

# The Causes and Consequences of Political Interference in Bureaucratic Decision Making: Evidence from Nigeria

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January 2014

## JOB MARKET PAPER

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### Abstract

Both politicians and bureaucrats are viewed as critically important agents in growth and public welfare. This paper investigates the causes and consequences of interactions between these agents, along two key margins: which bureaucrats a politician delegates the delivery of public projects to, and the incentives that politicians provide to those bureaucrats. To investigate these issues, I assemble a novel data set from Nigeria, which combines the political careers of politicians, measures of their interactions with bureaucrats, and credible audits of the projects they deliver. I find that politicians facing high levels of political competition are more likely to (1) delegate the implementation of public projects in their constituency to more autonomous organizations; and (2) provide informal incentives to bureaucrats in those organizations. Guided by a moral hazard model, I assess the separate impacts of the delegation and incentive margins using an instrumental variables strategy. I find that delegation to more productive bureaucrats is the key channel through which politicians improve the bureaucracy's output when faced with high levels of political competition. The results have implications for the design of organizations that regulate politicians' interactions with the bureaucracy.

**Keywords:** politicians, bureaucrats, public goods, decentralization

**JEL Classification:** D72, D73, H00, H11, H41, O20

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# 1 Introduction

How do politicians get bureaucrats to deliver public projects that might win them votes? This paper provides some of the first evidence of the channels through which politicians facing high levels of political competition increase the productivity of the bureaucracy.

Public projects are often left uncompleted or delivered to a poor quality (World Bank, 2004). Failure to deliver these projects undermines citizen welfare and leads to an estimated loss of US\$150 billion per year in public resources (World Bank, 2007). The extent of these failures varies within and across countries, driving national and global inequalities (Banerjee et al, 2007).

Both politicians and bureaucrats are viewed as critically important agents in the delivery of public projects. Politicians are elected by citizens to decide public policy, including the delivery of public projects, whereas bureaucrats are employed by the government to implement these policies. When faced by high levels of political competition in their constituencies, politicians may be incentivized to improve the quality of potentially vote-winning public projects. Consequently, they may seek to overcome barriers such as bureaucrats' inefficiency, inertia, or corruption.

Existing evidence suggests political competition can improve the delivery of public projects.<sup>1</sup> The outstanding puzzle is how politicians are able to influence the bureaucratic arm of government, and raise bureaucratic productivity, to satisfy short-term electoral concerns.<sup>2</sup> Typically, politicians do not undertake public projects themselves, but must delegate these tasks to bureaucrats, whom they then incentivize. Our understanding of the interactions between politicians and bureaucrats is very limited, both in terms of their causes and their consequences (Iyer and Mani, 2012). More broadly, there is a limited empirical literature on bureaucrats, despite their importance as the main producers of public projects in many countries. To understand the delivery of public projects, it is important to understand the incentive environments in which bureaucrats operate: both formal incentives in a bureaucrat's contract, and informal interactions she has with powerful actors such as politicians.

This paper contributes to our understanding of (1) how political competition affects politicians' decisions about their interactions with the bureaucracy along two key margins: which bureaucrats a politician delegates to, and the informal incentives that politicians provide them; and (2) the consequences of these choices in terms of the delivery of public projects. The key constraint to empirical progress on these issues has been a lack of adequate data. We rarely observe whether the bureaucracy delivers what was intended, in terms of the technical specifications of a project, but rather what they did deliver. This is a first-order constraint on the empirical study of public sector productivity. A second binding constraint is that we almost never directly measure the personal interactions of politicians with bureaucrats, which is the mechanism of informal incentive provision that I study (Banerjee et al, 2007). I make progress along both margins by collecting detailed data that address these constraints.

The novel data set that I have assembled follows the delivery of a representative set of public projects in the Federal Government of Nigeria, from their initiation in Congress, through the organizations that produce them, to independent evaluations of output. The data contains details of the politicians of Nigeria's 5th National Assembly, surveys of a representative sample of bureaucrats at each of the organizations

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<sup>1</sup>See, for example, Foster and Rosenzweig (2004), Besley et al (2010) and Ferraz and Finan (2011).

<sup>2</sup>The focus in this paper is how politicians influence the bureaucracy within a fixed institutional environment. In what follows, I fix the policy environment, staff and resource distribution, implying that politicians lack the power to recruit, dismiss, demote or change the formal wages of appointed bureaucrats, or modify the legislation governing how their organization functions. These are reasonable assumptions in the current context. Public sector recruitment is delegated to an independent organization that fiercely guards its independence. The modification of legislation governing an organization would require the agreement of a majority of politicians who are likely to have distinct political preferences across the constituencies served by an organization.

to which politicians delegate, and evaluations of how effectively each of 3,009 public projects - roughly 7 percent of the government's budget - were delivered by these organizations. Overall, it is a detailed profile of the key actors in the delivery of public projects and how they interact.

To guide the empirical work, I develop a theoretical framework that implies that delegation and informal incentive provision are simultaneously determined. The basic intuition is that a higher cost of providing incentives at an organization discourages politicians from delegating there, and incentives can only be provided to organizations to which politicians delegate. The model maps into equations for the three variables of interest: delegation, incentive provision, and the level of delivery of public projects. Separating the impacts of delegation and incentive provision requires instruments that independently vary each.

The first instrument drives variation in delegation independently of incentive provision. It is based on a congressional procedure along the lines of Aghion et al (2005, 2009, 2010) and Cohen et al (2011) which varies the extent of delegation power that a politician has. The procedure allocates power to delegate projects to a subset of politicians by making them members of congressional standing committees, but excludes others. My approach indicates that politicians from closely-contested constituencies, facing high levels of political competition, are 21 percent more likely to delegate to more autonomous organizations - those at the decentralized tier of government - than politicians in safe seats. When a politician faces little political competition in her constituency, she centralizes the delivery of public projects to ministries. Thus, this paper provides the first microeconomic evidence that the decision as to which bureaucrat should deliver a public project is a function of political incentives.

To assess the impact of political competition on a politician's choice of personal interactions with bureaucrats, I use an instrument correlated with the transaction cost of undertaking personal interactions with bureaucrats: the distance from the capital city, where politicians primarily reside, to the organization implementing the project. To ensure the instrument is not correlated with the capacity of organizations to build basic public projects, I control for the distance of the organization to the nearest state capital, where much of Nigeria's building infrastructure for producing public projects resides. This approach indicates that politicians in closely-contested constituencies personally interact with bureaucrats roughly 13 percent more than politicians in safe seats. I take this as a proxy for their providing bureaucrats with higher informal incentives.<sup>3</sup>

Estimation of the full instrumental variables specification evaluates the separate impacts of delegation and incentive provision on the delivery of public projects. I find that the key margin driving positive impacts of political competition on public productivity is delegation: decentralized organizations have project completion rates that are 40 percentage points higher than those of centralized organizations. Once politicians delegate to the most effective organizations, their interactions with the bureaucrats there are of second-order importance at best.

The results highlight the importance of organizational design as a driver of public sector productivity. They suggest that in Nigeria, politicians delegate to those organizations they know to be most effective when public good provision has the highest electoral returns, which requires them to relinquish a degree of formal influence over project delivery. They then try to regain some of this influence by offering informal incentives outside of the formal contracting structure of the civil service, but this has limited

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<sup>3</sup>Relative to the view that the executive should be independent of the legislature (Weber, 1922), the magnitudes of political interference reported here are large. My data shows that Nigerian politicians have a significant impact on the outcomes of 50 percent of public projects. Bureaucrats claim that they have *personal* interactions with members of the legislature on 14 percent of the projects they implement, with the nature of these interactions varying according to the political competition the politicians face. Comparing my findings with data from the World Bank's Public Officials Surveys (Manning et al, 2000), these orders of magnitude appear relatively typical across the developing world.

effect. Providing politicians with options to delegate to organizations that can effectively deliver public projects ensures a mechanism by which political competition translates into bureaucratic output.

These results provide some of the first evidence as to how political competition impacts on the choices of politicians in their interaction with the bureaucracy. An emerging literature links political competition to improved government performance. For example, Ferraz and Finan (2011) find that re-election incentives push Brazilian mayors to reduce misappropriation of resources in their municipality of 27 percent compared to mayors without such incentives.<sup>4</sup> For a comparable differential in political competition in Nigeria, I find an increase in bureaucratic productivity of 16 percent. However, the key contribution of this paper is to provide evidence of the mechanisms through which political competition impacts on bureaucratic performance. I assess the margins along which political competition alters the decisions of politicians, in ways that have subsequent impacts on the productivity of the bureaucracy.

This paper also provides some of the first micro-level quantitative evidence on the interaction between politicians and bureaucrats. Iyer and Mani (2012) use administrative data on the careers of Indian civil servants to show how politicians affect the process of bureaucratic assignment across public organizations. I document a related margin of interaction: keeping bureaucrats in the same organizations, politicians delegate project implementation to different bureaucratic organizations. The World Bank's Public Officials Surveys (Manning et al, 2000) provide descriptive evidence that political interactions with bureaucrats are significant across the developing world. I show that political competition is a key driver of this relationship, and quantify its impacts on government productivity.

These issues feed into a wider literature on the determinants of public sector productivity. A different approach to the analysis of productivity in the Nigerian Federal Government is taken in Rasul and Rogger (2013). There, we assess how differences in management practice, the formal rules of organization, underlie differences in productivity. Whilst I do not find that politicians are sorting across organizations due to the management practices we study, the paper describes how a standard deviation in management practice explains roughly a third of productivity. Thus, the paper reinforces the message implied by the results presented here, that organizational design is crucial for understanding government productivity, and the response of politicians to political competition.

The paper is organized as follows. Section 2 overviews the relevant aspects of the Nigerian government that define the environment in which politicians and bureaucrats interact. Section 3 outlines a simple model of moral hazard that guides the empirical work. Section 4 then describes the data used to test the predictions of this model. Section 5 outlines my empirical strategy for each stage of the analysis and the corresponding results. Section 6 provides concluding comments and discussion. The Appendix presents derivations of the model, further data description and robustness checks.

## 2 Institutional Background

Nigeria is the most populous country in Africa, with a population of 160 million people, or 20 percent of the population of sub-Saharan Africa. United Nations (2013) predicts that Nigeria's population will be larger than that of the United States by 2050. Nigeria represents a leading setting in which to understand the determinants of public sector productivity in the developing world.

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<sup>4</sup>Similarly, Foster and Rosenzweig (2004) use panel data on governance in India to show that politicians facing greater political pressures are more responsive to the needs of their citizens in the provision of public goods. Besley et al (2010) show how political competition leads state politicians across the US to adopt pro-growth policies. Martinez-Bravo et al (2012) find that democratization in China leads to an increase in the provision of public goods. Persson and Tabellini (2000) and Besley (2006) review the literature on political agency models which highlights the importance of elections as a disciplining device.

Nigeria also shares important features of its economy and polity with other developing countries. Its income per capita is roughly equivalent to that of India, or to that of sub-Saharan Africa as a whole (World Bank, 2012). Its government makes up a similar proportion of economic activity as those of many other developing countries, representing 26 percent of gross domestic product.<sup>5</sup> Its political history is marked by colonial origins preceding a string of military dictatorships, much like other developing nations. Thus, Nigeria presents a window into the workings of government in the developing world.

The country returned to civilian rule with Presidential elections and a new constitution in 1999. Its constitution has many similarities to the United States, and its Congress shares many of the functional components of the United States Congress. Nigeria is a Federal Republic, with an elected two-chamber National Assembly composed of the Senate and the House of Representatives. Its three branches are the legislative, executive, and judiciary, and its three tiers are the federal, state, and local government levels. This study will focus on the House of Representatives and on public organizations at the federal government level only.

The House of Representatives is made up of 360 representatives, each with their own constituency. Each politician can therefore be associated with public projects implemented in their constituency. Representatives serve four-year terms, and there are no limits on re-election. I study the representatives of the 5th National Assembly which was elected in 2003 and lasted until 2007.

## 2.1 Role and composition of standing committees

A core feature of the House of Representatives is the use of standing committees to consider policies relevant to their sector of expertise (such as water, health, etc.). For each sector, the relevant standing committee defines the public projects to be implemented in the coming year *and determines which bureaucratic organization should implement each one*. For example, the House Committee on Health will consider all issues relevant to health in Nigeria, including how many health centers should be built within a fiscal year, and by whom.

The standing committees play a crucial role in the design of the federal budget. The projects I study were all established in law by budget appropriation bills passed in 2006 or 2007. The committees are designated to hold hearings with relevant parties, scrutinize the proposals, and define budgets for each of the organizations I study. Membership of a standing committee provides a congressperson with significantly greater capacity to influence the details of that sector's budget than a non-member.<sup>6</sup> While there is a complex congressional bargaining game that defines the broad features of a sector budget, committee members have broad powers to determine which projects should be implemented and by whom, and thus are most able to influence which organization implements projects in their constituencies. This margin of delegation will be one of the key outcome variables.<sup>7</sup>

The delegation powers conferred by membership of House committees is the basis of one of the instrumental variables used in this paper. I will compare the delegation decisions of committee members to

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<sup>5</sup>According to the International Monetary Fund World Economic Outlook Database (October 2012), government expenditures as a percentage of GDP are 21 percent in China, 27 percent in Kenya, 28 percent in India and 30 percent in South Africa.

<sup>6</sup>The significant power of standing committees has long been recognized for the US Congress. Woodrow Wilson asserted that committees dominate congressional decision making, stating that "we are ruled by a score and a half of 'little legislatures'" (Wilson, 1887). Richard Fenno, in his magisterial book on committees in congress, states that committee decisions are usually accepted and ratified by the other members of the chamber, giving members of a committee significant influence over the sector they represent (Fenno, 1968). Shepsle and Weingast (1987) and Krehbiel et al (1987) elaborate theories of why the congressional committees are so powerful.

<sup>7</sup>Delegation decisions for projects in a representative's constituency have limited effect on the projects in other constituencies, nor impact on the total quantum of resources available to other politicians. There is little, if any, political discourse around delegation. As such, representatives *on a standing committee* should be little constrained in their ability to delegate to their preferred organization.

those of non-members. In doing so, I aim to compare politicians with greater delegation power to those with less. This allows us to observe what politicians do with these additional powers. How members of the standing committees are selected is thus an important element of my identification strategy.

To understand the process in the Nigeria context, I gathered information from the rules governing the House, from academic and committee secretary assessments of committee composition, and from newspaper reports. The Standing Orders of the House of Representatives states that the ‘Committee on Selection’ is the single authority for the determination of committee composition. The Committee on Selection states that it weighs up macro-political factors, made up of a need to represent geo-political zones and parties in proportion with their size in the Congress, and a guiding principle that members should be allocated to sectors in which they have relevant qualifications or experience. This implies that politicians who qualified as doctors are placed on the health committee, educationalists on the education committee, and so on.<sup>8</sup> I present evidence that demonstrates that these rules are being followed in section 5.1.<sup>9</sup>

## 2.2 Delegation to bureaucratic organizations

Members of the standing committees must decide which organizations within the bureaucracy to delegate to. Each of the projects funded by the federal budget must be assigned to an organization of the Executive. The National Assembly itself does not implement social sector public projects.

To analyze this delegation decision, I split the Executive into two ‘tiers’: centralized ministries and decentralized agencies.<sup>10</sup> This is the major categorical division of public organizations in Nigeria, and the one most closely aligned to the delegation decision faced by the politicians I study. A centralized organization is a ministry, the central organizing authority for a sector. For example, the Ministry of Health is the central organizing authority for the Health sector. It defines the long-term strategy for the sector and interacts regularly with the National Assembly, and its Standing Committee on Health, on the legislative aspects of healthcare in Nigeria. The centralized ministries are the first point of contact for politicians interested in a sector designated by the Public Service Rules, the rules that govern the public sector.

A decentralized organization is an agency, which is an independent body, established by law as a self-accounting entity with a budget line in the federal budget. Agencies are run by a chief executive with boards of long-term governors chosen by the President. Bureaucratically, they are more autonomous from the legislature than the centralized ministries are. Decentralized organizations are also geographically more distant from Parliament. Centralized organizations are all based in Abuja less than a kilometer from the politicians. The decentralized agencies are on average *hundreds of kilometers from the capital*, making personal interaction with decentralized organizations more costly for politicians.

For every project I study, politicians have a choice between a centralized ministry and a decentralized agency. Since the ministries are national in scope, they provide a centralized option for every project in their sector. There are also decentralized options for every project, since the decentralized agencies provide a contiguous coverage of Nigeria within each sector. A comparison of measures of project delivery across centralized and decentralized organizations implies that decentralized organizations are

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<sup>8</sup>As the Speaker of the House has confirmed in the House Hansard, “In the composition of Membership and Leadership of Committees, special attention will be paid to the skills and relevant experiences of Members in order to achieve greater efficiency” (House Hansard, 2011).

<sup>9</sup>More discussion on the process used by the Committee on Selection to select committee members is provided in the Appendix.

<sup>10</sup>In the broader literature on decentralization, such a split is known as ‘bureaucratic decentralization’ or ‘deconcentration’. This is in contrast to political decentralization where distinct tiers are governed by distinct politicians.

more productive than centralized ones. A key contribution of this paper will be to assess whether this is causal or a function of politicians sorting projects across tiers.

Whilst each of the projects is implemented by a single organization, projects alike in terms of type, budget, scale and complexity, are implemented by both centralized and decentralized organizations. For example, the Federal Ministry of Water Resources implements projects in districts throughout the areas covered by the (decentralized) River Basin Development Authorities. In many districts, water projects are implemented by centralized and decentralized organizations. Similar arguments can be made for other sectors. Table 2 shows that whilst there are differences in the mean levels of budget and complexity across tiers, there is significant overlap in these characteristics. To ensure that I am not picking up differences in project characteristics across tiers, I use control variables that reflect the budget, existing investment, and technical complexity of a project. There is significant overlap across tiers in the nature of projects implemented: the range of project complexity is almost identical at the centralized and decentralized organizations that I study.

### 2.3 Interactions between politicians and bureaucrats

Once a project in a particular politician's constituency has been delegated to an organization, politicians must choose whether to interact with the bureaucrats there and provide them with *informal* incentives. The *formal* incentive structure in the Nigerian Civil Service are rigidly defined by the Public Service Rules. These rules are for all bureaucrats working across all political constituencies. Thus, varying the formal contracting structure for a specific constituency is difficult if not infeasible.

If a politician wants to motivate a bureaucrat on a particular project in her constituency, she would have to provide these incentives informally. This requires personal interactions between politicians and bureaucrats.<sup>11</sup> Politicians can then offer an incentive contract made up of both elicit transfers and coercion.

## 3 A Model of Delegation and Informal Incentive Provision

To understand what determines the choices of politicians across these organizations, I develop a model of delegation and informal incentive provision. The model serves two purposes. First, it delivers a series of predictions about the response of politicians to changes in political competition along the margins of delegation and the provision of informal incentives. Second, it provides a clear empirical specification that takes into account the implied simultaneous nature of delegation and informal incentive decisions by politicians.

### 3.1 Model

The polity consists of a single constituency represented by an incumbent politician  $A$ . The politician faces single-member district electoral competition in an upcoming (stochastic) election, and she prefers to stay in power than to lose the election.

The politician can increase her chance of being re-elected by providing a public project to her constituency. The legislature has provided the politician with funds,  $Q$ , to implement a public project in her

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<sup>11</sup>In the qualitative interviews I held in conjunction with the data collection described in this paper, bureaucrats stated personal interaction was required for informal contracts to be credible.

constituency. She can use  $Q$  to make an investment in the public project,  $q$ , or for her own consumption,  $\kappa$ . The greater project output, the higher will be the politician's expected probability of winning the election.

The implementation of the project must be delegated to a bureaucrat. The politician can choose bureaucrat  $C$  or  $D$  (centralized and decentralized, respectively). To facilitate the implementation of the project, the chosen bureaucrat can exert costly effort,  $e$ . Effort can take two possible values:  $e \in \{0, 1\}$ . Exerting an effort of 0 or 1 implies disutility to the bureaucrat of  $\psi(0) = 0$  and  $\psi(1) = \psi$  respectively.

Implementation of the public project is uncertain, with effort affecting the output level as follows: if  $Q$  is invested in the project, the stochastic output level  $\tilde{q}$  can only take two values,  $\{\bar{q}, \underline{q}\}$  with  $\bar{q} > \underline{q} = 0$ , and the stochastic influence of effort on implementation is characterized by the probabilities,  $pr(\tilde{q} = \bar{q} | e = 0) = \pi_l$  and  $pr(\tilde{q} = \bar{q} | e = 1) = \pi_h$ , with  $\pi_h > \pi_l$ . If  $Q - \kappa$  is invested in the project, the higher output becomes  $\bar{q} - \kappa$ .

The politician cannot observe the effort of the bureaucrat, but she can observe the level of public project output. The politician can offer utility transfers contingent on the observed output;  $\bar{t}$  if a high output,  $\bar{q}$  (or  $\bar{q} - \kappa$ ), is observed and  $\underline{t}$  if a low output,  $\underline{q}$ , is observed. The politician must deliver these transfers through personal interaction with the bureaucrat. The intensity of politician interaction measures the degree of reward,  $t > 0$ , or punishment,  $t < 0$  (elicit transfers or coercion, respectively). For a politician to provide bureaucrat  $k = \{C, D\}$  with transfers personally, there may be a transaction cost, represented by  $\alpha^k$ . For example, a politician may be required to travel a large distance to personally provide those incentives. A high  $\alpha$  implies a relatively large transaction cost in the provision of informal incentives.

Political competition determines the extent to which the politician is concerned with delivering public goods. I address the feature of a politician's utility being dependent on her probability of re-election by adding a parameter to her utility,  $\gamma \in [\underline{\gamma}, \bar{\gamma}]$ , the range of which strictly contains 1.  $\gamma$  is a reduced form way of representing the positive relationship between the provision of public projects and the winning of citizen votes.<sup>12</sup> It is increasing in political competition as it corresponds to the additional electoral gains to the incumbent politician from a high-level of public project output.

The residual of the project budget that is not invested in the project is utilized for personal consumption (corruption) by the politician.<sup>13</sup> She must decide how much of the budget to consume. The utility from consuming project funds is subject to diminishing marginal returns.

Turning to bureaucrats, I assume that they are risk neutral, and their utility is separable in the utility from informal transfers from politicians and effort. Their utility function takes the form,

$$U^k = t - \psi(e) \tag{1}$$

where  $k = \{C, D\}$ . If the politician prefers to provide no incentives, (1) implies that  $\bar{t}^* = \underline{t}^* = 0$ . The bureaucrat will then optimally exert no effort.

The timing of the contracting process is described in Figure 1. The politician determines the optimal contracts for both bureaucrats and the level of rents to consume at each tier and compares the utilities of delegating to each. She then offers the appropriate contract to the bureaucrat with whom she can realize the highest utility. The bureaucrat accepts or rejects the contract, and chooses whether or not to exert effort. The stochastic output realization occurs, which determines the nature and intensity of

<sup>12</sup>There is a broad literature that shows a positive link between the provision of public projects and electoral gains for the incumbent politician. For the US, see Levitt and Snyder (1997) and for Africa see Weghorst and Lindberg (2013).

<sup>13</sup>Since there is no incentive to increase transfers to the bureaucrat from their minimum level required to induce high effort, the politician optimally consumes whatever rents are generated.

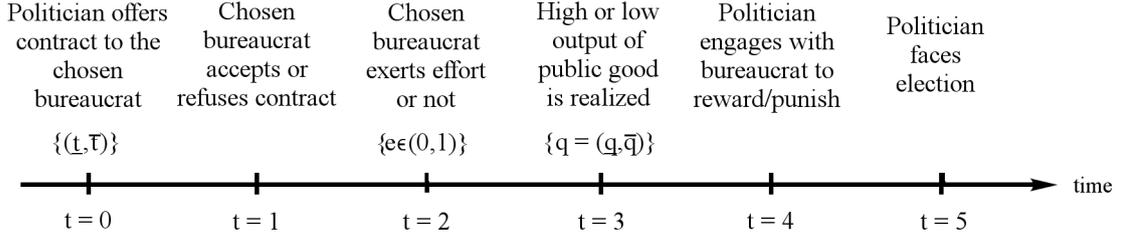


Figure 1: Time line for contracting under moral hazard

interaction of the politician with the bureaucrat. Finally, the politician faces the election and campaigns on the basis of the amount of public project provided.

The risk neutral politician gains an expected utility for the case of the bureaucrat exerting effort ( $V_1^k \equiv V_1^k(e=1)$ ) and not exerting effort ( $V_0^k \equiv V_0^k(e=0)$ ),

$$V_1^k = \pi_h^k (\gamma (\bar{q} - \kappa^k) - \alpha^k \bar{t}^k) - (1 - \pi_h^k) \alpha^k \underline{t}^k + (\kappa^k)^{\frac{1}{2}} \quad (2)$$

$$V_0^k = \pi_l^k \gamma (\bar{q} - \kappa^k) + (\kappa^k)^{\frac{1}{2}} \quad (3)$$

For the case with effort, with probability  $\pi_h^k$  output is high, yielding  $\gamma (\bar{q} - \kappa^k)$  of benefits from output and  $\alpha^k \bar{t}^k$  of costs. With probability  $(1 - \pi_h^k)$  output is low, with associated costs. Both yield  $\kappa^k$  of rents.

I differentiate between the bureaucrats  $C$  and  $D$  in two ways, both motivated by the descriptive statistics presented in section 4. The decentralized bureaucrat is more productive than the centralized bureaucrat, in the sense that  $\pi_h^D > \pi_h^C$ , whilst  $\pi_l^D = \pi_l^C$ . Second, I assume that the transaction costs for politicians interacting with centralized bureaucrats are less than for interacting with the decentralized bureaucrats. I set  $\alpha = 1$  for centralized organizations and  $\alpha > 1$  for decentralized organizations. This assumption stems from the institutional and geographical distance that decentralized organizations have from the National Assembly.

The politician who wants bureaucrat  $C$  or  $D$  to exert effort faces the following maximization problem,

$$\max_{\{\bar{t}, \underline{t}, \kappa\}} \pi_h^k (\gamma (\bar{q} - \kappa^k) - \alpha^k \bar{t}^k) - (1 - \pi_h^k) \alpha^k \underline{t}^k + (\kappa^k)^{\frac{1}{2}} \quad (4)$$

$$\text{subject to } \pi_h^k \bar{t}^k + (1 - \pi_h^k) \underline{t}^k - \psi \geq \pi_l^k \bar{t}^k + (1 - \pi_l^k) \underline{t}^k \quad (5)$$

$$\pi_h^k \bar{t}^k + (1 - \pi_h^k) \underline{t}^k - \psi \geq 0 \quad (6)$$

The constraints reflect incentive and participation constraints respectively. The optimal levels of politician interaction with the bureaucracy are determined by re-organizing the constraints. They are therefore (all proofs provided in the Appendix),

$$(\bar{t}^k)^* = \frac{(1 - \pi_l^k)}{(\pi_h^k - \pi_l^k)} \psi \quad (7)$$

$$(\underline{t}^k)^* = -\frac{\pi_l^k}{(\pi_h^k - \pi_l^k)}\psi \quad (8)$$

The optimal contract is where the politician rewards the bureaucrat with a positive transfer if the output is high, and punishes her if the output is low. The politician will only induce high effort using this incentive scheme when the utility of doing so is greater than the utility from the bureaucrat exerting no effort. For the centralized and decentralized organizations respectively, the relevant condition is,

$$V_1^C \geq V_0^C \Rightarrow (\pi_h^C - \pi_l^C) \gamma (\bar{q} - \kappa^C) \geq \psi \quad (9)$$

$$V_1^D \geq V_0^D \Rightarrow (\pi_h^D - \pi_l^D) \gamma (\bar{q} - \kappa^D) \geq \alpha\psi \quad (10)$$

The politician prefers to induce a high effort when the multiplier representing the degree of political competition,  $\gamma$ , is high enough that the marginal benefit of public project implementation is greater than the marginal cost of incentive provision. Since the left-hand sides of (9) and (10) are increasing in  $\gamma$ , a politician is more likely to personally interact with a bureaucrat as political competition rises. Thus, interaction is more likely to be characterized by (7) and (8) (positive in absolute magnitude) than by the no-inducement equilibrium,  $\bar{t}^* = \underline{t}^* = 0$ . The model predicts a positive relationship between political competition and the absolute levels of incentives.

By substituting the optimal transfers into the maximization problem, and taking first order conditions with respect to  $\kappa^k$ , we gain the optimal levels of corruption at tier  $k$ ,

$$(\kappa^k)^* = \left( \frac{1}{2\pi_h^k \gamma} \right)^2 \quad (11)$$

Since  $\pi_h^D > \pi_h^C$ ,  $(\kappa^D)^* < (\kappa^C)^*$ , and corruption is lower than at the decentralized tier. It is costlier in terms of foregone output for the politician to steal from the project implemented at the decentralized tier. Thus, the underlying performance differential leads to higher corruption at the worse performing tier, amplifying the difference in outputs.

Having determined the optimal level of incentives and corruption at each tier, I can turn to the conditions under which the politician delegates to the decentralized organization over the centralized organization,

$$V_1^D - V_1^C \geq 0 \Rightarrow (\pi_h^D - \pi_h^C) \gamma \bar{q} - (\alpha - 1) \psi - \frac{\pi_h^D - \pi_h^C}{4\pi_h^D \pi_h^C \gamma} \geq 0 \quad (12)$$

The differential of the middle expression of (12) is positive with respect to  $\gamma$ . Thus, increasing competition implies an increasingly higher utility from delegation to the decentralized agent. The model predicts a positive relationship between political competition and decentralization. This result arises from two sources. First, the reward to the politician from output, which is higher at the decentralized tier, increases. Second, the relative attractiveness of corruption falls, reducing the incentive to implement projects at the centralized tier where corruption is higher.

Equations (9), (10) and (12) together imply that more projects for which the politician induces high effort from the bureaucrat will be implemented by the decentralized bureaucrat. The model therefore predicts that more projects will be completed by decentralized bureaucrats than by centralized bureaucrats.<sup>14</sup>

<sup>14</sup>One way to interpret differences in  $\pi_h - \pi_l$  across tiers (in the sense that  $\pi_h^k - \pi_l^k > \pi_h^{k'} - \pi_l^{k'}$ ) is that they can be seen

## 3.2 From theory to empirics

Equations (9), (10) and (12) describe how politicians determine their choices over which bureaucrat to delegate to and the extent to which to interact with them to provide informal incentives. Together, they imply that delegation and incentive provision are simultaneously determined. Delegation is a function of the cost of incentives,  $\psi$ , whilst incentives are a function of who has been delegated to (the choice between equations 9 and 10). At the same time, they both enter the production function for public output,  $\tilde{q}$ .

This indicates a direct mapping from the theoretical model into a simultaneous equations regression model in which delegation choices and the level of informal incentives are simultaneously determined. Conditional on project characteristics (represented in the model as  $\pi$ ), public output,  $\tilde{q}$ , delegation,  $\{C, D\}$ , and informal incentives,  $\psi$ , make up a three equation system. The latter two variables are driven by the degree of political competition, the transaction cost of providing incentives, the cost of incentives, and the level of corruption (or conversely the productivity of the bureaucrats). These then feed into the probability of observing a high output.

To test the predictions implied by the model, I require variation that separates the delegation and informal incentives margins. In other words, I require instruments that enter into the structural equations of delegation and incentives alone. With these instruments, I can estimate equations (9), (10) and (12) separately.

## 4 Data

To test the causes and consequences of delegation and incentives, I require proxies for each of the components of my model from the context under study, the Nigerian public sector. This requires data from across government. I have assembled a data set that combines characteristics of politicians with their positions in the National Assembly. Based on a representative sample of projects from the Federal Government of Nigeria's 2006 and 2007 budgets, I have details of the projects that these politicians delegate to organizations, surveys of the organizations that implement these projects, and evaluations of how effectively they do so. Overall, I have a detailed profile of the delivery of public projects from initiation to implementation.

I begin by describing the core explanatory variables that relate to politicians, their constituencies, the characteristics of projects that are implemented in those constituencies, and the bureaucratic organizations which implement them. I then describe the dependent variables in the final sub-section.

### 4.1 Politicians and Political Competition

A politician in this paper is a Nigerian House of Representatives member. Nigeria's 5th National Assembly was inaugurated in May 2003, and consisted of 109 senators and 360 representatives. My focus will be on the House of Representatives because of the significance of standing committees and public projects

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as one bureaucrat having superior information about project delivery than another. In this case, the model predicts that projects that are characterized by information more easily available to the decentralized (centralized) bureaucrat are more likely to be delegated to decentralized (centralized) bureaucrats. Similarly, the set of equations we describe here jointly imply that projects with lower  $\pi_h$ , implying a higher technical complexity, will be more likely to be centralized and to induce a lower level of interaction. We will test these additional predictions in the set of robustness checks we undertake for the analysis of delegation and incentive provision.

in that chamber relative to the Senate.<sup>15</sup> The data used here covers 350 of the 360 constituencies, with 10 pairs of constituencies in this set aggregated to the local government level, leaving 345 constituencies under study.<sup>16</sup>

For each of the 345 representatives I study, I have assembled biographies that outline their demographic and political characteristics (such as their party affiliation), their educational qualifications and work experience, and the results of their election in 2003.<sup>17</sup> Tables 1 and A1 in the Appendix provide descriptive statistics for the politicians and their constituencies. The vast majority of the politicians under study are men, with a mean age of 48, and 16 years of education (equivalent to a Bachelor’s degree). The average population of a constituency is 370,000. This population is split, on average, between two local governments, which is the most basic administrative unit of government in Nigeria. The local nature of congressional politics implies that local public project provision is central to the success of a representative’s time in office. National Assembly politicians do not face term limits, implying they have an ongoing incentive to provide public projects to bolster their re-election chances. A quarter of the politicians whom I study are already serving a second term.

To understand the political dynamics of the constituencies under study, I collected data from the Independent National Electoral Commission on the returns for each of the elections in 2003 (when the politicians I study were voted into power). This is data that was published as the official roll of the national elections.

My main measure of political competition (proxying  $\gamma$ , the weight on the provision of public projects in the politician’s preferences) is a function of the margin of victory, defined as the winner’s vote share minus the runner’s up vote share. It represents the proximity of the runner up to the winner. My measure subtracts the margin of victory in a constituency from 1 so that it is increasing in competition. Thus, a value of 0.4 implies that the winner of the constituency election has a vote share 60 percentage points larger than that of her opponent. Such a measure is used by Besley and Burgess (2002), Lee (2008), and Da Silveira and De Mello (2011).

The political competition faced by representatives is relatively heterogeneous across constituencies. While the mean margin of victory is 0.33, there is substantial heterogeneity across the country. As Figure 1A shows, I observe constituencies subject to the full distribution of levels of political competition, providing sufficient variation from which to estimate parameters. This also allows for interpretations of coefficients that describe competition at very low and very high levels.<sup>18</sup>

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<sup>15</sup>Richard Fenno’s famous 1973 study comparing the US Senate and House argued strongly that decision making inside the Senate is much less of a committee-dominated process than in the House. “In the House,” Fenno writes, “the individual member’s influence on chamber decisions is exerted, almost wholly, within and through his committees. Senators operate with no such constraints.” A corollary of this is important for the current exercise. Fenno continues, “That is, a Senator’s committee membership adds far less to his total potential for influence inside his chamber than a Representative’s committee membership adds to his potential for influence in his chamber.”

<sup>16</sup>I do not have evaluations of project outcomes for 10 constituencies, so I exclude these constituencies in the analysis. I describe the sampling of projects in the Appendix. The constituencies of 10 representatives are smaller than a local government area, the smallest administrative unit in my data. I therefore aggregate constituencies to their local government, leaving 345 federal constituencies to be studied. The characteristics and winning vote shares of the representatives who share local governments are very similar. I therefore allocate the constituency to that one of the two representatives who is first on the nominal roll of the election records. The core results of the paper are qualitatively unchanged if I include or exclude the projects located in local governments with multiple representation or use the second of the two representatives.

<sup>17</sup>The Appendix details the construction of these biographies.

<sup>18</sup>The distribution of political competition across constituencies in other countries is similarly diverse. For the US, the most recent election data is surprisingly similar to that of Nigeria. The average margin of victory for House elections in 2012 was 0.32, and constituency contests spanned the full distribution of political competition. For the UK, the margin of victory varies continuously between 0.01 and 0.58, with a mean of 0.19. There is substantial heterogeneity across neighboring constituencies, as in my data. Comparing this context to other developing country democracies, India is closer to the UK context, with the margin of victory spanning 0.01 to 0.61, with a mean of 0.12. Ethiopia, the second largest democracy in Africa after Nigeria, has an average margin of victory of 0.5 and varies between 0.01 and 0.96. (All figures are authors calculations based on election statistics from relevant election bodies).

The heterogeneity in competition is not concentrated in one area of Nigeria. As Figure 1B indicates, there are large differences in competition between proximate constituencies. The average differential in margin of victory across neighboring constituencies is 20 percentage points. Thus, political incentives vary substantially across constituencies with similar geographic characteristics. This implies that competition is not pre-determined by geographic or socio-economic characteristics.

To further characterize a representative's constituency, I use the largest household survey ever undertaken in Nigeria, the 2005 Core Welfare Indicators Questionnaire (CWIQ). This was a cluster-randomized household survey run by Nigeria's National Bureau of Statistics, representative at the local government level. The CWIQ survey was implemented at the end of 2005, at the same time as politicians were making delegation decisions in the first round of standing committees, and it therefore provides a baseline profile of the constituencies that I study. Using this survey, I create constituency-level averages for indicators of poverty, access to existing public projects and local economic dynamics. These will be used as controls in the core specifications and are described in detail in the Appendix.

Table 1 describes the constituencies under study in terms of the socio-economic characteristics for which I control. Nigeria's citizens are generally poor, with a high proportion of the population in extreme or relative poverty. The average years of education is five years, equivalent to less than primary school completion. Only 48 percent of Nigerians have potable water, and the average number of hours of electricity available per day is 4.5. There are plenty of opportunities for public projects to have significant welfare impacts across the constituencies that I study. These potential impacts support the direct link between public project provision and the votes that a representative receives.

Table 1 also compares the characteristics of politicians and their constituencies at the top and bottom 10 percent of competitive constituencies as defined by my measure of political competition. The table implies that the politicians are not particularly different. However, there are a small number of statistically significant differences to note. Politicians in the most competitive constituencies have roughly half a year more education. Similarly, there are no clear patterns of difference between the constituencies in terms of deprivation, although the most competitive constituencies seem to have a little *less* access to water and a slightly *longer* walk to the nearest primary school. I control for all of these variables in the main specifications to take account of any impacts of these differences.

The bottom of Table 1 looks at the difference in OPEN funds allocated to the top and bottom 10 percent of constituencies in terms of political competition. It shows that in this context, politicians faced by significant competition are not able to realize significantly higher levels of public funding for their constituencies. For the full distribution of constituencies, the correlation between the volume of OPEN funds (number of projects a constituency receives) and political competition is 0.02 (0.06).<sup>19</sup>

Table 1 does imply that political competition is positively associated with the completion of projects. It shows that projects in the most competitive 10 percent of constituencies have a significantly higher level of progress than those in the bottom 10 percent. In the full data, a standard deviation increase in political competition is unconditionally correlated with a six percent increase in the proportion of public projects delivered. Together, these simple correlations support the approach of this paper, which fixes the distribution of resources across constituencies and looks for the mechanisms through which political competition impacts on bureaucratic output.

From the set of politicians voted into power in 2003, the Committee on Selection chose members for

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<sup>19</sup>One concern in Nigeria is that politicians of the ruling party have very different behaviors to those of other parties. Roughly two-thirds of constituencies are governed by a politician of the ruling party. I investigated the extent to which politicians of the ruling party have very different outcomes to members of other parties. The correlations imply that they are not able to secure higher funds per constituency or more projects. Overall, ruling party politicians are not operating in a substantially different context to other politicians.

the standing committees that provided politicians with delegation power (giving them the powers of politician  $A$  in the model). For each of the relevant committees of the 5th National Assembly, I coded the membership of the committee using data from Nigerian Congress, a web site that provided details of all the House Committees set up in 2003. I also gained information on membership for the relevant period from secretaries of the appropriate committees. The committees I study are agriculture, appropriation, education, environment, Federal Capital Territory (city building), finance, health, housing, power, water, women, and youth. I then matched each representative to the committee membership records, and noted their position as member, chair, or vice-chair.<sup>20</sup> The mean and median number of committees under study that a representative sits on is one. All representatives in the House are expected to serve on a committee. We now turn to those projects that the committees made decisions over.

## 4.2 Public projects

In 2006 and 2007, the 5th National Assembly legislated a Federal Budget of US\$12.7 billion and US\$15.1 billion respectively, or US\$27.8 billion in total over the two years. The focus in this paper is social sector capital projects, which account for roughly 35 percent of the total, or 73 percent of capital expenditures.

In both of these years, Nigeria's Presidency undertook a unique monitoring and evaluation initiative that tracked the implementation of a representative sample of social sector projects. The 'Overview of Public Expenditure in NEEDS' (OPEN) monitoring initiative arose out of Nigeria's receipt of debt relief in 2005. As a result of sweeping reforms across major organs of government (for an overview see Nkonjo-Iweala and Osafo-Kwaako, 2007), Nigeria received cancellation of its external debt to the tune of US\$18 billion from the Paris Club. At the federal level, the annual savings from debt interest were channeled into the social sectors (health, education, water etc.) that are the focus here. The Presidency viewed this as an opportunity to track the effectiveness of government expenditures, and so in 2006 and 2007 the Nigerian Government traced, at a project level, the use and impact of 10 percent of all Federal Government social sector expenditures.

The OPEN projects were designed to be a representative set of government social sector expenditures, providing me with data on a representative sub-set of the federal social sector budget.<sup>21</sup> Since I am investigating delegation, I am only interested in those projects that can be feasibly delegated to either tier of government. In other words, I studied only those projects that could be implemented by either centralized ministries or decentralized agencies. I therefore exclude all projects from the full set of OPEN expenditures that have national or inter-jurisdictional scope, such that a single decentralized organization does not have the mandate to implement such a project. Examples of these projects are those that require engagement with international organizations or that are implemented nationwide. This leaves us with a representative set of social sector projects that could be delegated to both centralized and decentralized organizations. All projects therefore have an organization at the centralized and decentralized tier

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<sup>20</sup>The US literature on standing committees I take as the guide for this study (Aghion et al (2005, 2009, 2010) and Cohen et al (2011)) conditions quantitative regression specifications on the 'grade' of the standing committee. Congressional committees are typically seen as having a hierarchy of importance, and the grade of the committee reflects the standing of the committee within that hierarchy. The rationale for following this practice is that in politically important committees, the dynamics of delegation may be distinct from other committees. I follow this practice by including a binary indicator of the grade of the committee under which the project falls in all specifications. This is a dummy that takes the value 1 if the committee is perceived to be of high political weight or 0 otherwise. I follow Ojeifo's (2007) delineation of grade A (agriculture, water, education, power, housing, environment, Federal Capital Territory) and grade B (health and women) committees. The core results are all qualitatively the same when I do not include this variable.

<sup>21</sup>In the survey of bureaucrats I use in this paper, I was not able to undertake a survey at the decentralized organization to which electrification projects can be delegated. I therefore have to exclude all electrification projects for this analysis. This means that I have a representative set of delegatable projects for social sector projects that are not electrification infrastructure.

that could implement them, and that implement comparable projects in terms of budget and technical complexity.

These projects are typically small-scale infrastructure projects (84 percent), with some procurement and other programmatic projects (16 percent). Descriptive statistics for the projects across constituencies are provided in the bottom half of Table A1. Note that constituencies typically have multiple projects, of multiple project types, covered by multiple sectoral committees. The projects are small in terms of budget, with a mean budget of US\$130,000, and complexity, with a mean of 27 percent on the index of complexity spanning the distribution of projects observed in the wider OPEN data set. They can be thought of as the ‘nuts and bolts’ of village economies. There is heterogeneity across project types (boreholes, buildings, dams, procurement, roads, financial projects, canals, training, advocacy, and research) in terms of the quality of output. I therefore control for project type fixed effects throughout the analysis.

For each of the projects studied here, I have evaluations of how effectively they were implemented (proxies of  $\tilde{q}$ , the level of output in the model). Under the OPEN initiative, expert teams were sent to visit the selected projects and identify the extent to which they had been implemented as planned in the Federal Budget, and embodied in each project’s technical documentation. The Presidency contracted national and regional teams to undertake the monitoring process outside of the institutions of the civil service. Thus, the public sector projects were not evaluated by potentially biased civil servants, but rather by teams of independent engineers and civil society representatives. The engineers evaluating the projects were not those working on the project sites, and the civil society groups were recognized third sector organizations.

Evaluations of the OPEN process indicate it successfully achieved its aims (Eboh 2010, Dijkstra et al 2011). To ensure the accuracy of monitoring reports, the Presidency put in place a system of checks and balances. First, a centralized team of technocrats monitored the evaluation teams, providing them with training and opportunities for standardization of their methods at national conferences. Second, evaluators were asked to provide material, photographic, or video evidence to support their reports. Third, the national teams and Presidency performed random checks on evaluated sites, all of which were consistent with the findings of OPEN monitors.

The reports of OPEN evaluators describe the fate of projects budgeted for execution in the 2006 and 2007 federal budgets (Federal Government of Nigeria 2008a, 2009a). I hand-coded the material from all projects recorded in OPEN initiative reports.<sup>22</sup> Taken together, the coverage of projects in the sample I study traces 7 percent of all Federal Government social sector expenditures in 2006/7 budget years, corresponding to 3,009 projects from 54 organizations, with an aggregate budget of around US\$560 million.<sup>23</sup>

The OPEN evaluation teams coded: (i) whether the project had started; (ii) its stage of completion; (iii) the quality of the inputs and work. The main outcome variable is a continuous measure, from zero to one, of project completion rates: zero refers to the project never having been started, one corresponds to the project being completed as specified in the original project description, and intermediate scores

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<sup>22</sup>The OPEN reports comprised of roughly 21,000 evaluation reports, photo and video files, and recipient testimonies. I personally reviewed each of these documents and entered the appropriate evaluations into a single database according to a set of specified benchmarks agreed by the OPEN engineers and civil society teams.

<sup>23</sup>I consider projects traced under the OPEN initiative that were approved in either the 2006 or 2007 federal budgets. For projects funded in the 2006 (2007) federal budget, monitoring teams visited the relevant project sites around June 2007 (2008). Therefore, project implementers were given roughly 18 months from the time the project was centrally approved until when it could be used by the community. All the projects I study had twelve month completion schedules, so that even accounting for any delay in the disbursement of funds, it is feasible for these projects to be completed by the time of the monitoring survey.

reflect part completion. I have this ‘proportion completed’ variable for all of the 3,009 projects I study, and that will be my proxy for organizational productivity.

Table A1 provides a summary of my proxy of  $\tilde{q}$ , the proportion completion rate, across constituencies. Roughly 40 percent of projects are never started, while a third are completed.<sup>24</sup> Conditional on being started, therefore, a project has a 53 percent chance of being completed.

A politician’s delegation decision may be a function of a project’s characteristics. In my model, politicians’ decisions were sensitive to  $\pi_h$  and  $\pi_l$ , the technical uncertainties of public projects. I therefore hand-coded data on project-level characteristics such as the budget allocated to the project, whether it was a rehabilitation project, and a brief summary of its technical specifications from project documentation. I also coded which of 10 project types the projects fell into, with categories in both construction (water wells, buildings, and so on) and non-construction fields (procurement, financial projects, and so on). The project technical specifications were used to form engineer-approved measures of the technical complexity of each project and informational characteristics, in the sense of whether centralized or decentralized tiers had an informational advantage in project delivery. The Appendix: (i) details the construction of these indices, and presents descriptive statistics for them; (ii) describes checks I put in place, using multiple engineers, to establish the validity of these complexity measures.

### 4.3 Bureaucrats

A bureaucrat in this paper is a civil servant of the Federal Government of Nigeria. The 3,009 projects I study in this paper were implemented by one of 54 bureaucratic organizations. These are split into 7 centralized ministries (represented by bureaucrat  $C$  in the model) and 47 decentralized agencies (represented by bureaucrat  $D$ ). For each project I study, the politician always has a choice between a centralized and a decentralized organization.

For all of these organizations I collected data on their budgets, staffing, and location. Table 2 provides descriptives for the organizations under study. On all the margins presented, centralized organizations differ from decentralized ones. They are larger in terms of budget, staffing, and the number of federal constituencies they serve. The key difference for the current setting is the difference in productivity. The bottom half of Table 2 describes how along multiple margins, centralized organizations seem less productive than decentralized ones. Whilst I aim to better understand whether this correlation is an artifact of political sorting across tiers (as modeled above) or a reflection of underlying productivity differences, it is this that motivates me to set the likelihood of high output of the effort-exerting decentralized bureaucrats above that of centralized bureaucrats.

To gain measures of the utility transfer that arises from interactions between politicians and bureaucrats,  $t$  in the model, I undertook surveys of a representative sample of roughly 10 percent of the staff at each of the organizations I study.<sup>25</sup> As part of this survey, I collected some of the first systematic measurements of interactions between politicians and bureaucrats. Such interactions are typically not observed. My main measure of politicians’ incentive provision is a question from this survey that proxies the degree to which a politician was involved in project implementation. Each of the officers I surveyed was asked the following question, which I use as the core measure of politician-bureaucrat interactions, “Rate the influence you think [members of the National Assembly] have on the success of a typical project

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<sup>24</sup>It is not possible for me to distinguish between whether projects were not started due to active or passive waste (Bandiera et al, 2009). Rather, the focus of this paper is on whether the decisions and actions of politicians can overcome bureaucratic inefficiency, whatever its nature.

<sup>25</sup>There is an emerging literature in political science on informal politics, such as the research described in Helmke and Levitsky (2006). This paper adds to that literature by providing large-scale and detailed measures of informal political pressures, embedded in a model that relates those measures to output.

implemented by your organisation”, where responses were categorical and divided into ‘Most influence’, ‘Significant influence’, ‘Some influence’, ‘Less influence’ and ‘Least influence’. For each bureaucrat, I determine a binary variable that takes the value 1 if they responded ‘Most influence’ or ‘Significant influence’, and 0 otherwise.

Table 3 describes means and standard deviations for the average answers to this question. To gain reflections of the *intensity* of politician interactions, I weight the averages by the number of projects implemented at an organization. On average, roughly 50 percent of officials state that politicians have significant or most influence over the projects they implement. There is significant heterogeneity across organizations, with only 26 percent of officials stating such influence at the least influenced organization and 84 percent stating such influence at the most influenced. As predicted by the model, I find higher levels of interaction with bureaucrats at the decentralized tier, and the difference is significant at the 1 percent level.

I present descriptive statistics separately for managers and non-managers. The pattern of interactions across seniority of bureaucrat differs across centralized and decentralized organizations. In centralized organizations, managers state that politicians have a higher influence on the projects at the organization than non-managers. However, at decentralized organizations, this pattern is reversed. Non-managers state politicians have a more significant impact on the success of projects at their organization than managers.

I also asked bureaucrats, “Think about recent projects and/or programs you worked on for this organisation. How often, if at all, do you *personally* engage with [member(s) of the National Assembly] in the work that you do?” [italics in original]. I present descriptive statistics for the answers to this question in Table 3. They imply that members of the National Assembly *personally* engage with bureaucrats on the implementation of 14 percent of public projects. I again find significantly higher levels of interaction between politicians and decentralized bureaucrats. Both of these measures are organizational averages, which take the approach that projects are impacted on equally by politicians at an organization.<sup>26</sup>

## 5 Empirics

I begin by examining what determines whether a project is delegated to a decentralized organization. I then turn to the determinants of politicians’ interactions with bureaucrats. Finally, I look at the consequences of these decisions on project output.

### 5.1 Causes of delegation

To assess the drivers of political delegation separately from those of incentive provision, I exploit a congressional procedure that provides exogenous delegation power to a subset of politicians. Membership of a sectoral standing committee in the Nigerian House of Representatives provides its members with significantly greater power to delegate projects *in that sector* than non-members. For each project, I

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<sup>26</sup>Survey data on politician interaction with bureaucrats around project implementation is rare. The closest numbers I have for comparison to this paper come from the World Bank’s ‘Public Officials’ Surveys’ (Manning et al, 2000). These surveys covered 16 countries, and there is significant heterogeneity in the average level of bureaucrat’s perception of politicians’ interference. Evidence from Bangladesh shows that when politicians stop interfering in day-to-day decisions, the perception of corruption in that organization will fall by 31 percent (Mukherjee et al, 2001). A similar impact of political interference was found for Bolivia (Manning et al, 2000). In Guyana, 42 percent of officials interviewed stated that politicians’ interference is frequently or very frequently a “significant problem” (Gokcekus et al, 2001). Thus, whilst these figures reflect varying contexts and survey questions, they are indicative that the magnitude of the issues studied here are of widespread significance.

construct a membership dummy that takes the value 1 if the project is in a constituency in which the representative is on the sectoral committee of the same sector as the project.

Using committee membership as a binary indicator of additional delegation power, I interact this dummy with my measure of political competition to test whether members are more prone to delegating to decentralized organizations of government when they face political competition. The levels effect of the membership variable measures the impact of membership for constituencies with zero political competition. The interaction measures the impact of membership for higher levels of political competition.

In summary, I use the following specification:

$$\begin{aligned} decentralization_{icn} = & \gamma_1 membership_{ic} + \gamma_2 competition_c + \gamma_3 membership_{ic} * competition_c \\ & + \gamma_4 PC_{ij} + \gamma_5 CC_c + \lambda_j + \epsilon_{icn} \end{aligned} \quad (13)$$

where I estimate for the  $i$ th project, implemented in constituency  $c$  by organization  $n$ .

*Decentralization<sub>icn</sub>* is a dummy variable that takes the value 1 if the project is implemented by a decentralized organization and 0 otherwise. *Membership<sub>ic</sub>* is a dummy variable indicating whether the congressperson of the constituency in which the project is implemented is a member of the sectoral committee relevant to the project; *competition<sub>c</sub>* is a continuous measure on the unit interval of one minus the margin of victory in the constituency; *membership<sub>ic</sub> \* competition<sub>c</sub>* is an interaction between membership and competition and thus also measured on the unit interval; project controls ( $PC_{ij}$ ) are the key project characteristics described above; constituency controls ( $CC_{ij}$ ) are the key congressperson characteristics and socio-economic characteristics of the constituency described above; and, project type fixed effects ( $\lambda_j$ ) absorb 10 project type level effects.

My strategy relies on the membership variable being uncorrelated with constituency-level factors that might determine which organization the politician delegates to. Particularly, it should be uncorrelated with factors that might influence how effectively an organization is able to implement the project. I therefore investigate how membership of sectoral committees is determined, to assess the validity of its exogeneity.

Both the politician members of the Committee on Selection and their administrative secretaries state that selection decisions are based on the geo-political factors and qualifications I have described in section 2.1.<sup>27</sup> To empirically test these claims, I can assess the factors that determine the sector/s in which a politician has been selected to serve. Table A2 provides motivating evidence that politicians are similar across committees. It reports regressions of characteristics of politicians and their constituencies, including the political competition they face, on dummies for each of the sectoral committees we study. I find no evidence of sorting across committees on politicians' observed characteristics, such as the level of political competition they face, sex, age, years of education, or the extent of poverty in their constituency.

A formal test of which observable characteristics explain selection into committee membership is reported in Table A3. I estimate a seemingly unrelated regression (SUR) model across indicators of committee membership. For each constituency-level regression in the SUR system, the dependent variable is a binary variable reflecting whether a representative is a member of the committee for the named sector. I regress these indicator variables on the politician and constituency controls described above, and a series of dummy variables that indicate the politician's geo-political region. I then display the coefficients for

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<sup>27</sup>For example, the vice chairman of the Committee on Selection states, as reported in This Day newspaper, "The Selection Committee ... considered cognate experience, areas of specialization and zonal representation in order to ensure that the chairman and vice chairman of a committee do not come from the same geopolitical zone." (This Day, 2007)

those variables relevant to all the sectors. Table A3 indicates that for all but one of the committees, there is strong evidence that qualifications play the major role in determining which politicians are allocated to a particular committee. There is also little correlation in error structure, implying there is no evidence of underlying unobservables selecting politicians across sectors. There is evidence that other factors play a role in the membership of the agriculture committee, and I will check the robustness of the results for this deviation.

One concern is that constituency characteristics indirectly influence committee membership by determining the sector of a representative's qualifications and experience.<sup>28</sup> For example, a politician from an arid region of Nigeria may enter into the water sector. It may then be more challenging to implement water projects in that region, and so the politician experienced in the water sector delegates to decentralized organizations, who better understand her constituency's needs. Table A4 investigates the determinants of a politician's sector of qualifications and experience by estimating a SUR model of sector expertise on constituency characteristics. I create dummies for each of the sectors into which a politician could have specialized. These take the value 1 when the politician has specialized in that sector, and zero otherwise. I present coefficients on variables relevant to all sectors, as well as those variables most relevant to each sector from within the set of controls used in my core specifications. I find that there is almost no evidence that constituency characteristics determine the sector into which a politician specializes. Almost none of the coefficients are significant at the usual levels.<sup>29</sup>

Another quantitative check comes from comparison between the Senate and House. If constituency-level characteristics determined the sectors into which representatives selected, I should find that senators from the same areas have selected into the same sectors. I find this is rare. Only 13 percent of representatives are on a committee of the same sector as their senator. For any particular committee, that figure is at most 3 percent.

The totality of the evidence points towards the House Selection Committee determining committee membership based on factors that are exogenous to constituency-level characteristics that might have significant impacts on project implementation or the choice of organisation delivering public projects.<sup>30</sup> Thus, as Payne (2001) finds substantial evidence for arbitrariness in the makeup of US congressional committees, I find a similar phenomenon in Nigeria with respect to local political conditions. Relative to local factors that determine project implementation, the granting of committee membership for a particular sector is an arbitrary allocation of additional power to delegate public projects within that sector. Having identified a feature of the chain of public project implementation that is plausibly exogenous,

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<sup>28</sup>As complementary to the formal tests of this, I note that Nigeria only became a democracy in 1999, such that almost all of the qualifications on which the Selection Committee made their decisions were gained well before the standing orders were even conceptualized. When they made their career decisions, politicians would not have known how the House standing orders would be designed or perhaps whether Nigeria would have a National Assembly at all.

<sup>29</sup>Another perspective on this test is that it may be of greater interest to assess the extent to which past constituency characteristics explain the sector of politician qualifications and experience. They act as a secondary check on whether constituency characteristics determine the context of implementation today as well as politician's career sector, and link the analysis to the context in which politicians made their career decisions. Table 1 states that the mean politician is 48 years of age in 2006, implying that they made primary career decisions during the late 1970s. In 1980, Nigeria undertook its first systematic household survey, the National Integrated Survey of Households. I therefore coded state-level averages from this survey for the variables closest to those in the core analysis. I then associated them with the corresponding politician in the data set. Where new administrative units have formed, I matched the politician to the data that most closely corresponded to their constituency. Using this data, I re-estimated the regressions described here to assess how constituency characteristics in 1980 impacted on the sector decisions of the politicians I study. They had little explanatory power, mirroring the findings in Table A4. The 1980 variables are, however, strong predictors of contemporary constituency characteristics, providing a validation of both sets of household data, collected a quarter of a century apart.

<sup>30</sup>To what extent would unobservable factors not picked up in the tests be able to play a significant role in the analysis? I can explore the potential for unobservable factors to reduce the estimates in this section to 0 using the correction for unobserved heterogeneity described by Altonji et al (2005) and Oster (2013). Based on an intended R-squared of 0.8, I find that explanatory variation in unobserved factors would have to be roughly 4 times as large as the observed variation in the controls. Given that we see almost no evidence of sorting in the observables, this provides additional assurance that membership is a valid instrument in this setting.

I can observe what committee members do with the projects under their remit versus projects in the constituencies of non-members.

I can therefore turn to estimating specification (13). Table 4 presents the baseline results on how politicians delegate to the two tiers of government under study. The dependent variable in all specifications is a binary variable reflecting whether a project is decentralized or not, which takes the value 1 when the project is implemented by a decentralized organization. Thus, a positive coefficient implies a greater likelihood to delegate a project to a decentralized organization. The baseline proportion of projects in the data used here that are decentralized is 0.73. Throughout I will control for project characteristics, as motivated by the model, and to keep the focus on political incentives.

Column 1 includes the ‘relevant committee’ dummy, project characteristics, and project type fixed effects only, and none of the other controls. The relevant committee dummy takes the value 1 when a project from a particular sector is implemented in a constituency in which the politician is on the relevant sectoral committee. For example, it would take the value 1 for a health project in the constituency of a member of the health committee, and 0 for health projects in other constituencies.

The coefficient on committee membership is a precisely estimated zero. This implies that the mean effect of committee membership on delegation is zero. Since I have motivated my analysis by the differential effects of levels of political competition, this is not unexpected. Politicians’ electoral concerns imply that politicians facing low and high levels of competition will make opposing delegation decisions.

I test this idea in column 2 by including a measure of political competition and an interaction of this measure with the indicator of committee membership. The interaction variable is centered at zero competition, so the coefficient on committee membership describes the behavior of committee members faced by zero political competition.

The coefficient on committee membership is significantly negative ( $\gamma_1 < 0$ ), implying that when competition is low in a constituency, politicians centralize projects. In contrast, the coefficient on the interaction term is significantly positive ( $\gamma_3 > 0$ ), implying that when a politician faces strong competition in her constituency, she is more prone to decentralization. The coefficients on committee membership and the interaction with political competition are both significant at the 1 percent level.

These findings imply that the distribution of projects across government is determined in part by political factors. The tendency to decentralize in response to pressures of political competition seems to be of a similar magnitude to the tendency to centralize when faced with limited political competition. A test of the null that the coefficient on committee membership,  $\gamma_1$ , is of equal and opposite magnitude to the sum of the coefficients on political competition and on the interaction term,  $\gamma_2 + \gamma_3$ , has a p-value of 0.18. This fits with the finding of a zero coefficient in column 1. Columns 3 and 4 test the robustness of these specifications to controlling for politician and constituency characteristics.

The analysis in this paper focuses on the delegation and informal incentive decisions of politicians, keeping constant the resources available to each constituency. I can test the validity of this assumption by undertaking a similar analysis as that undertaken in this section on the volume of resources a representative is able to secure for her constituency. Columns 6 and 7 of Table 4 provide results of constituency-level regressions of total resources and number of projects similar to the analysis in the baseline specification. Specifically, I regress the sum of project budgets in a constituency or the number of projects I observe, on the proportion of projects for which the congressperson is a member of the relevant committee, political competition, and their interaction, as well as project, politician and constituency controls.

I find that in both specifications there is little evidence that a congressperson is able to secure greater resources for their constituency by being a member of a standing committee. Neither of the coefficients

corresponding to  $\gamma_1$  or  $\gamma_3$  are significant at the usual levels. In contrast to Aghion et al (2005, 2009, 2010), I find that members of the Nigerian House of Representatives have influence over delegation, rather than resource control, when they are members of a standing committee. These findings support the approach taken in this paper.

The implication of the results in Table 4 is that if you are a member of a standing committee and you face zero political competition in your constituency, you are 11 percentage points more likely to centralize a project than a non-member. On the other hand, if you are a member of a committee and you face significant political competition in your constituency, you are more likely to decentralize a project. A 1 percentage point increase in political competition leads to a 0.15 percentage point increase in the probability of decentralization. Together, these coefficients imply that members in marginal constituencies will decentralize 21 percent more projects than those in constituencies with 100 percent of the vote. I observe the full distribution of competition levels in my data, and so this is a valid comparison. For the projects that I study, this implies an average shift of resources across tiers of government of US\$231,000 per constituency.

To assess the robustness of the baseline results in column 4 of Table 4, I undertake a number of checks of the preferred specification in Table A6. These are described in the Appendix. The checks probe the robustness of the results along the following margins: (i) clustering at the politician level; (ii) including organization-level controls thought to be of significance to the delegation decision; (iii) including a dummy variable that absorbs the impact of the committee chair; (iv) excluding projects implemented in the constituencies of committee chairs; (v) including a dummy variable that absorbs the impact of two-term politicians; (vi) excluding projects implemented in constituencies governed by two-term politicians; (vii) excluding projects implemented in constituencies where a politician does not have relevant qualifications or experience in the agriculture sector; and, (ix) whether the results fit the information-oriented predictions of the model of the model of moral hazard presented in section 3. The results are robust to each of these checks.

## 5.2 Causes of informal incentive provision

To assess the drivers of informal incentive provision by politicians separately from those of delegation, I need to observe differences amongst politicians in terms of the costs they face in interacting with bureaucrats. The distance to the National Assembly in the capital city of Nigeria, Abuja, to the organization, where bureaucrats can be interacted with, is a proxy for the costs of interaction. Using distance to organization as a proxy for the cost of interaction with bureaucrats, I can interact this dummy with my measure of political competition to test whether members are more prone to interacting with - and providing informal incentives to - bureaucrats who are further from Abuja when they face political competition.

The perspective taken here is that politicians face higher transaction costs when interacting with bureaucrats a greater distance from the capital city. Whilst politicians spend part of their time in their constituencies, closer to the organizations that may be far from Abuja, they are based in Abuja. The assumption here is that the monitoring process requires sufficient personal interaction that their residence in Abuja creates costs to interacting with organizations a greater distance from the capital.

However, for this variable to be a valid instrument, it should not be correlated with other factors that determine project implementation or the necessity to provide additional incentives. I therefore condition this variable on the distance of the implementing organization to the local state capital. The majority of building capacity (such as markets specializing in building materials) are based in state capitals

distributed across Nigeria. Therefore, once I control for distance to the nearest state capital, distance from the organization to the National Assembly is only a measure of the transaction cost to the politician of providing informal incentives there. To create the relevant variable, I undertake an unconditional regression at the organization level of distance to Abuja on distance to the nearest state capital. I then take the residuals of this regression to be the new variable reflecting distance to Abuja net of the variation explained by distance to the local state capital. It is a demeaned variable in the spirit of a z-score.

In summary, I use the following specification:

$$\begin{aligned} \text{Informal incentives}_{icn} = & \gamma_1 \text{distance}_n + \gamma_2 \text{competition}_c + \gamma_3 \text{distance}_n * \text{competition}_c \\ & + \gamma_4 PC_{ij} + \gamma_5 CC_c + \lambda_j + \epsilon_{icn} \end{aligned} \quad (14)$$

where I estimate for the  $i$ th project, implemented in constituency  $c$  by organization  $n$ .

$\text{Informal incentives}_{icn}$  is a continuous measure of the proportion of officials at an organization who state that politicians have a significant influence on their implementation of public projects.  $\text{Distance}_n$  is a continuous variable, centered at zero that signifies the extent of transaction costs faced by the politician as defined above;  $\text{competition}_c$  is a continuous measure on the unit interval of one minus the margin of victory in the constituency;  $\text{distance}_n * \text{competition}_c$  is an interaction between my distance measure and competition; project controls ( $PC_{ij}$ ) are the key project characteristics described above; constituency controls ( $CC_{ij}$ ) are the key congressperson characteristics and socio-economic characteristics of the constituency described above; and, project type fixed effects ( $\lambda_j$ ) absorb 10 project type level effects.

My strategy relies on the distance to the capital net of distance to the local state capital being uncorrelated with constituency-level factors that might determine which organization the politician interacts with. Particularly, it should be uncorrelated with factors that might influence how effectively an organization is able to implement the project. I therefore investigate how the distance variable I create varies with constituency characteristics to assess the validity of its exogeneity.

Abuja was an artificial creation of a Nigerian military dictator who designated it the capital in 1991. The decision to situate Nigeria in its present day location (the geographic center of the country) was based precisely on its lack of any significant pre-existing population or economic institutions. There are therefore no historical institutions that relate Abuja to the capacity to produce small scale infrastructure projects like those I study.

Figure 2 displays this argument graphically. It is a map of Nigeria's local governments, each colored by the extent to which building markets locate there. The deeper the color, the higher the index. The capital city, Abuja, is highlighted by stripes. As can be seen, centers of building capacity are located across Nigeria in a way uncorrelated with their distance to Abuja. Abuja continues to be a political rather than an economic capital for Nigeria. Whilst building infrastructure has grown up around the capital, the historical locations for building infrastructure are in the state capitals, which defines my choice of distance to local state capital as measures of building capacity access for an organization.

I can empirically test these claims by creating an index of building capacity across the country. Using data on Nigeria's market infrastructure, I aggregate the number of building markets in each local government (the basic administrative unit in my data) to create an index of 'building capacity'. I can regress this variable on distance to Abuja net of distance to state capital, and as one might expect from a visual inspection of Figure 2, it is not significant at the usual levels.

I also generate an aggregate index for each organization from this building capacity index by averaging the building capacity of all the local governments in which they are implementing an OPEN project. I

then regress this on my distance variable, and again see that an organization's distance to Abuja does not predict this index.

The evidence therefore points towards the distance to Abuja net of distance to state capital being uncorrelated with constituency-level characteristics that might have significant impacts on project implementation. Relative to local factors that determine project implementation, the variation in an organization's distance to Abuja not explained by the distance to the local state capital reflects the transaction cost of a politician interacting with a bureaucrat at that organization.

I can therefore turn to estimating specification (13). Table 5 estimates specifications similar to those in Table 4, but with the core measure of political influence over the bureaucracy as the dependent variable and distance as my instrument of interest. The dependent variable is a continuous proportion varying between 0 and 1 representing the organization-level average of bureaucrat's responses to the extent of influence politicians have over projects in the organization. I am therefore estimating the likelihood of a project being implemented by an organization with high levels of politician influence. On average, 54 percent of bureaucrats state that politicians have significant or most influence on their implementation of projects.

Since a zero value of the competition measure in the interaction corresponds to zero competition,  $\gamma_1$  estimates the interaction decisions of politicians who face low levels of competition in their constituency.  $\gamma_3$  estimates the interaction decisions of members who face high levels of competition in their constituency. These are the core coefficients of interest for specification (13).

Column 1 of Table 5 estimates the impact of distance to organization on politician's likelihood of interacting with a bureaucrat implementing a project, conditional on project characteristics and project type fixed effects. I find that organizations far from Abuja have higher levels of interaction, summarizing the finding in the model that decentralized organizations, distant from Abuja, will have generally higher levels of interaction with politicians, despite the transaction costs they must face.

However, the main interest here is whether interaction varies with the degree of political competition that a politician faces. In column 2, I introduce the measure of political competition and an interaction of this measure with an indicator of my transaction cost variable. The interaction variable is centered at zero competition, so the coefficient on committee membership describes the behavior of committee members faced by zero political competition.

The coefficient on the measure of political competition is positive ( $\gamma_2 > 0$ ), indicating that at higher levels of political competition, politicians are more likely to engage with bureaucrats, as the model predicts. Secondly, the coefficient on the interaction term is positive ( $\gamma_3 > 0$ ), implying that when a politician faces strong competition in her constituency, she is more prone to engaging with bureaucrats on projects, even when the cost to doing so is higher. The coefficient is again significant at the 1 percent level.

I find similar results when controlling for politician characteristics (column 3) and constituency controls (column 4). All coefficients on the interaction are significant at the 1 percent level. The results in column 5 undertakes a specification with all controls for the decentralized tier only. Here, at low levels of political competition, transaction costs do indeed reduce the likelihood of interaction. At high levels of political competition, political interaction increases.

Together, the results in Table 5 indicate that political competition also affects a politician's interaction with bureaucrats on public projects. Taking politicians as motivated by electoral concerns, a natural interpretation of these findings is that in closely-contested constituencies, politicians are incentivized to personally interact with bureaucrats to ensure that projects are delivered. Whether this interpretation finds support in project implementation data will be assessed in the next section.

Before that, I note a similar set of robustness checks on the results on interaction as those described for delegation. Taking a similar approach to Table A6, Table A7 provides specifications that assess potential drivers of the baseline results. These extended specifications are described in the Appendix. They probe the robustness of the results along the following margins: (i) clustering at the politician level; (ii) including organization-level controls that may be important determinants of the cost of interaction; (iii) including a dummy variable that absorbs the impact of the committee chair; (iv) excluding projects implemented in the constituencies of committee chairs; (v) including a dummy variable that absorbs the impact of two-term politicians; (vi) excluding projects implemented in constituencies governed by two-term politicians; and, (vii) excluding projects implemented in constituencies where a politician does not have relevant qualifications or experience in the agriculture sector; and, (viii) whether the results fit the information-oriented predictions of the model of moral hazard presented in section 3. The checks are again supportive of the results in Table 5.

### 5.3 Consequences of delegation and incentive provision

Sections 5.1 and 5.2 provide evidence that the distribution of public projects across tiers of government, and the political pressures faced by bureaucrats implementing them, is a function of the political competition faced by politicians. I now turn to how these two margins of politician-bureaucrat interaction impact on the outputs of public organizations.

The analysis continues to be at the project level, and the dependent variable is now the proportion of project completion, a continuous variable that takes values between 0 and 1. A project that never started has a completion level of 0, one that was half-way completed of 0.5, and one that is fully completed of 1.<sup>31</sup> This is my proxy of public output. The mean level of completion in the data is 0.5.

Given the simultaneity between delegation and incentives implied by the model of section 3, we require independent variation in our proxies of these margins to evaluate their independent effects. The instruments described in sections 5.1 and 5.2 provide such independent variation. To explain the variation in project completion, I therefore include the decentralization dummy I used to assess delegation, the continuous measure of political interaction I used in (13), my measure of political competition, as well as the battery of project and constituency controls I describe above. In summary, I use the following specification:

$$\begin{aligned} \text{proportion completed}_{icn} = & \theta_1 \widehat{\text{decentralization}}_n + \theta_2 \widehat{\text{informal incentives}}_n + \theta_3 \text{competition}_c + \\ & + \theta_4 PC_i + \theta_5 CC_c + \lambda_i + \epsilon_{icn} \end{aligned} \quad (15)$$

where I again estimate for the  $i$ th project, implemented in constituency  $c$  by organization  $n$ .

$\text{Proportion completed}_{icn}$  is the proportion completed of the public project.  $\widehat{\text{Decentralization}}$  is the instrumented projection of a dummy variable that takes the value 1 if the project is implemented by a decentralized organization and 0 otherwise;  $\widehat{\text{informal incentives}}$  is the instrumented projection of a continuous measure on the unit interval that signifies the extent of politician interaction at the organization

<sup>31</sup>The utility of a project at various degrees of completion will vary across project types. To check the robustness of the following analysis to the stage of project completion, I performed the following specifications. For all potential thresholds from 1 percent to 100 percent in increments of 1 percent, I define a dummy variable equal to one if the project completion rate is above the given threshold  $p$  percent, and zero otherwise. I then re-estimate the core instrumental variables regression used in this section for each of these thresholds. Across the full distribution of project completion rates, I find the results very similar to the baseline results.

in which the project is implemented; *competition* is a measure of one minus the margin of victory in the constituency; project controls ( $PC_{ij}$ ) are key project characteristics; constituency controls ( $CC_{ij}$ ) are key congressperson characteristics and socio-economic characteristics of the constituency; and, project type fixed effects ( $\lambda_j$ ) absorb project type level effects.

The instrumented projections of decentralization and informal incentives arise from estimating equations (13) and (14) with both sets of instruments. The results of these reduced form equations are provided in column 5 of Table 4 and column 6 of Table 5 respectively. In both cases, the reduced form equations reflect the qualitative patterns of the baseline specifications in those tables.

Before I build up to the full estimation of (15), I motivate the analysis by looking at the direct impact of the (uninstrumented) proxies for delegation and incentive provision. Table 6 presents OLS estimates of the impact of decentralization and political interaction with bureaucrats, conditional on the level of political competition. Column 1 estimates a regression of project completion rates on a decentralization dummy reflecting the tier of the organization implementing the project. In all specifications I include project, politician, and constituency controls, and project type fixed effects. The coefficient on the decentralization dummy,  $\theta_1$ , is positive, implying that decentralization increases project completion rates. It is large, explaining roughly a quarter of project completion rates, and significant, at the 1 percent level.

In column 2, I introduce the core measure of politician interaction, the proportion of projects at an organization in which bureaucrats state politicians have significant influence. The coefficient on this variable,  $\theta_2$ , is 0.51, and is significant at the 1 percent level. Since the mean level of politician influence is roughly 50 percent, this implies the average impact of politician interaction with bureaucrats implementing a project is an increase in that project's completion rate of 25 percentage points, a very similar figure to the impact of decentralization.

Column 3 then looks at the two variables together. The coefficients on decentralization and political interaction are still positive, but the coefficient on politician-bureaucrat interactions has now fallen significantly to 0.17. The coefficients imply that if the OLS results are correct, the impact of delegation is on average three times more significant for government productivity than incentive provision. Moreover, one interpretation of the fall is that politicians are interacting with decentralized organizations when they want to increase project completion rates, and the variable is simply a noisy proxy for decentralization.

To investigate this possibility, I require independent variation in both delegation and incentives. I therefore turn to the instrumental variables results. I estimate the full instrumental variables specification described by (13), (14), and (15) by two stage least squares. Column 4 of Table 6 presents this specification using my core proxy for politician interactions with the bureaucracy, the proportion of bureaucrats at an organization who state politicians have a significant impact on the success of a typical project at that organization. As a robustness check, I also estimate the full IV specification using a second proxy for politician interactions, the proportion of projects on which bureaucrats state they personally engage with politicians at an organization. This specification is presented in column 5.

I see that the two columns present similar estimates of the separate impacts of decentralization and the provision of informal incentives. I begin with the coefficient on decentralization, which in both cases is positive, significant, and large. The coefficient implies that for a project of a particular type, and of a given budget and complexity, the impact of being implemented by a decentralized organization rather than a centralized one is an increase in the completion rate of at least 40 percentage points.

These results provide estimates of the impact of decentralization conditional on political sorting leading to the non-random distribution of projects across tiers. To assess the plausibility of the findings, I

can compare this figure to the existing literature on decentralization. Fisman and Gatti (2002) study decentralization across countries, defining it as the ratio of local government expenditures over total government expenditures. They find that a one standard deviation in their measure of decentralization leads to a 30 percent reduction in corruption. Galasso and Ravallion (2005) study a Bangladeshi transfer program and find that the maximum targeting differential between tiers of government is 20 percent. Both of these figures are of a similar order of magnitude as the impacts I find here, despite measuring quite distinct concepts of decentralization in distinct contexts.

Second, I can look at the impact of the provision of informal incentives by politicians, using both measures of political interaction. By comparing columns 4 and 5 of Table 6, I see that once I take account of the impact of decentralization, the impact of politician interference falls to basically zero. Once a politician chooses the more productive decentralized bureaucrat, marginal changes in incentives have limited effects.

Taking broad interpretations of these coefficients, the delegation decision is explaining the response of bureaucratic productivity to political competition. In terms of magnitude, I can relate these findings to the literature that motivated this paper. Ferraz and Finan (2011) estimate the impact of Brazilian mayors facing election incentives, and show how such incentives lead to a reduction in the share of resources found to involve corruption of roughly 27 percent. For a similar differential in political competition in Nigeria, I find an increase in bureaucratic productivity of 10 percent. In contrast to the existing literature however, this paper has documented changes in politicians decisions that explain this relationship.

The model of section 3 also allows us to explain the pattern of bias in the OLS coefficients: a *downwards* bias in the decentralization coefficient and an *upwards* bias in the coefficient on my proxies for informal incentive provision. The system of equations requires us to understand the biases within the context of the system as a whole. The model shows how political competition drives politicians *both* to delegate public projects to decentralized organizations and to provide greater informal incentives simultaneously. The OLS coefficient on incentive provision therefore absorbs some of the impact of decentralization on project output, and is therefore upwards biased.

At the same time, I do not observe an appropriate counterfactual for projects in more competitive constituencies implemented at the centralized tier when estimating by OLS. The separation of the delegation and incentive provision decisions indicates that projects in closely-contested constituencies at the centralized tier still induce politicians to provide some degree of informal incentives. The proper counterfactual within the estimated system is a project from a close-constituency at the centralized tier without politicians providing informal incentives. In this case, my model implies, and my results support, that centralized organizations would deliver even more inferior project outputs in such constituencies. Based on an incorrect counterfactual, the OLS coefficient on decentralization is downwards biased.

The interpretation of these results suggested by the model is the following. Politicians are interacting with decentralized organizations most intensively when they are incentivized by political competition to deliver public projects in their constituency.<sup>32</sup> However, since decentralized organizations are more effective than centralized ones, it is the delegation margin along which political competition is having the most significant impacts on project completion. Once the politician has delegated to the decentralized organization, her efforts to provide incentives there are of second-order importance at best. It is that political competition drives politicians to delegate the implementation of public projects to more

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<sup>32</sup>As the results in section 5.1 show, politicians are centralizing to centralized organizations when they face limited political competition. Given the formal influence politicians have over the centralized tier, centralization may reflect politicians affecting the provision of public projects for personal consumption. For example, Besley et al (2004) find that politicians in charge of distributing fiscal transfer programs and public projects are prone to directing resources towards themselves or their ethnic group. Pande (2008) provides an overview of the determinants of political corruption in low income countries.

effective organizations of government that is driving improved completion rates in politically competitive constituencies.

An obvious question implied by this line of reasoning is why politicians continue to provide incentives when they are ineffective? It is quite plausible that politicians face the same identification problem as the econometrician. The model of section 3 implies that higher levels of political competition induce politicians to simultaneously delegate to decentralized organizations and increase their incentive provision there. In equilibrium, they do not observe the counterfactual of more delegation without an increase in incentive provision. Unless they can effectively separate the impacts of delegation and incentive provision, they interpret the impact of their efforts using a form of OLS, along the lines of column 3 of Table 6. They may mistakenly interpret their efforts as having positive impacts and thus undertake ineffective incentive provision.

To conclude this section, I turn to the question of why it is that decentralized organizations are more productive than centralized ones. First I look at whether the formal rules governing the two sets of organizations are distinct. A natural counterpart to the informal interactions politicians engage in with bureaucrats, is the formal rules bureaucrats work under. In Rasul and Rogger (2013), we formulate measures of the management practices that make up the formal rules of the organizations studied here. Extending the analysis there to the current setting, I do not find significant differences in the indices of management across tiers of government.

Second, the literature on decentralization has argued that the staff of organizations across tiers may differ. Using data from the survey of bureaucrats used in this paper, I can compare characteristics of officials in both centralized and decentralized organizations. Again, I find limited differences in basic characteristics. This is supported by my findings in tables A6 and A7 that my results are robust to a basic set of organization-level controls.

A classic claim in the decentralization literature is that bureaucrats at decentralized organizations are closer, and therefore more accessible, to citizens. This may enable citizens to better hold bureaucrats to account. I find significant support for this claim amongst the organizations I study. In the survey of bureaucrats I undertook, I asked officials the nature of interactions they had with citizens on the projects they implemented. Table A8 provides evidence that citizens are in fact more frequently holding decentralized bureaucrats to account. Whilst both centralized and decentralized bureaucrats engage with citizens in some way on roughly 40% of projects, the nature of those interactions differ across tiers. Citizens are 57% more likely to threaten a decentralized bureaucrat, 49% more likely to report the bureaucrat to her manager, and almost 90% more likely to report her to an elected official than a centralized bureaucrat. These differences provide support to the notion that decentralized bureaucrats are more frequently held to account by citizens. Given that this difference is more significant than other key margins I have investigated, it may be an important determinant of their increased productivity.

## 6 Discussion and conclusions

This paper aims to provide evidence on how politicians get bureaucrats to deliver public projects that might win them votes. It establishes the extent to which politicians influence the productivity of the bureaucracy along two specific margins: which bureaucrats they delegate the implementation of public projects to, and the incentives they provide those bureaucrats. Using data from across the Federal Government of Nigeria, I find that political competition motivates politicians to delegate the implementation of small-scale public projects to more autonomous, decentralized organizations. A politician in a

closely-contested constituency is 21 percent more likely to delegate to decentralized organizations than a politician in a completely safe seat. Political competition also motivates politicians to interact more intensively with the bureaucrats to whom they have delegated, so to provide them with informal incentives to deliver public projects. A politician in a closely-contested constituency interacts with organizations 13 percent more often than a politician in a completely safe seat.

These findings provide some of the first evidence on the causes and consequences of political interference in the bureaucracy. A growing literature identifies the positive impacts of political competition on government performance (Foster and Rosenzweig, 2004; Besley et al, 2010; Ferraz and Finan, 2011). However, the mechanisms through which political competition affects bureaucratic implementation has largely remained a puzzle. I show that politicians' delegation decisions are the key margin by which politicians improve the productivity of the bureaucracy. The 10% increase in bureaucratic productivity attributable to political competition is primarily due to politicians choosing more effective bureaucrats. Providing those bureaucrats with additional incentives has second-order effects at best.

Understanding the determinants of the resource distribution across government, and the drivers of public project completion, is essential for our ability to improve government effectiveness. The findings of this paper suggest that electoral accountability acts as a powerful mechanism to align politicians' decisions over public resources with citizen welfare. By tying politicians' electoral incentives to the effective delivery of public projects, citizens may influence them to delegate to the most productive public organizations.<sup>33</sup> A clear next step on this research agenda is to map out other margins of politicians' preferences that would lead to decisions that improve the bureaucracy's productivity. Are there aspects of politicians' relationships to their political parties, for example, that influence their interactions with the bureaucracy?

Assessing politicians' interactions with bureaucrats allows us to better understand the incentives under which bureaucrats work.<sup>34</sup> I provide some of the first quantitative evidence of the scale of political interference in the bureaucracy. The evidence from Nigeria is that politicians personally engage with bureaucrats on over 10 percent of public projects. This provides us with novel detail on the informal incentives under which bureaucrats work. There is substantial scope for more clearly outlining the nature and intensity of politicians' interactions with the bureaucracy. Along which margins do these interactions have significant impacts on government output, or as I find in this paper, more limited impacts?

That question can partly be addressed by identifying the features of organizations within the public sector that manage the relationship between politicians and bureaucrats. In my data, decentralized organizations are characterized by a higher intensity of interaction with politicians and a higher level of productivity. My results imply that building effective bureaucratic organizations within the public sector gives politicians the opportunity to support public project delivery when they face the appropriate incentives. Political competition in itself may be a necessary, but not sufficient, condition for improved public project delivery. The availability of effective public organizations for politicians to delegate to is an important determinant of the responsiveness of politicians to political competition.

When and how political competition improves the way government works has been at the research frontier for many years. New efforts to collect novel data, like that used in this paper, will allow us to answer

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<sup>33</sup>For example, Banerjee et al (2010) assess the provision of newspaper reports on legislator performance in India. They find that access to such reports increases turnout, reduces cash-based vote buying, and increases electoral gains for better-performing incumbents.

<sup>34</sup>Incentives for bureaucrats instituted by politicians can be said to be 'top-down' in nature. The literature on 'bottom-up' incentives for bureaucrats could be seen as a natural counterpart, for which there is a more extensive literature. Examples of this literature are Besley and Burgess (2002) which documents the benefits of media development on Indian local government performance, Reinikka and Svensson (2005), which studies a newspaper campaign that empowered Ugandan citizens to monitor local officials, and Olken (2007), which contrasted the impacts of community and audit monitoring efforts on the quality of rural road implementation in Indonesia. A related literature to that studied in this paper shows how management practices impact on bureaucrats' incentives and behavior (Rasul and Rogger, 2013).

those questions with increasing clarity and depth. Given the key role politicians and bureaucrats play in the public service, their interactions will be central to this analysis.

## Appendix

### Model Appendix

The full derivation of the model is as follows. The preferences of politician A are:

$$V_1^C = \pi_h^C (\gamma (\bar{q} - \kappa^C) - \bar{t}^C) - (1 - \pi_h^C) \underline{t}^C + (\kappa^C)^{\frac{1}{2}}$$

$$V_0^C = \pi_l^C \gamma (\bar{q} - \kappa^C) + (\kappa^C)^{\frac{1}{2}}$$

$$V_1^D = \pi_h^D (\gamma (\bar{q} - \kappa^D) - \alpha \bar{t}^D) - (1 - \pi_h^D) \alpha \underline{t}^D + (\kappa^D)^{\frac{1}{2}}$$

$$V_0^D = \pi_l^D \gamma (\bar{q} - \kappa^D) + (\kappa^D)^{\frac{1}{2}}$$

This leads to the following maximization problem for the politician,

$$\max_{\{\bar{t}^k, \underline{t}^k, \kappa\}} \pi_h^k (\gamma (\bar{q} - \kappa^k) - \alpha^k \bar{t}^k) - (1 - \pi_h^k) \alpha^k \underline{t}^k + (\kappa^k)^{\frac{1}{2}}$$

$$\text{subject to } \pi_h^k \bar{t}^k + (1 - \pi_h^k) \underline{t}^k - \psi \geq \pi_l^k \bar{t}^k + (1 - \pi_l^k) \underline{t}^k$$

$$\pi_h^k \bar{t}^k + (1 - \pi_h^k) \underline{t}^k - \psi \geq 0$$

Solving these constraints with equalities yields,

$$(\bar{t}^k)^* = \frac{(1 - \pi_l^k)}{(\pi_h^k - \pi_l^k)} \psi$$

$$(\underline{t}^k)^* = -\frac{\pi_l^k}{(\pi_h^k - \pi_l^k)} \psi$$

Given this, I can calculate the expected intensity of interaction to which the politician exposes the bureaucrat,

$$\begin{aligned} E[t^k] &= \pi_h^k (\bar{t}^k)^* + (1 - \pi_h^k) (\underline{t}^k)^* \\ &= \pi_h^k \left( \frac{(1 - \pi_l^k)}{(\pi_h^k - \pi_l^k)} \psi \right) + (1 - \pi_h^k) \left( -\frac{\pi_l^k}{(\pi_h^k - \pi_l^k)} \psi \right) \\ &= \psi \end{aligned}$$

I can use these facts to determine when the politician is incentivized to induce high effort at the centralized tier,

$$V_1^C \geq V_0^C$$

$$\pi_h^C (\gamma (\bar{q} - \kappa^C) - \bar{t}^C) - (1 - \pi_h^C) \underline{t}^C + (\kappa^C)^{\frac{1}{2}} \geq \pi_l^C \gamma (\bar{q} - \kappa^C) + (\kappa^C)^{\frac{1}{2}}$$

$$(\pi_h^C - \pi_l^C) \gamma (\bar{q} - \kappa^C) \geq \psi$$

And at the decentralized tier,

$$V_1^D \geq V_0^D$$

$$\pi_h^D (\gamma (\bar{q} - \kappa^D) - \alpha \bar{t}^D) - (1 - \pi_h^D) \alpha \underline{t}^D + (\kappa^D)^{\frac{1}{2}} \geq \pi_l^D \gamma (\bar{q} - \kappa^D) + (\kappa^D)^{\frac{1}{2}}$$

$$(\pi_h^D - \pi_l^D) \gamma (\bar{q} - \kappa^D) \geq \alpha \psi$$

Under what conditions in each of the effort settings would the politician delegate to the decentralized organization over the centralized organization? For the high effort equilibrium,

$$V_1^D - V_1^C \geq 0$$

$$\begin{aligned} \pi_h^D (\gamma (\bar{q} - \kappa^D) - \alpha \bar{t}^D) - (1 - \pi_h^D) \alpha \underline{t}^D + (\kappa^D)^{\frac{1}{2}} - \pi_h^C (\gamma (\bar{q} - \kappa^C) - \bar{t}^C) + (1 - \pi_h^C) \underline{t}^C - (\kappa^C)^{\frac{1}{2}} &\geq 0 \\ (\pi_h^D - \pi_h^C) \gamma \bar{q} - (\alpha - 1) \psi - \pi_h^D \gamma \kappa^D + (\kappa^D)^{\frac{1}{2}} + \pi_h^C \gamma \kappa^C - (\kappa^C)^{\frac{1}{2}} &\geq 0 \end{aligned}$$

Substitute in the optimal levels of corruption and simplify,

$$(\pi_h^D - \pi_h^C) \gamma \bar{q} - (\alpha - 1) \psi - \pi_h^D \gamma \left( \frac{1}{2\pi_h^D \gamma} \right)^2 + \left( \frac{1}{2\pi_h^D \gamma} \right) + \pi_h^C \gamma \left( \frac{1}{2\pi_h^C \gamma} \right)^2 - \left( \frac{1}{2\pi_h^C \gamma} \right) \geq 0$$

$$(\pi_h^D - \pi_h^C) \gamma \bar{q} - (\alpha - 1) \psi - \frac{\pi_h^D - \pi_h^C}{4\pi_h^D \pi_h^C \gamma} \geq 0$$

## Data Appendix

### DA.1 Sample of projects

The Overview of Public Expenditure in NEEDS (OPEN) monitoring and evaluation process forms the basis of the sample of projects selected for this study. The OPEN evaluation was set up in 2006 and “was

adopted as the mechanism to monitor and evaluate public expenditure” (Federal Government of Nigeria, 2009a). The scheme intended to monitor the implementation of projects to be funded by debt relief savings and evaluate their outcomes. The evaluation reports from the first two rounds of this process act as the basis for the data used in this paper.

The President created an ‘OPEN office’ with a Presidential mandate to track and report on the expenditure of the debt relief gains. Rather than set up a parallel organization to spend debt relief savings, as had been done elsewhere, OPEN was seen as an opportunity to “find out where the most significant barriers to public expenditure lay” (Federal Government of Nigeria, 2007a). Thus, it was decided to channel the funds through standard institutions of government: the ministries, departments, and agencies of the Federal Government. This enables us to use the OPEN evaluation as a window into the workings of Nigeria’s government.

As background, it is worth understanding a little about the context in which the OPEN initiative was started. In 1999, Nigeria transitioned to a democratic government under President Olusegun Obasanjo after more than a decade and a half of military dictatorship. The new administration inherited a huge external debt portfolio.<sup>35</sup> Partially motivated by the promise of debt relief, the newly-elected President began his second term aiming to strengthen Nigeria’s economic position. A fiscal rule was introduced to de-link public expenditures from volatility in oil-revenues, state institutions were privatized, and a number of sectors deregulated to encourage private sector participation. Based on the thrust of the government’s reform agenda, the Paris Club granted Nigeria debt relief of about US\$18billion in September 2005. This translated to annual debt-service savings of roughly US\$1billion, US\$750 million of which would accrue to the Federal Government. The OPEN evaluation reports evaluate the effectiveness of the federal portion of these savings.

The President directed that debt relief expenditures go to “core projects and programs in the social sector” (Federal Government of Nigeria, 2007a). A comparison of the distribution of funds in the OPEN program with that in the Federal Government budget as a whole indicates that the sample is representative across sectors. The OPEN office helped direct funds to a relatively representative sample of the nation’s small-scale social-sector projects. All were suppose to take roughly 12 months to complete. This implies they are not representative of the entire budget, which includes much recurrent expenditure (salaries, materials and supplies, and so on) and the funding of large scale dams, oil refineries and so on. However, they are representative of social-sector capital expenditures.

In the survey of bureaucrats I use in this paper, I was not able to undertake a survey at the decentralized organization to which electrification projects can be delegated. I therefore have to exclude all electrification projects for this analysis.

I hand-coded the information from the 21,000 documents and project files that made up the monitoring and evaluation report of the OPEN initiative for 2006/7. This makes up the set of representative evaluations of Federal Government public projects on which I draw.

From this representative set, I defined a dummy variable that indicated whether a project was inherently national in nature, or could be implemented by organizations at different tiers of government. The analysis in this paper focuses on projects that are delegatable, rather than being specialized so that they could only be implemented at a single tier of government. The projects excluded are those projects whose scope is national or multi-jurisdictional (across many states for example).

The guidelines for excluding projects on the basis that they were not able to be decentralized were the following. A project cannot be decentralized if: (i) it contains components that require access to

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<sup>35</sup>Nigeria’s Debt Management Office estimated that the nation owed external creditors US\$36billion at the end of 2004, which was roughly twice the value of annual government expenditures (Debt Management Office, 2005).

international policy inputs; (ii) it contains components that require engagement with stakeholders at the national or international level; or, (iii) the scope of the project crosses multiple jurisdictions beyond the mandate of any single decentralized organization.

An example of a project that was not delegatable or decentralizable is from the Ministry of Women Affairs. It was entered into the budget as ‘Development and production of 2000 copies of a National Gender Policy (NGP) and 2000 copies of its Strategic Implementation Framework for the sustenance of gender equality perspective in all sectors’. This project requires international-level technical assistance, inputs from multiple sectors, and national-level engagement with international donors and Nigerian stakeholders. Thus, given the constraints on national and international engagements in the Public Service Rules, it is infeasible that this would be implemented by any organization but the Ministry of Women Affairs.

On the other hand, a borehole to be provided in Borno state could equally be implemented by the Ministry of Water Resources or the Chad Basin River Basin Development Authority. Such a project is specific to a single jurisdiction, has technical specifications that can be handled by either organization, and is permissible for implementation at either tier of government in the Public Service Rules.

## **DA.2 Politician characteristics**

To effectively characterize the politicians studied in this paper, I constructed biographies of each of the 360 representatives in the 5th (2003-7) National Assembly. I undertook the following process.

I drew the list of winning politicians from the Independent National Electoral Commission’s ‘Compendium of Results of the 2003 General Elections: Vol.1: Presidential and National Assembly Elections’. Where there were electoral tribunals, I followed the judicial process for each and noted where there was a change of representative and the date on which the successful petitioner took up office. I also used National Assembly web site records to identify any deaths amongst the congresspersons. This defined a complete set of representatives relevant to the 2006 and 2007 budget processes.

For each politician, I then hand-coded basic demographic information (sex, age and education) from the National Assembly’s ‘Nigeria Legislature 1861-2011: Compendium of Members and Officials’. In the very small number of places where age was missing, I either confirmed this using other sources or replaced their age with the mean of all representatives and include a dummy indicating that age was missing in all specifications that include representative age.

I then built up a profile of the career of each representative and coded their relevant experience into the sectors of the standing committees in the data. These represent all the major social sectors. Only substantive experience in a sector over a sustained period of time was counted as relevant experience. To give a brief overview of how I sorted candidates into sectors, those with a training in finance or who had been a financial officer at a large private firm or public organization were coded as having experience in finance. Doctors or other health professionals such as nurses, pharmacists, or affiliates of medical institutions were coded as having experience in health. Electrical or other relevant engineers and those involved in contracting power facilities were coded as having experience in the power sector. Mechanical engineers or those with experience in river basins management were coded as having experience in the water sector. Farmers and those involved in the agro-processing industry were coded as having experience in the agriculture sector. Women and those who have engaged with gender-focused organizations were coded as having experience in the women’s sector. Civil engineers or those with experience in building large-scale urban infrastructure were coded as having experience relevant to to the Committee on the Federal Capital Territory. Anyone who had qualifications in environmental management or worked for an organization with experience implementing environmental projects was coded as having experience

relevant to the environment sector. Architects and those involved in small-scale urban development projects were coded as having experience in the housing sector.

The information for the biographies came first from the National Assembly web site, and where relevant from the publication, 'Nigeria's 4th Republic Handbook 1999-2003'. Where these did not yield sufficient detail, a comprehensive search of the AllAfrica archive of all newspaper articles from major Nigerian newspapers was used to collect biographical information. Finally, when this was insufficient, simple Google searches yielded biographical details. In roughly 15 percent of cases this did not yield an appropriate biography of the individual. In such cases, I took the most conservative approach and coded that individual as having no relevant experience.

I then used education regulations from Nigeria's education sector to define years of education variables from the collection of qualifications that each representative had earned. For the very small number of representatives for which educational qualifications were not available, I replaced their years of education with the mean of all other representatives and include a dummy indicating that years of education is missing in all specifications that include representative years of education.

### **DA.3 Process of defining committee membership**

The Selection Committee of the House of Representatives selects those politicians they deem fit to be members of the standing committees. Section XVII of the House Standing Orders states that, "There shall be a Committee to be known as the Committee on Selection appointed at the commencement of every Assembly ... The Committee's jurisdiction shall cover nominating Members to serve on Standing and Special Committees" amongst other duties.

The Selection Committee is required to select committee members such that each committee is representative of Nigeria in terms of its six geo-political regions (North Central, North East, North West, South East, South South, South Central) and the strength of the parties in the House. For example, Order XIV of the House Standing Orders states, "Members of Committees shall be nominated by the various political parties and appointed by the Committee on Selection in accordance with their strength in the House."

The Selection Committee has a guiding principle to match representative's qualifications with the committees on which they sit. For example, the vice chairman of the Committee on Selection states, as reported in This Day newspaper, "The Selection Committee ... considered cognate experience, areas of specialization and zonal representation in order to ensure that the chairman and vice chairman of a committee do not come from the same geopolitical zone." (This Day, 2007).

For each committee, the House Standing Orders outline the list of topics to which the House delegates oversight responsibility. For example, the Health Committee's jurisdiction covers specialist hospitals, teaching hospitals, medical research, federal medical centers, and a host of other topics including 'health matters generally'. The Selection Committee therefore determine, for each committee, those members who have relevant qualifications to provide appropriate oversight of the sector. They then choose individuals from this set within each geo-political zone, and within the appropriate proportions of the relative weights of the parties in the House.

Since I have only coded the committees relevant to the social sectors, I observe some politicians sitting on no committees. They are likely to sit on a committee outside of the social sectors. Some representatives serve on multiple committees, and the maximum number of committees a representative sits on is 4. To understand how this reconciles with the need for sectoral knowledge, some politicians have qualifications/experience in multiple sectors. For example, they may be a qualified doctor who is a professor of

medicine at a university. This individual would likely serve on both the health and education committees. Where there are small changes to the committees over time, I use the membership relevant to the 2006 and 2007 budgets.

As was seen in section 5.1 of the main text, there is strong evidence that the Selection Committee does this based on the three factors of geo-political and party representation and relevant qualifications and experience. In a number of fora, members of the Selection Committee have stated that once they must find a doctor within the North-East zone from the ruling party, there is typically very little room for other factors to play a role. This was confirmed by interviews with the secretaries of the standing committees and with external academics.

#### **DA.4 Project controls**

To control for a range of constituency-level characteristics, I use data from the largest household survey ever undertaken in Nigeria, the 2005 Core Welfare Indicators Questionnaire (CWIQ). The CWIQ survey targeted 77,400 households, 100 in each local government area. I define a battery of controls from the CWIQ survey along the following lines. One might expect politicians to delegate to areas of need, where deprivation is highest or where there are significant degrees of inequality. I therefore construct constituency-level means and standard deviations of the following indices: the proportion of poor in the constituency, measured by a national poverty index, the average years of education of the household head, the proportion of constituents with access to potable water, the average time in minutes to the nearest primary school, and the average journey time in minutes to the nearest secondary school. These indices reflect the sectors under which the majority of the projects in my data fall.

One may also expect politicians to respond to recent investments in their constituency. For example, a politician may feel less inclined to invest in an area that has recently received substantial public projects investments. To reflect the frequency with which constituents have benefited from a public project of the named type in the five years preceding the survey, I also construct indices of whether constituents have received: construction of electrification infrastructure, rehabilitation of electrification infrastructure, a well/borehole, construction of piped water infrastructure, rehabilitation of piped water infrastructure, sanitation, school construction project, school rehabilitation, health facility construction, health facility rehabilitation, road construction, tarring/grading of roads, transportation services, and agricultural-inputs schemes. Again, these indices correspond to the sectors of the projects I study.

Finally, there may be complementarities between the economic environment and public investments. For example, greater access to credit may lead citizens to demand public projects that will facilitate their use of that credit. Politicians may therefore respond to the economic dynamics of a constituency in their delegation decisions, and so I create indicators of changes in opportunities for employment, the availability of agricultural inputs, number of buyers of agriculture produce, the availability of extension services, the availability of credit facilities, and the availability of consumer goods.

#### **DA.5 Defining complexity indicators**

Data on the complexity of government projects is not collected by the Nigerian Government, nor is it a part of the OPEN data set. To create this data, I worked with a pair of Nigerian engineers familiar with the OPEN projects and a number of international researchers working on project technical complexity to define a relevant set of indicators. I followed the perspectives on complexity suggested by Remington

and Pollack (2007), by asking the engineer-assessors to individually assess projects along the following five topics, each with its own set of indicators.

*Structural complexity* stems from the scale of different interconnected tasks and activities. The indicators associated with this topic capture structural aspects such as project size and the number of inputs required for production. They also capture issues in raw material and labor supply, and the ease with which any necessary specialized skills and equipment can be sourced. *Temporally complex* projects are those in which production involves uncertainties. Hence there are indicators for uncertainties in design and implementation. *Technically complex* projects are those in which production have ambiguous risks, namely their uncertainties are not well understood. Hence some indicators capture ambiguities in design and implementation. *Directional complexity* refers to the potential for preferences over the project to diverge. The engineer assessors were thus asked to rate the managerial complexities of the project. Finally, there is a subjective assessment as to the overall complexity of the project. This allows any unassessed aspects of complexity to be measured and provides a coherent picture of project complexity.

Two qualified and independent Nigerian engineers were then contracted to assess each project in the OPEN data set along these margins. The process of aggregation between engineers used in this project aimed to build a consensus. The first engineer coded indicators for the entire data set. The codings of the first engineer were then provided to the second engineer, who then constructed his own codings with reference to the codings of the first. The aim was to anchor the coding of the second engineer in that of the first, but give him freedom to disagree where he felt the coding was incorrect. Other methods would have been to have them code independently and average the two data sets or to have them work together. I decided that this approach was a balance between consensus and subjectivity.

The two engineers were provided with project details and documents, and asked to code a value for each indicator. The documents only contained information available *before* implementation, such that there was no bias from the coding being done after the projects were implemented.

Table A5 provides descriptive statistics for all 16 indicators from which the complexity index is constructed, as well as how each is correlated with the other indicators. Aggregate complexity is a subjective assessment of the overall complexity of the projects by the two engineers, that includes ‘all factors that might influence the difficulty of implementing the project, not only those assessed [by the other indicators]’. I asked the engineers to take the distribution of complexity in the OPEN data set as a whole, with the least complex project in the data having an aggregate complexity of zero and the most complex project having an aggregate complexity of 100, and place each project within this distribution.

I undertook a number of measures to check the complexity of the OPEN indicators coded by the engineers. First, I inserted 200 randomly chosen repeated projects into the data set provided to the engineers. Since the project characteristics of the original and repeat projects are identical, I would expect that the codings of the two sets of projects would be similar. Reassuringly, I find that in general the original and duplicate projects are coded in similar ways. I compare the differences between these two sets by looking at group and paired means, and distributional tests for each variable. The differences are only statistically significant at conventional levels in a few cases, and the magnitude of the differences are relatively small. For example, the only variable that is statistically significantly different below the 10 percent level in the mean-comparison t-test relates to raw material storage. Here, despite a standard deviation of 0.2 in the originals, the difference is 0.07 between the originals and the duplicates.

Second, I looked at the similarity of the codings of the two engineers. I find that the second engineer’s codings are not dramatically different from the first engineer’s efforts. Whilst there is a small number of differences, they are limited and rarely significant at the usual levels, indicating that the re-coding left the overall picture relatively stable.

Finally, more than a year after he had completed the prompted codings, I asked the second engineer to re-code a sub-sample of projects from scratch, this time without prompting by the first engineer’s coding choices. The differences between these independent codings and the consensus data on which I rely are again relatively minor. It seems that once he had become accustomed to the broad parameters of the coding framework, the second engineer’s coding was not dissimilar to the consensus generated by the two engineers working one after the other.

There is therefore evidence of similar projects within the data set being coded in a similar way; of the two engineers coding in similar ways both when prompted and unprompted; and when there were deviations, of the deviations being quantitatively small. Taken together, these checks reassure us that the complexity measures pick up meaningful variation across projects, rather than merely picking up noise that should have led to the multiple reports (either across engineers or over time) being uncorrelated.

These measures of complexity allow me to condition all the specifications on the aggregate complexity of the project, which are likely to be important determinants of project completion. They also allow me to define indices of local and national information needs (akin to measures of whether a particular tier  $k$  has a higher increase in the probability of project delivery when bureaucrats exert high effort;  $\pi_h^k - \pi_l^k > \pi_h^{k'} - \pi_l^{k'}$ ). Given how important information has been to the study of delegation (Moe, 2005; Mookherjee, 2006), it is important to understand how I am controlling for the informational demands of each project. The literature on delegation emphasizes the possible importance of superior information at a tier of government as a rationale for delegation. Some projects require a lot of local information to be implemented. For example, they may require sourcing of materials from the local area or be characterized by a high degree of uncertainty that requires local information to respond to. Similarly, some projects may require a lot of information more readily available at the national level. For instance, sourcing international expertise is something national organizations are likely to be better at procuring than local organizations.

I asked one of the engineers with whom I’d worked to define the complexity data to allocate the complexity variables to one of three indices: (i) indicative of the project requiring local information for successful implementation; (ii) indicative of the project requiring national information for successful implementation; or, (iii) indicative of neither. This process led to three complexity indices being generated using z-scores of the underlying variables. These indices were: (i) localized information index (containing the variables ‘Storage of raw materials’, ‘Requires local labor’, ‘Access to construction equipment’, ‘Design uncertainty’, ‘Implementation uncertainty’, ‘Design ambiguity’ and ‘Implementation ambiguity’); (ii) national information index (containing the variables ‘Access to raw materials’ and ‘Requires skilled labor’); and (iii) neither information index (containing the variables ‘Project size’, ‘Number of inputs’, ‘Number of methods’, ‘Interdependencies’, ‘Difficulty to manage’ and ‘Number of agencies involved’).

## Results Appendix

### RA.1 Robustness of delegation results

To assess the robustness of the baseline results in column 4 of Table 4, I undertake a number of checks of this preferred specification in Table A6. I include the baseline specification in column 1 of Table A6 for reference.

First, one may believe that decisions made by a politician relating to her constituency are correlated. I am therefore motivated to cluster the results at the politician level. Column 2 of Table A6 reruns the

preferred specification clustering the standard errors at the politician level. The core coefficients are both still significant at the 5 percent level.

Second, I may be concerned that characteristics of the organization are driving the decision to delegate projects across tiers. While I do not seek to explain the difference in performance across tiers of government here, it is informative to understand whether my results are robust to a number of basic controls that are said to be of first order importance to delegation decisions. First, the decentralization literature has stated that centralized organizations may have more highly educated bureaucrats. I therefore include the average years of education of officials at each organization. Second, I may be concerned that officials at different tiers of government have different incentives to be in government. In particular, the literature on decentralization emphasizes that bureaucrats may differ in how intrinsically, rather than extrinsically, motivated they are. To proxy the degree of intrinsic motivation of the bureaucrats I study, I use a question from the representative survey of bureaucrats I undertook. To measure civil servant's intrinsic motivation, I asked bureaucrats which factor had most influenced them to originally enter the civil service, and those that stated 'the chance to serve Nigeria' are coded as being intrinsically motivated.<sup>36</sup> Third, I include a proxy for the extent of sorting of bureaucrats across tiers. The most closely related paper to this one, Iyer and Mani (2012), shows how Indian politicians move bureaucrats around the civil service for their own ends. This does not seem to be feasible in Nigeria, due to the independence of the civil service commission that defines bureaucratic postings. However, I include a variable from the survey of bureaucrats to control for this. The variable I use is the proportion of officials at the organization who state that their placement was 'random'. Note that well over 90 percent of bureaucrats state that influence was not involved in their posting, and over 60 percent believe their posting was random. When I include these variables, the core coefficients are still significant at the 5 percent level.

Now I turn to a concern that arises from a reading of another related economics literature. In their studies of standing committees in the US Congress, Aghion et al (2005, 2009, 2010) and Cohen et al (2011) emphasize the importance of the chair to the decisions of a committee. They argue that a chair has additional power to implement her political agenda through the committee. I can assess the extent to which this is true in the context of this study, as well as whether the chairs of the committees are driving the results.

First, I can include a chair dummy, which takes the value 1 when a project is implemented in the constituency of a chair of the relevant sectoral committee. I include such a dummy in column 4 of Table A6. I find evidence that the chair centralizes even more projects than other members of the committee. Comparing the coefficients on the core variables to those in column 1, I find that the core coefficients do not change substantially when I include a chair dummy.

I can also test for the impact of the chair by excluding projects from constituencies in which the politician is chair of the relevant sectoral committee. Column 5 of Table A6 repeats the core specification excluding all projects in which the constituency politician is chair of the committee corresponding to that project's sector. I find that there is little change in the coefficients of interest.

An aspect of congress that is often studied in economics and political science is politician power. I therefore assess whether the results are driven by the most powerful politicians in the House of Representatives. Following the political economy literature for the US, and echoing similar work for Nigeria, an

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<sup>36</sup>The question used to determine intrinsic motivation asked bureaucrats which factor had most influenced them to originally enter the service from the following options: 'I was interested in the type of work', 'income prospects', 'the prestige associated with such a job', 'the stable career path that a job in the service affords', 'the chance to serve Nigeria', 'it was the only employment I could get', 'educational opportunities', 'other'. Roughly 40 percent stated, 'the chance to serve Nigeria', and it is the modal answer. I then construct the fraction of intrinsically motivated bureaucrats for each organization. The other two most frequent reasons were 'I was interested in the type of work' and 'the stable career path that a job in the service affords', that were each given by around 20 percent of individuals.

often used proxy for the relative power of a congressperson is the number of terms she has served. Given that democracy was instated in Nigeria in 1999, I can observe at most two-term representatives in the National Assembly in 2006/7.<sup>37</sup> I therefore define a dummy for projects implemented in constituencies of two-term representatives.

Adding this dummy to the baseline specification in column 6 of Table A6, I find that being a two-term politician does not impact on the pattern of delegation. The coefficient on this variable is close to zero. I can also exclude projects in constituencies of two-term politicians, as I do in column 7 of Table A6. I find the coefficients on the core variables are similar to the baseline specification, although slightly larger.

Finally, I return to the discrepancy identified in the analysis of the determinants of committee membership. It was seen in section 4.1 that constituency-level characteristics had limited impact on committee selection for all sectors bar agriculture. However, there seemed to be indications of selection for the agriculture committee. I therefore exclude from the analysis agriculture projects in all constituencies where a member of the Agriculture Committee does not have relevant qualifications or experience in the agriculture sector. The results of this regression are reported in column 8 of Table A6. I find that the core coefficients are very similar to the baseline specification and continue to be significant at the 1 percent level.

Another way of checking the robustness of the approach taken in this paper is to test other predictions of the moral hazard model. As described in section 4.2, I had engineers code, for each project, the aggregate complexity of each project and its informational demands at the national and local levels. These are proxies for  $\pi_h$  and  $\pi_h^k - \pi_l^k$  respectively, implying I can test the comparative statics of equation (12) with respect to these quantities. I see that an increase in complexity (a reduction in  $\pi_h$ ) leads to greater centralization. One interpretation of the model I present is that different  $\pi_h^k - \pi_l^k$  across tiers implies national (local) information requirements induce politicians to delegate projects to the centralized (decentralized) tiers. In column 1 of Table A6, I include the coefficients on the complexity and information indices estimated in the baseline specification. I see that both the complexity and information indices display the correct signs and are all significant at the 1 percent level, as predicted by the model.

## RA.2 Robustness of informal incentive provision results

To assess the robustness of the baseline results in column 4 of Table 5, I undertake a number of checks of this preferred specification in Table A7. Column 1 repeats the preferred specification of Table 5 for comparison.

In column 2, I check whether the results are robust to clustering at the politician level. The coefficient on the interaction continues to be significant at the 1 percent level, but the coefficient on the distance variable itself is no longer significant.

Column 3 checks whether the results are robust to a number of key organization controls: the average years of education of officials at each organization, the degree of intrinsic motivation of the bureaucrats, and the degree to which officials were posted to the organization under influence of politicians. Once I include these variables in the baseline specification, the coefficients change slightly, but they are similar in magnitude to the baseline specification and still significant at the 1 percent level.

I now turn to the potential impact of the most powerful members of the legislature. As described above, committee chairs are said to be powerful members of the US Congress, and thus I introduce a dummy to the baseline specification in column 4 of Table A7 that indicates whether the project is in the constituency

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<sup>37</sup>Nigerian congresspersons serve 4 year terms and there are no term limits on the number of times a politician can serve.

of the relevant chair to the project. Chairs may have additional authority to engage bureaucrats that other members may not, and it may be important to understand their role in the observed patterns. The coefficient on the dummy is significant at the 10 percent level, indicating that chairs do in fact interact more intensively with the bureaucracy. However, the core coefficients are the same as in the baseline specification, indicating that chairs do not play a significant role in explaining the patterns of engagement I observe. This interpretation is supported by the finding in column 5 that excludes projects in the constituencies of chairs. I see that the core coefficients are similar to those of the baseline.

Politicians with experience in the National Assembly may better understand how to work with the bureaucracy and affect the change they desire. I therefore test whether the results are driven by those politicians who have more experience by defining a dummy for projects implemented in constituencies of two-term representatives. Adding this dummy to the baseline specification in column 6 of Table A7, I find that being a two-term politician is associated with a slightly higher level of engagement with the bureaucracy. However, again the core coefficients are unchanged. Excluding projects in constituencies of two-term politicians, as I do in column 7 of Table A7, I find a similar pattern of coefficients to the baseline specification.

Finally, I return again to the discrepancy identified in the analysis of the determinants of committee membership. It was seen in section 4.1 that constituency-level characteristics had limited impact on committee selection for all sectors bar agriculture. In case the agriculture sector is distinct in ways that impact on engagements between politicians and bureaucrats, I test the robustness of the baseline specification to the exclusion of projects in constituencies where a member of the Agriculture Committee does not have relevant qualifications or experience for the agriculture sector but is on the committee. The results of this regression are reported in column 8 of Table A7, and the results are similar to the baseline specification.

I can also run a similar set of checks on the engagement specifications using other predictions of the moral hazard model as I did for the delegation specification. From the model, I see that complexity decreases the degree of incentive provision, and thus interaction, while greater tier-related information leads to greater interaction due to the higher returns to providing incentives. Column 1 of Table A7 reports the coefficients corresponding to the complexity and information indices for the baseline specification. I see that they are all of the correct sign and significant at the 1 percent level.

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**Table 1: Investigating the Differences in Constituency Characteristics by Level of Competition**

Means, standard deviations and p-values of differences

	(1) All constituencies	(2) 10% most competitive constituencies	(3) 10% least competitive constituencies	(4) p-value of difference between 2/3
<i>Politician characteristics</i>				
<b>Sex [female=1]</b>	0.06 (0.23)	0.06 (0.24)	0.12 (0.33)	0.38
<b>Politician age</b>	47.70 (6.93)	46.71 (4.34)	49.17 (8.13)	0.13
<b>Politician years of education</b>	16.17 (1.58)	16.26 (1.09)	15.62 (1.61)	0.06
<b>Tenure in house [second term=1]</b>	0.27 (0.44)	0.23 (0.43)	0.15 (0.36)	0.39
<i>Constituency characteristics</i>				
<b>Proportion of constituency population in extreme poverty</b>	0.23 (0.15)	0.26 (0.14)	0.23 (0.15)	0.47
<b>Standard deviation of poverty index</b>	0.38 (0.1)	0.41 (0.08)	0.38 (0.11)	0.22
<b>Proportion of constituents with access to potable water</b>	0.48 (0.27)	0.37 (0.24)	0.52 (0.24)	0.01
<b>Standard deviation of access to potable water</b>	0.41 (0.1)	0.41 (0.09)	0.44 (0.07)	0.17
<b>Average hours of electricity in a day</b>	4.46 (3.89)	3.69 (3.03)	4.80 (4.19)	0.21
<b>Standard deviation of hours of electricity</b>	5.37 (2.25)	5.50 (2.5)	5.48 (2.49)	0.98
<b>Time in minutes to nearest primary school</b>	20.33 (7.27)	22.25 (5.86)	19.43 (6.6)	0.07
<b>Standard deviation of time to nearest primary school</b>	14.39 (4.26)	14.88 (3.6)	14.78 (4.53)	0.92
<b>Time in minutes to nearest secondary school</b>	33.43 (10.04)	35.05 (7.66)	33.15 (10.71)	0.40
<b>Standard deviation of time to nearest secondary school</b>	16.63 (3.37)	16.95 (2.41)	17.21 (3.43)	0.72
<i>OPEN projects</i>				
<b>OPEN funds allocated per constituency (US\$)</b>	1,100,000 (1,900,000)	1,500,000 (1,600,000)	1,100,000 (1,000,000)	0.28
<b>Average level of progress of constituency projects</b>	0.46 (0.25)	0.50 (0.23)	0.38 (0.24)	0.03
<b>Observations</b>	345	35	35	

**Notes:** Standard deviations are in parentheses. Politician characteristics are a dummy variable indicating the sex of a politician, which takes the value 1 when the politician is female, the age in years and years of education of the relevant politician, and whether they were in congress in the 1999-2003 National Assembly (before which Nigeria was ruled by a military government). In the very small number of cases in which age or years of education are missing, I replace the missing value with the mean of the rest of the politicians and include a dummy variable to indicate the missing data. Constituency characteristics are comprised of the means and standard deviations of the following indices: the proportion of poor in the constituency, measured by a national poverty index, the average years of education of the household head, the proportion of constituents with access to potable water, the average time in minutes to the nearest primary school, and the average time in minutes to the nearest secondary school. T-tests are performed under the assumption of equal variances when the chi-squared test statistic is less than or equal to 3.84, and under the assumption of unequal variances otherwise. Figures are rounded to two decimal places or significant figures where relevant. I have weighted constituencies equally.

**Table 2: Descriptive Statistics of Nigeria's Federal Organizations, by Tier**  
Means, standard deviations, and p-values of differences with centralized organizations

	(1) Centralized	(2) Decentralized	p-value of difference between (1)/(2)
<i>Organization characteristics</i>			
<b>Number of organizations</b>	7	47	-
<b>Total budget (millions of US\$)</b>	- 190 (187)	- 11 (11)	0.05
<b>Capital budget (millions of US\$)</b>	130 (150)	7 (11)	0.07
<b>Personnel budget (millions of US\$)</b>	17 (13)	3.6 (2.8)	0.04
<b>Overheads budget (millions of US\$)</b>	11 (17)	0.41 (0.26)	0.16
<b>Number of staff at organization</b>	5,700 (6,400)	720 (480)	0.09
<b>Distance to Abuja (km)</b>	0 (0)	310 (170)	0.00
<b>Federal constituencies served in OPEN data</b>	48 (88)	15 (38)	0.08
<i>OPEN projects</i>			
<b>Number of projects</b>	822	2,187	-
<b>Average project budget (millions of US\$)</b>	- 0.18 (0.53)	- 0.11 (0.48)	0.00
<b>Average project complexity</b>	0.40 (0.24)	0.23 (0.17)	0.00
<b>Proportion focused on rehabilitation</b>	0.27 [0.14]	0.18 [0.19]	0.00
<b>Proportion focused on construction</b>	0.82 [0.56]	0.85 [0.57]	0.07
<b>Proportion never started</b>	0.50 [0.36]	0.31 [0.30]	0.00
<b>Average level of progress of organization projects</b>	0.34 [0.49]	0.57 [0.56]	0.00
<b>Proportion completed conditional on being started</b>	0.68 [0.49]	0.83 [0.56]	0.00
<b>Proportion fully completed</b>	0.20 [0.34]	0.44 [0.39]	0.00
<b>Proportion started with satisfactory quality</b>	0.73 [0.37]	0.83 [0.56]	0.00

**Notes:** Standard deviations are in round parentheses. In square parentheses are corresponding averages for the variable in question weighted by the project budget. Abuja is the capital city of Nigeria. Organization budget data are an average of organization budget figures for the years 2006-7. Data on number of staff are mainly from administrative data. In the few cases where I do not have the staff numbers explicitly, I estimate them from the personnel expenditures, which are correlated with staff numbers with a magnitude of over 0.9. Centralized organizations are main ministries which act as the central organizing authority for the sector. Decentralized organizations are 'parastatals', with day-to-day running largely independent of the central authority. Figures are rounded to two decimal places. T-tests are performed under the assumption of equal variances when the chi-squared test statistic is less than or equal to 3.84, and under the assumption of unequal variances otherwise. I have weighted organizations equally.

**Table 3: Descriptive Statistics of Political Interactions with Bureaucrats, by Tier**  
Means, standard deviations, and p-values of differences with centralized organizations

	(1) All organizations	(2) Centralized	(3) Decentralized	(4) p-value of difference between (2)/(3)
Proportion of bureaucrats who state politicians impact projects significantly	0.54 (0.16)	0.38 (0.08)	0.60 (0.13)	0.00
Proportion of managers who state politicians impact projects significantly	0.52 (0.16)	0.40 (0.04)	0.57 (0.16)	0.00
Proportion of non-managers who state politicians impact projects significantly	0.53 (0.24)	0.27 (0.15)	0.63 (0.18)	0.00
Proportion of projects involving personal engagement of member of National Assembly	0.14 (0.07)	0.08 (0.05)	0.16 (0.07)	0.00
<b>Organizations</b>	54	7	47	

**Notes:** Standard deviations are in parentheses. Decentralized organizations are 'parastatals', with day-to-day running largely independent of the central authority. Figures are rounded to two decimal places. T-tests are performed under the assumption of equal variances when the chi-squared test statistic is less than or equal to 3.84, and under the assumption of unequal variances otherwise. I have weighted organizations by the number of projects they implement in the OPEN data set so to reflect the intensity of interaction between politicians and bureaucrats.

**Table 4: Delegation by Politicians to Centralized and Decentralized Organizations**

**Dependent Variable Cols 1-4: Indicator of decentralization [decentralization=1]; Column 5: Sum of project budgets within relevant federal constituency (in millions of Naira); Column 6: Count of projects within relevant federal constituency**

**Robust Standard Errors**

**OLS Estimates**

	(1) No interaction	(2) Interaction	(3) Politician controls	(4) Constituency controls	(5) Reduced form	(6) Total constituency resources	(7) Number of projects in constituency
<b>Politician member of relevant committee [yes=1]</b>	0.00 (0.01)	-0.12*** (0.03)	-0.13*** (0.03)	-0.11*** (0.03)	-0.06*** (0.02)	-52.3 (96.10)	3.29 (2.23)
<b>Level of political competition</b>	0.02 (0.02)	-0.04 (0.03)	-0.04 (0.03)	-0.03 (0.03)	0.01 (0.02)	-5.86 (94.20)	2.21 (1.51)
<b>Politician member of relevant committee x level of political competition</b>		0.18*** (0.04)	0.19*** (0.04)	0.18*** (0.04)	0.08*** (0.03)	138 (145)	-3.48 (3.02)
<b>Project controls</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Politician controls</b>	No	No	Yes	Yes	Yes	Yes	Yes
<b>Constituency controls</b>	No	No	No	Yes	Yes	Yes	Yes
<b>Mean of dependent variable</b>	0.73	0.73	0.73	0.73	0.73	173	9
<b>Adjusted R-squared</b>	0.59	0.59	0.59	0.61	0.81	0.31	0.27
<b>Observations</b>	3,009	3,009	3,009	3,009	3,009	345	345

**Notes:** \*\*\* denotes significance at 1%, \*\* at 5%, and \* at 10% level. Robust standard errors are in parentheses. All columns report OLS estimates. The analysis in columns 1-4 is at the project level. The dependent variable in columns 1-4 is a binary variable reflecting whether a project is decentralized or not, which takes the value 1 when the project is implemented by a decentralized organization. Decentralization refers to whether the organization is an agency, with day-to-day running largely independent of the central authority, rather than a centralized ministry, the central organizing authority for the sector. The level of political competition is measured as one minus the difference between the winner's vote share and the runner's up vote share. Project controls are comprised of project-level controls for the log of the project budget; binary variables indicating whether the project is new or a rehabilitation, and whether it was implemented in 2006 or 2007; assessments of its aggregate complexity, national and local information requirements by Nigerian engineers; and project type fixed effects. Project type fixed effects relate to whether the primary classification of the project is as an advocacy, building, borehole, canal, dam, financial, procurement, research, road or training project. The analysis in columns 5 and 6 is at the constituency level. The dependent variable in column 5 is the total resources allocated to a constituency in the OPEN data in millions of Nigerian Naira. In column 6, the dependent variable is the total number of projects allocated to a constituency in the OPEN data. The committee membership variable is defined as that proportion of projects within the constituency where the politician sits on the relevant committee. Project controls are comprised of constituency-level averages for the log of the project budget, binary variables indicating whether the project is new or a rehabilitation, and whether it was implemented in 2006 or 2007, assessments of its aggregate complexity, national and local information requirements by Nigerian engineers, and the fraction of projects in the constituency classed as an advocacy, building, borehole, canal, dam, financial, procurement, research, road or training project. For both sets of specifications, politician controls are comprised of constituency-level controls for the sex, age, years of education and tenure in congress of the relevant politician. In the very small number of cases in which age or years of education are missing, I replace the missing value with the mean of the rest of the politicians and include a dummy variable to indicate the missing data. Constituency characteristics are comprised of the means and standard deviations of the following indices: the proportion of poor in the constituency measured by a national poverty index, the average years of education of the household head, the proportion of constituents with access to potable water, the average time in minutes to the nearest primary school, and the average time in minutes to the nearest secondary school. Means and standard deviations of the following indices are also included to reflect the frequency with which constituents benefit from a public project of the named type in the five years preceding 2006: construction of electrification infrastructure, rehabilitation of electrification infrastructure, well/borehole, construction of piped water infrastructure, rehabilitation of piped water infrastructure, sanitation, school construction project, school rehabilitation, health facility construction, health facility rehabilitation, road construction, tarring/grading of roads, transportation services, and agricultural-inputs schemes. Finally, constituency characteristics include a set of indicators of the economic dynamics of the constituency, comprised of indicators of improvements in opportunities for employment, the availability of agricultural inputs, number of buyers of agriculture produce, the availability of extension services, the availability of credit facilities, and the availability of consumer goods. All specifications include an indicator of the 'grade' of the committee under which the project falls, which is a dummy that takes the value 1 if the committee is perceived to be of high political weight or 0 otherwise. Figures are rounded to two decimal places.

**Table 5: Interactions between Politicians and Bureaucrats**

**Dependent Variable: Proportion of implementing organization bureaucrats who state politicians impact projects significantly**

**Robust Standard Errors**

**OLS Estimates**

	(1) No interaction	(2) Interaction	(3) Politician controls	(4) Constituency controls	(5) Decentralized organizations	(6) Reduced form
<b>Distance to Abuja (net of distance to state capital)</b>	0.028*** (0.003)	0.010** (0.005)	0.009* (0.005)	0.010** (0.004)	-0.057*** (0.005)	0.010** (0.004)
<b>Level of political competition</b>	0.045*** (0.007)	0.051*** (0.008)	0.049*** (0.008)	0.041*** (0.008)	0.027*** (0.008)	0.030*** (0.010)
<b>Distance to Abuja x level of political competition</b>		0.026*** (0.006)	0.027*** (0.006)	0.031*** (0.005)	0.038*** (0.005)	0.031*** (0.005)
<b>Project controls</b>	Yes	Yes	Yes	Yes	Yes	Yes
<b>Politician controls</b>	No	No	Yes	Yes	Yes	Yes
<b>Constituency controls</b>	No	No	No	Yes	Yes	Yes
<b>Mean of dependent variable</b>	0.54	0.54	0.54	0.54	0.60	0.54
<b>Adjusted R-squared</b>	0.58	0.58	0.58	0.68	0.66	0.68
<b>Observations</b>	3,009	3,009	3,009	3,009	2,187	3,009

**Notes:** \*\*\* denotes significance at 1%, \*\* at 5%, and \* at 10% level. Robust standard errors are in parentheses. All columns report OLS estimates. The dependant variable in all specifications is a continuous variable on the unit interval that reflects the proportion of bureaucrats at the organization in which the project is implemented who state that politicians have a significant impact on the implementation of projects there. The distance to capital city is a variable constructed as follows: I measure the geodesic distance between the organization and the capital city of Nigeria, Abuja, where the Parliament sits. I then regress this on the geodesic distance between the organization implementing the project and the capital city of the state in which the organization sits, and take the residuals of that regression as the measure used here. The level of political competition is measured as one minus the difference between the winner's vote share and the runner's up vote share. Project controls are comprised of project-level controls for the log of the project budget; binary variables indicating whether the project is new or a rehabilitation, and whether it was implemented in 2006 or 2007; assessments of its aggregate complexity; national and local information requirements by Nigerian engineers; and project type fixed effects. Project type fixed effects relate to whether the primary classification of the project is as an advocacy, building, borehole, canal, dam, financial, procurement, research, road or training project. Politician controls are comprised of constituency-level controls for the sex, age, years of education and tenure in congress of the relevant politician. In the very small number of cases in which age or years of education are missing, I replace the missing value with the mean of the rest of the politicians and include a dummy variable to indicate the missing data. Constituency characteristics are comprised of the means and standard deviations of the following indices: the proportion of poor in the constituency, measured by a national poverty index, the average years of education of the household head, the proportion of constituents with access to potable water, the average time in minutes to the nearest primary school, and the average time in minutes to the nearest secondary school. Means and standard deviations of the following indices are also included to reflect the frequency with which constituents benefit from a public project of the named type in the five years preceding 2006: construction of electrification infrastructure, rehabilitation of electrification infrastructure, well/borehole, construction of piped water infrastructure, rehabilitation of piped water infrastructure, sanitation, school construction project, school rehabilitation, health facility construction, health facility rehabilitation, road construction, tarring/grading of roads, transportation services, and agricultural-inputs schemes. Finally, constituency characteristics include a set of indicators of the economic dynamics of the constituency, comprised of indicators of improvements in opportunities for employment, the availability of agricultural inputs, number of buyers of agriculture produce, the availability of extension services, the availability of credit facilities, and the availability of consumer goods. Columns 1 to 4 utilize the full sample of projects in my data, whilst column 5 restricts the sample to those projects implemented by decentralized organizations only. Figures are rounded to two decimal places.

**Table 6: Consequences of Delegation and Engagement at Different Levels of Political Competition**

**Dependent Variable: Proportion of Project Completed**

**Robust Standard Errors**

**OLS Estimates in Columns 1 to 3; IV Estimates in Columns 4 and 5**

	(1) Decentralized	(2) Incentives	(3) Both (OLS)	(4) IV (influence)	(5) IV (engage)
<b>Decentralization [decentralized=1]</b>	0.27*** (0.03)		0.24*** (0.03)	0.40*** (0.09)	0.48*** (0.09)
<b>Degree of politician influence on project implementation</b>		0.51*** (0.07)	0.17** (0.08)	-0.08 (0.66)	-0.01 (0.01)
<b>Level of political competition</b>	-0.01 (0.03)	-0.02 (0.03)	-0.02 (0.03)	-0.02 (0.04)	-0.01 (0.04)
<b>Project, politician and constituency controls</b>	Yes	Yes	Yes	Yes	Yes
<b>Mean of dependent variable</b>	0.50	0.50	0.50	0.50	0.50
<b>Adjusted R-squared</b>	0.34	0.32	0.34	0.33	0.33
<b>F-statistic</b>	-	-	-	140	328
<b>Observations</b>	3,009	3,009	3,009	3,009	3,009

**Notes:** \*\*\* denotes significance at 1%, \*\* at 5%, and \* at 10% level. Robust standard errors are in parentheses. The dependant variable in all specifications is the proportion of the project completed (that is a continuous measure between zero and one). Decentralization refers to whether the organization is a 'parastatal', with day-to-day running largely independent of the central authority, rather than a centralized ministry, the central organizing authority for the sector. The degree of politician influence on project implementation is an organizational-average of the bureaucrat responses to the question 'Rate the influence you think [member(s) of the National Assembly] have on the success of a typical project implemented by your organization' where I code a bureaucrat's response as 1 if they answer 'Significant influence' or 'Most influence' and 0 otherwise. The level of political competition is measured as one minus the difference between the winner's vote share and the runner's up vote share. Project controls are comprised of project-level controls for the log of the project budget; binary variables indicating whether the project is new or a rehabilitation, and whether it was implemented in 2006 or 2007; assessments of its aggregate complexity; national and local information requirements by Nigerian engineers; and project type fixed effects. Project type fixed effects relate to whether the primary classification of the project is as an advocacy, building, borehole, canal, dam, financial, procurement, research, road or training project. Politician controls are comprised of constituency-level controls for the sex, age, years of education and tenure in congress of the relevant politician. In the very small number of cases in which age or years of education are missing, I replace the missing value with the mean of the rest of the politicians and include a dummy variable to indicate the missing data. Constituency characteristics are comprised of the means and standard deviations of the following indices: the proportion of poor in the constituency, measured by a national poverty index, the average years of education of the household head, the proportion of constituents with access to potable water, the average time in minutes to the nearest primary school, and the average time in minutes to the nearest secondary school. Means and standard deviations of the following indices are also included to reflect the frequency with which constituents benefit from a public project of the named type in the five years preceding 2006: construction of electrification infrastructure, rehabilitation of electrification infrastructure, well/borehole, construction of piped water infrastructure, rehabilitation of piped water infrastructure, sanitation, school construction project, school rehabilitation, health facility construction, health facility rehabilitation, road construction, tarring/grading of roads, transportation services, and agricultural-inputs schemes. Finally, constituency characteristics include a set of indicators of the economic dynamics of the constituency, comprised of indicators of improvements in opportunities for employment, the availability of agricultural inputs, number of buyers of agriculture produce, the availability of extension services, the availability of credit facilities, and the availability of consumer goods. All specifications include an indicator of the 'grade' of the committee under which the project falls, which is a dummy that takes the value 1 if the committee is perceived to be of high political weight or 0 otherwise. The F-statistics reported for the instrumental variables specifications in columns 4 and 5 is the lower of the two first stage regressions corresponding to the two endogenous variables. Figures are rounded to two decimal places.

## Table A1: Descriptive Statistics of Nigeria's Political Constituencies

### Means and standard deviations

<i>Constituencies</i>	
<b>Number of constituencies</b>	345
	-
<b>Number of local governments in a constituency</b>	2.03 (0.79)
<b>Population (2006)</b>	370,000 (130,000)
<b>Winning vote share (2003 elections)</b>	0.62 (0.15)
<b>Runner's up vote share (2003 elections)</b>	0.29 (0.12)
<b>Proportion of constituencies run by ruling party</b>	0.63 -
<b>Proportion of constituencies ruling party is runner up</b>	0.34 -
<i>OPEN projects</i>	
<b>OPEN funds per constituency (US\$)</b>	1,100,000 (1,900,000)
<b>Number of OPEN projects by constituency</b>	9 (7.1)
<b>Number of OPEN project types by constituency</b>	3 (1.5)
<b>Number of sectors in constituency</b>	3 (0.9)
<b>Average project budget (US\$)</b>	130,000 (150,000)
<b>Average project complexity (proportion)</b>	0.29 (0.10)
<b>Proportion of constituency projects never started</b>	0.41 (0.25)
<b>Average level of progress of constituency projects</b>	0.46 (0.25)
<b>Level of progress conditional on being started</b>	0.76 (0.22)
<b>Proportion of constituency projects fully completed</b>	0.32 (0.28)
<b>Proportion started with satisfactory quality</b>	0.78 (0.31)
<b>Proportion implemented by decentralized organizations</b>	0.73 (0.24)

**Notes:** Standard deviations are in parentheses. In the OPEN data, I do not observe projects in 15 of Nigeria's 360 federal constituencies, so the descriptives provided here are for the restricted set of 345 constituencies only. Population data is from the 2006 Census. Election data is from the Independent National Electoral Commission official record for the 2003 election. Centralized organizations are ministries which act as the central organizing authority for the sector. Decentralized organizations are agencies whose day-to-day running is largely independent of the central authority. Budget figures originally in Nigerian Naira are converted to US dollars at a rate of US\$1:N150. Figures are rounded to two decimal places where relevant. I have weighted constituencies equally.

**Table A2: Politician Characteristics across Committees**

OLS Estimates

	(1) Age of politician	(2) Sex of politician [female=1]	(3) Years of education	(4) Political competition in constituency	(5) Index of poverty in constituency
<b>Constant</b>	47.35*** (0.61)	0.03** (0.01)	16.22*** (0.14)	0.69*** (0.02)	0.23*** (0.01)
<b>Finance Committee</b>	-0.37 (1.21)	-0.03 (0.03)	0.01 (0.28)	0.04 (0.04)	-0.01 (0.03)
<b>Appropriation Committee</b>	0.12 (1.16)	-0.05* (0.03)	0.29 (0.27)	-0.01 (0.04)	0.00 (0.02)
<b>Water Committee</b>	1.50 (1.11)	-0.02 (0.03)	-0.07 (0.25)	0.00 (0.04)	0.01 (0.02)
<b>Agriculture Committee</b>	1.28 (1.19)	0.02 (0.03)	-0.42 (0.27)	-0.05 (0.04)	-0.01 (0.03)
<b>Health Committee</b>	-0.79 (1.23)	0.02 (0.03)	-0.13 (0.28)	0.04 (0.05)	0.02 (0.03)
<b>Education Committee</b>	2.83** (1.19)	0.00 (0.03)	0.31 (0.27)	0.01 (0.04)	-0.02 (0.03)
<b>Environment Committee</b>	0.21 (1.2)	-0.03 (0.03)	0.29 (0.27)	-0.09** (0.04)	0.01 (0.03)
<b>Housing Committee</b>	-0.24 (1.11)	-0.04 (0.03)	0.08 (0.26)	-0.07* (0.04)	-0.03 (0.02)
<b>Women and Youth Committee</b>	0.22 (1.46)	0.63*** (0.04)	-0.53 (0.33)	0.05 (0.05)	-0.04 (0.03)
<b>FCT Committee</b>	-1.69 (1.2)	-0.01 (0.03)	-0.41 (0.28)	0.03 (0.04)	0.00 (0.03)
<b>H<sub>0</sub>: All coefficients equal [p-value]</b>	0.27	0.00	0.28	0.34	0.91
<b>H<sub>0</sub>: All coefficients bar Women and Youth equal [p-value]</b>	-	0.51	-	-	-
<b>Observations</b>	345	345	345	345	345

**Notes:** \*\*\* denotes significance at 1%, \*\* at 5%, and \* at 10% level. Robust standard errors are in parentheses. All columns report OLS estimates. The dependent variable in column 1 is the age of the politician. In column 2, it is a binary variable reflecting the sex of the politician, which takes the value 1 if the politician is female. In column 3, the dependent variable is the years of education of the politician. In column 4, it is my measure of political competition (one minus the difference between the winner and runner up vote shares) in the constituency that the politician represents. In column 5, it is the proportion of poor in the politician's constituency, measured by a national poverty index. The 'FCT Committee' refers to the Federal Capital Territory Committee that has jurisdiction over the building of infrastructure within the Federal Capital Territory, the municipal area in which the capital, Abuja, sits. At the foot of the table, I report the p-value on the null that the coefficients in each column are of equal magnitude. I also report the p-value on the null that the coefficients in column 2, excluding that on the Women Affairs and Youth committee, are of equal magnitude. Figures are rounded to two decimal places.

**Table A3: Investigating the Determinants of Committee Membership**

Dependent Variable: System of Ten Equations in Membership of Sectoral Committees

Robust Standard Errors

Estimates by Maximum Likelihood to Fit a SUR Model

	Member of Finance Committee	Member of Appropriation Committee	Member of Water Committee	Member of Agriculture Committee	Member of Health Committee	Member of Education Committee	Member of Environment Committee	Member of Housing Committee	Member of Women/Youth Committee	Member of FCT Committee
Politician has relevant qualifications/experience [yes=1]	0.30*** (0.06)	0.36*** (0.05)	0.50*** (0.09)	0.54*** (0.06)	0.77*** (0.08)	0.54*** (0.07)	0.69*** (0.08)	0.65*** (0.07)	0.17** (0.08)	0.79*** (0.08)
Level of political competition	0.09 (0.08)	0.02 (0.09)	-0.04 (0.09)	-0.20*** (0.07)	0.06 (0.08)	-0.03 (0.08)	0.05 (0.09)	-0.10 (0.07)	0.07 (0.05)	0.06 (0.05)
Index of poverty	0.35 (0.29)	-0.15 (0.26)	0.02 (0.33)	-0.55*** (0.2)	-0.26 (0.23)	-0.24 (0.22)	-0.21 (0.22)	0.22 (0.3)	0.17 (0.21)	-0.01 (0.21)
Politician and constituency controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Correlation of residuals in SUR system:</b>										
Appropriation	-0.22									
Water	-0.01	0.07								
Agriculture	-0.11	0.02	-0.10							
Health	-0.04	-0.09	0.01	-0.07						
Education	0.02	-0.05	-0.13	-0.21	-0.04					
Environment	0.04	0.03	0.04	-0.02	0.09	0.06				
Housing	0.00	0.00	0.01	-0.04	0.05	-0.01	-0.02			
Women/Youth	-0.02	0.18	0.06	-0.01	0.01	-0.05	0.15	-0.14		
FCT	0.02	-0.07	-0.04	-0.06	0.02	0.00	0.00	0.14	0.00	
<b>Observations</b>	345	345	345	345	345	345	345	345	345	345

**Notes:** \*\*\* denotes significance at 1%, \*\* at 5%, and \* at 10% level. Robust standard errors are in parentheses. Columns report maximum likelihood estimates to fit a SUR model for the ten sectoral committees. The dependent variable in all specifications is a binary variable reflecting whether a politician is a member of the committee for the named sector, taking the value 1 when the politician is a member. The 'FCT Committee' refers to the Federal Capital Territory Committee that has jurisdiction over the building of infrastructure within the Federal Capital Territory, the municipal area in which the capital, Abuja, sits. Politician controls are comprised of constituency-level controls for the sex, age, years of education and tenure in congress of the relevant politician. In the very small number of cases in which age or years of education are missing, I replace the missing value with the mean of the rest of the politicians and include a dummy variable to indicate the missing data. Constituency characteristics are comprised of the means and standard deviations of the following indices: the proportion of poor in the constituency, measured by a national poverty index, the average years of education of the household head, the proportion of constituents with access to potable water, the average time in minutes to the nearest primary school, and the average time in minutes to the nearest secondary school. Means and standard deviations of the following indices are also included to reflect the frequency with which constituents benefit from a public project of the named type in the five years preceding 2006: construction of electrification infrastructure, rehabilitation of electrification infrastructure, well/borehole, construction of piped water infrastructure, rehabilitation of piped water infrastructure, sanitation, school construction project, school rehabilitation, health facility construction, health facility rehabilitation, road construction, tarring/grading of roads, transportation services, and agricultural-inputs schemes. Finally, constituency characteristics include a set of indicators of the economic dynamics of the constituency, comprising indicators of improvements in opportunities for employment, the availability of agricultural inputs, number of buyers of agriculture produce, the availability of extension services, the availability of credit facilities, and the availability of consumer goods. All specifications include dummies for five of the six geo-political zones and an indicator of the 'grade' of the committee under which the project falls, which is a dummy that takes the value 1 if the committee is perceived to be of high political weight or 0 otherwise. Figures are rounded to two decimal places.

**Table A4: Investigating the Determinants of Politicians' Qualifications and Experience**

**Dependent Variable: System of Nine Equations in Sector of Politician's Qualifications and Experience**

**Robust Standard Errors**

**Estimates by Maximum Likelihood to Fit a SUR Model**

	Finance Sector	Water Sector	Agriculture Sector	Health Sector	Education Sector	Environment Sector	Housing Sector	Women/Youth Sector	FCT (city building) Sector
<b>Level of political competition</b>	0.04 (0.12)	-0.02 (0.08)	-0.02 (0.09)	-0.04 (0.07)	-0.11 (0.08)	-0.10 (0.08)	-0.23*** (0.08)	-0.03 (0.03)	0.03 (0.08)
<b>Index of poverty</b>	-0.44 (0.35)	0.23 (0.29)	0.08 (0.08)	0.46 (0.31)	-0.26 (0.25)	-0.05 (0.17)	0.14 (0.29)	-0.03 (0.03)	0.31 (0.29)
<b>Proportion of constituents with access to potable water</b>		0.19 (0.14)	-0.04 (0.11)	-0.02 (0.08)		-0.10 (0.06)			
<b>Time in minutes to nearest secondary school</b>					0.01 (0.00)			0.00 (0.00)	
<b>Existing tarred road infrastructure investments</b>							0.08 (0.28)		-0.01 (0.22)
<b>Politician and constituency controls</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Correlation of residuals in SUR system:</b>									
<i>Water</i>	0.13								
<i>Agriculture</i>	-0.12	0.11							
<i>Health</i>	-0.12	-0.05	-0.08						
<i>Education</i>	0.10	-0.03	-0.09	-0.06					
<i>Environment</i>	-0.02	0.17	0.24	-0.15	-0.04				
<i>Housing</i>	0.06	0.31	0.09	-0.04	-0.05	0.12			
<i>Women/Youth</i>	0.13	-0.02	-0.03	-0.05	-0.03	-0.06	-0.05		
<i>FCT</i>	0.09	0.28	0.06	-0.03	-0.05	0.07	0.23	-0.02	
<b>Observations</b>	345	345	345	345	345	345	345	345	345

**Notes:** \*\*\* denotes significance at 1%, \*\* at 5%, and \* at 10% level. Robust standard errors are in parentheses. Columns report maximum likelihood estimates to fit a SUR model for the nine sectors. The dependent variable in all specifications is a binary variable reflecting whether a politician has qualifications and/or experience in the named sector, taking the value 1 when the politician has relevant qualifications and/or experience. The 'FCT Committee' refers to the Federal Capital Territory Committee that has jurisdiction over the building of infrastructure within the Federal Capital Territory, the municipal area in which the capital, Abuja, sits. Politician controls are comprised of constituency-level controls for the sex, age and years of education of the relevant politician. In the very small number of cases in which age or years of education are missing, I replace the missing value with the mean of the rest of the politicians and include a dummy variable to indicate the missing data. Constituency characteristics are comprised of the means and standard deviations of the following indices: the proportion of poor in the constituency, measured by a national poverty index, the average years of education of the household head, the proportion of constituents with access to potable water, the average time in minutes to the nearest primary school, and the average time in minutes to the nearest secondary school. Means and standard deviations of the following indices are also included to reflect the frequency with which constituents benefit from a public project of the named type in the five years preceding 2006: construction of electrification infrastructure, rehabilitation of electrification infrastructure, well/borehole, construction of piped water infrastructure, rehabilitation of piped water infrastructure, sanitation, school construction project, school rehabilitation, health facility construction, health facility rehabilitation, road construction, tarring/grading of roads, transportation services, and agricultural-inputs schemes. Finally, constituency characteristics include a set of indicators of the economic dynamics of the constituency, comprising indicators of improvements in opportunities for employment, the availability of agricultural inputs, number of buyers of agriculture produce, the availability of extension services, the availability of credit facilities, and the availability of consumer goods. Figures are rounded to two decimal places.

**Table A5: Correlation of Subcomponents of the Project Complexity Indicator**

	Mean	Standard deviation	Project size	Number of inputs	Number of methods	Interdependencies	Access to raw materials	Storage of raw materials	Requires local labor	Requires skilled labor	Access to construction equipment	Design uncertainty	Implementation uncertainty	Design ambiguity	Implementation ambiguity	Difficulty to manage	Number of agencies involved
<b>Project size</b>	0.32	0.46															
<b>Number of inputs</b>	7.48	4.71	0.08														
<b>Number of methods</b>	5.27	2.63	0.38	0.62													
<b>Interdependencies</b>	0.58	0.49	0.06	0.14	0.08												
<b>Access to raw materials</b>	0.08	0.27	-0.17	-0.11	-0.13	-0.30											
<b>Storage of raw materials</b>	0.06	0.23	0.16	-0.10	0.04	0.13	0.00										
<b>Requires local labor</b>	0.42	0.49	0.47	0.06	0.56	-0.11	-0.23	0.22									
<b>Requires skilled labor</b>	0.45	0.50	-0.22	0.04	-0.36	0.59	-0.27	0.00	-0.48								
<b>Access to construction equipment</b>	0.08	0.27	0.12	-0.19	0.10	0.23	-0.08	0.33	0.29	0.26							
<b>Design uncertainty</b>	0.68	0.46	0.30	0.18	0.15	0.75	-0.43	0.11	0.19	0.42	0.18						
<b>Implementation uncertainty</b>	0.79	0.41	0.19	0.29	0.24	0.52	-0.54	0.03	0.34	0.39	0.14	0.72					
<b>Design ambiguity</b>	0.61	0.49	0.02	0.05	-0.03	0.82	-0.36	0.14	-0.14	0.67	0.21	0.64	0.55				
<b>Implementation ambiguity</b>	0.59	0.49	0.11	0.05	0.03	0.85	-0.35	0.17	-0.10	0.62	0.23	0.69	0.47	0.89			
<b>Difficulty to manage</b>	0.18	0.38	0.35	-0.07	0.34	0.27	-0.13	0.41	0.49	-0.04	0.60	0.26	0.13	0.36	0.37		
<b>Number of agencies involved</b>	3.58	0.50	-0.03	0.21	-0.16	0.16	-0.34	-0.07	-0.09	0.35	-0.34	0.35	0.57	0.28	0.19	-0.22	
<b>Aggregate complexity</b>	27.48	20.33	0.49	0.18	0.56	0.26	-0.09	0.20	0.56	-0.13	0.27	0.30	0.33	0.29	0.32	0.61	-0.10
<b>Observations (projects)</b>	3,009	3,009	3,009	3,009	3,009	3,009	3,009	3,009	3,009	3,009	3,009	3,009	3,009	3,009	3,009	3,009	3,009

**Notes:** 'Project size' is a binary variable that aims to gauge the physical size of the project. It takes the value 1 if it is classified as equivalent to a medium scale build or larger. 'Number of inputs' counts the number of distinct product classes the finished project contains. 'Number of methods' counts the number of distinct disciplines or methods involved in implementing the project. 'Interdependencies' is a binary variable reflecting the extent of interdependencies between the activities involved in the project. It takes a value of 1 if the project is classified as highly interdependent. 'Access to raw materials' is a binary variable that takes the value 1 if raw materials could not be sourced within the state of implementation. 'Storage of raw materials' is a binary variable that takes the value 1 if some of the raw materials could not be easily stored or transported. 'Requires local labor' is a binary variable that takes the value 1 if local labor was useful or critical. 'Requires skilled labor' is a binary variable that takes the value 1 if specialized skills were necessary and difficult to obtain. 'Access to construction equipment' is a binary variable that takes the value 1 if the equipment required is difficult to obtain, heavy duty, or difficult to transport to the site. 'Design uncertainty' is a binary variable that takes on the value 1 if the design of the project is context specific. 'Implementation uncertainty' is a binary variable that takes on the value 1 if there are substantial risks involved in implementation. 'Design ambiguity' is a binary variable that takes on the value 1 if there is a risk of redesign late on in the project. 'Implementation ambiguity' is a binary variable that takes on the value 1 if the technical risks of the project cannot be fully understood at implementation. 'Difficulty to manage' is a binary variable that takes the value 1 if the project is seen to have elements that require project management skills of above-average level. 'Number of agencies involved' is simply a count of the estimated number of agencies involved in the project cycle. 'Aggregate complexity' is a subjective assessment as to the overall complexity of the project by the coding engineers. This variable is an assessment of the interaction of the other variables as well as any unassessed aspects of complexity, and provides a coherent picture of the complexity of the projects by a specialist. The variables 'interdependencies', 'access to raw materials', 'requires local labor', 'requires skilled labor', 'access to construction equipment', 'design uncertainty', 'implementation uncertainty', 'design ambiguity', 'implementation ambiguity' and 'difficulty to manage' are binary variables reflecting the variation in these previously categorical variables. Figures are rounded to two decimal places.

**Table A6: Robustness of Delegation Findings**

**Dependent Variable: Indicator of decentralization [decentralization=1]**

**Robust Standard Errors in All Columns Bar 2 and Clustered at the Politician Level in Column 2**

**OLS Estimates**

	(1) Baseline specification	(2) Clustering at politician level	(3) Organization controls	(4) Chairperson dummy	(5) Excluding chairperson projects	(6) Two-term dummy	(7) Excluding two-term projects	(8) Excluding unqualified agriculture
Politician member of relevant committee [yes=1]	-0.11*** (0.03)	-0.11** (0.05)	-0.05** (0.03)	-0.11*** (0.03)	-0.12*** (0.03)	-0.11*** (0.03)	-0.17*** (0.04)	-0.09*** (0.03)
Level of political competition	-0.03 (0.03)	-0.03 (0.06)	0.04 (0.06)	-0.03 (0.03)	-0.03 (0.03)	-0.03 (0.03)	-0.03 (0.04)	-0.02 (0.03)
Politician member of relevant committee x level of political competition	0.18*** (0.04)	0.18** (0.07)	0.08** (0.04)	0.20*** (0.04)	0.20*** (0.04)	0.18*** (0.04)	0.25*** (0.06)	0.17*** (0.04)
Chairpersons [yes=1]				-0.14*** (0.04)				
Politician in second term at congress [yes=1]						0.01 (0.01)		
Aggregate complexity index	-0.46*** (0.06)							
National information index	-0.08*** (0.01)							
Local information index	0.08*** (0.02)							
Project, politician and constituency controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.61	0.61	0.71	0.61	0.60	0.61	0.62	0.60
Observations (clusters)	3,009	3,009 (345)	3,009	3,009	2,962	3,009	2,161	2,980

**Notes:** \*\*\* denotes significance at 1%, \*\* at 5%, and \* at 10% level. Standard errors are in parentheses. They are robust in all columns bar 2 and clustered by politicians in Column 2. The dependent variable in all specifications is a binary variable reflecting whether a project is decentralized or not, which takes the value 1 when the project is implemented by a decentralized organization. Decentralization refers to whether the organization is a 'parastatal', with day-to-day running largely independent of the central authority, rather than a centralized ministry, the central organizing authority for the sector. The level of political competition is measured as one minus the difference between the winner's vote share and the runner's up vote share. In Column 3 we include organizational-level variables that measure the average years of education of bureaucrats, a proxy for their intrinsic motivation, and a measure of what determined their posting at the organization that implements the project. In Column 4, we include a dummy for whether the project is located in a constituency represented by the chair of the relevant sectoral committee for that project. Column 5 restricts our specification to those projects that are not implemented in constituencies in which the politician is the chair of the relevant sectoral committee. In Column 6 we include a dummy for whether the project is located in a constituency in which the politician is in their second term at congress. Column 7 restricts our specification to those projects that are not implemented in constituencies in which the politician is in their second term of congress. Column 8 restricts our specification to those projects that are not implemented in constituencies in which the politician did not have relevant qualifications or experience in agriculture, but was a member of the agriculture committee. Project controls are comprised of project-level controls for the log of the project budget, binary variables indicating whether the project is new or a rehabilitation, and whether it was implemented in 2006 or 2007, assessments of its aggregate complexity, national and local information requirements by Nigerian engineers, and project type fixed effects. Project type fixed effects relate to whether the primary classification of the project is as an advocacy, building, borehole, canal, dam, financial, procurement, research, road or training project. Politician controls comprise constituency-level controls for the sex, age, years of education and tenure in congress of the relevant politician. In the very small number of cases in which age or years of education are missing, I replace the missing value with the mean of the rest of the politicians and include a dummy variable to indicate the missing data. Constituency characteristics are comprised of the means and standard deviations of the following indices: the proportion of poor in the constituency, measured by a national poverty index, the average years of education of the household head, the proportion of constituents with access to potable water, the average time in minutes to the nearest primary school, and the average time in minutes to the nearest secondary school. Means and standard deviations of the following indices are also included to reflect the frequency with which constituents benefit from a public project of the named type in the five years preceding 2006: construction of electrification infrastructure, rehabilitation of electrification infrastructure, well/borehole, construction of piped water infrastructure, rehabilitation of piped water infrastructure, sanitation, school construction project, school rehabilitation, health facility construction, health facility rehabilitation, road construction, tarring/grading of roads, transportation services, and agricultural-inputs schemes. Finally, constituency characteristics include a set of indicators of the economic dynamics of the constituency, comprised of indicators of improvements in opportunities for employment, the availability of agricultural inputs, number of buyers of agriculture produce, the availability of extension services, the availability of credit facilities, and the availability of consumer goods. All specifications include an indicator of the 'grade' of the committee under which the project falls, which is a dummy that takes the value 1 if the committee is perceived to be of high political weight or 0 otherwise. Figures are rounded to two decimal places.

**Table A7: Robustness of Engagement Findings**

**Dependent Variable: Proportion of implementing organization bureaucrats who state politicians impact projects significantly**

**Robust Standard Errors in All Columns Bar 2 and Clustered at the Politician Level in Column 2**

**OLS Estimates**

	(1) Baseline specification	(2) Clustering at politician level	(3) Organization controls	(4) Chairperson dummy	(5) Excluding chairperson projects	(6) Two-term dummy	(7) Excluding two-term projects	(8) Excluding unqualified agriculture
Distance to Abuja (net of distance to state capital)	0.010** (0.004)	0.01 (0.009)	0.012*** (0.005)	0.010** (0.004)	0.010** (0.004)	0.010** (0.004)	0.019*** (0.006)	0.009** (0.004)
Level of political competition	0.041*** (0.008)	0.041*** (0.016)	0.043*** (0.008)	0.040*** (0.008)	0.039*** (0.008)	0.041*** (0.008)	0.022** (0.011)	0.041*** (0.008)
Distance to capital city x level of political competition	0.031*** (0.005)	0.031*** (0.011)	0.023*** (0.005)	0.031*** (0.005)	0.031*** (0.005)	0.031*** (0.005)	0.022*** (0.007)	0.033*** (0.005)
Chairpersons [yes=1]				0.023* (0.013)				
Politician in second term at congress [yes=1]						0.009** (0.004)		
Aggregate complexity index	-0.042*** (0.015)							
National information index	0.034*** (0.004)							
Local information index	0.023*** (0.004)							
Project, politician and constituency controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.68	0.68	0.72	0.68	0.68	0.68	0.70	0.68
Observations (clusters)	3,009	3,009 (345)	3,009	3,009	2,962	3,009	2,161	2,980

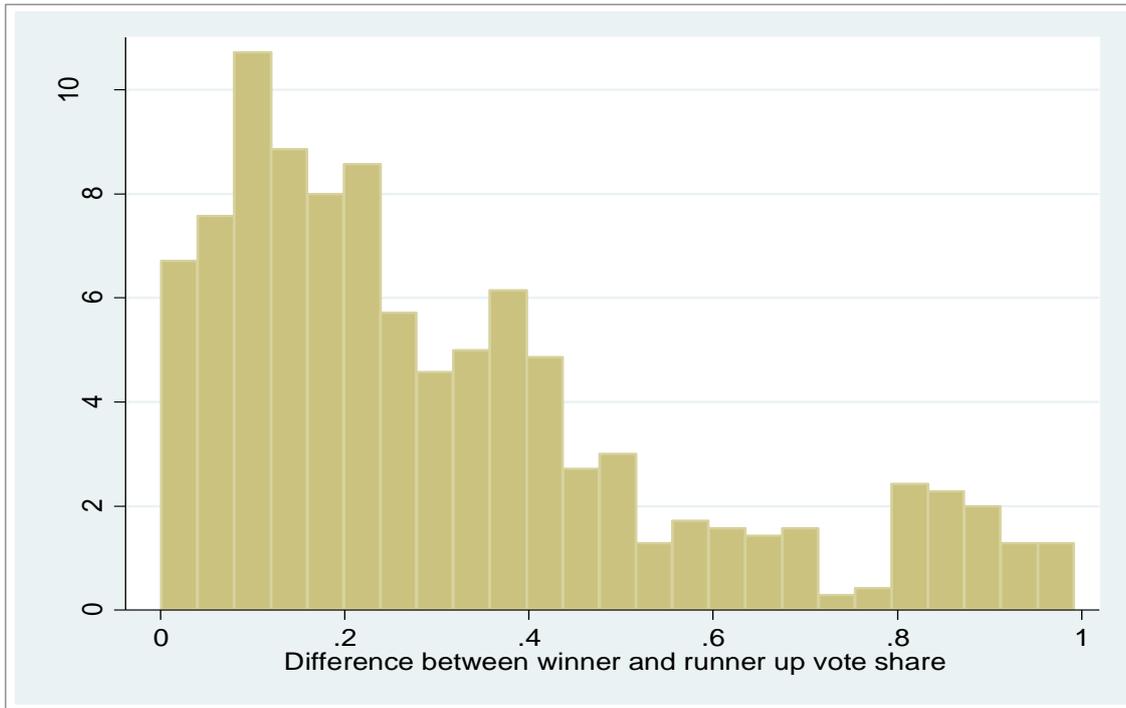
**Notes:** \*\*\* denotes significance at 1%, \*\* at 5%, and \* at 10% level. Standard errors are in parentheses. They are robust in all columns bar 2 and clustered by sectors within each constituency in Column 2. The dependent variable in all specifications is a continuous variable on the unit interval that reflects the proportion of bureaucrats at the organization in which the project is implemented who state that politicians have a significant impact on the implementation of projects there. The distance to Abuja is a variable constructed as follows: I measure the geodesic distance between the organization and the capital city of Nigeria, Abuja, where the Parliament sits. I then regress this on the geodesic distance between the organization implementing the project and the capital city of the state in which the organization lies and take the residuals of that regression as the measure used here. In Column 3 we include organizational-level variables that measure the average years of education of bureaucrats, a proxy for their intrinsic motivation, and a measure of what determined their posting at the organization that implements the project. In Column 4, we include a dummy for whether the project is located in a constituency represented by the chair of the relevant sectoral committee for that project. Column 5 restricts our specification to those projects that are not implemented in constituencies in which the politician is the chair of the relevant sectoral committee. In Column 6 we include a dummy for whether the project is located in a constituency in which the politician is in their second term at congress. Column 7 restricts our specification to those projects that are not implemented in constituencies in which the politician is in their second term of congress. Column 8 restricts our specification to those projects that are not implemented in constituencies in which the politician did not have relevant qualifications or experience in agriculture but was a member of the agriculture committee. Project controls are comprised of project-level controls for the log of the project budget, binary variables indicating whether the project is new or a rehabilitation, and whether it was implemented in 2006 or 2007, assessments of its aggregate complexity, national and local information requirements by Nigerian engineers, and project type fixed effects. Project type fixed effects relate to whether the primary classification of the project is as an advocacy, building, borehole, canal, dam, financial, procurement, research, road or training project. Politician controls are comprised of constituency-level controls for the sex, age, years of education and tenure in congress of the relevant politician. In the very small number of cases in which age or years of education are missing, I replace the missing value with the mean of the rest of the politicians and include a dummy variable to indicate the missing data. Constituency characteristics are comprised of the means and standard deviations of the following indices: the proportion of poor in the constituency, measured by a national poverty index, the average years of education of the household head, the proportion of constituents with access to potable water, the average time in minutes to the nearest primary school, and the average time in minutes to the nearest secondary school. Means and standard deviations of the following indices are also included to reflect the frequency with which constituents benefit from a public project of the named type in the five years preceding 2006: construction of electrification infrastructure, rehabilitation of electrification infrastructure, well/borehole, construction of piped water infrastructure, rehabilitation of piped water infrastructure, sanitation, school construction project, school rehabilitation, health facility construction, health facility rehabilitation, road construction, tarring/grading of roads, transportation services, and agricultural-inputs schemes. Finally, constituency characteristics include a set of indicators of the economic dynamics of the constituency, comprised of indicators of improvements in opportunities for employment, the availability of agricultural inputs, number of buyers of agriculture produce, the availability of extension services, the availability of credit facilities, and the availability of consumer goods. All specifications include an indicator of the 'grade' of the committee under which the project falls, which is a dummy that takes the value 1 if the committee is perceived to be of high political weight or 0 otherwise. Figures are rounded to two decimal places.

**Table A8: Descriptive Statistics of Organizational Characteristics, by Tier**  
**Means, standard deviations, and p-values of differences with centralized organizations**

	(1) All organizations	(2) Centralized	(3) Decentralized	(4) p-value of difference between (2)/(3)
How often, if at all, do you personally engage with project communities?	0.41 (0.12)	0.42 (0.08)	0.41 (0.13)	0.72
Proportion of citizens who threaten bureaucrat	8.66 (4.15)	5.81 (2.47)	9.10 (4.20)	0.05
Proportion of citizens who report bureaucrat to manager	10.16 (3.81)	7.13 (1.88)	10.62 (3.83)	0.02
Proportion of citizens who report bureaucrat to elected official	6.44 (3.94)	3.66 (1.98)	6.87 (4.00)	0.04
<b>Organizations</b>	54	7	47	

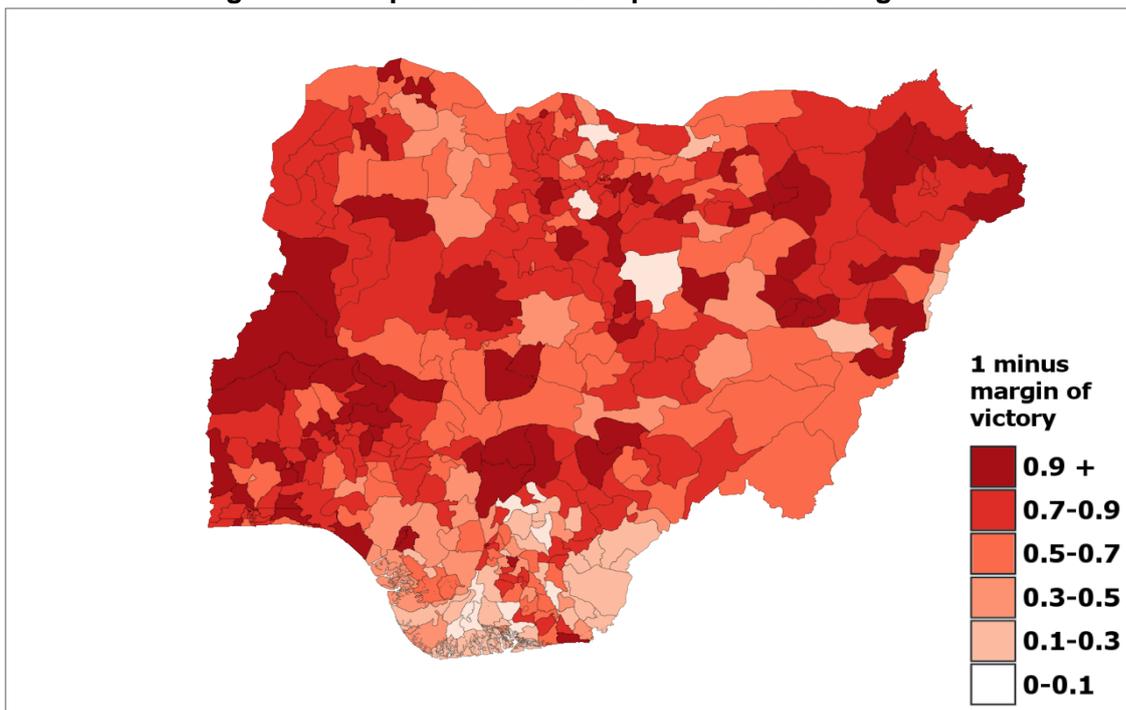
**Notes:** Standard deviations are in parentheses. Decentralized organizations are 'parastatals', with day-to-day running largely independent of the central authority. Figures are rounded to two decimal places. T-tests are performed under the assumption of equal variances when the chi-squared test statistic is less than or equal to 3.84, and under the assumption of unequal variances otherwise. I have weighted organizations equally.

**Figure 1A: Histogram of Difference Between Winner and Runner Up Vote Share**



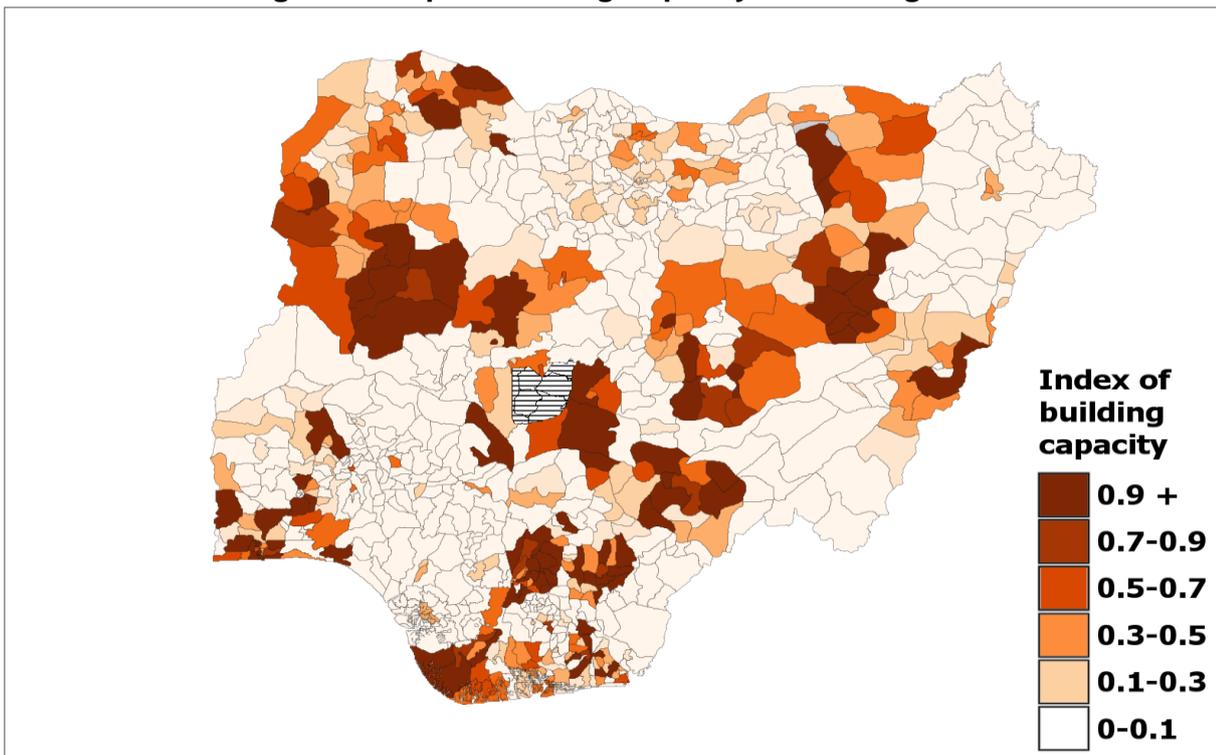
**Notes:** This is a histogram of the difference between the winning vote share in a constituency and that of the runner up. The sample used to construct the histogram is those constituencies for which I observe the implementation of public projects.

**Figure 1B: Map of Political Competition Across Nigeria**



**Notes:** This is a choropleth map of one minus the difference between the winning vote share in a constituency and that of the runner up. The choropleth map is colored such that the deeper the intensity of shading, the higher the level of political competition.

**Figure 2: Map of Building Capacity Across Nigeria**



**Notes:** This is a choropleth map of an index of the intensity of building capacity across Nigeria. The index is a function of the number of building materials markets in a local government. The striped section indicates the Federal Capital Territory, in which the capital city, Abuja, sits. The choropleth map is colored such that the deeper the intensity of shading, the higher the number of building materials markets.