower public goods. They argue that municipalities with fewer resources are less able to mobilize voters and so incumbents rarely win reelection. It is in these places that *look* competitive that social spending is also lowest. While we aim to account for such an explanation by estimating a first differences model and controlling for factors that would impact the local budget such as population size and indices of development, we can also control for the potential mediator of voter turnout. When we add the change in voter turnout from 2004 to 2009 to Equation 2, the coefficients on our measures of political competitiveness remain substantially unchanged and still statistically significant, providing evidence against this alternative explanation.

Another plausible alternative explanation for a negative relationship between political competition and public goods provision is that parties are competing on private transfers instead of or in addition to public goods provision. In young democracies where newer parties have weak reputations, clientelist appeals or political promises to targeted groups and individuals are often more credible than universal policies (Keefer 2007) and demands to supply targeted benefits can outweigh marginal increases in returns to programmatic investments (Kitschelt and Wilkinson 2007). Studies have documented a positive correlation between political competition and clientelism or targeted transfers in such contexts (Weitz-Shapiro 2012; Wilkinson 2007; Levitsky 2007; Kopecký 2011). But for increases in targeted transfers to be the cause of subsequent decreases in public goods provision, the two outputs must be substitutes, e.g. because of distinct politician types or a limited budget of time or effort (Adida et al. 2016).

In our qualitative data, competition is indeed predicated, at least in part, on targeted rather than programmatic interests. As one respondent says: "Here, personal interests reign.

Supporters want to have more, so political parties work hard to satisfy them."[41] However, there is little evidence in our qualitative or additional quantitative data that the provision of public goods and private transfers are substitutes. One observable implication would be that politicians have a time budget such that spending more time on constituent service makes them less likely to work to provide public goods. Evidence for this is weak: about 70 percent of respondents say that doing one does not impede them from doing the other.

To quantitatively assess the relationship between private transfers, public goods provision, and political competition, we conducted a phone survey with 479 elected officials in a representative sample of 246 rural communes in the weeks before the 2016 Malian local elections, surveying the mayor and a high-ranking member of the largest opposition party. To measure private transfers, we asked how much money per month each politician spent on constituents during the last mandate; to measure vote-buying—sometimes considered another instance of private transfers to citizens—we asked each respondent how much they expected their party to spend on campaigning in the upcoming election (see Figures A.1 and A.2 for distribution of responses). We find a *positive and significant* correlation between constituent transfers and the 2008 and 2013 levels of the public goods index (and no correlation with expected vote-buying) – evidence against their relationship as substitutes. When we regress monthly constituent spending during the 2009-2016 period on political competition in the 2009 elections in Table 3, we find a null relationship, further suggesting that an increase in private transfers due to political competitiveness is not driving the decline in public goods.[42]

[41] Respondent 54.

[42] Our formal model (in Appendix E) illustrates how increased competition can simultaneously lead to a decrease in public goods provision and a decrease in (or no effect on) private transfers—specifically, at low levels of substitutability between public and private goods.

Table 3: Effect of Political Competition (2009) on Monthly Constituent Spending during 2009-2016

	(1)	(2)	(3)	(4)
HHI (2009)	0.208	0.289		
	(0.338)	(0.359)		
Margin of victory (2009)			−0.210	−0.218
			(0.303)	(0.312)
Logged Population (1998)		0.061		0.061
		(0.109)		(0.109)
Number of Sources of National Electricity (2008)		0.066		0.042
		(0.152)		(0.151)
Kilometers of Paved Roads (2008)		−0.001		−0.001
		(0.000)		(0.000)
NGO/Development Projects (2008)		−0.008		−0.009
		(0.012)		(0.011)
Mayor		0.363**		0.362**
		(0.124)		(0.124)
Observations	474	474	474	474

Ordered probit models with region fixed effects and standard errors clustered at the cercle level.
$^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

6 Generalizability

While we have demonstrated evidence of a novel relationship between political competitiveness and public goods provision in Mali, its import should not be limited to a single case. In the theory section, we identified scope conditions that indicate where such a relationship should manifest outside of Mali. In particular, the depressive effect of competition on public goods provision should be most likely to arise in contexts with weak and non-programmatic parties that are less able to discipline members and less able to achieve compromise in policy debates. Additionally, the established positive effect of competition on public goods provision should be more likely to manifest (and even reverse the negative effect) where voters are better able to hold politicians accountable.

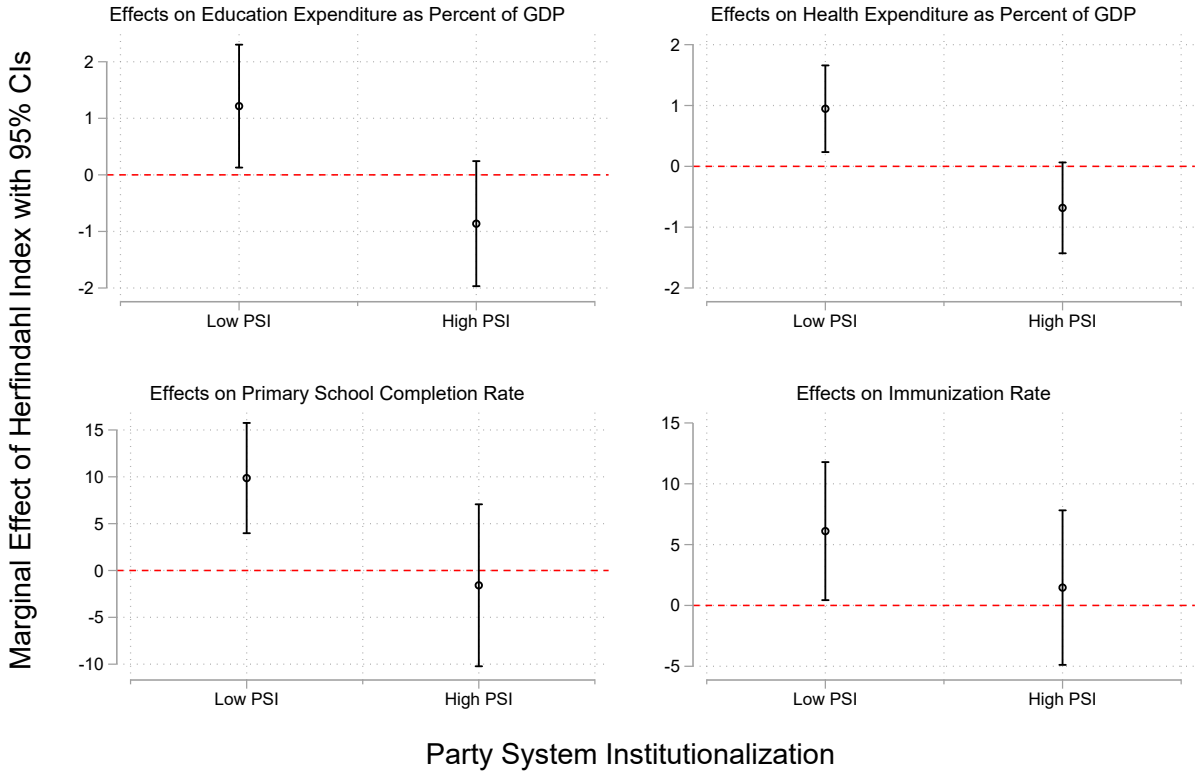
To test these predictions outside the Mali case, we constructed a panel dataset of 164 countries spanning the period 1975–2015. Since we are interested in legislative competition,

we use a Herfindahl index (HHI) for legislative elections coded from the DPI dataset (Keefer 2005) as our independent variable. For our dependent variable, a proxy for public goods provision, we use data on both public expenditures from the Statistics on Public Expenditures for Economic Development (SPEED) database (IFPRI 2017) and on development outcomes related to public expenditures from the World Development Indicators (WDI) database (World Bank 2017).

As our key moderating variable, we use an index of party system institutionalization from V-Dem (Coppedge et al. 2017), which is formed by combining indicators for party organizations, party branches, party linkages, distinct party platforms, and legislative party cohesion. For simplicity, we code an indicator variable for the index of party system institutionalization being above the median (high), as opposed to below the median (low). In settings of high party system institutionalization, our theory predicts that an increase in the HHI (i.e. a decrease in legislative competition) may harm public goods outcomes. In contrast, when party system institutionalization is low, an increase in the HHI should be beneficial for public goods outcomes.

Our empirical specification takes advantage of over-time changes in both competitiveness and public goods outcomes, running a country and year fixed effects regression. We interact the time-varying independent variable of competitiveness with a time–invariant country-level indicator for high party system institutionalization, which allows us to estimate differential slopes for the two sets of countries. Results appear in Appendix Table A.20 and key outcomes are depicted visually in Figure 5. We find strong support for our theory outside the Mali case, whether looking at public expenditures (inputs) or citizens' access to services (outputs). In countries with low party system institutionalization, there is a positive and statistically significant relationship between the Herfindahl index and several outcomes: education and health expenditures as a share of GDP, primary school completion rates, and immunization rates for measles. By contrast, in countries with high party system institutionalization, this relationship either attenuates or reverses to obtain the *negative* relationship between the

Figure 5: Cross-country Analysis of Effect of Political Competition on Public Goods, Conditional on Party System Institutionalization



Herfindahl index and public goods outcomes that is predicted by the existing literature.[43]

Our theory additionally suggests that the benefits of party competition should accrue in more transparent systems where electoral accountability is more likely to produce voter-preferred outcomes. Lacking comparable cross-country data on government transparency, we instead use country-level data on perceptions of corruption from Transparency International as a proxy for the extent to which electoral incentives are perceived to discipline politician behavior. Our expectation from the theory is that salutary effects of political competition should only manifest in a setting of high party system institutionalization where elections additionally discipline politician behavior. We thus compare the relationship between party competition and public goods provision across three categories of countries: those with low party system institutionalization (where we expect the relationship to be negative), those with high party system institutionalization and low corruption (where we expect the relationship to be positive), and those with high party system institutionalization and high corruption (where we expect no systematic trend). [44] We find that, in most cases, having higher party system institutionalization *and* lower corruption is superior: those are the countries where the expected benefits of competition are most likely to accrue (Appendix Table A.20, Panel B).

7 Conclusion

We presented an argument that introduces two ways in which political competition can moderate public goods provision – electoral incentives and legislative bargaining – whereas the extant literature focuses largely on the first. Our theory suggests the conditions under which we should expect a net negative relationship between political competition and public goods provision to emerge: places where parties are weak and government transparency is

[43]Results are robust to normalizing public goods expenditures by population rather than GDP (Appendix Table A.20, columns 3 and 4).

[44]To do this, we construct a three-level indicator for our moderating variable that takes a value of 0 if the country has low party system institutionalization, 1 if the country falls below the median on the corruption index (less transparent) and a 2 if it falls above the median (more transparent).

low – features common among many young, low-income democracies. We test this main implication of our theory in two ways. First, using detailed local government–level panel data, we robustly show that increases in political competition lead to decreases in public goods provision in one low-income democracy, Mali. Second, we show that these results generalize to other weak party systems using panel data from 164 countries.

Using quantitative and qualitative data from Mali, we further provide evidence that the negative relationship between political competitiveness and public goods outcomes is indeed being generated by bargaining inefficiencies, as suggested by our theory. First, we show that the negative effects of competition on public goods are most likely to materialize where legislative coalitions are more difficult to maintain—namely, where there is no majority party on the council that can railroad through policy decisions or greater preference fractionalization among voters. Second, we demonstrate that goods that are more excludable and thus more difficult to share (like boreholes and clinics) imply greater bargaining inefficiencies, making a net negative effect of political competition on their provision more likely. Finally, we provide evidence that money is indeed being wasted; we show that the production function turning public expenditures into public goods is less efficient in more competitive places. In addition, we find no evidence that expenditures on public goods are instead being reallocated to private transfers.

Our theory and evidence highlight an important feature of political competition that has thus far been ignored in the literature: its potential to exacerbate the daily workings of governance in between elections. This suggests that efforts to support democracy in the developing world would do well to pay attention to the increased potential for bargaining inefficiencies in legislatures, and perhaps experiment with ways to improve effective governance in the long intervals between elections.

While our work highlights how political competition may worsen public goods production between elections, we have also noted that this could be due to either of two factors: inefficiencies in forming a coalition or inefficient decision-making by a weak coalition that cannot

commit to decisions related to public goods provision. Future research is needed to adjudicate between these mechanisms and also to uncover precisely at which stage inefficiencies emerge. For example, how does political competition separately influence the speed and durability of coalition formation, the speed with which decisions over which public goods and services to build and supply are made, and the efficiency of their actual provision (construction or delivery)? Answers to these questions have important implications for our understanding of how public goods provision could suffer as a result of political competition, and what policies may work to circumvent such a deterioration.

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Supporting Information:
The Countervailing Effects of Competition on Public Goods Provision: When Bargaining Inefficiencies Lead to Bad Outcomes

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A Evidence Review

To generate a comprehensive list of studies that examine the effect of political competition on public goods provision, we had a research assistant conduct a literature search in Google Scholar, JSTOR, and top political science and economic journal websites for articles written in the last 20 years. Search terms included "democracy," "electoral competition" or "political competition," and "public goods" or other specific welfare outcomes (e.g. education, health). Targeted political science journals included *American Political Science Review*, *Quarterly Journal of Political Science*, *American Journal of Political Science*, *British Journal of Political Science*, *Journal of Politics*, *Comparative Political Studies*, and *World Politics*. Targeted economics journals included *American Economic Review*, *Quarterly Journal of Economics*, *Review of Economics and Statistics*, *Review of Economic Studies*, *Journal of Political Economy*, *The Economic Journal*, *Journal of Development Economics*, and *World Development*.

Table A.1: Evidence Review of the Relationship between Political Competition and Public Goods Provision

Citation	**Context**	**DV**	**IV**	**Effect**	**Details**
Boix (2001)	cross-country	Size of the public sector	Democracy	Mixed	Positive relationship in higher-income countries, none in low-income ones
Mukherjee (2003)	cross-country	Size of expenditures	Number and size of legislative parties	Mixed	An increase of represented parties leads to a decrease in public goods; transfers and subsidies increase
Ross (2006)	cross-country	Child mortality	Democracy (POLITY)	Mixed	Highly democratic nations spend more on health and education, but tends to benefit the middle and upper classes
Stasavage (2005)	cross-country	Government spending on education	Multiparty competition, election year, GDP per capita	Mixed	Increased political competition leads to more spending on primary education; university education is unaffected
Chhibber and Nooruddin (2004)	India	Public goods	Competition from two party and multiparty systems	Mixed	Positive relationship in two party systems, not in multiparty ones
Sjahrir, Kis-Katos and Schulze (2014)	Indonesia	Per capita government expenditures	Impact of diret elections	Mixed	Overspending higher in districts with less competition, but direct elections have not improved governance
Boulding and Brown (2014)	Brazil	Incumbent victory and turnout	Budget size	Negative	More political competition associated with less social spending
Chatterjee (2018)	India	Provision of electricity	Transition from single-party rule	Negative	The transition from single party is harmful for provision of electricity
Banerjee and Somanathan (2007)	India	Share of villages with public goods	Fragmentation of competition (vote shares of parties)	Null	Fragmentation had no impact on provisions of most goods

Evidence Review of the Relationship between Political Competition and Public Goods Provision (cont.)

Citation	Context	DV	IV	Effect	Details
Cleary (2007)	Mexico	Municipal government performance	Electoral competition	Null	Electoral competition did not improve delivery of public goods
Ashworth et al. (2014)	Belgium	Government efficiency	Political competition	Positive	Net positive: increased political competition improves local efficiency (which can confer goods), but can also lead to fracturing
Arvate (2013)	Brazil	Local public goods	Number of executive candidates running	Positive	An increase the number of executive candidates running led an increase in the supply of local goods
Binzer Hobolt and Klemmensen (2008)	Britain, Denmark, US	Executive rhetoric and changes in public expenditures	Electoral uncertainty and policy preference	Positive	High levels of executive discretion with opposition of political parties led to low levels of output
Besley and Kudamatsu (2006)	cross-country	Life expectancy	Measure of democracy, income level	Positive	Health spending is higher in more democratic countries
Deacon (2009)	cross-country	Public good provision	Regime type	Positive	Democratic regimes are likely to spend more on public goods provisions
Lake and Baum (2001)	cross-country	Education and health provision	Level of democracy	Positive	Public good provision higher in more democratic states
Boyne et al. (2012)	England	Composite measure ofservice quality and effectiveness	Political party control and change in control	Positive	Positive
Hecock (2006)	Mexico	Education spending	Political competition	Positive	More competitive democracies are more responsive to social demands
Crost and Kambhampati (2010)	North India	Number of schools and school infrastructure	Margin of victory and probability of losing seat	Positive	Turnover among governing parties, and a lower margin of victory, has a positive effect education provision
Besley, Persson and Sturm (2010)	US	Personal income, infrastructure spending	Political Competition	Positive	Increased competition led to increased infrastructure spending

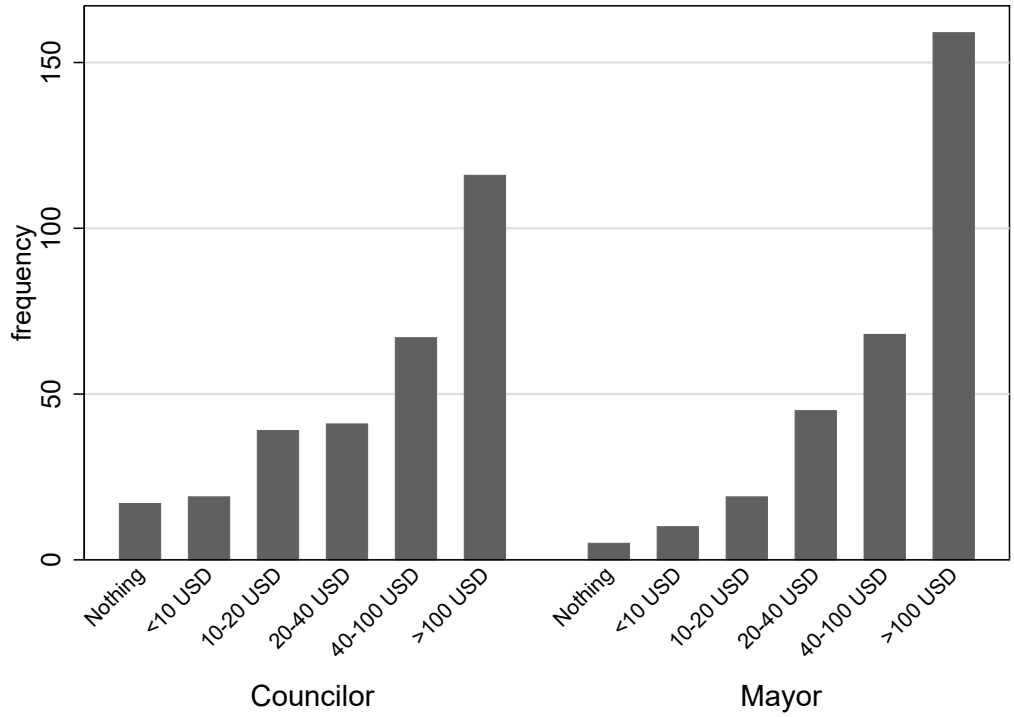
B Descriptive Statistics

B.1 Summary Statistics

	Mean	SD	Min	Max	N
Dependent Variables					
2013-2008: Anderson index (4 components)	-0.00	0.51	-3.49	3.62	666
2013-2008: PCA index; first component (4 inputs)	0.00	0.94	-5.70	4.76	592
Boreholes (2013)	0.00	1.00	-0.92	7.57	660
Clinics (2013)	-0.00	1.00	-1.13	8.33	660
Rural Roads (2013)	0.00	1.00	-0.93	6.38	655
Schools (2013)	-0.00	1.00	-1.34	6.17	660
Boreholes (2008)	0.00	1.00	-0.92	7.84	654
Clinics (2008)	0.00	1.00	-1.19	7.39	636
Rural Roads (2008)	0.00	1.00	-0.57	9.18	660
Schools (2008)	0.00	1.00	-1.16	7.40	612
Independent Variables					
Difference in HHI (2009-2004)	-0.03	0.16	-0.68	0.76	664
Difference in Margin (2009-2004)	-0.03	0.23	-1.00	0.87	664
Competition, HHI (2009)	0.37	0.16	0.13	1.00	665
Competition, Margin (2009)	0.21	0.20	0.00	1.00	665
Competition, HHI (2004)	0.40	0.18	0.11	1.00	664
Competition, Margin (2004)	0.24	0.24	0.00	1.00	664
Preference Fractionalization	0.77	0.05	0.55	0.85	232
Controls					
Difference in Volatility (2009-2004)	-0.14	0.26	-1.00	1.00	660
Volatility (2004)	0.59	0.23	0.00	1.00	662
Public Goods Index (2008)	0.00	0.75	-1.03	4.53	666
Public Goods Index, PCA (2008)	0.00	1.46	-1.93	8.92	598
Difference in Logged Population (2009-1998)	0.35	0.23	-0.72	1.77	666
Percent of Local Roads Paved (2008)	8.26	20.04	0.00	100.00	666
Level of Electrification (2008)	3.73	12.77	0.00	263.70	666

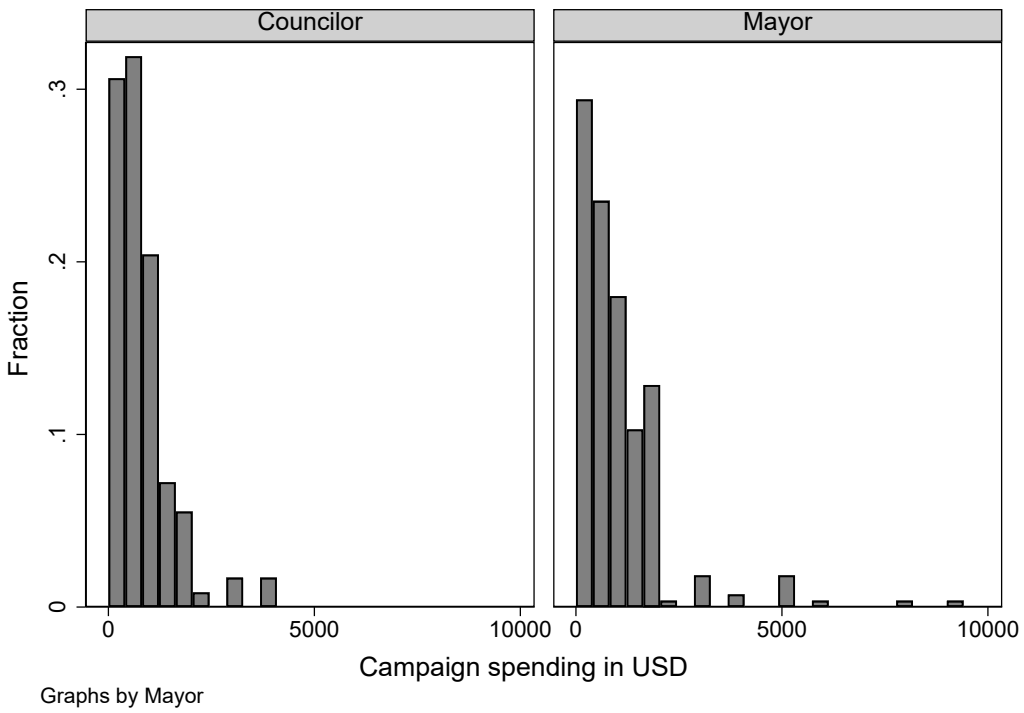
B.2 Politician spending, 2016 survey of Malian politicians

Figure A.1: Distribution of monthly transfers to constituents (2009-2016), by post



Note: Informed by a pre-survey, we used a multiple-choice response set with pre-defined increments to increase reliability. Values are translated into USD amounts from franc CFA using the exchange rate of 1 USD = 500 CFA.

Figure A.2: Distribution of estimated campaign spending in 2016, by post



Note: For better visibility, we exclude three extreme outliers from the graphic depiction of the distribution.

C Robustness Checks

C.1 Accounting for Time Trends

Table A.2: Effect of Change in Political Competition (2004-2009) on Change in Public Goods Index (2008-2013), Including Region-Specific Time Trends

	(1)	(2)	(3)	(4)	(5)
Panel A: HHI measure					
Difference in HHI (2009-2004)	0.202^{+}	0.225^{*}	0.202^{+}	0.204^{+}	0.413^{*}
	(0.102)	(0.107)	(0.105)	(0.111)	(0.170)
Public Goods Index (2008)	-0.236^{***}	-0.235^{***}	-0.256^{***}	-0.245^{***}	-0.264^{***}
	(0.047)	(0.047)	(0.050)	(0.048)	(0.050)
Kayes	-0.127	-0.130	-0.132	-0.165	-0.124
	(0.107)	(0.108)	(0.115)	(0.106)	(0.116)
Sikasso	-0.319^{**}	-0.326^{**}	-0.320^{**}	-0.330^{**}	-0.318^{*}
	(0.109)	(0.111)	(0.118)	(0.110)	(0.120)
Segou	-0.208^{+}	-0.206^{+}	-0.201^{+}	-0.216^{+}	-0.196
	(0.112)	(0.114)	(0.120)	(0.108)	(0.120)
Mopti	-0.219^{+}	-0.228^{+}	-0.224^{+}	-0.234^{*}	-0.220^{+}
	(0.112)	(0.114)	(0.122)	(0.110)	(0.123)
Tombouctou	-0.346^{*}	-0.349^{*}	-0.355^{*}	-0.304^{*}	-0.342^{*}
	(0.139)	(0.141)	(0.143)	(0.126)	(0.143)
Gao	-0.377^{**}	-0.383^{**}	-0.381^{*}	-0.362^{**}	-0.365^{*}
	(0.133)	(0.134)	(0.145)	(0.130)	(0.141)
Kidal	-0.526^{***}	-0.520^{***}	-0.588^{***}	-0.465^{***}	-0.553^{***}
	(0.109)	(0.116)	(0.116)	(0.125)	(0.120)
Difference in Volatility (2009-2004)		0.065	0.078	0.071	0.100
		(0.067)	(0.069)	(0.066)	(0.071)
Difference in Logged Population (2009-1998)			0.045	0.090	0.049
			(0.057)	(0.061)	(0.057)
Kilometers of Paved Roads 2008			0.000		0.000
			(0.000)		(0.000)
Number of Sources of National Electricity 2008			0.138^{**}		0.131^{**}
			(0.047)		(0.047)
NGO/Development Projects 2008			0.001		0.001
			(0.004)		(0.004)
Change in Km of Paved Roads (2013-2008)				0.000^{*}	
				(0.000)	
Change, Sources of Electricity (2013-2008)				0.133^{*}	
				(0.065)	
Change in NGO/Dev. Projects (2008-2013)				0.014^{**}	
				(0.004)	
Majority Party					-0.061
					(0.039)
Majority Party × Difference in HHI					-0.277
					(0.204)
Constant	0.214^{*}	0.227^{*}	0.184	0.166	0.212^{+}
	(0.096)	(0.099)	(0.111)	(0.099)	(0.114)

Table continued on next page...

	(1)	(2)	(3)	(4)	(5)
Panel B: Margin of victory measure					
Difference in Margin (2009-2004)	0.149*	0.161*	0.154*	0.145*	0.329*
	(0.065)	(0.068)	(0.066)	(0.069)	(0.132)
Public Goods Index (2008)	−0.234***	−0.233***	−0.255***	−0.244***	−0.260***
	(0.047)	(0.047)	(0.049)	(0.047)	(0.050)
Kayes	−0.131	−0.134	−0.135	−0.168	−0.133
	(0.107)	(0.108)	(0.116)	(0.107)	(0.118)
Sikasso	−0.316**	−0.323**	−0.317*	−0.327**	−0.319*
	(0.110)	(0.111)	(0.119)	(0.111)	(0.122)
Segou	−0.209+	−0.207+	−0.202+	−0.216+	−0.202
	(0.111)	(0.113)	(0.120)	(0.108)	(0.121)
Mopti	−0.217+	−0.224+	−0.221+	−0.231*	−0.223+
	(0.112)	(0.114)	(0.122)	(0.110)	(0.125)
Tombouctou	−0.336*	−0.337*	−0.343*	−0.293*	−0.330*
	(0.142)	(0.144)	(0.146)	(0.129)	(0.146)
Gao	−0.368**	−0.372**	−0.372*	−0.353**	−0.354*
	(0.134)	(0.136)	(0.146)	(0.131)	(0.143)
Kidal	−0.524***	−0.518***	−0.587***	−0.462***	−0.560***
	(0.109)	(0.116)	(0.117)	(0.125)	(0.120)
Difference in Volatility (2009-2004)		0.065	0.079	0.071	0.103
		(0.068)	(0.070)	(0.067)	(0.073)
Difference in Logged Population (2009-1998)			0.049	0.095	0.051
			(0.057)	(0.062)	(0.057)
Kilometers of Paved Roads 2008			0.000		0.000
			(0.000)		(0.000)
Number of Sources of National Electricity 2008			0.140**		0.136**
			(0.047)		(0.046)
NGO/Development Projects 2008			0.001		0.000
			(0.004)		(0.004)
Change in Km of Paved Roads (2013-2008)				0.000*	
				(0.000)	
Change, Sources of Electricity (2013-2008)				0.134*	
				(0.065)	
Change in NGO/Dev. Projects (2008-2013)				0.014**	
				(0.004)	
Majority Party					−0.057
					(0.037)
Majority Party × Difference in Margin					−0.256
					(0.159)
Constant	0.211*	0.223*	0.180	0.162	0.213+
	(0.097)	(0.100)	(0.112)	(0.100)	(0.117)
Observations	664	660	660	660	660

OLS models with standard errors clustered at the cercle level. $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Table A.3: Effect of Change in Political Competition (2004-2009) on Change in Public Goods Index (2008-2013), Dropping Initial Period Level of Dependent Variable

	(1)	(2)	(3)	(4)	(5)
Panel A: HHI measure					
Difference in HHI (2009-2004)	0.086	0.112	0.102	0.092	0.236
	(0.133)	(0.139)	(0.139)	(0.138)	(0.227)
Difference in Volatility (2009-2004)		0.078	0.075	0.088	0.079
		(0.062)	(0.063)	(0.059)	(0.063)
Difference in Logged Population (2009-1998)			0.045	0.052	0.041
			(0.056)	(0.056)	(0.056)
Kilometers of Paved Roads 2008			−0.000		−0.000
			(0.000)		(0.000)
Number of Sources of National Electricity 2008			0.033		0.030
			(0.050)		(0.050)
NGO/Development Projects 2008			−0.003		−0.003
			(0.005)		(0.005)
Change in Km of Paved Roads (2013-2008)				0.000**	
				(0.000)	
Change, Sources of Electricity (2013-2008)				0.092	
				(0.069)	
Change in NGO/Dev. Projects (2008-2013)				0.014**	
				(0.005)	
Majority Party					0.008
					(0.052)
Majority Party × Difference in HHI					−0.255
					(0.242)
Constant	0.002	0.014	0.011	−0.037	0.017
	(0.033)	(0.034)	(0.049)	(0.042)	(0.055)

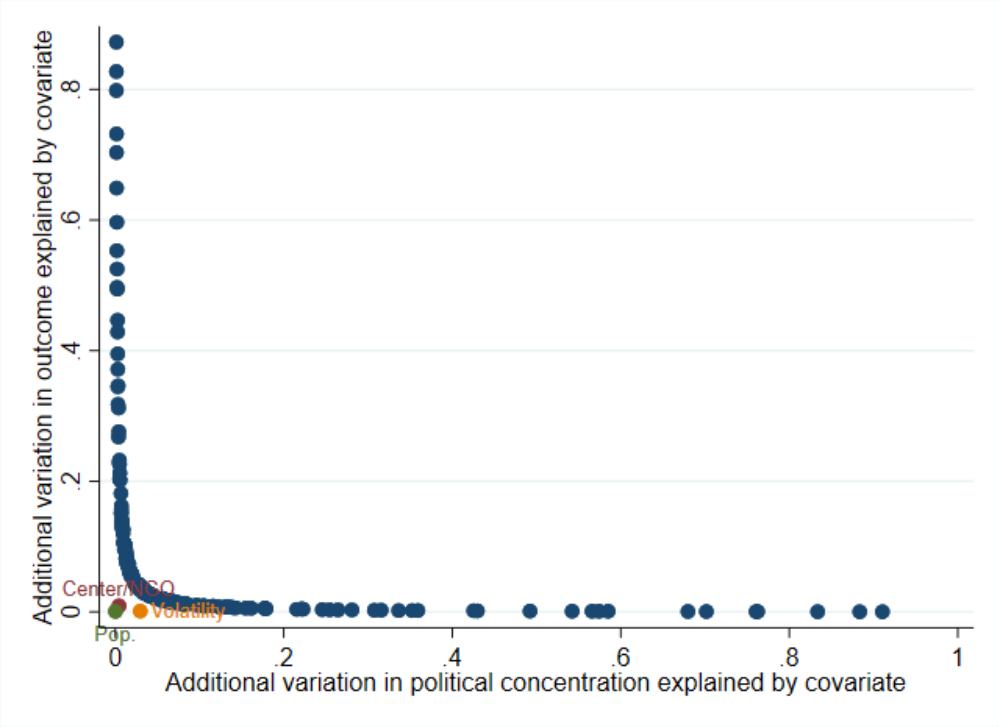
Table continued on next page...

	(1)	(2)	(3)	(4)	(5)
Panel B: Margin of victory measure					
Difference in Margin (2009-2004)	0.126	0.144	0.142	0.119	0.295^{+}
	(0.088)	(0.091)	(0.091)	(0.090)	(0.165)
Difference in Volatility (2009-2004)		0.089	0.087	0.096	0.097
		(0.064)	(0.065)	(0.061)	(0.066)
Difference in Logged Population (2009-1998)			0.048	0.055	0.044
			(0.056)	(0.056)	(0.057)
Kilometers of Paved Roads 2008			−0.000		−0.000
			(0.000)		(0.000)
Number of Sources of National Electricity 2008			0.032		0.030
			(0.049)		(0.049)
NGO/Development Projects 2008			−0.003		−0.003
			(0.005)		(0.005)
Change in Km of Paved Roads (2013-2008)				0.000^{**}	
				(0.000)	
Change, Sources of Electricity (2013-2008)				0.092	
				(0.069)	
Change in NGO/Dev. Projects (2008-2013)				0.014^{**}	
				(0.005)	
Majority Party					0.001
					(0.048)
Majority Party × Difference in Margin					−0.270
					(0.189)
Constant	0.004	0.017	0.013	−0.035	0.024
	(0.032)	(0.034)	(0.048)	(0.041)	(0.053)
Observations	664	660	660	660	660

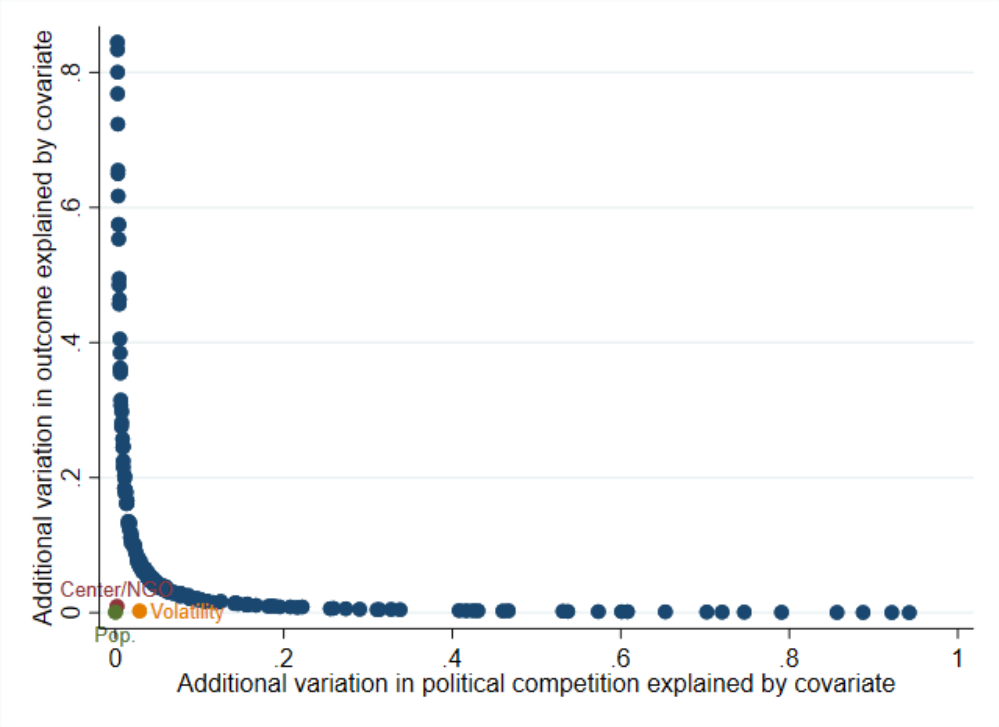
OLS models with standard errors clustered at the cercle level. $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

C.2 Generalized Sensitivity Analysis

Imbens (2003) and Harada (2012) describe sensitivity analysis that helps us examine whether our results are appreciably affected by omitted variable bias. Specifically, we take our preferred specification of column 3 in Table 1 and relax the exogeneity assumption to allow for correlation between political competition and unobserved covariates correlated with both political competition and our public goods index. We allow a vertical axis to show the marginal increase in the R-squared from adding an unobserved covariate to a regression of the public goods index on our full set of controls. We let a horizontal axis show the the marginal increase in the R-squared from adding the covariate to a regression of political competition on our full set of controls. Generating pseudo-unobservables via 200 iterations, Figures A.3a (for our HHI measure of political competition) and Figure A.3b (for our margin of victory measure) each plot a series of points that trace out a curve representing the combination of R-squared values that would lead to a halving of our effect size—thus significantly altering our empirical findings. Blattman and Annan (2010) perform a similar test. As the figures illustrate, modest correlation between political competition and an omitted variable would only be problematic in the case of very high correlation between that same omitted variable and our public goods index. To shed light on how much correlation between some hypothetical omitted covariate and our key dependent and explanatory variables to expect, we also plot, for each of our three (sets of) controls, its partial correlation with political competition and with our public goods index. These controls are: (1) the difference in logged population, (2) the difference in volatility, and (3) initial period levels of public goods provision by the central government and NGOs projects. The HHI and margin of victory sub-figures are nearly identical, likely reflecting that similar types of omitted variables affect each. And in both figures, none of the three sets of existing controls comes close to the threshold for reducing our estimated coefficient on political competition by half. Hence, any omitted variable would need to be a lot more influential than our existing control sets to invalidate our findings. This substantially supports our causal interpretation of the results.



(a) HHI measure of political competition



(b) Margin of victory measure of political competition

Figure A.3: Robustness to Relaxing the Exogeneity Assumption

Notes: Pop indicates difference in logged population 2009–1998), Volatility indicates difference in volatility (2009–2004), and Center/NGO indicates controls for initial period levels of public goods provision by the central government (kilometers of paved roads and number of sources of electricity in 2008) and the number of NGO/ development projects in 2008.

C.3 Use of Alternate Measures of Political Competition

Measures of bargaining power, such as Shapley-Shubik or Banzhaf indices, take into account the extent to which a party is formative on any given coalition due to their ability to swing a vote by threatening exit. To calculate the power of an individual party, the Banzhaf measure determines, of all the potential coalitions the party could serve on, the number of times that party would be swing—or could change the outcome of a referendum (Banzhaf III 1964). Power measures differ from simply accounting for relative seat share because a party's ability to form winning coalitions and threaten exit depends on the distribution of seats among other parties.

Any of our independent variables could be constructed using the simple seat share of each party or by instead using each party's bargaining power index that captures how pivotal the party is likely to be in coalitions. We prioritized seat share measures in the body of the paper, but show robustness to using parties' Banzhaf power indices here. We do this for three main reasons. First, seat shares are more common, easier to construct and more straightforward to interpret. Second, as our theory encompasses both electoral competition and legislative bargaining, we wanted to employ measures that apply to both arenas. Third, computing a competition measure using Banzhaf power indices empirically captures much less variation than a seat share HHI, because it assigns all councils with a majority party a value of 1 whereas the HHI index discriminates between majority parties of different sizes. Using seat shares rather than power indices to measure legislative bargaining power would be problematic if there were a highly non-linear relationship between the two, but plotting the measures against each other reveals a linear relationship. Additionally, the measures are highly correlated (as also confirmed by (Kline 2009)), suggesting that they measure similar concepts. Perhaps not surprisingly, we find substantively indistinguishable results when we check robustness to these alternate measures of political competition.

Table A.4: Effect of Change in Banzhaf Index (2004-2009) on Change in Public Goods Index (2008-2013)

	(1)	(2)	(3)	(4)	(5)
Difference in Banzhaf Index (2009-2004)	0.075	0.077	0.070	0.065	0.185^{+}
	(0.049)	(0.050)	(0.049)	(0.047)	(0.095)
Public Goods Index (2008)	-0.210^{***}	-0.210^{***}	-0.230^{***}	-0.224^{***}	-0.244^{***}
	(0.045)	(0.045)	(0.050)	(0.047)	(0.050)
Difference in Volatility (2009-2004)		0.034	0.048	0.045	0.076
		(0.056)	(0.058)	(0.055)	(0.061)
Difference in Logged Population (2009-1998)			0.050	0.099	0.055
			(0.055)	(0.060)	(0.054)
Kilometers of Paved Roads 2008			0.000		0.000
			(0.000)		(0.000)
Number of Sources of National Electricity 2008			0.126^{*}		0.119^{*}
			(0.054)		(0.052)
NGO/Development Projects 2008			0.002		0.002
			(0.005)		(0.005)
Change in Km of Paved Roads (2013-2008)				0.000^{**}	
				(0.000)	
Change, Sources of Electricity (2013-2008)				0.153^{*}	
				(0.064)	
Change in NGO/Dev. Projects (2008-2013)				0.014^{**}	
				(0.005)	
Majority Party					-0.103^{+}
					(0.055)
Majority Party × Difference in Banzhaf Index					-0.095
					(0.134)
Constant	0.003	0.008	-0.040	-0.062	0.012
	(0.030)	(0.032)	(0.052)	(0.042)	(0.062)
Observations	664	660	660	660	660

OLS models with standard errors clustered at the cercle level. $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Table A.5: Effect of Change in Margin of Banzhaf Scores of Top Two Parties (2004-2009) on Change in Public Goods Index (2008-2013)

	(1)	(2)	(3)	(4)	(5)
Difference in Banzhaf Margin (2009-2004)	0.073^{+}	0.075^{+}	0.069^{+}	0.062^{+}	0.140^{*}
	(0.038)	(0.038)	(0.037)	(0.037)	(0.063)
Public Goods Index (2008)	-0.216^{***}	-0.215^{***}	-0.235^{***}	-0.230^{***}	-0.244^{***}
	(0.046)	(0.046)	(0.051)	(0.048)	(0.051)
Difference in Volatility (2009-2004)		0.048	0.064	0.056	0.085
		(0.066)	(0.067)	(0.064)	(0.069)
Difference in Logged Population (2009-1998)			0.082	0.132^{+}	0.082
			(0.065)	(0.067)	(0.064)
Kilometers of Paved Roads 2008			−0.000		0.000
			(0.000)		(0.000)
Number of Sources of National Electricity 2008			0.124^{*}		0.119^{*}
			(0.055)		(0.054)
NGO/Development Projects 2008			0.002		0.002
			(0.005)		(0.005)
Change in Km of Paved Roads (2013-2008)				0.000^{**}	
				(0.000)	
Change, Sources of Electricity (2013-2008)				0.158^{*}	
				(0.066)	
Change in NGO/Dev. Projects (2008-2013)				0.014^{**}	
				(0.005)	
Majority Party					−0.076
					(0.051)
Majority Party × Difference in Banzhaf Margin					−0.090
					(0.099)
Constant	0.011	0.017	−0.039	−0.064	0.003
	(0.031)	(0.034)	(0.053)	(0.045)	(0.061)
Observations	633	631	631	631	631

OLS models with standard errors clustered at the cercle level. $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Table A.6: Effect of Change in Standard Deviation of Banzhaf Index (2004-2009) on Change in Public Goods Index (2008-2013)

	(1)	(2)	(3)	(4)	(5)
Difference in Banzhaf SD (2009-2004)	0.152*	0.155*	0.144*	0.124*	0.320**
	(0.063)	(0.063)	(0.062)	(0.060)	(0.115)
Public Goods Index (2008)	−0.216***	−0.215***	−0.236***	−0.230***	−0.247***
	(0.046)	(0.046)	(0.051)	(0.048)	(0.052)
Difference in Volatility (2009-2004)		0.051	0.067	0.058	0.093
		(0.065)	(0.066)	(0.064)	(0.069)
Difference in Logged Population (2009-1998)			0.077	0.128+	0.073
			(0.065)	(0.067)	(0.064)
Kilometers of Paved Roads 2008			−0.000		0.000
			(0.000)		(0.000)
Number of Sources of National Electricity 2008			0.123*		0.118*
			(0.055)		(0.054)
NGO/Development Projects 2008			0.002		0.002
			(0.005)		(0.005)
Change in Km of Paved Roads (2013-2008)				0.001**	
				(0.000)	
Change, Sources of Electricity (2013-2008)				0.156*	
				(0.065)	
Change in NGO/Dev. Projects (2008-2013)				0.014**	
				(0.005)	
Majority Party					−0.082
					(0.053)
Majority Party × Difference in Banzhaf SD					−0.246
					(0.158)
Constant	0.012	0.020	−0.036	−0.061	0.015
	(0.031)	(0.034)	(0.053)	(0.045)	(0.062)
Observations	633	631	631	631	631

OLS models with standard errors clustered at the cercle level. $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

One potential criticism of using the margin of victory is that it only takes into account the top two parties; in a system of proportional representation, the number of parties competing may also play a role. For example, with more parties competing, any given margin of victory may prove more powerful for legislative bargaining, since it may be easier to build a coalition with small and thus easily persuadable parties. We accordingly also estimate a specification in which we multiply the margin of victory in each year by the total number of parties competing; these results are shown in Appendix Table A.7, which similarly reveals a negative and statistically significant relationship between political competition and public goods provision. One again, this is evidence of a modest but robust decrease in the quantity of public goods provided by commune governments due to greater electoral competition.

Table A.7: Effect of Change in Margin of Victory Multiplied by Number of Parties Competing (2004-2009) on Change in Public Goods Index (2008-2013)

	(1)	(2)	(3)	(4)	(5)
Difference in Margin × No. Parties	0.036*	0.037*	0.037*	0.029+	0.059*
	(0.015)	(0.015)	(0.014)	(0.015)	(0.029)
Public Goods Index (2008)	−0.213***	−0.213***	−0.233***	−0.226***	−0.242***
	(0.046)	(0.045)	(0.050)	(0.047)	(0.051)
Difference in Volatility (2009-2004)		0.038	0.053	0.047	0.070
		(0.059)	(0.060)	(0.057)	(0.062)
Difference in Logged Population (2009-1998)			0.052	0.103+	0.063
			(0.054)	(0.059)	(0.055)
Kilometers of Paved Roads 2008			0.000		0.000
			(0.000)		(0.000)
Number of Sources of National Electricity 2008			0.128*		0.125*
			(0.052)		(0.051)
NGO/Development Projects 2008			0.002		0.002
			(0.005)		(0.005)
Change in Km of Paved Roads (2013-2008)				0.000**	
				(0.000)	
Change, Sources of Electricity (2013-2008)				0.151*	
				(0.065)	
Change in NGO/Dev. Projects (2008-2013)				0.014**	
				(0.005)	
Majority Party					−0.068+
					(0.036)
Majority Party × Difference in Margin × No. Parties					−0.027
					(0.033)
Constant	−0.004	0.001	−0.047	−0.068	−0.021
	(0.030)	(0.032)	(0.051)	(0.042)	(0.054)
Observations	664	660	660	660	660

OLS models with standard errors clustered at the cercle level. $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

While conceptually similar to our margin of victory measure of political competition, we can operationalize the concept of total dispersion of party strength on the council by taking the *Standard Deviation* (SD) of the seat shares of all parties on the council. As expected, there is more variation in the SD measure because it takes more than the shares of the top two parties into account. However, using this measure of political competition yields similar results (the p-value = 0.08 in our baseline specification of column 4), as shown in Appendix Table A.8.

Table A.8: Effect of Change in Standard Deviation of Seat Shares (2004-2009) on Change in Public Goods Index (2008-2013)

	(1)	(2)	(3)	(4)	(5)
Difference in SD Seat Shares (2009-2004)	0.343^{+}	0.357^{+}	0.350^{+}	0.271	1.017^{*}
	(0.201)	(0.202)	(0.195)	(0.204)	(0.415)
Public Goods Index (2008)	-0.210^{***}	-0.210^{***}	-0.231^{***}	-0.224^{***}	-0.237^{***}
	(0.045)	(0.045)	(0.050)	(0.047)	(0.051)
Difference in Volatility (2009-2004)		0.031	0.046	0.042	0.061
		(0.058)	(0.060)	(0.057)	(0.062)
Difference in Logged Population (2009-1998)			0.049	0.100	0.056
			(0.054)	(0.060)	(0.055)
Kilometers of Paved Roads 2008			0.000		0.000
			(0.000)		(0.000)
Number of Sources of National Electricity 2008			0.128^{*}		0.117^{*}
			(0.053)		(0.052)
NGO/Development Projects 2008			0.002		0.002
			(0.005)		(0.005)
Change in Km of Paved Roads (2013-2008)				0.000^{**}	
				(0.000)	
Change, Sources of Electricity (2013-2008)				0.152^{*}	
				(0.065)	
Change in NGO/Dev. Projects (2008-2013)				0.014^{**}	
				(0.005)	
Majority Party					-0.064^{+}
					(0.038)
Majority Party × Difference in SD Seat Shares					-0.910^{+}
					(0.469)
Constant	-0.001	0.004	-0.044	-0.066	-0.010
	(0.030)	(0.032)	(0.051)	(0.042)	(0.054)
Observations	664	660	660	660	660

OLS models with standard errors clustered at the cercle level. $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

C.4 Measuring Public Goods Provision Using a Principal Components Index

Table A.9: Effect of Change in Political Competition (2004-2009) on Change in Public Goods Index, PCA (2008-2013)

	(1)	(2)	(3)	(4)	(5)
Panel A: HHI measure					
Difference in HHI (2009-2004)	0.298^{+}	0.331^{+}	0.299^{+}	0.318^{+}	0.764*
	(0.171)	(0.176)	(0.176)	(0.177)	(0.362)
Public Goods Index, PCA, 2008 (4 items)	−0.209***	−0.209***	−0.225***	−0.223***	−0.233***
	(0.045)	(0.045)	(0.047)	(0.045)	(0.048)
Difference in Volatility (2009-2004)		0.093	0.112	0.122	0.156
		(0.122)	(0.127)	(0.113)	(0.131)
Difference in Logged Population (2009-1998)			−0.003	0.077	0.005
			(0.139)	(0.131)	(0.141)
Kilometers of Paved Roads 2008			0.000		0.000
			(0.001)		(0.001)
Number of Sources of National Electricity 2008			0.222*		0.210*
			(0.090)		(0.090)
NGO/Development Projects 2008			0.000		−0.000
			(0.009)		(0.009)
Change in Km of Paved Roads (2013-2008)				0.001***	
				(0.000)	
Change, Sources of Electricity (2013-2008)				0.289*	
				(0.119)	
Change in NGO/Dev. Projects (2008-2013)				0.028**	
				(0.010)	
Majority Party					−0.110
					(0.080)
Majority Party × Difference in HHI					−0.656
					(0.441)
Constant	0.010	0.025	−0.012	−0.077	0.055
	(0.055)	(0.057)	(0.095)	(0.079)	(0.107)

Table continued on next page...

	(1)	(2)	(3)	(4)	(5)
Panel B: Margin of victory measure					
Difference in Margin (2009-2004)	0.276*	0.298*	0.287*	0.254*	0.665*
	(0.116)	(0.118)	(0.116)	(0.118)	(0.256)
Public Goods Index, PCA, 2008 (4 items)	−0.210***	−0.209***	−0.225***	−0.223***	−0.232***
	(0.045)	(0.045)	(0.047)	(0.045)	(0.048)
Difference in Volatility (2009-2004)		0.104	0.125	0.127	0.174
		(0.124)	(0.129)	(0.117)	(0.136)
Difference in Logged Population (2009-1998)			0.005	0.086	0.014
			(0.139)	(0.130)	(0.139)
Kilometers of Paved Roads 2008			0.000		0.000
			(0.001)		(0.001)
Number of Sources of National Electricity 2008			0.224*		0.217*
			(0.089)		(0.088)
NGO/Development Projects 2008			0.000		−0.000
			(0.009)		(0.009)
Change in Km of Paved Roads (2013-2008)				0.001***	
				(0.000)	
Change, Sources of Electricity (2013-2008)				0.290*	
				(0.119)	
Change in NGO/Dev. Projects (2008-2013)				0.027**	
				(0.010)	
Majority Party					−0.108
					(0.077)
Majority Party × Difference in Margin					−0.572+
					(0.321)
Constant	0.009	0.025	−0.013	−0.080	0.052
	(0.055)	(0.057)	(0.093)	(0.076)	(0.103)
Observations	664	660	660	660	660

OLS models with standard errors clustered at the cercle level. $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.
Index is the first principal component from a principal components analysis with our four public goods.

C.5 Placebo Tests: National Paved Roads and Electricity

Table A.10: Placebo Test: Effect of Change in Political Competition (2004-2009) on Change in Kilometers of Paved Roads and Number of Sources of National Electricity (2008-2013)

	(1)	(2)	(3)	(4)
Panel A: HHI measure, change in km of paved roads				
Difference in Competition, HHI (2009-2004)	−15.530	−22.853	−23.629	−48.350
	(18.471)	(24.076)	(23.954)	(41.535)
Kilometers of Paved Roads 2008	0.067	0.061	0.060	0.057
	(0.050)	(0.048)	(0.049)	(0.047)
Difference in Volatility (2009-2004)		−24.870	−24.675	−25.668
		(20.669)	(20.261)	(21.250)
Difference in Logged Population (2009-1998)			15.310	16.104
			(11.373)	(11.355)
Majority Party				−0.673
				(3.473)
Majority Party × Difference in HHI				45.790
				(32.145)
Constant	19.078***	15.617***	10.275*	9.108^{+}
	(4.998)	(2.973)	(3.856)	(4.957)
Panel B: Margin of victory measure, change in km of paved roads				
Difference in Competition, Margin (2009-2004)	7.079	2.758	2.802	5.455
	(5.619)	(6.338)	(6.333)	(11.236)
Kilometers of Paved Roads 2008	0.066	0.061	0.059	0.059
	(0.050)	(0.048)	(0.049)	(0.050)
Difference in Volatility (2009-2004)		−21.949	−21.673	−20.509
		(18.735)	(18.316)	(17.492)
Difference in Logged Population (2009-1998)			14.768	15.275
			(11.536)	(11.503)
Majority Party				−4.376
				(2.841)
Majority Party × Difference in Margin				−1.175
				(16.742)
Constant	19.781***	16.805***	11.689**	13.454***
	(5.514)	(3.555)	(3.530)	(3.741)

Table continued on next page...

Panel C: HHI measure, national electricity sources				
Difference in Competition, HHI (2009-2004)	0.103	0.091	0.090	0.172
	(0.078)	(0.080)	(0.080)	(0.148)
Number of Sources of National Electricity 2008	-0.360^{***}	-0.363^{***}	-0.368^{***}	-0.375^{***}
	(0.046)	(0.046)	(0.046)	(0.047)
Difference in Volatility (2009-2004)		-0.045	-0.045	-0.026
		(0.056)	(0.056)	(0.057)
Difference in Logged Population (2009-1998)			0.048	0.056
			(0.054)	(0.053)
Majority Party				-0.068^{*}
				(0.029)
Majority Party × Difference in HHI				-0.042
				(0.163)
Constant	0.085^{***}	0.079^{***}	0.063^{**}	0.093^{**}
	(0.014)	(0.015)	(0.022)	(0.027)
Panel D:Margin of victory measure, national electricity sources				
Difference in Competition, Margin (2009-2004)	0.037	0.028	0.028	0.025
	(0.045)	(0.047)	(0.047)	(0.090)
Number of Sources of National Electricity 2008	-0.358^{***}	-0.361^{***}	-0.366^{***}	-0.370^{***}
	(0.045)	(0.045)	(0.046)	(0.046)
Difference in Volatility (2009-2004)		-0.050	-0.050	-0.037
		(0.056)	(0.056)	(0.057)
Difference in Logged Population (2009-1998)			0.049	0.059
			(0.054)	(0.052)
Majority Party				-0.059^{*}
				(0.027)
Majority Party × Difference in Margin				0.053
				(0.103)
Constant	0.082^{***}	0.076^{***}	0.060^{**}	0.081^{**}
	(0.013)	(0.015)	(0.021)	(0.025)
Observations	664	660	660	660

OLS models with standard errors clustered at the cercle level. $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$.

C.6 Falsification Test: Pre-treatment Changes in Public Goods

Table A.11: Effect of Change in HHI (2004-2009) on Change in Public Goods Index (2003-2006)

	(1)	(2)	(3)	(4)	(5)
Difference in HHI (2009-2004)	−0.065	−0.039	−0.058	−0.058	0.092
	(0.134)	(0.133)	(0.133)	(0.135)	(0.234)
Public Goods Index (2008)	−0.019	−0.020	−0.005	−0.025	−0.011
	(0.052)	(0.052)	(0.050)	(0.057)	(0.056)
Difference in Volatility (2009-2004)		0.077	0.062	0.078	0.078
		(0.087)	(0.087)	(0.088)	(0.095)
Difference in Logged Population (2009-1998)			0.446***	0.413***	0.450***
			(0.101)	(0.096)	(0.103)
Kilometers of Paved Roads 2008			−0.000		−0.000
			(0.000)		(0.000)
Number of Sources of National Electricity 2008			−0.070		−0.074
			(0.091)		(0.092)
NGO/Development Projects 2008			−0.012+		−0.012+
			(0.006)		(0.006)
Change in Km of Paved Roads (2013-2008)				−0.000	
				(0.000)	
Change, Sources of Electricity (2013-2008)				−0.050	
				(0.129)	
Change in NGO/Dev. Projects (2008-2013)				−0.001	
				(0.005)	
Majority Party					−0.044
					(0.078)
Majority Party × Difference in HHI (2009-2004)					−0.198
					(0.302)
Constant	−0.002	0.011	−0.066	−0.129*	−0.042
	(0.040)	(0.042)	(0.067)	(0.061)	(0.082)
Observations	664	660	660	660	660

OLS models with standard errors clustered at the cercle level. $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Table A.12: Effect of Change in Margin of Victory (2004-2009) on Change in Public Goods Index (2003-2006)

	(1)	(2)	(3)	(4)	(5)
Difference in Margin (2009-2004)	−0.133	−0.118	−0.116	−0.113	−0.008
	(0.098)	(0.101)	(0.101)	(0.102)	(0.174)
Public Goods Index (2008)	−0.017	−0.018	−0.003	−0.023	−0.007
	(0.052)	(0.052)	(0.050)	(0.057)	(0.055)
Difference in Volatility (2009-2004)		0.063	0.050	0.067	0.064
		(0.091)	(0.090)	(0.090)	(0.100)
Difference in Logged Population (2009-1998)			0.443***	0.411***	0.446***
			(0.101)	(0.095)	(0.103)
Kilometers of Paved Roads 2008			−0.000		−0.000
			(0.000)		(0.000)
Number of Sources of National Electricity 2008			−0.069		−0.071
			(0.092)		(0.092)
NGO/Development Projects 2008			−0.012*		−0.012*
			(0.006)		(0.006)
Change in Km of Paved Roads (2013-2008)				−0.000	
				(0.000)	
Change, Sources of Electricity (2013-2008)				−0.051	
				(0.130)	
Change in NGO/Dev. Projects (2008-2013)				−0.001	
				(0.005)	
Majority Party					−0.033
					(0.075)
Majority Party × Difference in Margin (2009-2004)					−0.162
					(0.234)
Constant	−0.004	0.006	−0.068	−0.132*	−0.049
	(0.040)	(0.041)	(0.067)	(0.060)	(0.082)
Observations	664	660	660	660	660

OLS models with standard errors clustered at the cercle level. $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

C.7 Impacts of Political Competition, by Preference Fractionalization

In the below tables, we examine the observable implication that policy consensus on the demand side could moderate the extent of bargaining inefficiencies. In particular, where there is greater consensus over policy, we should expect a smaller negative relationship between political competition and public goods provision than where there is greater preference fractionalization. We construct an index of preference fractionalization using geo-coded data from the 232 communes in which Afrobarometer surveys were conducted prior to 2009.[45] First, we count the number of people per commune who listed each public good as one of three priorities they thought the government should address. Then, we use the same measurement strategy used in other contexts to create ethnolinguistic fractionalization measures and take 1 minus the sum of squared shares of the time that people report each good. Importantly, preference fractionalization is not significantly correlated with levels or changes in competition. Controlling for preference fractionalization also does not reduce the relationship between our independent variables of interest and dependent variable (columns 3 and 4 of Table A.13). This suggests that the demand side is not likely a principal driver of political competitiveness. However, it does appear that the demand side could help account for one of the mechanisms through which political competition leads to bargaining inefficiencies or muted public goods provision. Interacting preference fractionalization with the independent variable of interest yields a positive and significant coefficient on the interaction term (columns 5 and 6 of Table A.13).

[45] Columns 1 & 2 of Table A.13 show that the magnitude of the effect of political competition on public goods provision is approximately the same in this sample, though it is no longer statistically significant due to reduced power.

Table A.13: Effect of Change in Herfindahl Index (2004-2009) on Change in Public Goods Index (2008-2013), by Preference Fractionalization

	(1)	(2)	(3)	(4)	(5)	(6)
Difference in HHI (2009-2004)	0.258		0.260		−9.558*	
	(0.246)		(0.244)		(4.677)	
Difference in Margin (2009-2004)		0.267		0.277		−5.058+
		(0.175)		(0.174)		(2.653)
Preference Fractionalization			1.717*	1.742*	2.066**	1.920**
			(0.653)	(0.670)	(0.763)	(0.685)
Difference in HHI (2009-2004) × Preference Fractionalization					12.738*	
					(6.222)	
Difference in Margin (2009-2004) × Preference Fractionalization						6.923+
						(3.533)
Difference in Volatility (2009-2004)	0.124	0.125	0.105	0.107	0.088	0.090
	(0.131)	(0.128)	(0.131)	(0.128)	(0.130)	(0.132)
Difference in Logged Population (2009-1998)	−0.067	−0.058	−0.083	−0.074	−0.074	−0.045
	(0.149)	(0.152)	(0.154)	(0.158)	(0.156)	(0.167)
Kilometers of Paved Roads 2008	−0.000	−0.000	−0.000	−0.000	−0.000	−0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Number of Sources of National Electricity 2008	0.188+	0.191*	0.179+	0.182+	0.161+	0.165+
	(0.094)	(0.094)	(0.091)	(0.090)	(0.092)	(0.091)
NGO/Development Projects 2008	−0.005	−0.005	−0.004	−0.004	−0.003	−0.003
	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)
Public Goods Index (2008)	−0.221**	−0.222**	−0.222**	−0.223**	−0.221**	−0.224**
	(0.071)	(0.071)	(0.070)	(0.070)	(0.069)	(0.069)
Constant	0.146+	0.142+	−1.173*	−1.197*	−1.448*	−1.346*
	(0.076)	(0.075)	(0.476)	(0.489)	(0.568)	(0.510)
Observations	231	231	231	231	231	231

OLS models with standard errors clustered at the cercle level. $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

C.8 Impacts of Political Competition on Individual Public Goods

Table A.14: Effect of Change in Political Competition (2004-2009) on Change in Public Goods (2008-2013)

	Boreholes	Clinics	Roads	Schools
Panel A:HHI measure				
Difference in HHI (2009-2004)	0.218	0.399^{+}	0.203	−0.016
	(0.176)	(0.210)	(0.195)	(0.145)
Observations	660			
Panel B: HHI measure, majority party interaction				
Difference in HHI (2009-2004)	0.611^{*}	0.693^{**}	0.319	0.306
	(0.280)	(0.258)	(0.316)	(0.249)
Majority Party	−0.093	-0.145^{*}	−0.014	-0.152^{*}
	(0.059)	(0.061)	(0.087)	(0.071)
Majority Party × Difference in HHI (2009-2004)	−0.562	−0.296	−0.186	−0.322
	(0.418)	(0.320)	(0.343)	(0.359)
Observations	660			
Panel C: Margin of victory measure				
Difference in Margin (2009-2004)	0.206^{*}	0.356^{**}	0.077	0.067
	(0.095)	(0.130)	(0.130)	(0.100)
Observations	660			
Panel D: Margin of victory measure, majority party interaction				
Difference in Margin (2009-2004)	0.597^{***}	0.512^{*}	0.204	0.146
	(0.161)	(0.203)	(0.228)	(0.153)
Majority Party	−0.095	-0.137^{*}	−0.005	-0.147^{*}
	(0.061)	(0.061)	(0.087)	(0.069)
Majority Party × Difference in Margin (2009-2004)	-0.607^{*}	−0.165	−0.219	−0.012
	(0.266)	(0.253)	(0.246)	(0.209)
Observations	660			

Pooled seemingly unrelated regression analyses with standard errors clustered at the cercle level.
Controls from column 3 of Table 1 included in all models. $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

C.9 Changes in Public Goods Provision Given Changes in Expenditures, by Level of Political Competition

Table A.15: Effect of Borehole Expenditures (2006-08) on Boreholes Built (2006-08) By Level of Political Competition

	Full Sample	No majority	Majority	Full Sample	No majority	Majority
Borehole Expenditures (2006-08)	-0.006^{*}	-0.007^{*}	-0.013	-0.001	-0.001	-0.002
	(0.002)	(0.003)	(0.015)	(0.001)	(0.001)	(0.009)
HHI (2004)	-0.111	0.247	-0.311			
	(0.263)	(0.387)	(0.625)			
Borehole Expenditures (2006-08) × HHI (2004)	0.018^{*}	0.021^{*}	0.027			
	(0.007)	(0.008)	(0.021)			
Logged Population (1998)	-0.628^{***}	-0.647^{**}	-0.541^{*}	-0.655^{***}	-0.677^{**}	-0.577^{**}
	(0.154)	(0.188)	(0.197)	(0.155)	(0.200)	(0.207)
Margin (2004)				-0.102	0.065	-0.091
				(0.181)	(0.297)	(0.346)
Borehole Expenditures (2006-08) × Margin (2004)				0.007	0.015^{*}	0.007
				(0.008)	(0.007)	(0.013)
Constant	5.895^{***}	5.983^{**}	5.162^{**}	6.058^{***}	6.255^{**}	5.356^{**}
	(1.404)	(1.678)	(1.676)	(1.378)	(1.766)	(1.799)
Observations	172	107	65	172	107	65

OLS models with region fixed effects and standard errors clustered at the cercle level. $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Table A.16: Effect of Clinic Expenditures (2006-08) on Clinics Built (2006-08) By Level of Political Competition

	Full Sample	No majority	Majority	Full Sample	No majority	Majority
Clinic Expenditures (2006-08)	−0.001	−0.003	0.020	0.000	0.001	0.009
	(0.004)	(0.007)	(0.014)	(0.003)	(0.003)	(0.008)
HHI (2004)	0.480	1.269	0.268			
	(0.507)	(0.799)	(1.183)			
Clinic Expenditures (2006-08) × HHI (2004)	0.007	0.005	−0.034			
	(0.009)	(0.017)	(0.031)			
Logged Population (1998)	−0.592***	−0.715***	−0.286^{+}	−0.611***	−0.742***	−0.319^{+}
	(0.141)	(0.178)	(0.148)	(0.151)	(0.183)	(0.173)
Margin (2004)				0.299	1.558	−0.309
				(0.483)	(1.060)	(0.658)
Clinic Expenditures (2006-08) × Margin (2004)				0.006	−0.010	−0.013
				(0.008)	(0.017)	(0.022)
Constant	4.946***	5.804***	2.599*	5.231***	6.146***	3.056^{+}
	(1.099)	(1.471)	(1.231)	(1.231)	(1.567)	(1.506)
Observations	133	86	47	133	86	47

OLS models with region fixed effects and standard errors clustered at the cercle level. $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Table A.17: Effect of School Expenditures (2006-08) on Schools Built (2006-08) By Level of Political Competition

	Full Sample	No majority	Majority	Full Sample	No majority	Majority
School Expenditures (2006-08)	−0.001	−0.000	-0.011^{+}	−0.000	−0.001	0.000
	(0.003)	(0.003)	(0.006)	(0.001)	(0.001)	(0.003)
HHI (2004)	−0.013	−0.200	−0.344			
	(0.331)	(0.402)	(0.504)			
School Expenditures (2006-08) × HHI (2004)	0.005	0.003	0.024^{*}			
	(0.006)	(0.008)	(0.012)			
Logged Population (1998)	-0.905^{***}	-0.948^{***}	-0.781^{***}	-0.909^{***}	-0.956^{***}	-0.810^{***}
	(0.097)	(0.131)	(0.128)	(0.097)	(0.131)	(0.131)
Margin (2004)				−0.071	−0.497	0.222
				(0.221)	(0.341)	(0.209)
School Expenditures (2006-08) × Margin (2004)				0.005	0.010^{+}	0.002
				(0.004)	(0.005)	(0.006)
Constant	8.191^{***}	8.615^{***}	7.391^{***}	8.241^{***}	8.710^{***}	7.400^{***}
	(0.905)	(1.235)	(1.153)	(0.895)	(1.225)	(1.085)
Observations	424	274	150	424	274	150

OLS models with region fixed effects and standard errors clustered at the cercle level. $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

D A Test of Generalizability Using Cross-Country Data

Table A.18: List of Countries by Level of Party System Institutionalization

High party system institutionalization	**Low party system institutionalization**
Afghanistan*	Albania
Algeria	Argentina
Angola	Australia**
Armenia*	Austria
Azerbaijan	Bangladesh
Belarus	Barbados
Benin*	Belgium
Bhutan	Bolivia
Burkina Faso*	Bosnia and Herzegovina***
Burundi	Botswana
Cambodia*	Brazil
Cameroon	Bulgaria
Cent. Af. Rep.	C. Verde Is.
Chad*	Canada
Colombia	Chile
Comoro Is.*	Croatia
Congo	Cyprus
Congo (DRC)	Czech Rep.
Costa Rica	Denmark
Cote d'Ivoire*	El Salvador
Cuba*	Estonia
Djibouti*	FRG/Germany
Dom. Rep.	Fiji
Ecuador	Finland
Egypt	France
Eq. Guinea	Gambia
Eritrea*	Georgia
Ethiopia	Greece
Gabon*	Guyana*
Ghana	Honduras*
Guatemala	Hungary
Guinea*	Iceland
Guinea-Bissau	India
Haiti*	Indonesia
Iran	Ireland
Iraq*	Israel
Jordan	Italy
Kazakhstan	Jamaica
Kuwait	Japan
Kyrgyzstan	Kenya
Laos*	Latvia
Lesotho	Lebanon
Liberia	Lithuania
Libya*	Macedonia*
Madagascar	Malaysia
Malawi	Mauritius
Maldives	Mexico
Mali*	Mongolia

Table continued on next page...

High party system institutionalization	**Low party system institutionalization**
Mauritania*	Myanmar
Moldova	Namibia
Morocco	Netherlands
Mozambique	New Zealand
Nepal	Nicaragua*
Niger*	Norway
Nigeria	PRC
Oman	Pakistan
P. N. Guinea	Poland
PRK*	Portugal**
Panama	ROK
Paraguay	Romania
Peru	Russia
Philippines	S. Africa
Qatar	Singapore**
Rwanda	Slovakia
Saudi Arabia*	Slovenia
Senegal*	Spain
Sierra Leone	Sri Lanka
Solomon Is.*	Suriname*
Somalia***	Sweden
South Sudan***	Switzerland
Sudan	Tajikistan*
Swaziland	Tanzania
Syria	Trinidad-Tobago
Thailand	Turkey
Timor-Leste*	Turkmenistan***
Togo*	UK**
Tunisia	USA**
Uganda	Uruguay
Ukraine	Uzbekistan*
Vanuatu	Venezuela
Yemen	Vietnam
Yemen (AR)	
Zambia	

Notes: We only list countries which appear in at least one of the four regressions (i.e. four outcomes) used to create Figure 5. * indicates a country not in the regression of education spending as a share of GDP (PPP) on the HHI and PSI. ** indicates a country not in the regression of the primary completion rate on the HHI and PSI. *** indicates a country only in the regression of the measles immunization rate on the HHI and PSI. All other countries appear in all four regressions.
Sources: WDI (2017), IFPRI (2017), and V-Dem (2018).

Table A.19: Summary Statistics in Cross-country Dataset by Level of Party System Institutionalization

	Low PSI Countries					High PSI Countries				
	N	**Mean**	**SD**	**Min**	**Max**	**N**	**Mean**	**SD**	**Min**	**Max**
Dependent Variables										
Education spending share of GDP	966	3.56	2.13	0.00	16.22	1,849	3.87	2.30	0.16	13.95
Health spending share of GDP	930	1.62	1.20	0.00	7.87	1,820	3.14	2.61	0.02	12.08
Education spending per capita	966	254.30	519.72	0.06	4605.36	1,849	704.63	686.90	2.69	3138.02
Health spending per capita	930	127.65	309.21	0.02	2564.87	1,820	674.29	821.81	1.39	3696.89
Primary completion rate	1,472	67.94	26.79	6.27	185.30	1,600	91.34	15.63	13.52	122.32
Immunization rate (measles)	2,164	69.76	23.83	1.00	99.00	2,453	84.15	17.61	1.00	99.00
Independent Variables										
HHI	966	0.50	0.30	0.01	1.00	1,849	0.41	0.23	0.09	1.00
Population (100,000s)	966	213.19	259.86	1.19	1672.97	1,849	702.19	2034.87	2.28	13506.95
PSI Index	966	0.34	0.13	0.00	0.54	1,849	0.80	0.13	0.56	1.00
Transparency index	907	32.94	9.96	12.00	71.00	1,797	57.80	20.65	17.00	91.00

Notes: The first two rows are education and health expenditures as a share of GDP (PPP) (0-100) while the next two rows are total education and health expenditures per capita in constant 2005 USD. Primary completion rate is the number of new entrants in the last grade of primary education divided by the population at the entrance age for that grade. The immunization rate for measles is the percentage of children ages 12–23 months who have received at least one dose of the measles vaccine.
Sources: WDI (2017), IFPRI (2017), and V-Dem (2018).

Table A.20: Effect of HHI on Public Goods Provision by Party System Institutionalization

	(1) Education share GDP	(2) Health share GDP	(3) Education per capita	(4) Health per capita	(5) Primary completion	(6) Immunization (measles)
Panel A: By Party System Institutionalization (PSI)						
HHI	1.216**	0.947**	260.497***	224.670***	9.863***	6.109**
	(0.554)	(0.363)	(68.004)	(64.938)	(3.003)	(2.894)
HHI × high PSI	−2.078***	−1.630***	−270.844**	−305.474***	−11.443**	−4.644
	(0.738)	(0.531)	(116.932)	(105.521)	(5.554)	(4.320)
Observations	2815	2750	2815	2750	3072	4617
Panel B: By Party System Institutionalization (PSI) and Level of Corruption						
HHI	1.208**	0.940**	264.994***	228.040***	9.777***	6.225**
	(0.557)	(0.364)	(69.319)	(66.328)	(2.975)	(2.888)
HHI × high PSI, high corruption	−1.992***	−0.593	−96.366	−82.906	−7.712	−5.696
	(0.755)	(0.522)	(133.632)	(106.539)	(8.902)	(5.427)
HHI × high PSI, low corruption	−2.132**	−2.024***	−339.889**	−391.393***	−12.858**	−3.602
	(0.891)	(0.580)	(141.512)	(128.801)	(5.980)	(5.276)
Observations	2763	2698	2763	2698	3037	4559

Notes: OLS models with standard errors clustered at the country level. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$. Data for columns (1) – (6) are available for 1980–2012, data for column (7) are available for 1975–2015, and data for column (8) are available for 1980–2015. All specifications include country and year fixed effects, the initial period value of the outcome interacted with a linear time trend, and a control for population. The base group in both panels is low PSI. Columns (1) – (3) indicate total expenditures as a share of GDP (PPP) (0-100) while columns (4) – (6) indicate total expenditures per capita in constant 2005 USD. Primary completion rate is the number of new entrants in the last grade of primary education divided by the population at the entrance age for that grade. The immunization rate for measles is the percentage of children ages 12–23 months who have received at least one dose of the measles vaccine. *Sources:* WDI (2017), IFPRI (2017), and V-Dem (2018).

E Modeling the countervailing effects of competition on public goods

We have argued that, while political competition may increase the amount of resources that can potentially fund public goods (by reducing corruption and increasing policymaker effort via electoral incentives), it may simultaneously exacerbate the ease and stability of legislative bargains and thus make public spending less efficient. To make empirical predictions about when each of these forces will dominate, we develop a simple model of public goods provision that takes both into account. For tractability, we do not model the bargaining problem of councils; rather, we assume that political competition makes legislative bargaining more costly (as supported by literature discussed in the manuscript) and focus on the trade-offs between gains stemming from electoral incentives and bargaining costs. Into our model, we incorporate an additional feature of electoral competitiveness that is manifest in our empirical context and most other developing democracies, but excluded from many of the standard models of electoral accountability: that political competition may not be predicated on the provision of public goods, but rather—at least in part—on private transfers to citizens.

Consider the following stylized model that uses insights from existing models of political competition while further incorporating these two additional factors. A local politician (mayor) overseeing an elected local council is assumed to be motivated both by being in office and by personal benefits she can obtain through misappropriation of public funds.[46] The politician has a fixed budget B that incorporates both transfer funds from higher levels of government as well as the value of her time. She can allocate it across three investments: keeping it for herself (misappropriation of funds and/or reduction of effort), s; providing it to voters in the form of direct, private transfers, t; and investing it in public goods, p.

A production function translates investments into output. Both s and t have the feature

[46]To make the model more tractable, we consider the politician as a unitary actor. Policymaking in our empirical case is a function of a council of actors, but for the purposes of the theoretical abstraction, we assume that the mayor bears all bargaining costs and behaves accordingly.

that output equals investment; that is, $O_s(s) = s$ and $O_t(t) = t$. However, investments in p require the politician to coordinate with some members of the local council to form a majority coalition, and such investments are accordingly subject to coordination inefficiencies, e.g. a complex process of coalition formation or unsustainable bargains. Specifically, $O_p(p) = \delta p$, where $\delta \in [0, 1]$ is a decreasing function of an exogenously determined level of political competition c—that is, $\delta = f(c)$. With more political competition, the same investment p thus results in fewer public goods, O_p.

Motivated by existing literature, we assume s and thus O_s is strictly decreasing in political competition c. The politician then allocates these additional resources across t and p so as to maximize voter utility and thus the likelihood of reelection. Voter utility is described by the function $U = g(O_t, O_p)$.

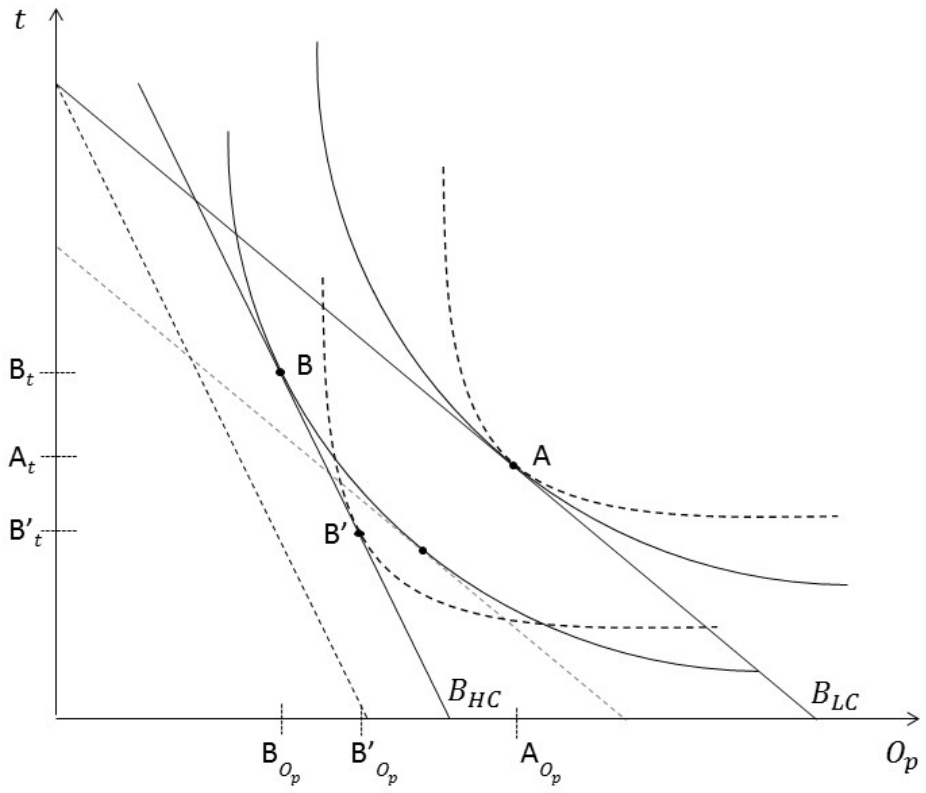
From the setup, it is clear that the politician will have some optimal allocation of $B - s$ over t and p. However, as political competition increases, δ decreases and thus investments in p become relatively less attractive, while at the same time s is decreasing and so $B - s$ is increasing. The speed with which δ decreases relative to s will determine whether increases in political competition lead to increases in O_t and/or in O_p; this is an empirical question. However, the model yields several predictions:

P1 How increases in political competition c affect public goods provision O_p depends on the relative rate of change of δ and s. More precisely, as $\left|\frac{d\delta}{dc}\right|$ increases relative to $\left|\frac{ds}{dc}\right|$, increases in political competition are more likely to decrease O_p.

The comparative statics prediction regarding the relative rate of change of δ and s in *H1* is depicted graphically in Figure A.4. Here, we show the effect of an increase in competition on both O_p and O_t (i.e. t). The net effect on the budget constraint is represented by the move from B_{LC} to B_{HC}. In this example, the positive income effect produced by the decrease in s is swamped by the negative income and substitution effects produced by the decrease in δ. As a result, we see that the new budget's y-intercept indicates that the politician can now afford more private transfers t, but its x-intercept indicates that the politician can now

obtain fewer public goods, O_p. Of course, a greater decrease in s could move the budget line far enough rightward that both t and O_p are increased.

Figure A.4: Graphical representation of the effect of an increase in competition on public goods provision and private transfers



Note: The gray dotted line isolates the income effect of increasing δ while the black dotted line shows the combined income and substitution effects. The budget line B_{HC} has the same slope as the black dotted line, but has moved outward to represent the positive effect on income of decreasing s.

At a given level of c, s and δ, investments in private and public goods, t and p, are substitutes because they both enter positively into the politician's budget. However, the elasticity with which one good can be substituted for another depends on voter preferences. For instance, voters may place exactly equal weight on both goods such that a relative change in price leads to a complete substitution of the more expensive good for the less expensive

one. Or, voters may place greater weight on one, or have some minimum threshold of the good that needs to be met before they would substitute one for another.

Given this, even if O_p decreases with competition, the effect on t is ambiguous. Depending on the relationship between the income and substitution effects generated by a decrease in δ, several outcomes may obtain. First, even when an increase in c results in a decrease in O_p, a politician may sufficiently increase t (because t is now relatively more efficient, and substitutable) such that we observe increasing outputs of private transfers O_t and decreasing outputs of public goods O_p. Second, if private transfers and public goods are less substitutable, the negative income effect from decreasing δ can swamp the positive substitution effect such that a null or even negative effect on O_t obtains. That is, political competition may reduce provision of *both* public goods and private transfers. The extent to which outputs of private transfers and public goods are substitutable is another empirical question. This leads to a second prediction:

P2 The less substitutable are private transfers and public goods, the greater the possibility that an increase in c (and subsequent decrease in δ) could simultaneously decrease O_p and decrease (or have no effect on) t and O_t.

Figure A.4 demonstrates graphically how the nature of the relationship between the two goods can affect whether an increase in competition has a positive or negative effect on t as proposed in *H2*. The two sets of indifference curves represent more substitutable goods (solid lines) and less substitutable goods (dashed lines). Moving from point A (low competition) to point B (high competition), or from point A (low competition) to point B' (high competition), the effect on O_p is always negative. By contrast, in the case of the more substitutable goods, the effect of competition is positive ($B_t > A_t$); while in the case of the less substitutable goods, the effect of competition is negative ($B'_t < A_t$).