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Citizens' Preferences and the Portfolio of Public Goods: Evidence from Nigeria

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Summary. — Developing countries have undertaken decentralization reforms to increase the efficiency of public goods' provisioning. By tailoring the goods to the preferences of smaller groups, the reforms aim to ensure that the resulting supply of public goods matches local demands. We analyze if local politicians tasked with supplying public goods in a developing country respond to citizens' preferences. We ask two questions: First, faced with demands for increased spending on a particular type of public good, will politicians increase the overall spending on public goods or keep it constant while reallocating resources between different public goods? Second, if politicians reallocate resources rather than increase overall spending, which public good will receive additional funds at the expense of another good? We examine these questions using sub-national spending and preference data in Nigerian districts. Our empirical strategy accounts for interdependency between spending areas as increased spending in one area can be offset by decreasing expenditures elsewhere. We find that local politicians reallocate resources across education, health, infrastructure, and agricultural support to match the preference profile of citizens across these goods but do not increase overall spending for public goods.

Key words — local public goods, citizens' preferences, budgetary policy, Nigeria, simultaneous estimation

1. INTRODUCTION

Many developing countries have recently attempted decentralizing their governance structures. Though the reforms differ across countries, they share a common goal: improving the provision of public goods and services. Central administrations typically lack the knowledge to implement policies that reflect people's preferences concerning the quantity and type of public goods. In contrast, decentralization provides an opportunity to increase economic welfare by tailoring the provision of public goods to the preferences of smaller groups (Wallis & Oates, 1988, p. 5), thereby ensuring that the resulting supply of these goods matches local demands.

An impressive body of research investigates the effects of decentralization on such areas as poverty (Hickey, 2005), child mortality (Granados & Sánchez, 2014), and economic growth (Petrick & Gramzow, 2012). However, most work focuses on the form and type of decentralization. Thus, previous literature assesses variation in institutions (see Jütting *et al.*, 2005) while we focus on the variation in citizens' preferences—while holding the institutional context constant—to examine the success of decentralization.

For this reason, we focus on Nigeria. The 1999 Nigerian constitution restored democratic rule and implemented a system of elected local governance. A main goal of democratic decentralization is the devolution of decision-making powers to local governments in the interest of giving people a voice in the new democracy. By committing to decentralization initiatives, Nigeria's government is attempting to be more responsive to the local population's needs. Suberu (2015) points out that due to Nigeria's fiscal allocation system, sub-national political entities cannot blame budget mismanagement on the federal government, but are held accountable themselves. Moreover, as a country plagued by ethnic divisions, decentralization may alleviate distrust in government decisions and encourage popular participation (Azfar, Kahkonen, Lanyi, Meagher, & Rutherford, 1999), thereby accomplishing more than just improved service delivery.

In addition to its implementation of decentralization, Nigeria is an attractive case because our data provide a rare opportunity to test whether local supply of public goods corresponds to citizens' demands. Reliable data at the local level are scarce, so we take advantage of appropriately disaggregated data to test our theories. With respect to citizens' demands, we utilize survey data on 123,095 Nigerian households that measure district-level demand of four types of public goods: education, health care, infrastructure (in particular, roads, electricity, and water), as well as agricultural support. [1] We then analyze the supply of public goods by examining whether the budget allocations of Nigerian districts correspond to local demand.

Significant variation characterizes spending by Nigerian districts on public goods. For one, there is heterogeneity with respect to the overall level of all public goods combined. For example, Efon district spent just over 39 million Naira on public goods in 2006, while Kiyawa district spent over seven billion Naira. This is surprising considering the total population of Efon amounts to 86,941 while only 17,704 individuals live in Kiyawa district, resulting in significant differences in per capita spending on public goods. In addition to the variation in *overall* volume spent on public goods in general, significant heterogeneity exists with respect to the *types of public goods* politicians provide. For example, overall expenses for public goods are identical in Mubi South and Bagwai districts, amounting to nearly 213 million Naira each. In addition, the stock of existing public goods is comparatively similar, as both districts have completed the same number of education and health projects in the past five years. Yet, Mubi South spends 2% of its budget on education and 24% on

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health, while Bagwai spends 12% on education and 1% on health.

We seek to explain the variation in the types of public goods provided. While supply-side arguments can convincingly explain the variation in overall public good expenses, they have less traction in explaining the relative share of spending on a certain type of public good. What explains this variation in the portfolio of public goods provided?

To answer this question, we focus on variation in citizens' demands. In doing so, we disagree with Banerjee, Iyer, and Somanathan (2007, p. 3) who state that "It seems implausible that these very large differences in access to education, better hygiene, health, and longevity could be entirely explained by differences in what people want." We find that citizens do differ in the types of public goods they want, even after accounting for existing levels of public good provision. With successful constitutional reform, we expect politicians' allocation of resources across different types of public goods to closely match the preference profile of the local population.

To shed light on this, we analyze whether public goods' provision in Nigeria is responsive to citizens' preferences. This paper examines two questions: First, when faced with demands for increased spending on a particular type of public good, will politicians increase overall spending on public goods or keep it constant while reallocating resources between different public goods? Second, if politicians reallocate resources, which public good will receive additional funds at the expense of other goods?

We argue that politicians do not increase overall spending, but instead pursue a reallocation strategy when faced with demands for a particular type of public good. In such a situation, politicians allocate resources to the type of good preferred by the majority of citizens in their district at the expense of goods preferred by only a fraction of households. In contrast to Harding and Stasavage (2013), who focus on the characteristics of public goods, we argue that the aggregated preferences of individuals explain the type of public good provided.

We estimate a Differentiated Product Model since this methodology allows simultaneous testing of two hypotheses: Do politicians reallocate resources (rather than increase overall spending), and if so, do they allocate resources to the most preferred public good? Our results confirm that citizens' preferences explain which types of public goods are provided, and that the relative demand for different goods matters. We show that politicians follow the demands of their constituencies by providing the preferred type of public good while cutting expenditures on the least-preferred type.

2. EXPLAINING PUBLIC GOODS' PROVISION

Much work exists explaining the level of total spending on public goods. Yet, these approaches do not consider differences across various *types of public goods* such as education, health, or infrastructure. For example, Bueno de Mesquita, Morrow, Siverson, and Smith, 2002 suggest that leaders decide between providing a generic public good or an unspecified private good. Thus, the overall volume of spending on public goods is analyzed, not the mix of different types of public goods. Recent work has begun to analyze the allocation of resources to different types of public goods. In the context of developing countries, this body of work can be divided into several schools of thought.

First, there is the argument that ethnic groups have divergent tastes for public goods. Ethnic group A is hypothesized to want good i for historical and cultural reasons, while group B prefers good j. For example, Easterly and Levine (1997, pp. 1215–1216) review qualitative work suggesting that politicians provide different public goods as a function of different preferences across ethnic groups. Using quantitative analysis, Lieberman and McClendon, 2013 confirm that preferences vary across ethnic groups in most sub-Saharan African countries. However, this emphasis on the preferences of specific ethnic groups might not provide substantive insights. Bates (1974), Chandra (2007); and Posner (2005) describe ethnic political competition primarily as a battle over who gets the spoils from public policies rather than a substantive conversation regarding the relative priority of competing policy objectives. Consequently, the focus on historic, cultural, and context-specific group characteristics yields non-generalizable explanations. Moreover, this approach has produced contradictory findings. Lieberman and McClendon (2013) argue that ethnicity is a significant predictor for demand of public goods, while Habyarimana, Humphreys, Posner, and Weinstein (2009, p. 81) find that ethnic indicators are not jointly significant.

A second argument suggests that it is not the ethnic identities per se, but the degree of ethnic heterogeneity that undermines efficient supply of public goods. Following the seminal work by Alesina, Baqir, and Easterly (1999), Easterly (2001) shows that ethnically diverse societies receive only half the schooling but experience twice the number of electric power losses in comparison to more homogeneous societies. Others suggest that ethnic groups systematically disagree over the kinds of public goods they want provided (Habyarimana *et al.*, 2009). As a result, Jackson (2013), Kimenyi (2006) and Habyarimana, Humphreys, Posner, and Weinstein (2007) argue that ethnic diversity increases collective action problems, undermining communities' ability to demand public goods. However, empirical work has failed to provide convincing evidence for this argument. In a review of empirical work, Banerjee *et al.* (2007) argue that "the social composition of communities is able to explain only a fraction of the total variation in provision." When Alesina *et al.* (1999) include fixed effects in their models, the effect of heterogeneity on overall public good spending becomes insignificant. Two reasons for these findings have been suggested: first, exogenous factors affecting heterogeneity (such as migration patterns or urbanization) can affect heterogeneity measures as well as economic outcomes, including the demand for and supply of public goods (Banerjee *et al.*, 2007). Second, rarely observed public action complicates differentiating between (a) less collective action due to ethnic heterogeneity (Alesina *et al.*, 1999), and (b) more, albeit wasteful, collective action resulting in inefficient outcomes as suggested by Esteban and Ray (1999).

Another approach focuses on the characteristics of specific public goods to explain which type of good is provided. For example, Robinson and Verdier (2013), Rodrik (1998), and Katsimi (1998) show that public sector jobs are the preferred type of public good since they address politicians' commitment problems to voters preceding an election. Similarly, Harding and Stasavage (2013) provide evidence that visible public goods like infrastructure are more likely provided than invisible public goods like school quality. This explanation implies that *every* politician should *always* prefer providing a particular public good because its favorable characteristics are time- and space-invariant. Yet, we observe something different: politicians in one district prioritize good A, while good B is prioritized in another. One exception is Albertus (2013) who argues that politicians dispense different types of public goods depending on the characteristics of constituencies from which

they need to win votes. One-time payments are sufficient for party members because politicians can credibly promise them future one-time payments. Yet, mere promises of future payments are not credible to swing voters as they cannot hold politicians accountable through party channels. For this reason, politicians provide swing voters with land because it represents a credible long-term benefit. Different constellations of swing versus core voters could explain the variation in the type of goods provided across districts.

Our argument follows the approach by Albertus (2013), explaining which type of public good politicians provide conditional on the demands of the constituency. We extend this reasoning in several ways: First, empirical strategies often ignore the fact that governments have constrained budgets, implying that increased spending in one area must be counter-balanced by reduced spending elsewhere. For example, Albertus (2013) estimates tobit regressions to model the determinants of only one type of public good, which does not account for this interdependency. Similarly, Goncalves (2014) estimates separate panel regressions for different budget items. Both ignore the inter-relatedness of budget items. Others, such as Lieberman and McClendon (2013), estimate multinomial probit models assuming that politicians choose among different public goods. This estimation method assumes independence of irrelevant alternatives; yet, it is unreasonable to assume that budget share allocated to a particular public good will not be spent on other goods if that item suddenly becomes unavailable. The interdependency induced by the budget constraint must be reflected in both the theoretical argument and the empirical strategy.

Second, most arguments only distinguish between two categories of public goods: private versus public sector jobs (Robinson & Verdier, 2013; Rodrik, 1998; Katsimi, 1998), visible versus invisible public goods (Harding & Stasavage, 2013), or one-time payments versus land transfers (Albertus, 2013). Yet, conceptual precision is lost in the two-dimension scenario as governments typically provide more than just two kinds of public goods (Kramon & Posner, 2013). For this reason, we account for the trade-offs politicians make between multiple goods: education, health, infrastructure, and agriculture.

Lastly, the empirical strategy must account for both the interdependency as well as trade-offs between multiple goods; this implies estimating the demand for, and provision of, several different goods simultaneously. Multinomial logit models can model the choice among competing alternatives, but they assume that politicians choose to supply only one of several public goods while disregarding all others. This technique is unsuitable since governments typically provide several public goods concurrently. We suggest a Differentiated Product Model as a more appropriate methodology as it estimates the share of the budget allocated to several types of public goods simultaneously.

3. REVEALED PREFERENCES AND SPENDING ON PUBLIC GOODS

(a) *Our theory*

Existing approaches focus on the role of institutions in shaping the incentives of politicians when explaining overall spending on public goods. The findings suggest that higher overall public goods expenditures characterize more inclusive electoral systems where politicians provide public goods in exchange for political support. However, these analyses refer to an abstract type of good with undefined characteristics. It is commonly assumed that public goods—irrespective of type—benefit everyone equally because of their non-rivalrous and non-exclusionary properties. Bueno de Mesquita *et al.* (2002) offer this example: "Imagine that the leader has a pool of $1,000 with which to provide goods and that spending the entire $1,000 would produce a public good worth $20 to everyone in society." (Bueno de Mesquita *et al.*, 2002, p. 562).

We believe that this view is mistaken. While public goods are non-rivalrous and non-exclusionary, one citizen might *value* particular public goods differently than others. Schools, for example, might only directly benefit citizens with children while health facilities are primarily useful to individuals at higher risk of needing medical attention. In other words, even if a total of $1,000 of public goods is provided, some might value the $20 at $40, but others only at $5. Consequently, different citizens demand different types of public goods.

Our approach follows Kramon and Posner (2013) who argue that there is a need to better understand the *trade-offs* between different types of public services, as focusing on provision of one good in isolation can be misleading. We argue that a politician's response to popular demands has two dimensions: first, citizens' demands could affect the overall spending on public goods and second, they could play a role in explaining which types of public goods are provided. To illustrate the two options, assume that the government spends its entire budget on four types of public goods—A, B, C, and D—as well as non-public goods expenditure, X.

Assume that a politician is faced with citizens' demands for increased spending on public good A. This politician has two options: First, they might increase the spending on A while maintaining the current spending levels on public goods B, C, and D. Total spending on public goods—the sum of A, B, C, and D—will rise while spending on non-public good-related expenditure X will decrease. Alternatively, they could respond to citizens' demands by increasing spending on A while also maintaining the budget allocation to non-public goods expenditure X. Total spending on public goods will remain constant, despite the increased spending on A, necessitating a decrease in budget allocation to public goods B, C, and D. In this second scenario, politicians reshuffle resources between different types of public goods but do not increase overall public goods expenditure.

We argue that the second option—reshuffling of resources among different types of public goods while the overall level of spending on public goods remains constant—is more likely. The reason is that the relative budget shares allocated to (a) total spending on public goods and (b) total non-public goods expenditure are stable, for two reasons.

First, the total spending on public goods—the sum of A, B, C, and D—is unlikely to change for institutional reasons. Bueno de Mesquita *et al.* (2002) argue that the size of the winning coalition W relative to that of the selectorate S is crucial for explaining politicians' choices. Re-election requires satisfying the demands of the winning coalition. When W is small in comparison to S, this is best accomplished by providing private goods. A large W relative to S reduces the efficacy of private goods as a means of purchasing political favors, because the benefit for each member of W decreases as W increases. In contrast, the non-exclusionary and non-rivalrous nature of public goods implies benefits for every member of W. Bueno de Mesquita *et al.* (2002) argue that institutional features, such as suffrage requirements and voting rules, determine the size of W and S. Since Nigeria is a democracy, we assume W to be comparatively large, providing politicians with the incentive to supply public over private goods. At the same time, the electoral and suffrage rules have been

constant since Nigeria's democratization, implying that increases in demand for a particular public good do not translate to changes in the size of the winning coalition W. Even when faced with increased demand for a particular public good, politicians will not have the incentive to provide a higher level of total spending on public goods. Instead, we argue that politicians will reshuffle resources from less preferred to more preferred public goods, leaving the overall public good expenditure constant until there is a change in W.

Second, the share of the budget allocated to non-public goods, X, contains multiple expense items that cannot be easily reduced. Salaries for administrators and other service personnel cannot be reduced in response to increased demands for spending on public goods. Similarly, overhead costs cannot change rapidly. While not large, pension obligations exist and offer little flexibility for reductions. Lastly, debt repayment and interest payments on borrowed resources are a budget item that cannot be re-negotiated and are therefore relatively fixed.

In sum, total spending on public goods does not increase for institutional reasons, and cannot increase because the remaining budget items cannot be reduced easily. For these reasons, we hypothesize that

Hypothesis 1. *When faced with demands for a particular public good, politicians will reshuffle resources from less preferred public goods to the most demanded public good, while keeping the total spending on public goods constant.*

If Hypothesis 1 is correct, a second question must be asked: If politicians reallocate resources between different public goods, which public good will receive additional resources at the expense of other public goods? While we suggest that supply-side considerations determine the overall spending on public goods, we argue that demand-side considerations are crucial to explaining the variation in goods provided. We argue that politicians allocate resources to the type of good preferred by a majority of citizens in their district, at the expense of goods preferred only by a minority.

Examining the characteristics of Nigerian districts provides us with insights regarding which good, on average, should be prioritized over others: Table 1 provides information on the average Nigerian district with respect to the share of households that prefer a particular type of public good, showing 38% of households exhibit a preference for school facilities, 28% demand health facilities, 26% prefer infrastructure, and a mere 11% demand agricultural support. If the constitutional reform was successful, we would expect politicians' allocation of resources across different types of public goods to closely match the preference profile of the local population, as Azfar, Kahkonen, and Meagher (2001) found in a study of local government efficacy in the Philippines. Therefore, as citizens demand education over all other types of public goods, we expect politicians to increase spending on education at the expense of spending on health, infrastructure, and agriculture.

Hypothesis 2. *We expect a positive marginal effect of demand for education on education spending, but a negative marginal effect of health preferences on health expenses, infrastructure demand on infrastructure expenses, and agriculture preferences on agriculture spending.*

(b) *Additional empirical implications*

We argue that increased demand for one particular good does not translate to increased total spending in public goods; instead, we expect that local politicians reshuffle resources among different types of public goods to increase funding for the most preferred public good. In order to evaluate this unobservable causal mechanism, we propose a battery of testable implications.

(i) *Implication 1: Capital versus Recurrent spending*

Government budgets distinguish between capital spending and recurrent spending. Capital expenditure includes expenses for the purchase, creation, or construction of durable products expected to last more than a year, such as new school buildings, hospitals, or roads. Recurrent expenses occur regularly—monthly, quarterly, or yearly—and include intangible items such as salaries. Our argument focuses on the total expenditures for public goods, i.e., the sum of capital and recurrent expenditures. After all, if we were to focus only on capital expenditure, districts could spend more on school construction and health care workers and our data would not pick up the latter.

Yet, it is worthwhile analyzing whether capital or recurrent spending is driving the results obtained with total spending. There are good reasons to expect that capital expenditure is the main force. First, Bose (2007) find when analyzing developing countries—including Nigeria—that a growth effect is not significant for current expenditure, yet positive and significant for capital expenditure. Second, current spending does not allow for much discretion by local politicians as the spending is mostly a reflection of explicit (or implicit) commitments

Table 1. *Variation of dependent variable and independent variables*

	# of Obs.	Mean (%)	SD (%)	Minimum (%)	Maximum (%)
Percentage of the population demanding particular good					
Education	500	38.85	22.51	0.00	100.00
Health	500	27.71	18.17	0.00	87.18
Infrastructure	500	26.49	16.75	0.25	84.87
Agriculture	500	10.65	13.61	0.00	81.54
Spending (in mio. Nigerian naira) on differnet public goods					
Education	499	56.93	77.80	0.00	540.24
Health	497	75.01	70.83	0.00	674.95
Infrastructure	500	148.74	315.85	0.67	4976.59
Agriculture	499	37.19	52.39	0.00	593.83

Note: Table displays the percentage of households that exhibits preferences for a particular type of public good. It also displays the variation in spending across these different goods.

(Tanzi & Davoodi, 1998). Third, following Harding and Stasavage (2013), visible public goods are more attributable and thus provide greater political benefits to politicians. As construction of infrastructure such as schools and hospitals is easier to monitor than increased salaries for teachers and doctors, discretionary spending should primarily be observed in capital expenditure.

At the same time, however, there are good reasons why recurrent expenditure might drive the results. While observing higher salaries might be difficult, hiring more teachers is a visible sign that would count toward recurrent expenditure, and it is not prima facie clear if school construction or a higher number of jobs for teachers is easier to observe. In fact, some scholars suggest that more immediately visible current spending is preferable, particularly prior to an election (Vergne, 2009). In addition, recurrent expenditure encapsulates the vast majority of quality public service investments implemented in African countries (Bratton *et al.*, 2009). Local politicians might plausibly attempt to respond to citizen demands by improving quality of public services by purchasing new textbooks or medical supplies. Lastly, recurrent expenditures exceed capital expenditures for some goods. Table 2 shows that recurrent expenditure is higher than capital expenditure for education and health.

For these reasons, we analyze the effect of increased demands on capital and recurrent spending separately. As nothing in our argument suggests that the causal mechanisms are restricted to one or the other type of spending, we should observe the hypothesized effects of 1 and 2 not only for total expenditure, but also capital and recurrent expenditures separately.

Implication 1. *When analyzing capital and recurrent spending separately, increased demand for education should increase both capital and recurrent spending on education, while it should reduce both capital and recurrent expenditures on health, infrastructure, and agriculture.*

(ii) *Implication 2: Elected versus Appointed district commissioners*

Our theory assumes a link between citizens' demands and politicians' spending decisions. However, this assumes that citizens can attribute the increase in public spending to politicians. For citizens to reward politicians, they must be able to correctly attribute that good to the responsible politician (Harding, 2015). If this is not the case, politicians might not have the incentive to deliver the goods demanded by citizens. Indeed, recent findings demonstrate that in some cases voters do not necessarily vote for the incumbent after receiving goods (Kadt & Lieberman, 2015). While we do not have direct data that capture citizens' ability to attribute increased spending on their preferred good to politicians, there are good reasons to expect that this is the case. Recall that in Nigeria, districts are the sole providers of particular services. Thus local politicians cannot blame budget mismanagement on the federal government, but are held accountable themselves (Suberu, 2015). Furthermore, Nigerian local politicians enjoy a comparatively short tenure of only three years, which limits the possibility of voters "forgetting" what politicians did in the recent past. Both arguments suggest that—at least in Nigeria—the incentives for elected politicians to be responsive to citizens' demands exist.

In addition, we can test a corollary that follows from this observation: We should observe politicians responding to citizens' demands only if citizens are attributing public goods to politicians and only if they can 'punish' non-performing politicians at the ballot box. If this is not the case, politicians should be less responsive. We exploit a particular variation to test this argument. While the chairman, deputies, and councilors should be elected, they are at times appointed by state governors. There are several cases of governors dissolving democratically elected councils, then replacing the councils with members of the dominant ruling party (Wilson, 2013). For this reason, a significant number of districts appointed, rather than elected, local councils during the period of interest (Omar, 2012).

We expect that appointed commissions are less responsive to the demands of local citizens, instead using budget expenditures to please their principals (i.e., state governors). Following Harding and Stasavage (2013), we expect that appointed district politicians are more likely to spend resources on highly visible goods, as they are more easily observable should the governor visit. Also, we expect them to favor small, well-organized groups such as landowners. Thus, appointed politicians might prioritize spending on infrastructure and agricul-

Table 2. *Descriptive statistics of spending conditional on demand*

		Total Spending		Capital Spending		Recurrent Spending	
		Mean	S.E.	Mean	S.E.	Mean	S.E.
Education	low demand	50.23	4.63	16.12	2.26	34.11	3.83
	intermediate demand	57.85	5.92	16.49	1.99	41.36	5.43
	high demand	62.55	7.20	22.76	4.30	39.68	5.17
Health	low demand	81.56	7.19	26.01	4.75	55.55	5.60
	intermediate demand	72.43	4.25	22.33	2.63	50.10	2.91
	high demand	71.10	4.61	23.93	3.00	47.01	3.04
Infrastructure	low demand	162.52	15.43	130.60	14.95	31.93	2.67
	intermediate demand	180.63	37.93	124.54	31.04	56.09	22.54
	high demand	104.42	11.61	83.75	11.45	20.66	1.86
Agriculture	low demand	35.69	3.89	17.39	2.89	18.30	2.00
	intermediate demand	39.98	4.75	19.69	4.01	20.17	2.03
	high demand	35.95	3.50	18.82	2.92	17.12	1.44

Note: Spending on different goods conditional on level of demand. Spending data in millions of Nigerian Naira. The data show that higher demand does not uniformly translate to increased spending, but that politicians reshuffle resources among public goods. Furthermore, education is the good that benefits from reshuffling at the expense of other goods.

ture. This would correspond to findings by Zhang, Fan, Zhang, and Huang (2004) who examine 60 villages in a single Chinese province. They found that elected officials tend to spend more on local public goods demanded by the local population, while appointed ones do not.

Implication 2. *The expenditure decisions of elected local politicians should closely match the preference profile of local citizens. In contrast, spending by appointed local politicians should focus on highly visible goods such as infrastructure.*

(iii) *Implication 3: Household Preferences versus Household Characteristics*

We established that the demand for different types of public goods differs across districts. However, why do citizens' preferences differ? Scholars have suggested that household characteristics matter. For example, Ansell (2014), Kemeny (2005) and Castles (1998) suggest that households owning their home have different preferences with respect to the welfare state than those that rent. Similarly, Scheve and Slaughter (2001) illustrate how homeownership affects households' preferences for trade barriers. Kim and Bunte (2016) argue that even though public goods are non-rivalrous and non-exclusionary, citizens do not perceive the benefits of public goods in an identical manner. Rather, the distributional consequences of particular public goods differ across citizens. We follow this argument and suggest that actors are aware of their own socio-economic characteristics and have stronger preference for the types of public goods whose distributional consequences complement their own characteristics. For example, households owning a motorcycle should be more in favor of new roads than those without such a vehicle. This gives rise to an additional testable implication: if household characteristics explain which type of good is demanded, then these household characteristics could serve as proxies for the stated preferences of households.

Implication 3. *Information on socio-economic characteristics of individuals or households can serve as a proxy for stated preferences on public goods.*

(c) *The role of local politics for providing public goods in Nigeria*

Before testing our theories, it is important to describe the importance of local government in providing public goods. The Nigerian federal governance system consists of 36 states further decentralized into a total of 774 local government areas (LGAs).[2] The Nigerian constitution mandates elected local councils consisting of a chairman, deputy, and secretary, each elected for a three-year term. Each state's State Independent Electoral Commission (SIEC) organizes elections for all districts in the respective state. Bunte and Vinson (2016) show that local power-sharing arrangements shape the process of selecting candidates. For example, some districts require chairmanship candidates to run on a joint ticket with a deputy from another ethnic group. In others, candidates for the chairmanship are not supposed to come from the same ward (i.e., a subunit of each district) as the previous chairman. Local residents subsequently decide among the various candidates by voting in local elections.

These district councils have significant authority with respect to local provision of public goods. The Fourth Schedule of the Nigerian constitution lists the main functions of local government councils. Among them are "construction and maintenance of roads, streets, street lighting, drains and other public highways; [...] the provision and maintenance of primary, adult, and vocational education; the development of agriculture and natural resources, other than the exploitation of minerals; the provision and maintenance of health services" (Awotokun, 2005, p. 132). Thus, "It should be noted that, the broad objective of establishing local government is placed on the service delivery function. When roads are bad, when there are no markets stalls, no health centers, when there is no water, no drugs in the local dispensaries and when refuse is littered all around the place etc, the ordinary citizen blames it on the local government" (Oviasuyi, Idada, & Isiraojie, 2010, p. 83).[3] Districts have the explicit mandate to provide public goods as they deem necessary, and face generally low constraints by federal and state regulation (Aghayere, 1997). Subject to budget constraints, local-level politicians, rather than state- or national-level, decide how to spend the available resources, and which type of public goods to provide.

District politicians require monetary resources to accomplish these tasks. Section Seven of the Nigerian constitution delineates that local governments have three sources of revenue. First, districts can generate tax revenue locally. Second, districts receive resource allocations from the Federal Account, which is the principal source of government finance at all levels. 48.5% of this account is retained by the federal government, while allocating 24% to state budgets and 20% to districts (Barkan, Gboyega, & Stevens, 2002, p. 11).[4] In addition, if oil or natural resources are mined in the district, it is allowed to keep 13% of the proceeds directly, while the remainder is paid into the Federal Account. It is not generally the case that local government funds are earmarked for specific purposes.[5]

Observers conclude that "Nigeria is one of the few countries in the developing world to have significantly decentralized both fiscal resources and service delivery responsibilities" (Khemani, 2005, p. 285). Yet, even if local politicians have monetary resources and the authority to make spending decisions, do they have any incentive to incorporate popular demands in their own decision-making process? We understand that issues of corruption and incompetence are not unknown to Nigerian local politics (see Sklar, Onwudiwe, & Kew, 2006); nevertheless, we offer three reasons why local politicians are likely to heed the demands of their constituents.

First, local politicians have short, three-year terms, incentivizing politicians to satisfy the constituency for better re-election chances. Adeyemi, Akindele, Aluko, and Agesin (2012) point out that the Nigerian constitution also allows the electorate to recall non-performing local officials. Second, politicians' personal ambitions provide additional incentives to listen to their constituency, as a successful local career can open doors for a higher-level political career. For example, a World Bank report cites a politician as eager to prove his worth to the local constituency:

> The district chairman in Dunukofia is a 35-year-old attorney who practiced law for 12 years in Lagos before returning home to contest the 1999 elections as the APP candidate. [...] He has worked closely with members of the local government council to draw up a master plan of capital projects that serve all. [...] [He] views his tenure as district chairman as a stepping-stone to higher office at either the state or federal level.
>
> [Barkan *et al.*, 2002, p. 46]

Lastly, local politicians appear to be unconstrained by party politics. For this reason, local politicians have every incentive to implement policies that benefit the majority of their constituency, regardless of their party affiliation. For example,

> Each council in the districts considered included members of the opposition, but party was not a defining attribute of political conflict. The most frequent comment when asked about the significance of party was `we all get along.' The reasons for such apparent cooperation are the same as those that shape the policy-making process at the state level. District chairmen, like governors, do not regard party as important, and seek to spread development across the area embraced by the local government authority provided councilors cooperate with them.
>
> [Barkan *et al.*, 2002, p. 43]

In sum, local politicians in Nigeria have access to resources, possess the authority to make spending decisions, and have the incentive to listen to the preferences of their constituencies. However, how do politicians react when faced with demands for increased spending on a particular type of public good?

4. METHOD AND DATA

Implementing an appropriate empirical test of our hypotheses is a challenge. Recall that politicians facing increased demands for a particular type of public good are also subject to a budget constraint. They can either (a) increase total spending on public goods at the expense of non-public good-related spending, or (b) leave non-public good expenditures unchanged and reallocate spending between different types of public goods. In either case, there is interdependency: a spending increase in one area must be accompanied by a corresponding expenditure reduction in another. This interdependency implies that we cannot estimate five separate OLS regressions with the four shares of public goods and the share of non-public good expenditures as dependent variables; this would ignore the effect that an increase in spending on good A might have on the provision of good B, as well as how preferences for B affect spending on B, which has an impact on spending for A.

Instead, we estimate a Differentiated Product Model, initially developed to analyze the effect of household characteristics on how the household allocates its limited resources to purchase a variety of goods (Berry, 1994). For example, given a budget constraint, households with more children allocate a greater share of their budget toward baby food and diapers, at the expense of spending on movie tickets and restaurant meals. Thus, this methodological approach accounts for the fact that larger spending in some areas will need to be offset by smaller spending in others. We apply this model to Nigerian districts. Given the district-level budget constraint, how do district characteristics (i.e. citizens' demands for particular goods) shape budget allocations to competing spending areas (i.e., politicians' spending decisions)? This estimator calculates the predicted shares of the government's budget allocated to the four public goods and non-public goods simultaneously, thereby accounting for the interdependency between spending items.

Importantly, this estimation method can estimate Hypotheses 1 and 2 simultaneously: The model can differentiate between (a) the reshuffling of resources among public goods only, and (b) the increase in total spending on public goods. The former scenario is the case if some coefficients on the demand for specific public goods are positive while others are negative (indicating the trade-off suggested by Hypothesis 1), while the latter is the case if all coefficients are positive. At the same time, if reshuffling occurs, the model results identify which type of public good is preferred at the expense of others: A positive coefficient on education and negative coefficients for other public goods would provide support for Hypothesis 2. The Differentiated Product Model has the following form:

$$(ln(s_j) - ln(s_0))_i = \beta_1 X_{ji} + \beta_2 Z_j + \beta_3 X_{ji} \times Z_j + \gamma_i + \epsilon \quad (1)$$

where the dependent variable captures the share of the budget spent on public good j relative to the share of non-public good-related government spending. Since we consider four goods, this implies that each district is represented with four observations on the dependent variable: the share of the budget spent on education, health, infrastructure, and agriculture. We use standard errors clustered on districts to account for the interdependency across observations for a given district. Furthermore, the model requires using interaction terms to capture the effect of education preferences on education, health preferences on health spending, and so on. Z_j is a dummy for the respective type of public good so that the interaction term captures the effect of citizens' preferences for the type of good j.[6] The key explanatory variables, X_{ji}, are the share of citizens in district i that demand a particular type of public good j.

We construct the dependent variable using district-level spending and revenue data for the year 2006 obtained from the Nigerian National Bureau of Statistics.[7] The data include information on each district's total revenues accruing from tax revenue and federal transfers, as well as debt obligations, allowing for calculating the budget constraint. We obtain both capital and recurrent spending to determine each district's total spending on four types of public goods: education, health, infrastructure, and agriculture. Note that while recurrent spending on infrastructure was available, a single budget item for capital spending was not available. Instead districts' budgets provide information on capital expenditure for roads, electricity, and water separately. We combine these three items, together with recurrent expenditure, to obtain districts' total spending on infrastructure. Table 1 provides descriptive statistics on the variation of spending across different types of public goods. District-level revenue and spending data are notoriously difficult to obtain; we have revenue and spending data for 500 of 774 Nigerian districts. We were concerned about listwise deletion of districts with missing observations. This might result in bias if observations are systematically missing. However, this does not appear to be the case. For example, districts with missing observations are randomly located across Nigeria so that all but one of the 36 Nigerian states have missing districts.[8] Similarly, both large and small, rural and urban, sparsely and densely populated districts are equally likely to be missing. For this reason, we do not expect bias arising from missing data.

Eqn. 1 indicates that the dependent variable is a difference in logs (or, equivalently, a logged ratio) between the log of the budget share spent on a particular public good relative to non-public good-related spending. However, there are some districts that spend their total public good expenditure on three of the four types of public goods, leaving one with no budget allocation. As ln(0) is undefined, such cases present a challenge for constructing the dependent variable: Dropping these observations may introduce bias, because the fact that some districts choose to spend next to nothing on a specific good is important information. To prevent these observations from being undefined, we replace instances of zero expenditure with the 1st percentile expenditure for the respective good.[9]

Our independent variable is the share of households in each district demanding increased spending on either education, health, infrastructure, or agriculture. We utilize responses by 123,095 Nigerian households collected in the 2006 National Core Welfare Indicators Question Survey by the Nigerian National Bureau of Statistics. These data include information on *revealed preferences* of these households across *different*

types of public goods. The data cover the year 2006 only, forcing a cross-sectional approach; therefore, our results show different spending shares across districts resulting from different preferences across districts. The survey asks households which type of facility they would like improved. Respondents can then pick among options such as school facilities, health facilities, or agricultural assistance. To match our approach to the data on infrastructure spending, we calculate the average demand for infrastructure by taking the mean demand for roads, electricity, and water projects. The variation in these independent variables is displayed in Table 1.

Controlling for supply-side explanations is a key challenge for analyzing the effect of demand-side factors on public good provisioning. As mentioned above, scholars such as Bueno de Mesquita *et al.* (2002) argue that the varying degree that politicians are constrained by institutional features determines their incentives for providing public goods, with the relative size of the winning coalition W to the selectorate S determining whether politicians will provide public or private goods. Both S and W are coded using information on the institutional characteristics, such as whether executive recruitment is open to all or the nature of the legislative selection process. As such detailed institutional data do not exist on a sub-national level for all Nigerian districts, we use a second-best strategy of including district fixed effects, γ_i, for each of the 500 districts. These fixed effects capture the unobservable institutional differences across districts, controlling for the differences between districts in supply-side incentives of politicians.

5. THE EFFECT OF PREFERENCES ON PUBLIC GOOD PROVISIONING

(a) *Testing Hypotheses 1 and 2*

We first examine the raw data to assess how different patterns in citizens' demand result in divergent spending decisions for public goods; the descriptive statistics alleviate concerns about model dependence. Table 2 approximates the level of public spending corresponding to demand for a particular public good. It displays the mean of spending on different goods conditional on the level of demand. The cut-points for low, intermediate, and high demand are defined as the 33rd and 66th percentile of the respective preference distribution. The data show that higher spending for education corresponds with higher demand. In contrast, spending on health, infrastructure, and—to a degree—agriculture is lower with higher demand for the respective goods. These data suggest that increased demands do not translate in uniformly increased spending, but rather that politicians reallocate spending between different types of public goods as suggested by Hypothesis 1. Furthermore, education is the good that benefits from reshuffling at the expense of other goods, providing support for Hypothesis 2.

However, descriptive statistics do not account for the interdependencies of these budget items. For this reason, we estimate a Differentiated Product Model as it *simultaneously* estimates the effect of demand for four different goods on the share of the budget allocated to the respective goods. It therefore accounts for the interdependencies between spending items—the increase in one spending area must be accompanied by the spending reduction in another area—in a district's budget.

We do not present the tables for space considerations. [10] In addition, since the models include interaction effects, the substantive interpretation of the coefficients is not as straightforward as the marginal effect of preferences for a particular good equals

$$\frac{\partial Y}{\partial X} = \beta_1 + \beta_3 Z \tag{2}$$

For this reason, we visualize the marginal effects of citizens' demand on politicians' spending decisions. Figure 1 displays the marginal effects of preferences across public goods. A positive and statistically significant coefficient indicates that increased demand for this good is associated with an increased share of the budget allocated toward this public good, while a negative coefficient demonstrates that an increase in demand for this good is associated with a reduced budget allocation.

The results indicate that a higher demand for education is associated with a higher share of the district's budget allocated towards education. At the same time, higher demand for health, infrastructure, and agriculture lead to lower spending on these goods: As only a minority of citizens request these goods, their demands are traded off against increased spending on education. The results provide strong support for Hypothesis 1: at least one coefficient is positive while at least one other marginal effect is negative. This implies that politicians do not increase the overall share of the budget allocated to public goods (which would be the case if all coefficients were positive). Instead, politicians reallocate resources from one type of public good to another within these constraints. In addition, the results support Hypothesis 2: politicians prioritize education (positive coefficient) at the expense of health, infrastructure and agriculture (negative coefficients). Thus, they provide the good that the majority of Nigerian households prefer, while withdrawing resources from funding for goods preferred by a minority of households.

(b) *Implication 1: Capital versus Recurrent spending*

The results presented in Figure 1 are based on total spending for each type of public good (capital and recurrent expenditures combined for the respective goods). However, the discussion preceding Implication 1 notes that differentiating between

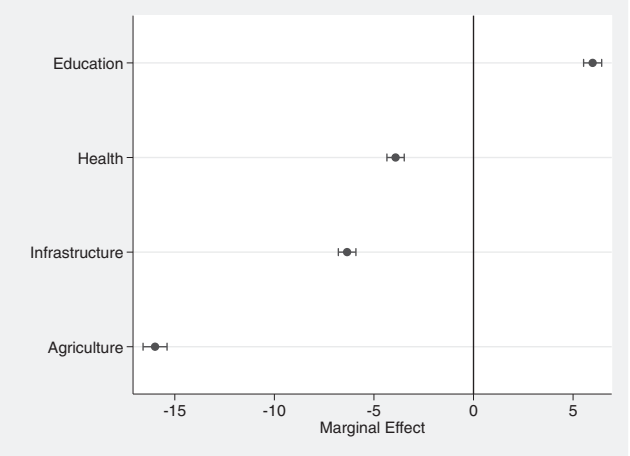

Figure 1. *Politicians' trade-offs between different types of public goods. Note: Marginal effect of preferences on total spending for the respective public good. A positive coefficient indicates that a higher demand for this good is associated with an increased share of the budget allocated towards this public good. The results indicate that local politicians reallocate resources to education at the expense of funding for health, infrastructure, and agriculture. 95% confidence intervals shown.*

capital and recurrent expenditures is meaningful. Ideally, we should observe the trade-offs encapsulated in Hypotheses 1 and 2 also when examining capital and recurrent spending separately.

Figure 2 presents the results of this exercise. The positive and statistically significant marginal effects indicate that increased demand for education is associated with higher capital and recurrent spending on education. Thus, in response to increased demands by citizens, local politicians increase funding for new school buildings as well as teachers. Local politicians afford these education increases by reducing expenditures on health (hospitals and doctors), infrastructure (roads and maintenance), and agriculture (equipment and credit programs). The demands for these goods are associated with a negative marginal effect, as only a minority of citizens demand more expenditures for these goods. In sum, the separate analysis of capital and recurrent spending provides support for both Hypotheses 1 and 2.

(c) *Implication 2: Elected versus Appointed district commissioners*

With frequent elections, local politicians should be responsive to citizens' demands in order to increase their chances for re-election. However, while most local-level politicians in Nigeria are elected, some are appointed by state governors (Wilson, 2013). Thus, appointed local politicians are likely loyal to the governor, not the local population.

This variation of district politicians' loyalties allows for an additional test of our causal mechanism. We collect data on elected versus appointed politicians for all Nigerian districts in the year 2006. This proved to be a veritable challenge due to the lack of pre-existing data. We reviewed articles by local newspapers published in 2006 with relevant information and determined that 387 of 500 districts had elected local politicians in 2006, while 113 districts were governed by appointed politicians. We subsequently split the sample in districts with and without elected officials, and separately re-estimate the model for each sample. The results are presented in Figure 3. The results provide support for Implication 2: Elected politicians make spending decisions that correspond closely to the demands of the local population. In contrast, appointed politicians reallocate resources to highly visible goods, such as infrastructure projects, or favor small, well-organized groups, such as landowners.

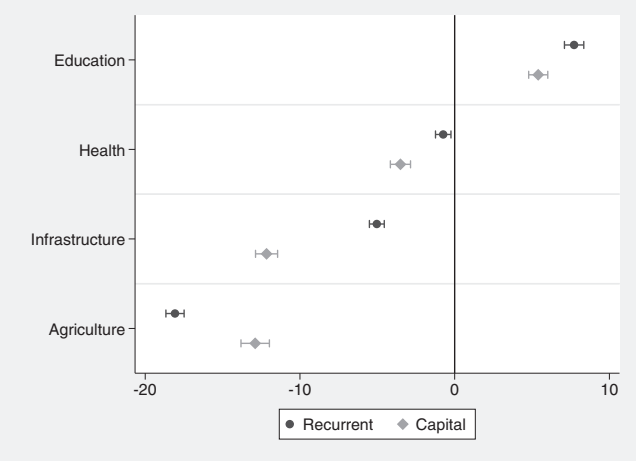

Figure 2. *Capital versus Recurrent Spending. Note: Marginal effect of preferences on capital or recurrent spending for the respective public good. The results indicate that local politicians reallocate resources to education at the expense of funding for health, infrastructure, and agriculture for both capital and recurrent spending. 95% confidence intervals shown.*

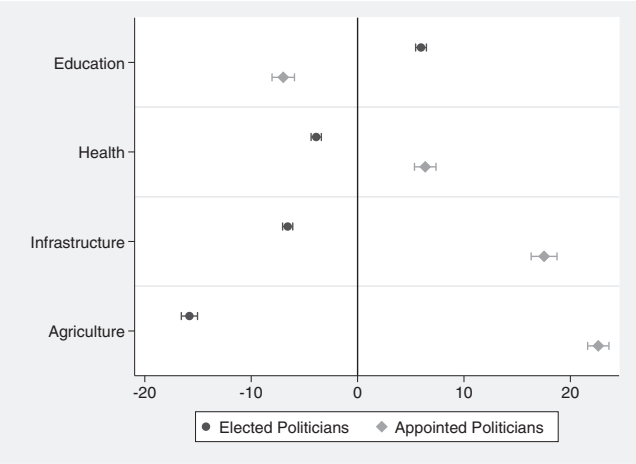

Figure 3. *Behavior by elected versus apppointed politicians. Note: Marginal effect of preferences on spending for the respective public good for districts with elected politicians versus those with appointed politicians. The results indicate that elected politicians reallocate resources to education at the expense of funding for health, infrastructure, and agriculture, which reflects the preference profile of citizens. In contrast, appointed politicians prioritize spending for highly visible goods such as infrastructure or favor the landed elites. 95% confidence intervals shown.*

(d) *Implication 3: Household Preferences versus Household Characteristics*

Implication 3 suggests that household characteristics could be used as a proxy for stated preferences. After all, household characteristics determine the perceived value of different public goods, and thus shape households' opinion regarding public goods' provision. We re-estimate Eqn. (1), with one significant modification: Instead of using the percentage of citizens in district i that demand a particular type of public good j as the independent variable, X_{ji}, we use the percentage of citizens that share a particular household characteristic.

For education, we use the average education of households in a district as a proxy for their preferences for increased education expenditure. Education is associated with higher income, more job security, and more employment opportunities; hence, we assume that educated heads of households recognize the value of education.[11] We proxy for health preferences by assuming that a larger share of households without convenient access to hospitals will be associated with stronger preferences for increased health expenditure. Households located far away from hospitals are more likely to demand these public goods. For this reason, we use the percentage of households in each district whose time to the nearest hospital is longer than 15 min. We mirror our strategy of measuring the demand for infrastructure spending by pooling information on the household characteristics concerning roads, electricity, and water. We combine data on the percentage of households owning a motorcycle (and thus requiring roads), the percentage of households owning a radio (which necessitates electricity), and the percentage of households without access to pipe-borne water to obtain a measure of household dependence on infrastructure. Lastly, we proxy the demand for agricultural spending by the average area of land owned by households in each district.

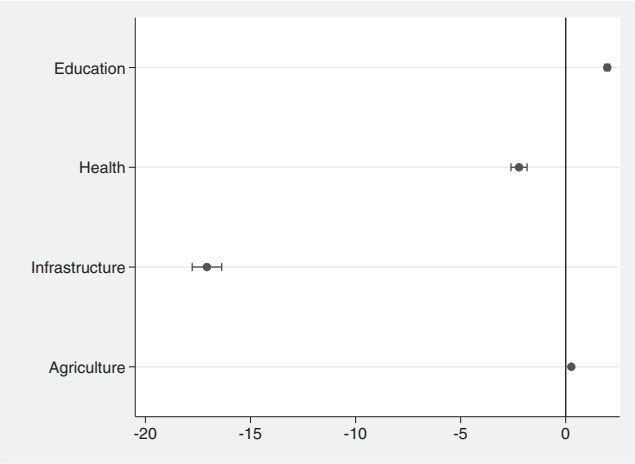

Figure 4. *Household characteristics as a proxy for household preferences. Note: Marginal effect of household characteristics on spending across different public goods. The model uses household characteristics as proxies for stated preferences across public goods. The results closely resemble the findings using actual demand for different goods, with the exception of agriculture. 95% confidence intervals shown.*

The results are visualized in Figure 4 and are consistent with the previous findings. Like preferences for improved education, households' past exposure to education is associated with higher spending on education, offset by decreased spending on other public goods. In particular, health and infrastructure expenditures decrease when there is high demand for education. The results concerning agriculture do not correspond closely to the prior findings. The imprecision might be due to the small sample size as only a minority of households demand agricultural goods. With respect to the three most important public goods—education, health, and infrastructure—the model using household characteristics as proxy for household demand provides support for Hypotheses 1 and 2.

6. CONCLUSION

Several developing countries have pursued decentralization efforts in the past decades. Nigeria's 1999 constitution gave districts far-reaching authority concerning spending on public goods such as education, health, infrastructure, and agriculture. In this paper, we examine whether local politicians respond to citizens' demands when deciding how to allocate their resources among different types of public goods.

We advance existing research by explicitly examining the trade-offs local politicians confront. Both our theory and methodological approach analyze how politicians respond to demands for increased spending on a public good while facing a budget constraint: This introduces an interdependency as an increase in one budget item requires decreases elsewhere. Local politicians could accommodate the increased demand for a particular public good by increasing total public goods expenditure at the expense of non-public good expenditures. However, we find that they instead maintain the current level of non-public good expenditure and reshuffle resources among different types of public goods by increasing spending on public goods at the expense of other goods. We find that politicians concentrate on providing funding for education—the public good most demanded by citizens in Nigerian districts—*at the expense* of expenditures for health, infrastructure, and agriculture. Expanding upon the literature explaining the variation in overall levels of spending on all public goods, we contribute to a better understanding of the factors explaining the *composition* of public goods provided.

Our study also has policy relevance, particularly in the context of developing countries embarking on decentralization reforms. Following decentralization, Afrobarometer (2008) reports that, "More than two-fifths (45%) of the respondents said they had problems with the way their local councils were run in the past year while about one-half (49%) had no such problem." We suggest two reasons for this phenomenon: First, and more obviously, the decentralized governance might not work perfectly. We demonstrate this by examining the differential performance of elected versus appointed politicians, as the spending decisions by the latter do not correspond to the preferences of local citizens. Second, even if decentralization was successful, we have shown that elected politicians have an incentive to cater to the demands of the majority in each district. This leaves a substantial part of the districts' population—up to 49%—potentially underserved. Thus, policy makers embarking on decentralization would be well-advised to point out that such reforms are unlikely to be a panacea for all citizens' demands and concerns.

NOTES

1. We use the term public good to describe goods that are government-provided and intended for use by the entire population, thereby non-exclusionary and non-rivalrous. For instance, according to the U.S. Embassy in Nigeria, primary and junior secondary education are free for youth in Nigeria, although in many cases students are required to purchase books and uniforms (Embassy, 2013). Public health care is provided for all citizens at the district level, though a small (even by Nigerian standards) nominal fee might be charged at times (Okpani & Abimbola, 2015). While Nigerians do pay for electricity consumption, we examine electricity infrastructure which is the responsibility of the government.

2. LGAs correspond to districts. We use "districts" throughout this paper.

3. Just as in other countries (see Granados & Sánchez, 2014), decentralization delegated the responsibility for water provision to districts. In Nigeria, this is evidenced by local newspaper reports: "Over 3,000 rural dwellers in Bodinga Local Government Area of Sokoto now have access to improved water supply with the rehabilitation of 30 boreholes ", see "Sokoto LG Rehabilitates 30 Boreholes," Daily Trust, June 23, 2011.

4. The remaining 7.5% is reserved for special projects.

5. However, some have argued that funds should be made more conditional to decrease discretion of local politicians (Khemani, 2005) as Nigeria is not immune to corruption at all levels of government.

6. We refer to these dummy variables as "baseline education", "baseline health", "baseline infrastructure", and "baseline agriculture" in the tables.

7. 2006 is the only year for which demand data are available.

8. See Online Appendix A for more details.

9. The effect sizes are sensitive to the replacement procedure, but the relative magnitude of coefficients is unaffected as they are scaled by the same factor. See the sensitivity analysis in the Online Appendix A.

10. All tables are available in the Online Appendix A.

11. If schools are present and functioning, this could also lead citizens to think that money might be better spent on other issue areas that currently lack funding, implying the opposite direction of the relationship. However, the analysis includes district fixed effects accounting for differences in existing supply of schools.

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APPENDIX A. SUPPLEMENTARY DATA

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.worlddev.2016.11.008.