

# Do Bureaucrats Contribute to the Resource Curse? Evidence from a Survey Experiment in New Oil States\*

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## Abstract

The resource curse literature argues that oil production reshapes the fiscal contract between citizens and the state: politicians become less responsive to citizen taxpayers and more likely to use public revenues for their own benefit. This paper examines whether and how bureaucrats influence this breakdown of the fiscal contract. Analyzing results of a survey experiment conducted with government employees in Ghana and Uganda, we find that, when primed to think about oil revenue, bureaucrats do not generally express attitudes indicating that they contribute to the resource curse. Although oil revenue does lead some Ghanaian bureaucrats to become less interested in responding to taxpayers, this finding does not operate as predicted, i.e. by bureaucrats expressing greater partiality toward the ruling elite. Instead, we attribute this outcome to ‘disgruntled employees’ – political outsiders with low salaries – who, unlikely to benefit from oil revenue, become disaffected from citizen service. The results shed new light on processes through which resource extraction changes state institutions.

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# 1 Introduction

In her pioneering research on oil-producing states, Terry Karl observed that ‘oil wealth molds institutions more dramatically than development specialists ever imagined’ (1999, 34). Since then, a large body of scholarship on the politics of the resource curse has shown that natural resource revenues undermine the fiscal contract between state and society: the ruling elite become less responsive to taxpayers and more responsive to foreign actors in the natural resource sector. Exactly how these changes take hold – and which actors contribute to them – however, remains under-theorized. Although much of the literature focuses on rent-seizing politicians, rulers often depend on agents, such as political allies, military personnel, or bureaucrats, to aid them in the construction of rentier states.

Building on recent advances in micro-level studies of the resource curse (Paler 2013; Cappelen et al. 2018; de la Cuesta et al. 2019; Sandefur et al. 2020; Paler et al. 2020), this study examines whether and how bureaucratic officials – those responsible for the day-to-day business of the state – contribute to resource-induced changes in the fiscal contract. We investigate bureaucrats’ responses to new or expanding resource revenues in a pre-registered survey experiment conducted with over 3,000 central government employees in Ghana and Uganda – two countries with relatively recent oil discoveries.<sup>1</sup> The experiment randomly assigns bureaucrats to receive information about an increase in government oil revenue, then follows with questions that ask respondents to rate their level of agreement with statements relating to 1) the importance of responding to taxpayers, 2) the political use of government revenue, and 3) the acceptability of using state resources for personal benefit. Although the experiment probes attitudes and not actual behavior, we provide suggestive evidence that survey participants’ attitudes are correlated with relevant behavior and that bureaucrats in these contexts have the power to impact broader actions of the ruling elite.

Overall, the findings suggest that bureaucrats in these contexts are not particularly likely to express attitudes indicating that they contribute to the resource curse. In Uganda, we find no evidence that learning of new oil revenue induces bureaucrats to express preferences that would undermine the state-taxpayer fiscal contract. In Ghana, we find that in only one of the three attitudinal ques-

tions – the importance of responding to taxpayers – do bureaucrats respond to the oil price in ways reflective of the resource curse. This finding, however, does not operate through those partial to the incumbent political leadership, as we had expected: among the Ghanaian bureaucrats surveyed, we find clear evidence that those who have lower salaries and lack political connections are more sensitive to the oil revenue treatment. We interpret this finding as evidence that changes in government responsiveness to taxpayers is driven in part by ‘disgruntled’ state employees who, unlikely to benefit from revenue windfalls, become disaffected from public and taxpayer service. This result suggests that the literature’s conventional focus on rent-seizing rulers and severed tax linkages may be misguided, emphasizing instead the roles of political outsiders and distributional concerns in undermining the fiscal contract in oil-producing states.

The paper sheds new light on the processes underlying the resource curse in contexts of new or expanding resource revenues and points to fruitful areas for future research. Specifically, the findings suggest that bureaucrats would not easily or willingly engage in the political spending and corrupt activities commonly associated with the resource curse. Such knowledge helps both academics and practitioners to better understand which types of actors are more or less likely to advance – or resist – changes to the fiscal contract that frequently co-occur with resource extraction.

We begin with a theoretical discussion about the potential roles of bureaucrats in facilitating the resource curse. We then provide a brief overview of oil management in Ghana and Uganda, followed by a description of the survey experiment design and the analysis. In Section 5, we present the overall findings for each of the three hypotheses and, in Section 6, we test for differences in treatment effects across subgroups of bureaucrats. We conclude with a discussion of the results as well as a call for more investigation of the processes through which the introduction of oil revenue brings about institutional change.

## **2 Resource Revenue, Bureaucrats, and the Fiscal Contract**

As resource-exporting states receive larger and larger proportions of their revenue from external rents, they become less reliant on – and less accountable to – the taxpaying population. Heightened

reliance on resource revenue undermines the implicit ‘fiscal contract’ involved in taxation, whereby the ruling elite respond to taxpayer demands in order to maintain power and secure future revenues (Bates and Lien 1985, e.g.). Rulers in the resulting ‘rentier’ states spend state revenue in ways that privilege their political or personal interests over those of the public.<sup>2</sup> They become reluctant to ‘use scarce administrative resources to promote broad economic development’ (Moore 2004, 306) and favor a range of policies based on short-term consumption and patronage over longer-term public investments (Mahdavy 1970; Anderson 1987; Sachs and Warner 2001; Ross 2001a, 2012). These spending practices help leaders to entrench their power by buying off political opponents and/or building the coercive force necessary to repress political rivals (Ross 2001a; Wantchekon 2002; Wright et al. 2015). Both large-N cross-national studies (e.g. Jensen and Wantchekon 2004; Morrison 2009; Ramsay 2011; Andersen et al. 2013) and case studies (e.g. Yates 1996; Karl 1997; Chaudhry 1997; Lewis 2009; Saylor 2014) have extensively documented these resource-induced changes in relationships between the ruling elite and taxpayers.

There is considerably less knowledge, however, about when and how the fiscal contract is weakened and which types of actors, beyond the political elite, help to drive these processes forward. In Angola, for example, leaders rely on parallel state structures, closely tied to the ruling party, that simultaneously administer oil production, manage revenues, and serve political interests (Croese 2017; De Oliveira 2015). In other cases, the military has gained prominence as a key ruling agent in petro-states, such as in Venezuela and in Nigeria in the 1960s and 1970s (Panter-Brick 1978). In still other cases, bureaucrats are likely to occupy central roles in processes of rentierization because they manage the distribution of mining permits, resource rents, or both (Ross 2001b).

We focus in particular on the roles of bureaucrats in shaping or re-shaping the fiscal contract in new oil-producing states. Bureaucrats are potentially important arbiters of the resource curse because they often have significant discretion to directly impact the day-to-day implementation of government programs (Lipsky 1980; Pressman and Wildavsky 1984). If, like politicians, revenue windfalls induce bureaucrats to adopt attitudes and behaviors that privilege their own interests over those of the public, they may serve as autonomous actors undermining the state-taxpayer fiscal con-

tract. Like politicians, bureaucratic officials may become less interested in serving taxpayers and more interested in engaging in activities to capture resource rents to advance their own personal, political, or career interests. As Mahdavy warned, ‘the temptations for a government bureaucracy to turn into a rentier class with its own independent source of income are considerable’ (1970, 467).

Bureaucrats may also contribute to the resource curse by serving as willing agents of political principals seeking to construct rentier states. In the midst of oil booms in Venezuela, for example, President Carlos Andrés Pérez sought to centralize and consolidate control over the bureaucracy, thus incentivizing bureaucrats to comply with presidential spending directives (Karl 1997, 90). In the Philippines, Ferdinand Marcos seized control of the agency responsible for timber licenses, entrusting only his hand-picked associate to grant licenses (Ross 2001b, 76). Whether bureaucrats respond to these political changes by serving as willing agents of the ruling elite or resisting rulers’ political agendas holds important implications for the broader development of the resource curse.<sup>3</sup>

## **2.1 Bureaucratic Responses to Resource Revenue**

Drawing on the extant literature, we hypothesize three ways in which bureaucrats’ preferences may change in response to new or expanded resource revenue. First, if bureaucrats observe that resource revenue displaces tax as a key source of government revenue, and the operations of government are less reliant on taxpayers; bureaucrats’ incentives to respond to taxpayer demands will decrease. Bureaucrats will come to feel that taxpayer response is less important than servicing foreign buyers or political superiors who seize control of rents. Likewise, political superiors may lessen the extent to which they monitor and sanction bureaucrats who are not providing adequate services to citizens. Additionally, to the extent that oil is associated with lower levels of bureaucratic resources to collect taxes or serve the public (Chaudhry 1997), it can undermine bureaucrats’ motivations and abilities to serve citizens (Dasgupta and Kapur 2020; Bakker 2015). This leads us to our first hypothesis regarding bureaucrats attitudes toward *responding to taxpayers*:

**Hypothesis 1.** *When civil servants learn of increased revenue from oil, they become less willing to respond to taxpayer demands for services.*

Second, bureaucratic officials could contribute to the politicization of the state apparatus. As the aforementioned examples from Venezuela and Indonesia suggest, politicians in rentier states are likely to use the bureaucracy – particularly those agencies that administer resource extraction and execute spending – to seize control of resource rents and use them for political advantage. Bureaucrats may respond to these pressures by themselves becoming more willing to serve and support the ruling elite in order to advance in their careers or to gain access to the expanding reservoir of rents. This leads us to a second hypothesis about bureaucratic support for political spending:

**Hypothesis 2.** *When civil servants learn of increased revenue from oil, they will demonstrate greater levels of acceptance for spending in politically-supportive districts.*

Third, resource extraction could make bureaucrats more willing to use of public resources for their own private benefit. A number of studies link resource extraction and monetary surpluses to higher levels of government corruption (e.g. [Ross 2015](#); [Robinson et al. 2006](#); [Leite and Weidmann 1999](#); [Sala-i Martin and Subramanian 2013](#); [Knutsen et al. 2017](#)). In Saudi Arabia, for example, oil revenue drove fragmentation of the bureaucracy in ways that loosened constraints on bureaucrats' use of their positions for personal benefit ([Mishra 2006](#); [Hertog 2010](#)).<sup>4</sup> Additionally, corruption itself may serve as a self-fulfilling prophecy ([Corbacho et al. 2016](#)). Just as citizens are likely to see resource extraction leading to more corruption ([Vicente 2010](#); [Cappelen et al. 2018](#)), bureaucrats could also become more willing to either overlook corrupt behavior or engage in it themselves because of the increased scale on which they expect it to occur. Since oil, in particular, comes with the expectation among state officials that future revenues will grow in perpetuity ([Mahdavy 1970](#)), bureaucrats would come to feel that small diversions of resources for personal use would not seriously harm the public. We therefore propose a third hypothesis about private benefit:

**Hypothesis 3.** *When civil servants learn of increased revenue from oil, they become more permissive of private benefits from state finances.*

## **2.2 Who is Susceptible to the Resource Curse?**

Beyond these general expectations, we also hypothesize that some types of bureaucrats are more likely to adopt attitudes that contribute to the resource curse. First, we expect that those who are better educated and have a longer history of public service should be *less* impacted by an increase in oil revenue. The logic here is that individuals with such characteristics are more likely to act autonomously from changes in the political, social, or economic environment (Carboni 2010) and in line with ethical standards and public service values (Perry and Hondegem 2008).

Although longer tenures of service would make bureaucrats less susceptible to the impacts of oil revenue, we hypothesize that those occupying higher-level positions are *more* likely to be affected because they are more involved in budgets and spending decisions. Higher-level employees are also subject to more direct pressures from the ruling elite, serving as another channel through which they could be impacted by oil revenue.

Partisanship may also play a key role. We expect that bureaucrats aligned with the ruling party will be more likely to adopt attitudes that undermine the fiscal contract because they will have greater access to rents and stronger expectations of personal gains that flow from their connections to the party.

Finally, we hypothesize that bureaucrats in organizations that manage oil revenue are also more likely to adopt attitudes consistent with the resource curse expectations. Although, theoretically, oil revenue could have impacts throughout the entire bureaucracy, we expect those working in oil-related sectors to be more strongly impacted by potential increases in oil revenue. All subgroup hypotheses are summarized in Table 1.<sup>5</sup>

Table 1: Subgroup Hypotheses

Subgroup	Hypothesised Effect
Years in Service	Those with longer tenure should be <i>less</i> sensitive to new oil revenue
Education level	Employees with higher education levels should be <i>less</i> sensitive to new revenue
Position/Grade	Higher-level employees should be <i>more</i> sensitive to new oil revenue
Political Affiliation	Ruling party supporters should be <i>more</i> sensitive to new oil revenue
Organization Revenue	Employees in organizations that plausibly receive oil revenue should be <i>more</i> sensitive to new oil revenue

### 3 Oil and the Bureaucracy in Ghana and Uganda

The context for our study is Ghana and Uganda – two countries with relatively recent oil discoveries. Ghana began producing and exporting oil from its offshore deposits in 2010. In the three years prior to the study, petroleum receipts constituted an average of 7% of Ghana’s domestic revenue ([Government of Ghana 2016](#)). In Uganda, oil was discovered onshore in 2006, but production has not yet begun. Once operational, Uganda’s oil production is expected to yield amounts that would constitute upwards of 30% of government revenue (additional revenue statistics are provided in Section 4.2 below). Despite these differences in the types of deposits and timing of oil production, the two countries are, together, largely representative of African countries with new oil and gas discoveries in terms of their political institutions, economic wealth, and demographics. They have been studied jointly in a number of recent projects examining natural resource management and its impacts in new oil states ([de la Cuesta et al. 2019](#); [Hickey et al. 2015](#)).

Importantly, both governments primarily manage oil through the existing bureaucracy: bureaucrats are involved in the management of oil revenue (Ghana) and pre-oil production decision-making (Uganda). In Ghana, the Petroleum Management and Revenue Act (2011, updated in 2015), calls for an Annual Budget Funding Amount (ABFA) that is allocated to the government budget with Parliamentary approval. Up to this point, the ABFA has funded road, education, health, agriculture and communications projects, which suggests that a broad set of bureaucrats/ministries



have engaged with oil revenue via these projects.<sup>6</sup> These spending priorities are included in agency budgets published as part of the Ministry of Finance’s annual budget statements.

In Uganda, the Oil and Gas Revenue Management Policy of 2012 outlines a similar system. The Ugandan Revenue Authority, in collaboration with ‘other relevant technical departments under the Ministry responsible for Energy’ will administer the collection and administration of government revenues from oil and gas activities. Like in Ghana, an ‘Annual Budget Funding Amount’ will be transferred to the consolidated fund in the government budget and later allocated to ministries, departments, and agencies ([Government of Uganda 2012](#), 30-31).

In both countries, the developing oil sectors have generated significant attention in the media and throughout government. In Ghana the terms of the government’s contract with Kosmos Energy, the U.S.-based company that discovered Ghana’s offshore deposits, became a major campaign issue in the 2012 election. Both the Ghanaian government and major donors like the World Bank have convened numerous conferences and workshops about oil revenue management, and there has been significant consultation with civil society groups on such issues. In Uganda, the sheer size of discoveries have generated significant attention from the media, civil society, and, in some cases, members of parliament ([Paler et al. 2020](#)). Oil in Uganda has also come with significant investments in related infrastructure, such as railways and pipelines connecting Uganda’s oil regions to coastal ports. Not only have these projects sustained media coverage of Uganda’s nascent oil industry, but they also suggest that bureaucrats across different government sectors are likely to be involved in oil-related projects. In short, regardless of whether or not bureaucrats have direct experience with the oil sector or its profits, they are, in both countries, likely to have formed expectations regarding the potential uses and impacts of oil revenue.<sup>7</sup>

## **4 Research Design**

The study involves a survey experiment conducted with employees of central government agencies in Accra and Kampala, the capital cities of Ghana and Uganda respectively. The survey experiment

primes bureaucrats to think about oil revenue then assesses their attitudes toward the three underlying elements of the fiscal contract. Following standard survey experiment design, the attitudinal questions are asked directly following the oil revenue prime, which helps to ensure that other survey content is not driving the results. This method facilitates a potential causal interpretation of the results with regards to the salience of oil revenue in bureaucrats' preferences toward taxpayer response, ruling party spending strategies, and private use of state resources. Second, the method provides a means to establish the exogeneity of oil revenue at the individual level. Additionally, the survey allows us to gather key data for bureaucrats in Africa, a population for which studies have so far provided limited systematic data, and provide a starting point for future studies interested in studying the institutional progression of the resource curse.

Of course, the experimental design captures only attitudes, not actual behavior. Studying the attitudes of bureaucrats is, however, important in its own right. There is abundant evidence that public servants who are principally motivated by personal or political gain, or do not embrace impartiality toward political or social groups, are more likely to engage in unethical behavior and are less likely to perform well in their jobs (Pinder 2014; Rothstein and Teorell 2008; Bellé 2013). Higher levels of motivation to perform service to the public, moreover, are associated employees' job satisfaction and work effort (Lyons et al. 2006; Mostafa et al. 2015). Thus, if oil revenue causes bureaucrats to become less eager to serve taxpayers, more subservient to politicians, or more interested in serving their private interests, their performance of government agencies is likely to suffer.

Moreover, the attitudinal outcomes may suggest, but do not necessarily imply, that an individual would act in accordance with their stated opinion. In behavioral experiments we conducted as part of the broader survey project (not related specifically to the oil experiment), we find a strong correlation between responses to direct survey questions and behavioral outcomes (see Section I in the supplementary material for this analysis). Additionally, recent studies from African contexts, including Ghana, suggest that at least some bureaucrats have considerable discretion in their ability to shape political and policy outcomes (e.g. Brass et al. 2020; Rasul et al. 2021).<sup>8</sup> In the resources

sector, in particular, it is not only elites who shape political and economic outcomes associated with natural resource extraction (Steinberg 2019). In short, there are good reasons to believe that the attitudes of bureaucrats studied in this paper would, at times, translate into meaningful action that is independent of ruling party pressure and that these actions would have implications for the broader development of the resource curse.

#### **4.1 Survey Sample and Demographics**

The survey was conducted in the two countries in 2017 with central government employees whose primary work location is in the capital city of each country. The sample excluded both local government employees and ‘street-level’ bureaucrats such as teachers, nurses, doctors, bus drivers, and police. To ensure a diverse sample, we recruited employees from multiple entry points across a range of organizations, functions, levels of employment, and, where relevant, contract-types. The sample is based primarily on access and convenience.<sup>9</sup> We reached 1,641 bureaucrats from a total of 49 different institutions in Ghana and 1,537 bureaucrats from 31 different institutions in Uganda, listed in the supplementary material (Section C). Using methods described in Section D of the supplementary material, we estimate that our samples contain 1.7% of the relevant population of ministry, department, and agency employees in Ghana, and 3.3% of the relevant population in Uganda.

The resulting samples are similar in a number of key areas that make comparisons across the two countries reasonable (See Table 2). Both samples have at least 80% with bachelors degrees, equal average years in the service, and nearly identical average ages. We also see roughly the same breakdown of managers, technical/professional staff, and administrators, which suggests that differences across the samples in terms of outcomes are not likely driven by different types of bureaucrats in each sample.<sup>10</sup>

Table 2: Survey Sample Demographics

	Ghana	Uganda
Number of Respondents	1641	1537
% Female	46.9%	45.0%
% with Bachelors degree or higher	80.1%	85.2%
Average Years of Service	10.9	10.9
Average Age	38.1	37.4
% Largest Ethnic Group (Ashante/Baganda)	17.4%	29.8%
<b>Type of Position</b>		
% Manager	11.7%	13.5%
% Technical/Professional	39.9%	39.2%
% Administrative	47.5%	39.3%
<b>Partisanship</b>		
Support/Member of Party	25.4%	30.7%
Non-Partisan	56.4%	53.4%
Prefer Not to Respond	18.2%	15.9%
Ruling Party Supporter	18.9%	23.07%
Opposition Party Supporter	7.6%	13.39%

## 4.2 The Priming Experiment

The survey experiment randomly assigns survey participants to one of three groups: treatment, placebo, and control. Those assigned to the treatment group received a message describing a projected increase in oil revenue flowing to the government budget. The use of a projection of future revenues in the prime enables us to use similar messages in Ghana and Uganda despite their different stages of oil production. The message delivered to the placebo group contains information about projected increases in government revenue, but does not mention oil specifically. The control group does not receive any message. The treatment and placebo messages are presented in Figure 1. The only difference in messaging between the two countries is that the treatment message received by Ugandans includes the phrase ‘once production begins.’ Whereas a more optimal behavioral design would be to randomly assign oil revenue to different organizations or individuals, this was not feasible in the context of our study.

The logic of the placebo is that any observed effects from the treatment could be due to generic increases in government revenue, rather than revenue increases that are specifically related to oil.

Figure 1: Treatment Conditions

**Ghana Treatment:** Did you know that over the next few years, government ministries, departments and agencies will receive at least \$500 million in additional revenue from oil production compared to the last few years? However the amount of revenue collected through taxes from citizens is unlikely to change.

**Uganda Treatment:** Did you know that over the next few years, government ministries, departments and agencies will receive at least \$500 million in additional revenue from oil once production begins? However, the amount of revenue collected through taxes from citizens is unlikely to change.

**Placebo (both countries):** Did you know that over the next few years the revenue of government ministries, departments and agencies will increase by at least an additional \$500 million?

The inclusion of the placebo message therefore allows us to distinguish effects of oil revenue from other possible sources of government revenue such as taxes or foreign aid. The control group, which receives no prime at all, is designed to provide a baseline against which those receiving the treatment are compared.<sup>11</sup>

We chose the \$500 million amount because it was high enough to be realistic in Uganda and low enough to be realistic in Ghana. At the time we were conducting the experiment (2017), the Ugandan government was expecting to earn \$3.6 billion dollars in revenue per year upon the start of oil production ([Oketch](#)).<sup>12</sup> In Ghana, the government had, in its 2016 budget, estimated that revenue would range from \$252 to \$787 Million per year over the next several years ([Government of Ghana 2016](#)). The \$500 million figure therefore permitted us to avoid the use of deception in the experiment while also making the treatments comparable across contexts.

### 4.3 Post-Treatment Attitudinal Questions and Analysis

After the prime, all survey participants were asked a series of questions designed to assess their attitudes toward the three dimensions of severed fiscal contracts described in Section 2. Each of the questions asked bureaucrats to indicate their level of agreement with the following statements. Agreement was assessed on a 5-point scale ranging from strongly disagree (1) to strongly agree (5):

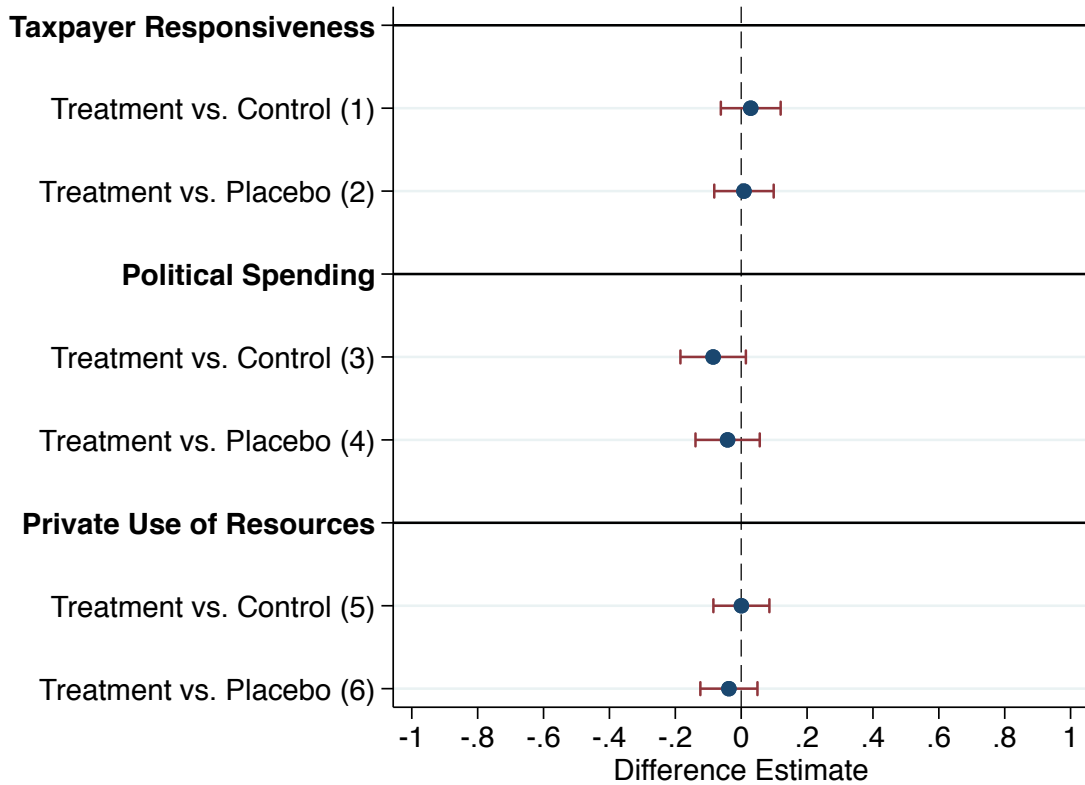
1. ‘Public servants should have the right to delay responding to taxpayer demands for services if they are overburdened with work.’
2. ‘Governments should have the right to increase public spending for districts that help them get elected.’
3. ‘It is acceptable for a public servant to divert government revenue to cover the costs of medical care for a critically-ill family member.’

In devising the post-treatment questions, we sought language that would minimize social desirability bias with the phrases ‘if they are overburdened by work’ and ‘to cover cost of medical care’. We also took measures, such as handing the tablet to the respondent to view the prime and respond to the questions, to further promote honest responses. Although we cannot be certain that participants felt comfortable answering honestly, we do find that social desirability bias does not appear to be a significant issue when using list experiments on other sensitive topics included in the survey (see supplementary material Section [H](#)).

We analyze the effects of the oil prime on responses to these questions by comparing average rates of agreement across the treatment and control groups. We consider higher levels of agreement with the outcome question as a positive response under treatment, indicating an individual’s acceptance of, or less resistance to, the resource curse mechanism of interest. In other words, if those in the treatment group have significantly higher levels of agreement with a statement than those in the control group, we interpret this result as evidence that bureaucrats adopt attitudes that would contribute to the resource curse. By contrast, negative (lower levels of agreement) or statistically indistinguishable responses indicate that bureaucrats’ are not affected by oil revenue in ways that would contribute to the resource curse. We also conduct tests comparing average responses across treatment and placebo groups, allowing us to better understand the extent to which any observed treatment effects are (or are not) driven by increases in oil revenue specifically.

To analyze the hypothesized differences in treatment effects between subgroups, we split respondents into ‘high’ and ‘low’ groups for each of the categories listed in Table [1](#). The operationalization of subgroups is described in detail in the supplementary material, Section [B](#).

Figure 2: Full Sample Pooled Results



Difference-of-means estimates with 95% confidence intervals.

A positive difference indicates that the treatment group has higher average levels of agreement with each statement. The number of observations are as follows (1) 2,072; (2) 2,103; (3) 2,070; (4) 2,097; (5) 2,077; (6) 2,107

## 5 Full Sample Results

We first present results from difference-of-means tests analyzing the pooled sample of bureaucrats from both countries. We then present the same sets of tests broken down for each country. Figure 2 plots results for the pooled sample. Positive differences indicate that those in the treatment group had *higher* levels of agreement with each statement, signifying attitudes consistent with the hypothesised resource curse expectations. Negative differences indicate that those in the treatment group had *lower* levels of agreement (or higher levels of disagreement) with each statement.

As is evident from Figure 2, the effects of the oil revenue prime on bureaucrats' attitudes toward taxpayers, political spending, and private use of resources are, at best, inconsistent. For the

taxpayer responsiveness hypothesis (Hypothesis 1), the difference between treatment and control groups is in the expected direction but does not achieve conventional levels of statistical significance. In the case of political spending (Hypothesis 2), the results are inconsistent with our predictions: bureaucrats in the treatment group have somewhat lower (though not statistically significant) levels of agreement with the statement about the acceptability of political spending than those either the control or placebo groups. Likewise, the results for Hypothesis 3 show that bureaucrats receiving the oil treatment are no more likely to tolerate corrupt behavior than those in the control or placebo groups.

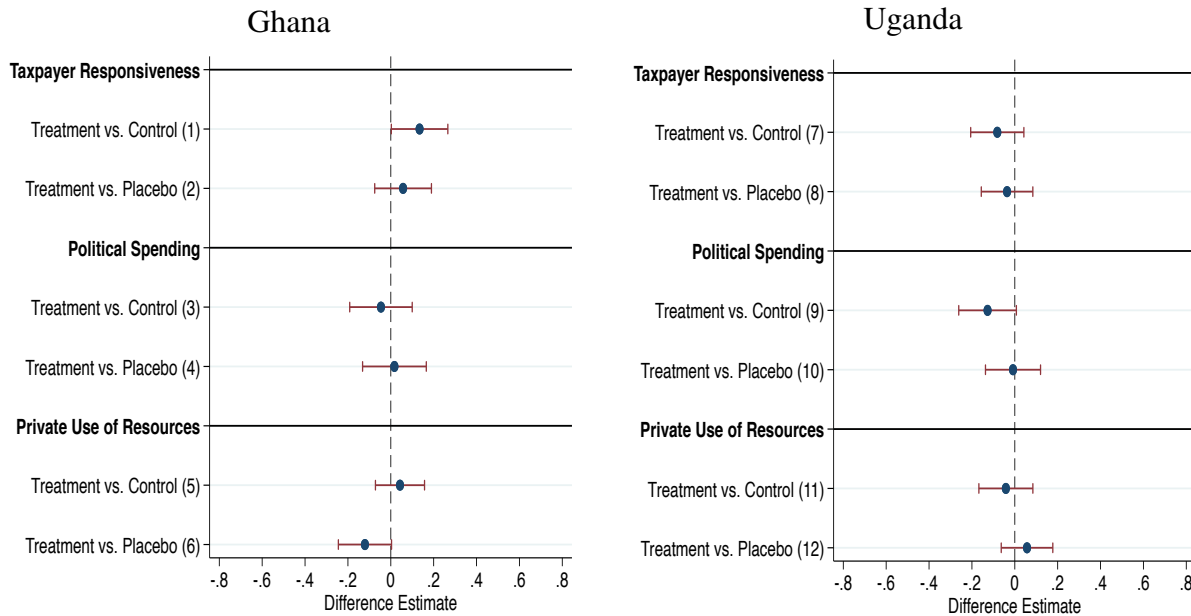
We further explore these results by breaking them down for each country, presented in Figure 3. We find that, in all but one test, the results, again, either do not conform with the directionality of our expectations or they do not meet the 95% confidence threshold (or both).<sup>13</sup> Overall, we find only limited evidence that bureaucrats in these two countries are likely to adopt attitudes that contribute to the resource curse. Only in one one of the tests in one of the countries do we detect response patterns consistent with the hypotheses. Specifically, bureaucrats in Ghana respond to the oil revenue prime in ways that indicate lowered levels of interest in serving taxpayers. We further explore this finding in Section 6.

The analyses therefore point to results that are largely null. We perform two further tests, both of which confirm these null results. First, we perform a set of equivalency tests, which allow us to explicitly consider substantive effect sizes. We follow past research (Hartman and Hidalgo 2018; Dynes and Holbein 2020) and adopt plus or minus 36% of a standard deviation as our equivalence range, which is the range within which the substantive difference between the treatment and control (or placebo) is substantively inconsequential. In all cases our estimates fall within the equivalence range. These results are shown in the supplementary material (Figure 4 in Section F).

Second, we replicate the tests comparing treatment and placebo groups, but we restrict the placebo sample only to those who did *not* associate the placebo message with oil. Since 41% of respondents in the placebo group associated the priming message with oil, removing these individuals should make it easier to find meaningful differences between treatment and placebo



Figure 3: Full Sample Results By Country



Difference-of-means estimates with 95% confidence intervals.

A positive difference indicates that the treatment group has higher average levels of agreement with each statement. The number of observations are as follows (1) 1,049; (2) 1,098; (3) 1,051; (4) 1,096; (5) 1,055; (6) 1,102 (7) 1,023 (8) 1,005 (9) 1,019 (10) 1,001 (11) 1,022 (12) 1,005

groups. Yet, when we remove these individuals from the sample, we still do not find any support for our hypotheses (See Table 10 in Section F in the supplementary material). This analysis also provides confidence that those in the treatment group were in fact treated, since a sizeable portion (41%) of placebo respondents – who received no signal to think about oil – indicated that oil was a source of the increase in revenue.

To summarize, both the pooled and country-specific results largely indicate that bureaucrats are unlikely to adopt attitudes that contribute to the severing of the fiscal contract between the state and taxpayers. Together, the mixed directionality of the main results, the presence of one statistically significant effect, the equivalence tests, and the analysis of the restricted placebo group all suggest that larger sample sizes or ‘stronger’ treatments would not necessarily produce clear or consistent support for our hypotheses.

## 6 Subgroup Results

We now turn to the analysis of subgroups presented in Section 2.2. These tests could serve as further confirmation of the null results obtained thus far. If we continue to find null results across different subgroups, we can be more confident that our findings are in fact null. If we do find effects for specific subgroups, however, the null findings in Figures 2 and 3 could signify heterogeneity in treatment effects.

### 6.1 Pre-Specified Subgroup Responses

Table 3 displays the differences in mean responses along with standard errors, t-statistics, and total number of respondents for each pre-specified subgroup, details of which are provided in the supplementary material, Section B. The results are broken down by country for each of the three hypotheses. Overall, the results reinforce the findings from the previous section. The vast majority of test results across subgroups are null.

Once again, the only observed treatment effects are for the taxpayer responsiveness hypothesis in Ghana. Among respondents whose jobs involve primarily technical or managerial work, those who receive information about oil revenue have an average level of agreement with the statement about delaying responses to taxpayers that is 0.24 points higher (on a scale of 1 to 5) than those who do not receive the information. By contrast, for those whose jobs involve primarily administrative work, treated respondents have only a 0.04 higher level of agreement with the taxpayer response statement, a difference that does not achieve conventional levels of statistical significance. This finding is consistent with our expectations that those in higher level positions (i.e. technical and managerial roles) are more likely to respond to treatment in ways that reflect the resource curse. However, when we assess grade of employment based on salary, we find, among those with higher salaries, that there is *no difference* in responses between treatment and control groups. By contrast, among *lower salaried* employees, those receiving information about oil revenue have a level of agreement with the statement about delaying taxpayer response that is 0.23 points higher than those

in the control group. This result is *not consistent* with our hypothesis that higher-level employees should be more susceptible to the resource curse.<sup>14</sup>

These results suggest some differentiation between salary levels and position type. Indeed, there is only a weak correlation ( $r=0.16$ ) between the two variables in Ghana, indicating that we are capturing two different groups of bureaucrats. Whereas those who perform primarily technical and managerial tasks have a wide range of salaries, those in administrative positions are more concentrated toward the lower end of the salary scale. As such, given that entry-level technical personnel might not have a high grade of employment, we believe that the salary level variable serves a better overall proxy for one's grade of employment than the position-type variable.

## **6.2 Disgruntled Bureaucrats and Taxpayer Responsiveness in Ghana**

This section moves beyond our pre-specified hypotheses to probe more deeply into the effects of oil revenue on taxpayer responsiveness in Ghana in hopes of better understanding the dynamics driving the results reported in Table 3. We begin by investigating differences in reactions to the taxpayer responsiveness question across control and treatment groups in Ghana, followed by a deeper analysis of heterogeneity in treatment effects among different subgroups.

Recalling that the post-treatment question is assessed on a likert scale measuring levels of agreement or disagreement with the statement about the acceptability of delaying responses to taxpayer requests, it is helpful to understand how responses differ based on treatment condition. Table 4 shows differences between the control and treatment groups across the five response categories. The largest difference is seen in the 'strongly disagree' category, where the treatment group had 4.29% fewer respondents, indicating that they were less likely to strongly disagree with the statement. For the 'somewhat agree' category, the percentage of responses among treated respondents was 3.27% higher than those of the control group. These comparisons suggest that the treatment is 'moving' respondents away from high levels of disagreement with the statement about delaying responses to taxpayers toward more moderate levels of agreement.

Table 3: Subgroup Results

	Taxpayer Responsiveness (H1)			Political Spending (H2)			Private Use of Resources (H3)					
	diff	se	t	obs	diff	SE	t	obs	diff	SE	t	obs
<b>Ghana</b>												
Years in Service ≤ 8	0.114	0.102	1.10	515	0.011	0.114	0.10	517	0.077	0.092	0.85	517
Years in Service > 8	0.127	0.089	1.45	522	-0.101	0.097	-1.05	522	-0.003	0.073	-0.05	526
Education: No Bachelors	0.072	0.155	0.45	199	-0.243	0.188	-1.30	199	-0.017	0.147	-0.10	200
Education: Bachelors	0.153	0.075	2.05	841	-0.011	0.081	-0.15	843	0.057	0.064	0.90	846
Grade/Position: Low Salary	0.229	0.092	2.50*	627	-0.025	0.101	-0.25	629	0.143	0.086	1.65	632
Grade/Position: High Salary	0.000	0.097	0.00	402	-0.068	0.109	-0.60	402	-0.071	0.070	-1.00	402
Position: Administrative	0.042	0.105	0.39	485	0.000	0.116	0.01	484	0.023	0.095	0.24	491
Position: Manager/Technical	0.242	0.086	2.83**	553	-0.070	0.097	-0.73	555	0.065	0.072	0.91	554
Party: Not Ruling	0.216	0.081	2.65**	666	0.051	0.091	0.55	669	0.12	0.072	1.65	671
Party: Ruling NPP	-0.022	0.192	-0.10	138	-0.064	0.207	-0.30	136	0.109	0.173	0.65	137
Not Politically Connected	0.235	0.074	3.15***	760	-0.012	0.079	-0.15	761	0.091	0.056	1.65	764
Politically Connected	-0.096	0.144	-0.65	281	-0.104	0.169	-0.60	282	-0.102	0.147	-0.70	285
Oil Revenue: None	0.070	0.079	0.90	677	-0.03	0.09	-0.35	678	0.045	0.067	0.70	682
Oil Revenue: Plausibly received	0.236	0.138	1.70	311	-0.049	0.148	-0.35	312	0.040	0.121	0.35	313
<b>Uganda</b>												
Years in Service ≤ 8	-0.103	0.090	-1.15	496	-0.148	0.100	-1.50	496	-0.009	0.091	-0.10	497
Years in Service > 8	-0.050	0.088	-0.55	517	-0.114	0.093	-1.20	513	-0.085	0.09	-0.95	515
Education: No Bachelors	-0.241	0.181	-1.35	150	-0.066	0.190	-0.35	149	-0.079	0.197	-0.40	149
Education: Bachelors	-0.053	0.068	-0.80	869	-0.137	0.074	-1.85	866	-0.035	0.068	-0.50	869
Salary: Low	-0.139	0.085	-1.65	582	-0.132	0.092	-1.40	580	-0.081	0.088	-0.90	582
Salary: High	-0.035	0.096	-0.35	427	-0.116	0.104	-1.10	425	0.005	0.096	0.05	426
Position: Administrative	-0.060	0.104	-0.57	398	0.090	0.119	-0.76	394	-0.112	0.108	-1.04	395
Position: Manager/Technical	-0.083	0.081	-1.02	609	-0.133	0.084	-1.57	609	0.088	0.081	0.11	609
Party: Not Ruling	-0.122	0.082	-1.50	627	-0.185	0.088	-2.10*	624	-0.054	0.085	-0.65	626
Party: Ruling NRM	-0.054	0.141	-0.40	208	-0.059	0.151	-0.40	208	-0.015	0.137	-0.10	208
Not Politically Connected	-0.083	0.066	-1.25	882	-0.107	0.071	-1.50	879	-0.007	0.068	-0.10	881
Politically Connected	-0.052	0.205	-0.25	138	-0.226	0.222	-1.00	137	-0.242	0.189	-1.30	138

T-test results comparing treatment and control groups across subgroup.

\* p<.05 \*\*p<.01 \*\*\*p<.004 (Bonferroni correction)

Table 4: Differences by Response Category: Taxpayer Responsiveness in Ghana

Response	Control	Treatment	Difference
Strongly Disagree	73.72%	69.43%	-4.29%
Somewhat Disagree	12.65%	11.79%	-0.86%
Neither Agree nor Disagree	5.14%	6.81%	+1.67%
Somewhat Agree	5.34%	8.29%	+3.27%
Strongly Agree	3.16%	3.68%	-0.52%

In Table 3 above, we found almost no support for our expectations about which types of government employees are most susceptible to the resource curse. Lacking a pre-specified explanation for why those with lower salaries and those without political connections would respond to the oil revenue treatment by expressing greater acceptance of delayed responses to taxpayers, we propose a ‘disgruntled employee’ hypothesis: those who perceive themselves as not benefiting from oil revenue become disaffected from public and taxpayer service. This hypothesis draws on research suggesting that public service employees in lower-level positions, and on lower ends of the salary scale in particular, are less likely to demonstrate high levels of work commitment and public service motivation (e.g. Crewson 1997). This hypothesis also draws on the theory, discussed in Section 2, that resource revenue generates expectations that others will profit personally from this revenue. Seeing themselves as especially unlikely to benefit from revenue windfalls, these bureaucrats become less motivated to perform their public service jobs.

We examine this hypothesis directly by comparing treatment effects among those in the ‘disgruntled group’ (low salary and not politically connected) to those who are not in that group. Indeed, as seen in Table 5, the difference between treatment and control groups is .336 for low-salary, not connected individuals (n=420), which is significantly higher than the full-sample difference of .134 (n=1,049) in Ghana (Figure 3, Model 1). The treatment effect within the disgruntled group has a high level of confidence (t=3.495, p<.001). Importantly, these disgruntled bureaucrats are the only group for whom the treatment effect remains: those who are only partially (groups 2 and 3 in Table 5) or not at all (group 4) disgruntled, are not significantly impacted by the oil revenue

prime.<sup>15</sup>

Table 5: ‘Disgruntled’ Employees and Taxpayer Responsiveness (Ghana Only)

Bureaucrat Type	Diff	SE	t	N (tr)	N (c)
(1) Low Salary, Not Connected	.336	.105	3.495***	211	209
(2) Low Salary, Connected	.001	.175	.008	105	98
(3) High Salary, Not Connected	.079	.102	.775	172	152
(4) High Salary, Connected	-.34	.258	-1.331	43	33

\*\*\* p<.001

## 7 Discussion

We extract two main takeaways from the experiment’s findings. First, in general, the results do not support the broad notion that bureaucrats contribute to the severing of the fiscal contract that is commonly associated with the resource curse. We find no support for the idea that oil would induce bureaucrats to embrace practices of politically-directed spending or the private use of public resources. The mixed directions of these results along with supplementary tests suggest rather clearly a lack of support for these hypotheses rather than weak treatment or flawed experimental design. Further, power analysis indicates that our realized sample sizes – approximately 1000 per country and 2000 pooled – are sufficient to detect effect sizes of .125 and .177, respectively. 44% of our main effects are at least these sizes while the remaining estimates are extremely close to zero and precisely estimated (see Figures 2 and 3). One possible interpretation of the null results is that when oil induces changes in bureaucratic institutions, these changes are likely driven by political actors rather than bureaucrats. To the extent bureaucrats do support politicians in their efforts to construct rentier states, they are likely to do so based on pressure or coercion rather than on any fundamental shift in their professional or ethical attitudes.

Second, we do find evidence that, in Ghana, where oil production had been active for some time, that the oil revenue prime did induce the bureaucrats surveyed to become less interested in

responding to taxpayers. However, we find that those most sensitive to the treatment are individuals who are likely to perceive little or no benefit from the expansions in rents and revenues. This finding points to the need for further attention to the roles of political outsiders, or others unlikely to benefit from oil revenue, in facilitating the resource curse.

## 8 Conclusion

The findings point to several important areas of future research that would enhance understanding of how the resource curse takes hold. First, longitudinal studies would better capture changes in bureaucratic attitudes and institutional structures. The present study could form a baseline for future work. Second, it would be useful to directly probe how bureaucrats perceive changes in political oversight of the bureaucracy following major oil shocks and whether their levels of discretion change after these events. It would also be useful to probe other types of actors who may serve as ruling party agents in the construction of rentier states, namely political party members or security sector personnel. Based on this study's findings, these groups may be more predisposed than bureaucrats to act as political agents in undermining the fiscal contract.

More broadly, the study speaks to the uneven development of the resource curse. Whereas increases in oil revenue may weaken bureaucrats' concerns about responding to taxpayers (at least in Ghana), there are no corresponding impacts on their attitudes toward either politically-directed spending or the use of public resources for personal needs. The results of this study point to potential sequences and unevenness in the onset of the resource curse. For scholars seeking to understand institutional and behavioral changes resulting from oil production, it is therefore critical to disaggregate the different dimensions of rentier states and study them separately.

Finally, the results raise a number of questions about potential heterogeneity in resource curse emergence across countries. Are the effects observed in Ghana likely to replicate in other new oil-rich countries? The results from Uganda – in which treated bureaucrats do not respond to the taxpayer responsiveness statement in expected ways – suggest heterogeneity across countries.

Whereas Ghana and Uganda are both African countries that have recently discovered oil, they differ on several key variables – regime type, economic structure, and the stage of oil production – that could be driving these differences. Such differences provide a roadmap for future research regarding why the resource curse progresses more rapidly in some contexts than it does in others.

Overall, the results of this study have implications for efforts to mitigate changes in the fiscal contract associated with the resource curse. If most bureaucrats are unlikely to adopt attitudes that contribute to rentierization, they may represent potential partners in efforts to dampen the adverse impacts of oil on government accountability. Whereas most interventions tend to focus on the government’s management of oil revenues, such as national trust funds and the enhancement of transparency, our research points to the need to address distributional concerns among key sets of actors. The allocation of resource revenue to bureaucrats’ salaries, and especially to rank-and-file bureaucrats who are not particularly well-compensated or well-connected, could attenuate changes in the fiscal contract that often accompany the resource curse.



## Notes

1. In Ghana, oil production began less than 10 years ago. In Uganda, oil was discovered in 2006 but is not yet in production.
2. The concept of the rentier state comes from [Mahdavy \(1970\)](#), who defines it as ‘those countries that receive on a regular basis substantial amounts of external rents’ (428).
3. Bureaucrats could also be coerced into supporting the political principal, an issue we bracket for now but return to in Section 7.
4. Constraints are lessened because (1) bureaucrats are not held accountable because they have information about the wrong-doing of their superiors or (2) bureaucrats shift their beliefs about service when seeing leaders steal and abuse.
5. This table is copied, with some edits for clarity and data availability, from the pre-analysis plan.
6. Ghana’s Public Interest and Accountability Committee tracks oil revenue spending. See <http://www.piacghana.org/portal/29/36/the-abfa>.
7. A growing body of research shows that resource endowments can generate expectations about future behavior, such that resource discoveries can shape attitudes before production actually begins ([Cappelen et al. 2018](#); [Frynas et al. 2017](#)).
8. In our survey only one-third of respondents, distributed evenly across both countries, said they were worried about being dismissed for political reasons and only 6% of respondents, again evenly distributed across both countries, said that they regularly ‘feel worried that someone from the ruling party will not approve of my work.’
9. Given the absence of accurate government employee registers, there are significant logistical challenges in obtaining a random sample of public officials in these countries.

10. Managers are classified as anyone who indicated in the survey that one of their job responsibilities is to supervise other public servants. Technical/professional staff are those that, as part of their jobs, provide technical or professional services such as program design, planning, or budgeting. Administrative positions are those who provide administrative support for the day-to-day running of the various offices across the public service.
11. The number of respondents assigned to each group are as follows. Ghana: control = 512, treatment = 539, placebo = 557. Uganda: 503, 516, 485, respectively. In order to test if the random assignment to treatment is balanced on observables, we regress treatment status on a number of covariates. We find that treatment status is generally not predicted by respondents' membership in the groups described in Section 2.2, nor by gender (see Table 9 in Section E of the supplementary material). We can therefore be relatively confident that the treatment was in fact randomly assigned.
12. This is based on oil prices in 2013-2014, which have since declined, risen, and declined again.
13. In Figure 3, it is apparent that Ugandans are driving the negative result for Hypothesis 2 whereby treated respondents have unexpectedly *lower* levels of agreement with the statement about political spending than those in the control group. Because This result is in the opposite direction as our hypotheses, and therefore does not support the idea that bureaucrats contribute to the resource curse, we do not explore it further here. We do, however, examine this result in a separate paper. See [*removed for anonymity*].
14. The technical/managerial control group and the low-salary control group have very similar baseline responses to the taxpayer responsiveness statement: 1.40 for the former and 1.54 for the latter.
15. If we interact connections with having a technical/managerial position, we find that there is a positive effect, but this is also the case with regards to interacting connections and administrative position.

## References

- Andersen, J. J., Johannesen, N., Dreyer Lassen, D., and Paltseva, E. (2013). Petro rents, political institutions, and hidden wealth: Evidence from bank deposits in tax havens. EPRU Working Paper Series.
- Anderson, L. (1987). The state in the Middle East and North Africa. *Comparative Politics*, 20(1):1–18.
- Bakker, A. B. (2015). A job demands–resources approach to public service motivation. *Public Administration Review*, 75(5):723–732.
- Bates, R. H. and Lien, D.-H. D. (1985). A note on taxation, development, and representative government. *Politics & Society*, 14(1):53–70.
- Bellé, N. (2013). Experimental evidence on the relationship between public service motivation and job performance. *Public Administration Review*, pages 143–153.
- Blair, G. and Imai, K. (2012). Statistical analysis of list experiments. *Political Analysis*, 20:47–77.
- Brass, J. N., Schon, J., Baldwin, E., and MacLean, L. M. (2020). Spatial analysis of bureaucrats’ attempts to resist political capture in a developing democracy: The distribution of solar panels in Ghana. *Political Geography*, 76:102087.
- Cappelen, A. W., Fjeldstad, O.-H., Mmari, D., Sjursen, I. H., and Tungodden, B. (2018). Understanding the resource curse: A large-scale experiment on corruption in tanzania. CMI Working Paper.
- Carboni, N. (2010). Changing relationships between politicians and bureaucrats in contemporary democracies: An empirical analysis of the Italian experience. *International Public Management Review*, 11(1):90–109.
- Chaudhry, K. A. (1997). *The Price of Wealth: Economies and Institutions in the Middle East*. Ithaca: Cornell University Press.
- Corbacho, A., Gingerich, D. W., Oliveros, V., and Ruiz-Vega, M. (2016). Corruption as a self-fulfilling prophecy: Evidence from a survey experiment in costa rica. *American Journal of Political Science*, 60(4):1077–1092.

- Crewson, P. E. (1997). Public-service motivation: Building empirical evidence of incidence and effect. *Journal of Public Administration Research and Theory*, 7(4):499–518.
- Croese, S. (2017). State-led housing delivery as an instrument of developmental patrimonialism: The case of post-war Angola. *African Affairs*, 116(462):80–100.
- Dasgupta, A. and Kapur, D. (2020). The political economy of bureaucratic overload: Evidence from rural development officials in India. *American Political Science Review*, 114:1316–1334.
- de la Cuesta, B., Milner, H. V., Nielson, D. L., and Knack, S. (2017). Taxation without representation? experimental evidence from Ghana and Uganda on citizen action toward taxes, oil, and aid. World Bank Policy Research Working Paper.
- de la Cuesta, B., Milner, H. V., Nielson, D. L., and Knack, S. F. (2019). Oil and aid revenue produce equal demands for accountability as taxes in Ghana and Uganda. *Proceedings of the National Academy of Sciences*, 116(36):17717–17722.
- De Oliveira, R. S. (2015). *Magnificent and Beggar Land: Angola Since the Civil War*. Oxford: Oxford University Press.
- Dynes, A. and Holbein, J. B. (2020). Noisy retrospection: The effect of party control on policy outcomes. *American Political Science Review*, 114(1):237–257.
- Frynas, J. G., Wood, G., and Hinks, T. (2017). The resource curse without natural resources: Expectations of resource booms and their impact. *African Affairs*, 116(463):233–260.
- Government of Ghana (2016). The budget statement and economic policy of the government of Ghana for the 2016 financial year. Report Presented in Parliament.
- Government of Uganda (2012). Oil and gas revenue management policy. [http://www.acode-u.org/Files/oildocs/Oil\\_Revenue\\_Mgt\\_Policy.pdf](http://www.acode-u.org/Files/oildocs/Oil_Revenue_Mgt_Policy.pdf).
- Hartman, E. and Hidalgo, F. D. (2018). An equivalence approach to balance and placebo tests. *American Journal of Political Science*, 62(4):1000–1013.

- Hertog, S. (2010). *Princes, Brokers, and Bureaucrats: Oil and the State in Saudi Arabia*. Ithaca: Cornell University Press.
- Hickey, S., Abdulai, A.-G., Izama, A., and Mohan, G. (2015). The politics of governing oil effectively: A comparative study of two new oil-rich states in africa. *Effective States and Inclusive Development (ESID) Working Paper series*, No. 54.
- Jensen, N. and Wantchekon, L. (2004). Resource wealth and political regimes in Africa. *Comparative Political Studies*, 37(7):816–841.
- Karl, T. L. (1997). *The Paradox of Plenty: Oil Booms and Petro-States*, volume 26. University of California Press.
- Karl, T. L. (1999). The perils of the petro-state: Reflections on the paradox of plenty. *Journal of International Affairs*, pages 31–48.
- Knutsen, C. H., Kotsadam, A., Olsen, E. H., and Wig, T. (2017). Mining and local corruption in Africa. *American Journal of Political Science*, 61(2):320–334.
- Leite, C. and Weidmann, J. (1999). Does mother nature corrupt? natural resources, corruption, and economic growth.
- Lewis, P. (2009). *Growing Apart: Oil, Politics, and Economic Change in Indonesia and Nigeria*. Ann Arbor: University of Michigan Press.
- Lipsky, M. (1980). Street-level bureaucracy: dilemmas of the individual in public services.
- Lyons, S. T., Duxbury, L. E., and Higgins, C. A. (2006). A comparison of the values and commitment of private sector, public sector, and parapublic sector employees. *Public Administration Review*, 66(4):605–618.
- Mahdavy, H. (1970). The patterns and problems of economic development in rentier states: The case of Iran. *Studies in Economic History of the Middle East*, pages 428–67.
- Mishra, A. (2006). Persistence of corruption: Some theoretical perspectives. *World Development*, 34(2):349–358.

- Moore, M. (2004). Revenues, state formation, and the quality of governance in developing countries. *International Political Science Review*, 25(3):297–319.
- Morrison, K. M. (2009). Oil, nontax revenue, and the redistributive foundations of regime stability. *International Organization*, 63(1):107–138.
- Mostafa, A. M. S., Gould-Williams, J. S., and Bottomley, P. (2015). High-performance human resource practices and employee outcomes: the mediating role of public service motivation. *Public Administration Review*, 75(5):747–757.
- Oketch, M. uganda. The Daily Monitor.
- Paler, L. (2013). Keeping the public purse: An experiment in windfalls, taxes, and the incentives to restrain government. *American Political Science Review*, 107(4):706–725.
- Paler, L., Springman, J., Grossman, G., and Pierskalla, J. (2020). Oil discoveries and political windfalls: Evidence on presidential support in Uganda.
- Panter-Brick, S. (1978). *Soldiers and Oil: The Political Transformation of Nigeria*. Routledge Press.
- Perry, J. L. and Hondeghem, A. (2008). *Motivation in Public Management: The Call of Public Service*. Oxford University Press, Oxford.
- Pinder, C. C. (2014). *Work Motivation in Organizational Behavior*. New York: Psychology Press.
- Pressman, J. L. and Wildavsky, A. (1984). *Implementation: How great expectations in Washington are dashed in Oakland*, volume 708. Univ of California Press.
- Ramsay, K. W. (2011). Revisiting the resource curse: Natural disasters, the price of oil, and democracy. *International Organization*, pages 507–529.
- Rasul, I., Rogger, D., and Williams, M. J. (2021). Management, organizational performance, and task clarity: Evidence from ghana’s civil service. *Journal of Public Administration Research and Theory*, 31(2):259–277.

- Robinson, J. A., Torvik, R., and Verdier, T. (2006). Political foundations of the resource curse. *Journal of Development Economics*, 79(2):447–468.
- Ross, M. L. (2001a). Does oil hinder democracy? *World Politics*, 53(3):325–361.
- Ross, M. L. (2001b). *Timber Booms and Institutional Breakdown in Southeast Asia*. Cambridge University Press.
- Ross, M. L. (2012). *The oil curse: how petroleum wealth shapes the development of nations*. Princeton University Press, Princeton.
- Ross, M. L. (2015). What have we learned about the resource curse? *Annual Review of Political Science*, 18:239–259.
- Rothstein, B. and Teorell, J. (2008). What is quality of government? a theory of impartial government institutions. *Governance*, 21(2):165–190.
- Sachs, J. D. and Warner, A. M. (2001). The curse of natural resources. *European Economic Review*, 45(4-6):827–838.
- Sala-i Martin, X. and Subramanian, A. (2013). Addressing the natural resource curse: An illustration from Nigeria. *Journal of African Economies*, 22(4):570–615.
- Sandefur, J., Birdsall, N., Fishkin, J., and Moyo, M. (2020). Deliberative democracy and the resource curse: A nationwide experiment in Tanzania. *Center for Global Development Working Paper No. 548*.
- Saylor, R. (2014). *State Building in Boom Times: Commodities and coalitions in Latin America and Africa*. Oxford: Oxford University Press.
- Steinberg, J. (2019). *Mines, Communities, and States: The Local Politics of Natural Resource Extraction in Africa*. Cambridge: Cambridge University Press.
- Vicente, P. C. (2010). Does oil corrupt? evidence from a natural experiment in west africa. *Journal of Development Economics*, 92(1):28–38.

- Wantchekon, L. (2002). Why do resource dependent countries have authoritarian governments? *Journal of African Finance and Economic Development*, 2(1):57–77.
- Wright, J., Frantz, E., and Geddes, B. (2015). Oil and autocratic regime survival. *British Journal of Political Science*, 45(2):287–306.
- Yates, D. A. (1996). *The Rentier State in Africa: Oil rent dependency and neocolonialism in the Republic of Gabon*. Africa World Press.



## **Online Supplementary Material**

**Do Bureaucrats Contribute to the Resource Curse?  
Evidence from a Survey Experiment in New Oil States**

# A Pre-Analysis Plan (Anonymised Version)

## A.1 Research Question

Does the addition of oil revenue to government budgets affect public servant performance? (Note: the full PAP contains more background information on case selection, sampling, etc., which is included in the paper itself and not reproduced here.)

## A.2 Motivation

Political theories of the resource curse tend to focus on two main sets of actors: 1) incumbent political leaders incentivised to engage in rentier behavior; and 2) would-be taxpayers lacking fiscal linkage to the state. The potential effects of resource revenue on public servants is considerably less clear. The results of this experiment will deepen our understanding of the processes through which new discoveries of natural resources may undermine state institutions; and the extent to which civil servants are likely to help or hinder the development of a resource curse.

## A.3 Research Design

This experiment primes central government employees with information about oil revenue to examine how this information affects attitudes toward political corruption, responsiveness to taxpayer demands, and public service motivation. The primes are used in Ghana and Uganda, two countries where recent discoveries of oil and gas resources are projected to deliver significant sums of additional revenue to government budgets.

The experiment is conducted using a between-subjects design in which respondents within each country randomly receive a treatment prime, a placebo prime or no prime at all (control). Based on a target survey sample of 1500 per country, we anticipate 500 respondents in each country-group.

The treatment provides projected future revenue statistics from the Ministry of Finance (Ghana) or the IMF (Uganda). By priming on the projection of future revenues, we are able to develop similar messages for the two countries despite different stages of oil production - Ghana is already actively producing oil while Uganda's oil production is still in development. This approach is also used by [de la Cuesta et al. \(2017\)](#) in a similar experiment conducted with citizens in Ghana and Uganda.

The treatment and placebo messages in the two countries are presented below. The logic of the placebo is that any observed effects from the treatment could be due to generic increases in government revenue, rather than increases that are specific to oil or other natural resources. The control group, which receives no prime at all, is designed to provide a baseline against which those receiving the treatment and the placebo would be compared.

### Ghana

- Treatment: Did you know that over the next few years, government ministries, departments and agencies will receive at least \$500 million in additional revenue from oil production compared to the last few years? However the amount of revenue collected directly from citizens is unlikely to change.

- Placebo: Did you know that over the next few years the revenue of government ministries, departments and agencies will increase by at least an additional \$500 million?

## Uganda

- Treatment: Did you know that over the next few years, government ministries, departments and agencies will receive at least \$500 million in additional revenue from oil once production begins? However, the amount of revenue collected through taxes from citizens is unlikely to change.
- Placebo: Did you know that over the next few years the revenue of government ministries, departments and agencies will increase by at least an additional \$500 million?

## A.4 Hypotheses

We test three sets of hypotheses corresponding to three possible manifestations of an ‘oil curse.’ First we examine the existence of a rentier effect. Respondents receiving the treatment prime should demonstrate greater levels of acceptance for the diversion of state resources for political gain. Second, we test the hypothesis that oil revenue makes government employees less accountable to tax-payers. Respondents receiving the treatment should demonstrate lower levels of agreement with statements about the need to respond quickly to taxpayer requests. Third, we test the hypothesis that knowledge of additional oil revenue makes public service employees more permissive of (non-political) misuse of state finances.

## A.5 Outcome Variables

As explained above, we are interested in three types of effects: rentier effects, taxpayer accountability effects, and private corruption effects. All respondents are asked the following three questions and asked to indicate their level of agreement on a 5-point scale.

1. Governments should have the right to increase public spending for districts that help them get elected.
2. Public servants should have the right to delay responding to taxpayer demands for services if they are overburdened with work.
3. It is condonable for a public servant to divert government revenue to cover the costs of medical care for a critically-ill family member.

Finally, for those receiving the placebo prime, we include an additional question in which the respondent is asked what type(s) of revenue come to mind when the enumerator shared the information about government revenue. This enables us to know if the respondent is associating unspecified sources of additional government revenue with oil revenue, thus suggesting that the placebo message may actually be acting as the treatment.

## A.6 Empirical Analysis

We will test the hypotheses using difference-of-means and Mann-Whitney tests. For all tests, we will include models a) in which we pool respondents from both countries; and b) in which we test for differences across the two countries.

Using the control group as a reference point, we will initially test for statistically significant differences in mean levels of agreement on each of the three outcome questions between the treatment group(s) and the control group(s). Mann-Whitney tests and difference-of-proportions using a dichotomous variable measuring percent who agree or strongly agree with the statement will be used for robustness. Should a statistically significant difference be present, we will then conduct the same set of test between the treatment group and the placebo group. For further robustness we will also test differences between the treatment group and the subset of placebo respondents who did NOT associate oil with the generic revenue increase message they received. Finally, we hypothesise the existence of several possible subgroup effects. The subgroup effects and mechanisms are listed in Table 4. For each subgroup, we will conduct the same set of tests as described in the preceding paragraph.

Table 6: Subgroup Analyses: Ghana and Uganda

Subgroup	Expected Treatment Effect
Years in Public Service	Those with longer tenure less likely to be affected by new revenue
Political association	Ruling party supporters more susceptible to rentier effects
Education level	Employees with higher education levels less susceptible to oil curse
Grade/Position	Higher-level employees more likely impacted by revenue sources
Organization Type	Organizations that raise their own revenue less susceptible to oil curse

## B Subgroup Operationalization

To analyze the hypothesised differences in treatment effects between subgroups, we split respondents into ‘high’ and ‘low’ groups for each of the categories listed in Table 1. For years of service, we divide the sample at the median, which is eight years of service. Similarly, for education level, we divide the sample into those who do not possess a bachelors degree and those who have obtained a bachelors degree or higher. Having completed a bachelors degree is both the median and modal education level in the sample.

We operationalize ‘higher-level employees’ in two ways. First, we divide respondents’ based on their self-reported salary level. Since we do not have data on respondents’ specific grades of employment, we believe salary level is a sound proxy. We find the median salary category in each country, then divide the sample into those who either have average or below-average salaries (lower level positions) and those who have above-average salaries (higher level positions). Second, we divide the sample between those whose jobs involve mainly technical or managerial functions and those whose jobs involve mainly administrative functions. Although these categories are not well correlated with salary level ( $r=.27$ ), they provide an alternative division based on position.

We measure political association in two different ways. First, we simply split the sample into those who support the ruling party (NPP in Ghana at the time of the survey and NRM in Uganda) and those who do not. We also measure political association by whether respondents report having connections to political patronage networks that are important for them in their jobs. We do so by constructing a measure from three questions asking about the importance of political connections in having obtained their job, their most recent promotion, or a raise in salary (These questions are listed in Appendix G). All questions are measured on a 1-7 scale where 1 represents ‘not at all important’ and 7 represents ‘very important’.<sup>16</sup> Since the sample skewed heavily toward individuals reporting no connections, we code those who answered 3 or above to any of the three questions as ‘connected’.<sup>17</sup>

Finally, for Ghana, we split the sample into those who work in organizations that have plausibly received oil revenue.<sup>18</sup> Drawing on annual reports published by Ghana’s Public Interest and Accountability Committee, we identify which ministries, departments, and agencies are likely to have implemented projects classified as ‘priority areas’ by the Committee.<sup>19</sup> For example, if agriculture is listed as a priority area, we assume that the Ministry of Food and Agriculture has plausibly received oil revenue. Organizations that have plausibly received oil revenue are marked with an asterisk in Table 7 in Appendix C.

## C Institutions Included in the Survey

Table 7: Institutions Included in the Ghana Survey

<b>Institution</b>	<b>N</b>
Bank of Ghana*	7
Controller and Accountant General	37
CSIR Food Research Institute	23
Copyright Office	7
Energy Commission*	44
Environmental Protection Agency	28
Fair Wages and Salaries Commission	19
Ghana Educational Trust Fund*	24
Ghana AIDS Control Program	8
Ghana Audit Service	42
Ghana Cocoa Board	20
Ghana Investment Fund for Electronic Communication	28
Ghana Investment Promotion Center	30
Medical and Dental Council	16
National Service Secretariat	30
Ghana Pharmacy Council	25
Ghana Revenue Authority	12
Ghana Standards Authority	71
Ghana Statistical Service	32
Information Services Department	39
Lands Commission	112
Ministry of Communications*	23
Ministry of Defence	48
Ministry of Education*	67
Ministry of Employment and Labour Relations	42
Ministry of Energy*	37
Ministry of Finance and Economic Planning*	70
Ministry of Food and Agriculture*	29

Institutions Included in the Ghana Survey (continued)

<b>Institution</b>	<b>N</b>
Ministry of Foreign Affairs and Regional Integration	66
Ministry of Gender, Children and Social Protection	41
Ministry of Health*	77
Ministry of Information	14
Ministry of Trade and Industry	62
Ministry of Works and Housing*	24
Ministry of Youth and Sports	32
National Identification Authority	60
National Information Technology Agency	39
National Board for Small Scale Industries	5
Petroleum Commission	5
Nursing and Midwifery Council	55
Office of the Head of the Civil Service	29
Registrar General's Department	32
Department of Feeder Roads*	41
Driver Vehicle Licensing Authority*	27
Other/Not Specified	5
Forestry Commission	31
Ghana Health Service	26
<b>Total</b>	<b>1641</b>

\* indicates that an institution has plausibly received oil revenue

Table 8: Institutions Included in the Uganda Survey

<b>Institution</b>	<b>N</b>
<b>Ministries</b>	
Agriculture, Animal Industry, and Fisheries	6
Communication and Information Communication Technology	1
Disaster Preparedness and Refugees	1
Education and Sports	111
Energy and Minerals	1
Finance, Planning and Economic Development	164
Foreign Affairs	2
Gender, Labor, and Social Affairs	65
Health	84
Internal Affairs	100
Justice and Constitutional Affairs	55
Lands, Housing, and Urban Development	75
Local Government	17
Public Service	60
Trade and Industry	95
Water and Environment	1
Works and Transport	114
<b>Agencies</b>	
Civil Aviation Authority	74
Uganda Revenue Authority	83
Inspectorate of Government	2
National Agricultural Advisory Services	4
National Council of Sports	3
Public Procurement	2
Public Service Commission	4
The Office of the Auditor General	60
Uganda Electoral Commission	44
Uganda National Bureau of Standards	1
Uganda National Examinations Board	45
Uganda National Roads Authority	1
Uganda Registration Services Bureau	47
<b>Other</b>	
Office of the President	8
Office of the Vice President	2
Office of the Prime Minister	86
<b>Total</b>	<b>1537</b>



## D Calculations of Population Sizes

We estimate the size of the population of Ghanaian bureaucrats from which the sample was drawn using the ‘Analysis of Staff Strength’ from Ghana’s Ministry of Finance and Economic Planning’s (MOFEP) 2017 Budget Statement Appendix. We take the total number of government employees listed as of January 2017: 507,052. Given that a number of organizations seem to have missing numbers, we first increase this estimate by 5%. We then subtract the numbers of employees from ministries, departments, and agencies that are primarily made up of ‘street-level’ bureaucrats such as the Ghana Education Service and the Ghana Prisons Service, as well as any regional and district offices listed. Our calculations suggest an estimated population of 97,655 public service employees. With 1,641 survey respondents, this means our sample constitutes an estimated 1.7% of the population.

In Uganda, the definition of traditional civil service included in the Uganda Statistical Abstract matches closely with the definition of civil servants we sought to interview. However, we did interview respondents in government agencies, which are not considered part of the traditional civil service. To create an estimate of the size of the population from which we drew our sample, we account for two things: growth of the traditional civil service since 2016 (the most recent estimate) and the number of civil servants in government agencies. If the civil service grew from 2016 to 2017 at the same rate it did from 2015 to 2016 (2.7%), then the traditional civil service at the time of the survey is likely to be 23,585. To our knowledge, there is no reliable estimate regarding the number of people employed by government agencies not included in the traditional civil service. To err on the side of caution, we assume that agencies employ as much staff as the entire civil service. Therefore we double the population estimate to 47,170. Given our calculations, our sample of 1,537 represents roughly 3.3% of the 47,170 estimated population at the time of the survey.

## E Balance Tests

Table 9 assesses random assignment using logistic regression on a range of observables. The results suggest that, overall, no subgroups were significantly more or less likely to be assigned to the treatment group. In Uganda, the test results suggest that ruling party supporters were somewhat more less likely to be assigned to treatment group. However, because party affiliation questions were asked post-treatment, it is possible that the treatment affected responses to this question.

Table 9: Logit Regression Predicting Assignment to Treatment

	Pooled	Ghana	Uganda
Years	-0.002 (-0.27)	-0.009 (-1.03)	0.005 (0.58)
Bachelors	-0.109 (-0.78)	-0.246 (-1.29)	0.036 (0.18)
Salary	0.078 (1.38)	0.126 (1.57)	0.062 (0.75)
Ruling Party	-0.198 (-1.62)	0.095 (0.50)	-0.401* (-2.44)
Female	0.074 (0.74)	0.047 (0.32)	0.100 (0.71)
Org Oil Revenue		-0.119 (-0.82)	
Constant	0.0164 (0.09)	-0.102 (-0.39)	-0.104 (-0.39)
N	1614	789	825
Pseudo R-Sq	0.004	0.003	0.007

Significance levels: \*: 10%

## F Confirming Null Results

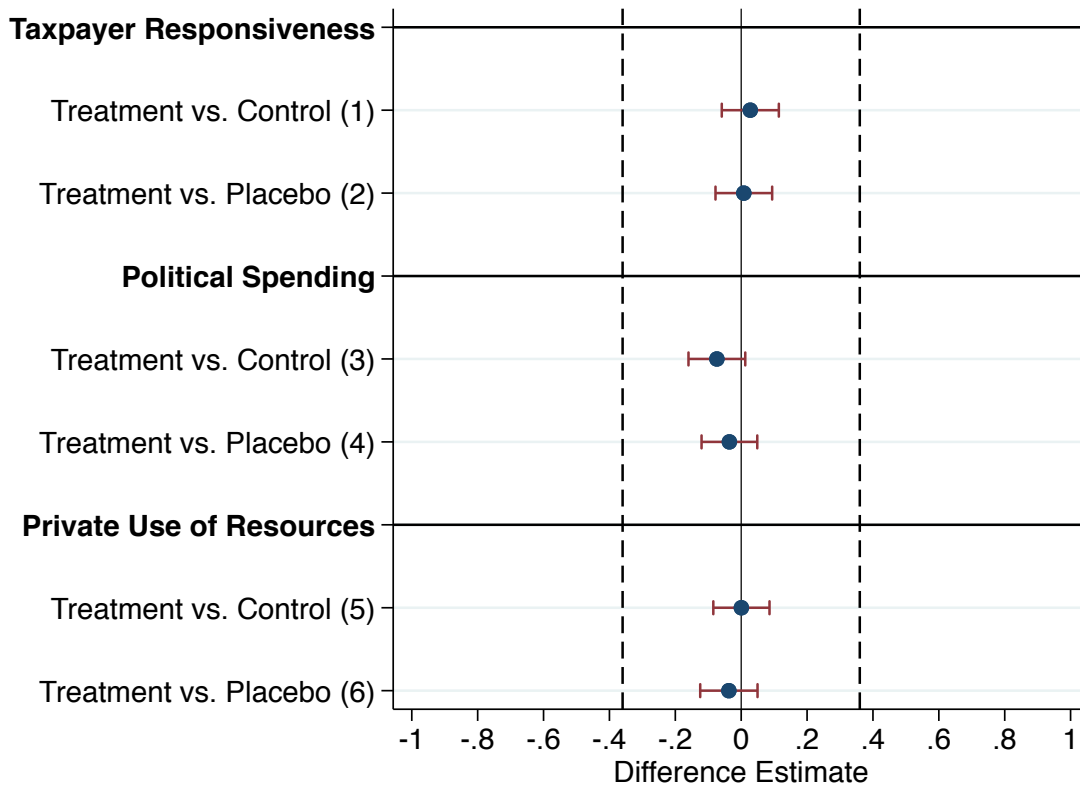
In Figure 4 we present results of equivalency tests using standardised differences from the pooled sample along with the equivalence range (dashed lines). All of our estimates fall within this range, increasing confidence that the substantive effects of the treatment do not represent substantively important effect. In country-specific tests (not shown), the treatment effects similarly fall within the equivalence range for the country-specific analysis.

In Table 10, we report results from difference of means tests comparing the treatment group to a restricted placebo group including only those respondents who did not associate the placebo prime with revenue from oil. The results remain null with one exception: in Ghana, the restricted placebo group is more likely to express attitudes tolerant of corruption than is the treatment group. This result suggests that, contrary to our expectations, that generic increases in revenue may bring about acceptance of corruption compared to increases in oil revenue.

## G Indicators of Political Connections

The following questions were used to construct a measure of connectedness, enabling us to divide the sample between those who have benefited from government patronage in their careers and those who have not benefited. Corresponding analysis appears in Section 5.3. Respondents are asked to rate the level of importance of the following on a 1-7 scale.

Figure 4: Standardised Full Sample Pooled Results with Equivalency Range



Difference-of-means estimates with 95% confidence intervals.

A positive difference indicates that the treatment group has higher average levels of agreement with each statement. Dashed lines represent the bounds of the equivalency range. Sample sizes are the same as in Figure 2.

Having connections with a politician or someone with political links can sometimes be important in the public sector. How important have connections to a politician or someone with links to political parties or politicians been to you in the following respects?

- To get your first job in the public sector
- To advance to a higher position in the public sector
- To get a salary increase in the public sector

## H Detecting Social Desirability Bias Using List Experiments

Additional questions in the survey allow us to estimate the risk of social desirability bias in our post-prime questions. We do so by comparing responses from two other questions in the survey:

Table 10: Treatment Effects Relative to Restricted Placebo

Hypothesis	Diff	SE	t	N(tr)	N(p)
<b>H1 Taxpayer Responsiveness</b>					
Pooled	-0.030	0.054	-0.55	1,062	615
Ghana	-0.080	0.084	-0.96	543	293
Uganda	0.000	0.067	0.01	519	322
<b>H2 Political Spending</b>					
Pooled	-0.066	0.058	-1.15	1,055	615
Ghana	-0.145	0.089	-1.62	539	294
Uganda	-0.005	0.073	-0.061	516	321
<b>H3 Private Use of Resources</b>					
Pooled	-0.048	0.052	-0.94	1,063	618
Ghana	-0.173	0.076	-2.29**	545	295
Uganda	0.068	0.069	0.98	518	323

Difference-of-means tests comparing treatment and placebo groups, but excluding those in the placebo group who associated oil revenue with the treatment.

a list experiment on diverting state resources to politicians and a direct question asking how frequently bureaucrats engage in such behavior.

This sensitive item in the list experiment is comparable to one of the outcome questions in that it involves the diversion of state funds for political purposes. The survey also contained a direct question in the survey that asked respondents to report the frequency that ‘in my institution, public servants help divert government resources to a party or person with political links’. This then allows us to compare responses to the list experiment and the direct question. If substantially more people are admitting to diverting funds in the list experiment than they indicate in the direct question, we have reason to be concerned that social desirability bias is a potential issue. Comparing these questions, we find little to no evidence of social desirability bias.

We use the estimation strategy developed by (Blair and Imai 2012) to estimate the proportions of respondents in the treatment condition of the list experiment who chose the sensitive item (diverting resources). Table 11 reports these proportions for the political use of funds experiment. It is important to note that the percentage of respondents saying yes or no to the sensitive item reported in Table 11 do not add up to exactly 100 because these statistics are only estimates and as such there is error associated with them (the table also reports standard errors for each estimate). The estimates suggest that 8% in Ghana and 16% in Uganda responded affirmatively to the sensitive treatment statement that they have ‘helped divert government resources to the party’ in the list experiment. Now, we can compare these estimated proportions to the direct question from the survey. We find that in Ghana 14.6% report that the diversion of funds to parties happens ‘all the time or very often’ or ‘often’ and the equivalent proportion in Uganda is 12.6% (the other response options are sometimes, rarely, or never). Therefore, in Uganda we see that fairly similar proportions in the direct questions (13%) and the list experiment (16%) are willing to admit to diverting public funds to the party. We do expect some increase in admitting to sensitive behavior when asked via the list experiment, but the difference between 13% and 16% is slight. Given that in Uganda 16% admit to diverting funds in the experiment and 13% suggest it is happening in their

institution when asked directly, social desirability of responses is not likely an issue in the survey and thus is not likely driving the effects we find in Uganda. In Ghana, surprisingly, more people acknowledge this happens in the direct question than in the survey experiment (probably because the direct question is asking about the overall frequency rather than specifically whether the person engages in it, or possibly due to the fact that some who admit it directly were not in the treatment condition in the experiment).

Table 11: Political Use of Funds Experiment: Proportions in Treatment Answering Affirmatively to the Sensitive Item

Response	Ghana				Uganda			
	No	s.e.	Yes	s.e.	No	s.e.	Yes	s.e.
0	4.7	NA	NA	NA	3.2	NA	NA	NA
1	22.7	.02	3.0	.02	27.6	.02	11.1	.02
2	50.1	.02	1.8	.02	42.1	.02	3.4	.02
3	17.4	.01	1.8	.00	12.5	.01	1.0	.00
4	NA	NA	1.8	NA	NA	NA	.7	NA
<b>Total</b>	94.9		8.4		85.4		16.2	

## I Attitudes vs. Behavior

While our study does not include behavioral outcomes for the oil revenue experiment, the Uganda survey contained a behavioral measure from a donation game that maps onto attitudinal questions in the survey. We find a high degree of correlation between stated attitudes and behaviors as measured by the donation game. In particular, in Uganda, we find that those who donated to charity are also significantly more likely to agree that 1) ‘It is important to contribute to activities that tackle social problems’, 2) ‘Considering the welfare of others is very important’, 3) ‘I would agree to a good plan to make a better life for the poor, even if it costs me money’, and 4) ‘I am willing to risk personal loss to help society’ than those who did not donate (See Table 12; responses in the survey are degrees of disagreement/agreement on a likert scale with 5 indicating that the respondent strongly agrees with the statement). These correlations show that attitudes of the surveyed bureaucrats do map well onto behaviors, which suggests that our attitudinal outcome measure is likely to correlate with actual behavior; however future research would do well to directly investigate behavior.

Table 12: Attitudinal and Behavioral Measures

	Did Not Donate (N)	Donated (N)	Difference (t-stat)
<b>Uganda</b>			
Contribute to Solve Probs.	4.69 (996)	4.81 (507)	-0.12 (-3.61)
Consider Welfare of Others	4.71 (994)	4.82 (509)	-0.11 (-3.44)
Help poor if cost money	4.15 (997)	4.40 (508)	-0.26 (-4.52)
Risk loss to help society	3.75 (997)	3.97 (507)	-0.21 (-3.16)