China and the African State
Evidence from Surveys, Survey Experiments, and Behavioral Games in Liberia

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MESSAGE FROM THE DIRECTOR

USAID's Center of Excellence in Democracy, Human Rights, and Governance is pleased to share "*China and the African State: Evidence from Surveys, Survey Experiments, and Behavioral Games in Liberia."* This publication was produced by USAID in partnership with the College of William and Mary and the Institute of International Education as part of the Research and Innovation Grants Working Papers Series.

The *Strategy on Democracy, Human Rights, and Governance*[1] reaffirmed USAID's commitment to "generate, analyze, and disseminate rigorous, systematic, and publicly accessible evidence in all aspects of DRG policy, strategy and program development, implementation, and evaluation." This paper, along with the others in the series, makes a valuable contribution to advancing this commitment to learning and evidence-based programming.

This series is part of USAID's Learning Agenda for the DRG Sector, a dynamic collection of research questions that serves to guide the DRG Center's and USAID field missions' analytical efforts. USAID seeks to inform strategic planning and project design efforts with the very best theory, evidence, and practical guidance. Through these efforts, the Learning Agenda is contributing to USAID's objective to support the establishment and consolidation of inclusive and accountable democracies to advance freedom, dignity, and development.

The research presented in this paper provides insights into the effects of Chinese aid and investment on local perceptions of government legitimacy and democratic quality in Liberia. The innovative research included a public opinion survey, a survey experiment, and an experimental game. While this issue warrants more comprehensive research, the findings from this pilot study suggest that exposure to Chinese aid in Liberia may have few detectable effects on citizens' views of the Liberian government. The paper finds also that exposure to US aid appears to be associated with improvements in the perceived quality of Liberian democracy.

I hope you find this research enlightening and helpful. As the DRG Center's Learning Agenda progresses, we will continue our effort to bring forward the latest in relevant social science research to important constituencies for our work, particularly our DRG cadre and implementing partners, but also others. I invite you to stay involved as this enriching, timely, and important work proceeds.

Neil Levine, Director
Center of Excellence on Democracy, Human Rights, and Governance
US Agency for International Development

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[1] https://www.usaid.gov/sites/default/files/documents/1866/USAID%20DRG_%20final%20final%206-24%203%20(1).pdf

ACRONYM LIST

CHICO	China Henan International Group
DRG Center	USAID's Center of Excellence on Democracy, Human Rights, and Governance
EU	European Union
FDI	Foreign Direct Investment
FOCAC	Forum on China-Africa Cooperation
GNI	Gross National Income
IIE	Institute of International Education
LD	Liberian Dollar
LIBRAMP	Liberia Road Asset Management Project
NGO	Non-Governmental Organization
NORAD	Norwegian Agency for Development Cooperation
OECD	Organization for Economic Cooperation and Development
ODA	Official Development Assistance
OLS	Ordinary Least Squares
SD	Standard Deviation
SIDA	Swedish International Development Cooperation Agency
TUFF	Tracking Under-Reported Financial Flows
USAID	United States Agency for International Development
USD	United States Dollars

ABSTRACT

What are the effects of Chinese investment and development projects on the perceived legitimacy of African states? In recent years, China has dramatically increased the size and scope of its aid to and investment in sub-Saharan Africa. This increase has ignited an acrimonious debate among scholars and policymakers, some of whom believe China is a "rogue donor" that has exacerbated corruption, eroded transparency, and further estranged African citizens from their own governments. We test this proposition in Liberia by combining sub-national analysis of original surveys, survey experiments, and behavioral games. Contrary to our expectations, we find that although exposure to Chinese aid and investment has improved Africans' perceptions of Chinese donors and investors, it generally has not affected their views of their own governments, nor has it changed their willingness to contribute to government social service provision through tax compliance. These null results are consistent across settings and across measurement and identification strategies, belying the conventional wisdom that China has provoked a backlash among those most affected by its presence, or that it has diminished tax morale and damaged perceptions of government. US aid and investment appears to have similar null effects, though it (unlike its Chinese counterpart) is associated with more positive perceptions of the quality of democracy in recipient countries.

INTRODUCTION

What are the effects of Chinese investment and development projects on the perceived legitimacy of African states? Since its "Year of Africa" in 2006, China has dramatically increased the size and scope of its aid and investment to the continent (Bräutigam 2009). In some countries, China now rivals USAID and other Western agencies. At a Forum on China-Africa Cooperation (FOCAC) in 2000, the Chinese inaugurated a "strategic partnership" with 44 African governments, and pledges to the continent have doubled at each FOCAC summit since then (Strange *et al.* 2013).

This growth has ignited an acrimonious debate among both scholars and policymakers. Some argue that China is a "rogue" donor whose tendency to impose few if any conditionalities on the aid and investment it delivers will only "[underwrite] a world that is more corrupt, chaotic, and authoritarian" (Naím 2007). They worry that China's increasing presence on the continent will erode transparency and further estrange African citizens from their own governments. Others (including some African heads of state) counter that, with fewer conditionalities, Chinese projects are implemented more quickly and at lower cost than their Western counterparts (Wade 2008). Critics respond that China prioritizes speed and low cost at the expense of quality and fair play in its negotiations with both the citizens and governments of recipient countries.

Empirical evidence traditionally has been scarce on both sides of this debate (Large 2008; Strange *et al.* 2013). This situation is starting to change: new research suggests that the effects of Chinese aid are more complex than the simplified policy debate that has been dominant suggests. On one hand, studies have found that China does not systematically favor resource-rich countries or less democratic or more corrupt governments in its allocations of foreign aid (Dreher and Fuchs 2015). Instead, like Western donors, Chinese aid policy seems to be largely shaped by foreign policy considerations (Dreher *et al.* 2015). On the other hand, there is also emerging evidence that Chinese aid differs from other forms of development assistance. It is more prone to "political capture" by recipient governments than World Bank assistance (Dreher *et al.* 2015), and there is emerging evidence that it may both increase local corruption and perceptions of corruption (Isaksson and Kotsadam 2016; Kelly, Brazys, and Elkink 2016).

In comparison, research on non-Chinese foreign aid and investment generally has found null or even positive effects on governance and perceptions of governance. Existing studies suggest that provision of social services by donors, investors, and other non-governmental organizations (NGOs) improves the quality of political institutions in recipient counties (Jones and Tarp 2016); strengthens rather than weakens tax morale, at least in sub-Saharan Africa (Sacks 2012); and has no effect on recipient governments' tax efforts (Morrissey 2015). In a survey experiment in India, Dietrich and Winters (2015) find no evidence to suggest that citizens rate their own governments less favorably after learning that social services are funded by foreign governments. Relatedly, in a field experiment in Bangladesh, Guiteras and Mobarak (2014) find that subsidies for the construction of sanitation facilities initially increase citizens' support for local government but have no effect after citizens learn that the facilities were funded by an NGO. Indeed, if anything, existing research suggests that politicians reap electoral gains from foreign aid designated for development (Cruz and Schneider 2012).

While valuable, these studies are limited in several ways. Most rely on just one or two sources of data, increasing the likelihood of bias induced by systematic measurement error. For example, if China is

more likely to disguise its aid to and investment in more authoritarian regimes, and if those regimes are more likely to be perceived as illegitimate, then cross-national comparisons are likely to underestimate the potentially harmful effect of China's presence on the perceived legitimacy of recipient states. Moreover, most studies rely on just one identification strategy—typically selection on observables or random assignment in the context of a survey experiment. The former strategy is susceptible to omitted variables, and the latter may produce results that cannot easily be generalized to the real world. Quasi-experimental studies (*e.g.,* regression discontinuity designs) may suffer from a lack of external validity as well.

We aim to overcome these limitations by using multiple sources of data, multiple approaches to measurement, and multiple identification strategies. Specifically, we combine sub-national analysis of original surveys, survey experiments, and behavioral games from both urban and rural settings in Liberia. We take several different approaches to measuring 1) citizens' exposure to Chinese aid and investment (using a combination of surveys, AidData records, and randomly assigned vignettes) and 2) tax compliance and perceptions of government (using answers to survey questions and actions during a behavioral game). Triangulation should increase confidence in our results by allowing us to identify patterns that are consistent across methods and robust to different measurement and identification strategies.

Contrary to our expectations (and our publicly pre-specified hypotheses[2]), we find that although exposure to Chinese aid and investment seems to have improved Liberians' perceptions of Chinese donors and investors, it generally has not affected their views of government, nor has it changed their willingness, or their belief that they are obliged, to pay taxes—arguably the single most important indicator of perceived legitimacy (Fain 1972; Gilley 2009; Lake 2010; Levi, Sacks, and Tyler 2009; Scholz 1994; Scholz and Pinney 1995). These null results are consistent across settings and across measurement and identification strategies, belying the conventional wisdom that China has provoked backlash among those most affected by its presence, or that it has diminished tax morale and damaged perceptions of government. US aid and investment appears to have similar null effects, though they (unlike Chinese aid and investment) are associated with more positive perceptions of the quality of democracy in recipient countries.

Is it possible that these null effects are false negatives—artifacts of the limitations of systematic measurement error, lack of statistical power, or some other limitation of our research design? We provide several reasons to believe this is not the case. First and perhaps most important, most of our null results are robust to different measurement and identification strategies, suggesting that neither statistical power nor systematic measurement error is likely to explain them. Second, we show that our sub-national data analysis is sufficiently powered to detect a more intuitive (though still contested) relationship: a positive correlation between exposure to foreign aid and investment and perceptions of foreign donors and investors themselves. Finally, we show that our various proxies for exposure (*e.g.,* AidData records versus survey respondent self-reports) are highly positively correlated with one another, suggesting that systematic measurement error is unlikely to account for our results.

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[2] See http://egap.org/registration-details/1285

Of course, our analysis is not without limitations. Most obviously, we posit that Chinese aid and investment have increased the infrastructural capacity of recipient states, but this assumption is not necessarily true. While we lack data to test this proposition, future research might treat it as a testable hypothesis rather than an assumption. Moreover, because data on tax returns are scarce and unreliable in Liberia (and in most other sub-Saharan African countries), we cannot assess the relationship between Chinese investment and development projects and the actual taxes collected by the Liberian government, much less by other governments on the continent. While we measure tax compliance in multiple ways, these methods all rely either on self-reports (as in the survey and survey experiment) or behaviors observed in stylized scenarios (as in the behavioral games). Chinese projects may affect real-world tax compliance in ways that our proxies simply cannot detect.

Finally, our analysis in this paper is limited to Liberia—one of the world's weakest and most aid-dependent states, still struggling to overcome the legacies of civil war from 1989 – 2003 and, more recently, the devastating Ebola virus epidemic of 2014 – 2015. Liberia also has been the site of important incidents of contestation between Chinese contractors and citizens, as we discuss below. Whether our results generalize to other settings remains an open question. We leave this possibility for future research to explore.

THEORY: VIRTUOUS CIRCLE OR VICIOUS CYCLE?

Scholars have long debated the effects of foreign aid on the perceived legitimacy of recipient states. Foreign aid, particularly when invested directly into infrastructural projects rather than disbursed as general budgetary support, may help bolster state capacity while reducing corruption (Bräutigam 2009). However, it may act as a "free resource" for elites, reducing their accountability to citizens (Ferguson 1994). It may also foster a "culture of dependency" among both citizens and their elected (or unelected) representatives, severing the ties that otherwise would bind them (Moyo 2010).

Perhaps the most problematic consequence of these severed ties is an unwillingness to pay taxes. If citizens believe public goods will be provided primarily or exclusively through foreign aid and investment, then they may be reluctant to sacrifice their own income to support state institutions—institutions that they perceive as ineffective, irrelevant, and illegitimate. This reluctance is problematic not only because it saps the government's ability to provide public goods in the future (herein the vicious cycle), but also because it impedes citizens' ability to "bargain" with their governments, demanding accountability and reform (*e.g.,* democratization) in return for quasi-voluntary tax compliance (Bates and Lien 1985; Moore 2004; North and Weingast 1989; Torgler 2007). This line of reasoning—standard in political economy—is believed to explain the empirical relationship between taxation and democratic representation (Ross 2004). Where citizens perceive no obligation to pay their taxes (and, perhaps, where governments perceive no reason to collect them), democracy may suffer.

China's model of aid to and investment in Africa[3] has a number of characteristics that make it especially relevant to this debate. First, although most bilateral donors and investors maintain a diverse

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[3] Of course, aid and investment are very distinct phenomena. Unfortunately, China generally does not distinguish between aid and investment, and the line between them is often unclear, as many Chinese-funded or Chinese-

portfolio of (relatively) small-scale projects across a variety of sectors, China tends to favor fewer, large-scale projects, focused on infrastructure: roads, electricity, schools, and hospitals. Infrastructure of this sort often is viewed as an important indicator of state capacity, as it allows the state to project power, collect taxes, and provide social services throughout its territory (Herbst 2000). By this metric, China has almost certainly enhanced the infrastructural (if not administrative) capacity of African states.

Second, although many donors attach "good governance" conditions to the aid they deliver, China typically does not (Bräutigam 2009; Schiere 2010), viewing conditionalities as a threat to state sovereignty (Mwase and Yang 2012). Relatedly, China has proven willing to engage with corrupt regimes that Western agencies prefer to avoid (though this point is contested).[4] Finally, although many donors hire local contractors to implement their projects, China often relies on Chinese contractors. Those contractors have been accused of predatory hiring and management practices in recipient countries, potentially exacerbating citizens' perceptions that their own governments are unable or unwilling to protect them from these forms of abuse.

This combination of characteristics raises the possibility that Chinese aid and investment may have complex and perhaps contradictory effects on the perceived legitimacy of the states to which they are delivered. On one hand, China's focus on infrastructural capacity may enhance African governments' ability to protect property rights, provide public goods, and promote the rule of law. Citizens, in turn, may be more likely to perceive these governments as legitimate—as having the right to enforce laws, collect taxes, and regulate social services. The result may be a virtuous circle of taxation and public goods provision: the more citizens perceive the state as legitimate, the more willing they will be to pay taxes (Levi 2003); the more citizens pay taxes, the more resources the state will have at its disposal to provide public goods; and the more the state provides public goods, the more legitimate citizens will perceive it to be. Some scholars have found that foreign aid and investment can help to create this virtuous circle, and to sustain it once it begins (Sachs 2005). Chinese donors and investors may have the same effect.

On the other hand, in the absence of good governance conditions, Chinese aid and investment may exacerbate citizens' perceptions that their own governments are corrupt and unaccountable. Further, China's reliance on Chinese contractors may undermine citizens' sense of "local ownership," and harsh labor conditions may foment grievances not just against the foreign companies themselves but also against the domestic governments that allowed those companies to operate unfettered and unregulated. The result may be not a virtuous circle but rather a vicious cycle whereby complaints of corruption foment disloyalty, subversion, and even violence (Englebert 2000; Scott 1987), eroding the state's ability to ameliorate its own perceived illegitimacy by providing public goods. Failure to provide public goods may further aggravate perceptions of illegitimacy, causing the vicious cycle to continue.

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implemented projects appear to serve both purposes simultaneously. We opt to aggregate these two categories, acknowledging the conceptual slippage that aggregation inevitably entails.

[4] Relying on China's official reports of foreign direct investment, Cheung *et al.* (2012) find that Chinese FDI tends to favor more corrupt countries in Africa. Using AidData data, Dreher and Fuchs (2015) find no evidence of this relationship.

Although there have been some attempts to test these theoretical possibilities empirically, existing studies are limited in at least three crucial ways. First, they typically rely on just one or two sources of data to operationalize both their independent and dependent variables. This reliance increases the likelihood of bias induced by systematic (*i.e.,* non-random) measurement error. For example, if China is disproportionately likely to hide its aid to and investment in more corrupt, autocratic regimes—and if those regimes are disproportionately likely to be perceived as illegitimate—then cross-national comparisons (even using sub-national data) are likely to underestimate the potentially deleterious effect of Chinese investment and development projects on the perceived legitimacy of recipient states.

Second, most existing studies tend to rely on just one identification strategy—typically either selection on observables or random assignment to treatment in the context of a survey experiment. Identification strategies based on selection on observables, however, are susceptible to omitted variables bias, while those based on survey experiments—which typically involve rather stylized vignettes—may produce results that cannot be reliably generalized to behavior in the real world. Finally, most existing studies are conducted at just one unit of analysis: either macro-level or micro-level. Although macro-level studies can capture general patterns but not the specific dynamics of particular countries, micro-level studies—most of which are qualitative or purely anecdotal—capture specific realities but not general trends. Our goal is to help overcome these limitations by using multiple sources of data and multiple identification strategies at multiple units of analysis.

SETTING AND DATE

A. Within-Country Data Analysis
i. Setting: China in Liberia

For the micro-level component of our analysis, we rely on original surveys, survey experiments, and behavioral games conducted in Liberia. Despite having enjoyed a decade of peace, Liberia remains one of the world's weakest states. The country boasts only 400 miles of paved roads, an electric grid that barely powers the capital city, and a police force of just 4,000 for a population of more than 4 million. Liberia is ranked 177 out of 188 countries on the 2015 United Nations Human Development Index.[5] According to 2010 data from the Organization for Economic Cooperation and Development (OECD), it is also by far the most aid-dependent country in the world, with a ratio of official development assistance (ODA) to gross national income (GNI) of over 176%—nearly three times the ratio of the next most dependent country (the Solomon Islands).[6] This situation is likely only to have worsened with the devastating Ebola epidemic of 2014 – 2015, making Liberia an especially important setting for our study.

As in other sub-Saharan African countries, China has dramatically expanded its presence in Liberia in recent years. And, as in these other countries, much of China's aid and investment has focused on infrastructure. China, moreover, remains one of the few donors working in this space, allowing us to disentangle the effect of Chinese projects from that of the many other donors operating in the country.

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[5] See http://hdr.undp.org/en/content/human-development-index-hdi [accessed August 12, 2016]
[6] "Top 10 countries with the highest ODA to GNI ratio," DEVEX, February 8, 2012, https://www.devex.com/news/top-10-countries-with-the-highest-oda-to-gni-ratio-77423.

Anecdotally at least, China's presence in Liberia has enflamed civil discontent and provoked episodes of unrest. In 2009, for example, the derelict Bong iron ore mine in Bong County, Liberia, attracted a $2.6 billion, 25-year investment from China Union. In addition to restoring the mine's capacity to 1 million tons a year, China Union promised thousands of new jobs for the people of Bong County, the refurbishment of a technical school, new roads, and improvements to other services in the area (including the reintroduction of electricity). China Union's investment had the potential to increase the Liberian government's capacity significantly through new and improved infrastructure, stronger administrative capabilities, and greater taxation potential.

Four years later, in October 2013, the Emergency Response Unit of the Liberian National Police was deployed to Bong Mines to disperse striking Liberian workers who had occupied the China Union compound and blocked the railroad in protest of what they described as conditions of "modern slavery" at the mine.[7] Dozens of aggrieved workers lambasted the government of Liberia for signing the concession agreement with China Union, arguing that "the Chinese do not have respect for human rights at all."[8] Notably, the target of their grievances was not just China Union but the Liberian government itself.

Of course, this is just one anecdote, and whether the events in Bong Mines are symptomatic of a more general trend remains very much an open question—one that our study is designed to help answer.

ii. Surveys and Survey Experiments in Liberia

Our first source of data on Liberia is a set of surveys and survey experiments that we implemented in Gbarnga (the fourth largest city in Liberia) in Bong County, and in 36 rural towns and villages throughout Bong, Lofa, and Nimba counties. We implemented the surveys and survey experiments in both relatively urban and relatively rural areas because we expect the effects of Chinese aid and investment to vary across these settings. We chose to focus on Bong, Lofa, and Nimba because these counties were especially devastated by violence during the civil war (Ellis 2006); because they are located along Liberia's volatile and strategically significant border with Guinea and Côte d'Ivoire; and because, in part for these latter two reasons, they have become focal points for state consolidation since 2003. We chose to implement the tax compliance game in Gbarnga alone for reasons of logistical feasibility.

For the urban survey, we randomly selected 193 residents of nine randomly selected Gbarnga neighborhoods within the city, using the random walk technique. For the rural survey, we sampled 18 randomly selected residents in each village, also using the random walk technique. Both surveys covered a variety of topics related to perceived legitimacy, including perceptions of corruption, trustworthiness, and impartiality. They also included questions on potential respondent-level confounders, including age, income, religion, and ethnicity. Both surveys also measured four proxies for respondents' prior exposure to Chinese investment and development projects, including whether they 1) could name or 2) had used any Chinese-funded projects, and also whether 3) they or 4) any of their friends or family members had

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[7] "China Union Employees Claim Modern Slavery," *The New Dawn*, October 8, 2013, http://www.thenewdawnliberia.com/index.php?option=com_content&view=article&id=9886:china-union-employees-claim-modern-slavery&catid=25:politics&Itemid=59.
[8] Ibid.

worked for a Chinese contractor. For comparability, both surveys measured prior exposure to US investment and development projects, as well.

Finally, both surveys included a survey experiment in which respondents were read vignettes about social services provided either by the Liberian government or by Chinese or American donors and investors. In the "China" treatment group, for example, respondents were read the following vignette:

> *Providing public services is one important role for foreign donors and investors. One country that gives a lot of foreign aid and investment to Liberia is China. China gives many millions of dollars to help provide public services. Chinese companies and organizations also help build and maintain public services themselves. China provides many public services to Liberia, including roads, schools, hospitals, and clinics, especially during Ebola. China does not collect taxes from Liberians to do these things. China can provide services even if we don't pay our taxes. China uses its own money to fund expensive public services that can be difficult for communities to provide for themselves, like new roads, new hospitals, and new schools.*

> *But China can also do some bad things. Sometimes China can spend money wastefully. For example it may pay companies that aren't very good at road building to build our roads. That's one reason our roads can get spoiled so quickly. Or China may hire companies that do not pay fair wages to Liberian workers. They may make them work long hours with little pay. And they may treat them badly or threaten them if they complain. Or Chinese officials or contractors may eat the money.*

The "US" and "government" vignettes were nearly identical, changing only the name of the social service provider and, in the case of the government vignette, the description of the source of funding (taxes rather than China's "own money"). After being read the vignettes, respondents were asked a series of questions about whether or not they believe Liberians have a normative obligation to pay their taxes— arguably the single most important indicator of perceived legitimacy, and one of the most prominent in the literature (Fain 1972; Gilley 2009; Lake 2010; Levi, Sacks, and Tyler 2009; Scholz 1994; Scholz and Pinney 1995). A control group was asked the same questions without the preceding vignette.

iii. Tax Compliance Game in Liberia

We complement the surveys with a modified version of the tax compliance game (Clotfelter 1983), a staple of behavioral economics. The tax compliance game typically is used to assess how citizens' willingness to pay their taxes varies with the tax rate and the probability of being audited. In the conventional setup, citizens are allocated some amount of income and told that they are expected to report how much income they received. They then pay a tax on declared income, and face some probability of being audited for undeclared income. Audited undeclared income is fined. A citizen's decision to comply (*i.e.,* to declare all of her income) is defined by her expected utility over these four parameters: the amount of income, the tax rate, the probability of being audited, and the size of the fine.[9]

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[9] Compliance may vary with other parameters as well, depending on the setup of the game (*e.g.,* the possibility of a public good being provided if enough citizens pay their taxes).

We conducted a variation on this experiment in Gbarnga. Before beginning the game, participants were randomly assigned to hear one of the same vignettes about social service provision used in the survey experiment. A control group played the game without hearing a vignette. The game was played over 10 rounds, with two additional rounds of practice at the beginning to ensure comprehension. In each round, participants were given an envelope containing between 0 and 200 Liberian dollars (LD) (200 LD is roughly equivalent to $2.14 USD). They were also given a template for reporting their income, which they filled and returned (anonymously) to one of the Liberian facilitators. Reported income was taxed at a flat rate of 25%. Participants then took turns drawing colored ping pong balls from a box. Those who drew a red ball would be audited; those who drew a green ball would not. The probability of being audited was a constant 10%, and audited unreported income was fined at a flat rate of 100 LD (roughly equivalent to $1.07 USD). Participants were repeatedly reassured of their anonymity. To contextualize the results of the game, participants also were asked to complete a short survey upon arrival at the study site, and were given the chance to explain their decision-making process in focus groups conducted after the game was complete. The focus group data have not been analyzed for this working paper.

iv. AidData

Finally, we complement our survey with data from the AidData's China in Africa program, which is part of the TUFF (Tracking Under-Reported Financial Flows) Project.[10] TUFF was created to attempt to quantify the amount of foreign aid flowing from "non-traditional" donors such as China, Iran, Venezuela, and Russia. Because these countries do not participate in various international regimes for transparency in foreign aid (such as the OECD's Creditor Reporting System or the International Aid Transparency Initiative), the details of their activities are unknown. The TUFF methodology[11] uses Factiva to find relevant newspaper articles and radio and television transcripts on these activities, supplemented by the websites of recipient governments and their respective Chinese embassies, as well as by academic articles and NGO reports.

Through this procedure, TUFF generates extensive information about each Chinese investment and development project in sub-Saharan Africa (and elsewhere), including cost, location, sector, and stage of implementation. We use this information to geocode all Chinese projects in Liberia and match them with the locations of the communities in our sample, calculating 1) the distance from each community to the nearest Chinese project and 2) the number of Chinese projects within a 10, 20, 30, 40, and 50 km radius. For completeness, we include not only Chinese foreign direct investment (FDI), but also projects in which a Chinese company is the primary contractor (even if the Chinese government is not the primary donor).[12]

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[10] http://china.aiddata.org/TUFF_codebook
[11] http://china.aiddata.org/content/methodology
[12] For example, in Liberia, the China Henan International Group (CHICO) is the primary contractor on several large road-building projects funded by the Liberia Road Asset Management Project (LIBRAMP), a consortium including the Liberian government, the EU, Irish Aid, UK Aid, SIDA, and NORAD.

B. *Advantages to our Approach*

One of the key contributions of our study is our ability to triangulate across multiple data sources and measurement and identification strategies. Each of these approaches complements, and compensates for, the limitations of the others. Although surveys are useful because they capture real-world, individual-level exposure to Chinese aid and investment, they rely on self-reports and are thus potentially susceptible to systematic measurement error (*e.g.*, respondents who view China favorably may be more likely to remember using Chinese-funded infrastructure). AidData captures real-world exposure to Chinese aid and investment without relying on self-report, but only indirectly, since not all Liberians who live near the projects included in the AidData dataset necessarily use or even know about the projects. Moreover, since exposure to Chinese projects is not random, an identification strategy that relies either on survey self-reports or AidData records will inevitably be vulnerable to selection bias.

Survey experiments solve this selection problem but are more stylized, using vignettes to operationalize exposure to Chinese aid and investment, and in any case still rely on self-reports for key dependent variables (in our case, respondents' perceived obligation to pay their taxes). Our behavioral game solves the selection problem while capturing observed rather than self-reported tax compliance, but is even more stylized.

Of course, all measurement and identification strategies are imperfect in some way, and no one method can overcome all of these limitations simultaneously. Our goal is to identify patterns that are consistent across methodological approaches. The more robust our results to different measurement and identification strategies, the more confident we can be that they are not merely the result of chance, or of the idiosyncrasies of a particular method or sample.

RESULTS

A. *Within-Country Results*
i. Descriptive Statistics

Table 1 in Appendix B provides descriptive statistics on exposure to foreign aid and investment, perceptions of government, and the perceived obligation to pay taxes among both rural and urban respondents in Liberia. Not surprisingly, urban respondents are much more likely than rural ones to report knowing about and using projects funded by foreign donors and investors, both US and Chinese (though the discrepancy is much larger for the latter than the former). Urban respondents are also much more likely to have used or heard about Chinese projects than US ones; among rural respondents, in contrast, the proportions are roughly equal. Urban respondents are more likely than rural ones to have worked for a foreign contractor, or to know someone who has, and are more likely to have worked for (or to know somebody who has worked for) a Chinese contractor than a US one. Again, for rural respondents the proportions are roughly equal.

While both urban and rural respondents generally perceive the Liberian government as equitable in its treatment of different ethnic and religious groups, 83% of urban respondents and 70% of rural respondents describe it as corrupt. Respondents are more divided on the Liberian government's

openness and transparency. Nonetheless, most believe they have an obligation to pay taxes, though the majorities are small in both the urban and rural samples.

ii. Survey Results

Tables 2 and 3 in Appendix B report correlations between respondents' perceptions of the Liberian government and their prior exposure to Chinese and US investment and development projects within our rural and urban samples, respectively. In the first column of each table, we operationalize perceptions as an additive index of three indicators for whether respondents believe the Liberian government 1) treats all religious and ethnic groups equally, 2) makes decisions in an "open and transparent" manner, and 3) is free from corruption. In the second column, we operationalize perceptions as an indicator for whether respondents are satisfied with the quality of democracy in Liberia. In the third, fourth, and fifth columns, we measure tax compliance and respondents' perceived obligation to pay their taxes (the wording of this question was taken from the Afrobarometer survey, allowing us to compare these results to those for other African countries.)

In the first panel of Table 2, we operationalize exposure to foreign aid and investment as an additive index consisting of indicators for whether respondents 1) know about or 2) have used any public goods provided by foreign donors and investors, and whether 3) they or 4) any of their friends or family members have ever worked for a foreign contractor. These indicators are based on respondents' survey self-reports. In the second panel, we operationalize exposure as the distance (in units of 10 km) from the nearest Chinese project, and in the third, fourth, and fifth panels as the number of Chinese projects within a 30, 40, or 50 km radius, respectively. Unfortunately, these proxies are available for Chinese aid and investment only, and for the rural sample only (since urban respondents all live within roughly the same distance of the nearest project). Table 3 therefore focuses on self-reported exposure alone.

We estimate all correlations via Ordinary Least Squares (OLS), and include individual-level controls for gender, age, occupation, religion, education, and wealth (proxied by the quality of the materials used to build the respondents' home). For the rural survey, we also include community-level controls for population, cell phone coverage, an indicator for whether or not there is a police station in the community, and an additive index of facilities available in the community. Standard errors are clustered by the neighborhood (for the urban survey) or the community (for the rural survey) from which the respondent was sampled.

In general, we find no evidence to suggest that Liberians' exposure to foreign aid and investment erodes their perceptions of their own government or diminishes their willingness to pay taxes. If anything, the opposite appears to be true: the correlation between exposure to Chinese projects and perceptions of the Liberian government is positive and statistically significant in two of our five specifications for the rural survey, and is positive (though not statistically significant) in the urban survey as well.

The correlation between foreign aid and investment and the perceived quality of democracy in Liberia is more complicated. While self-reported exposure to US projects is positively and statistically significantly correlated with respondents' perceptions of Liberian democracy in both the rural and urban surveys, self-reported exposure to Chinese projects is not. Moreover, exposure as measured by AidData is negatively correlated with the perceived quality of democracy, though this correlation appears to be strongest among respondents who live furthest from the nearest Chinese projects. Relatedly, the

positive correlation between exposure to Chinese projects and our index of perceptions of government becomes negative—though not statistically significant—among the most distant respondents as well. One possible explanation for this result is that respondents feel underserved by more distant projects, and blame the Liberian government for this disparity. Another is that the attitudes of respondents who live far from the nearest Chinese project are shaped by other factors altogether, in which case the relationship may be spurious.

iii. Survey Experiment Results

Figures 1 and 2 in Appendix A plot the average treatment effect of each of the survey experiment vignettes in our rural and urban samples, respectively. The dependent variable is an additive index capturing respondents' perceived obligation to pay taxes. Respondents were asked whether they believe Liberians have an obligation to pay their taxes 1) even if they are poor, 2) even if the Liberian government makes bad policies, 3) even if the Liberian government is corrupt, and 4) even if foreign donors and investors provide most public goods anyway. We code indicators for whether respondents agree or strongly agree with each of these statements, then add the resulting four indicators into an index. The figures report the marginal effect of each vignette holding all controls at their means, with standard errors clustered by neighborhood (for the urban sample) or community (for the rural sample). The squares denote our point estimates, and the lines denote 90% confidence intervals.

We find no evidence to suggest that the vignettes had any effect on respondents' perceived obligation to pay taxes in the rural sample. The point estimates are nearly identical across treatment groups, and the confidence intervals are almost fully overlapping. In the rural sample, however, the government and US vignettes appear to have primed a stronger perceived obligation to pay taxes relative both to the control group and to the China vignette. Differences with the China vignette are both statistically significant, albeit only weakly so ($p < 0.1$ for the comparison between the government and US treatment groups, $p < 0.05$ for the comparison between the US and China treatment groups). Treatment effects for the China vignette are substantively and statistically indistinguishable from zero.

iv. Tax Compliance Game Results

Finally, Figure 3 displays the average treatment effect of the vignettes on the proportion of their total income that participants hid in the tax compliance game in urban Liberia. Rates of tax avoidance were very high—at or above 50% in all treatment groups—but were not affected by the vignettes.[13] If anything, tax compliance appears to have been lower rather than higher in the government treatment group, though this difference is not statistically significant.

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[13] Interestingly, observed rates of tax avoidance in the tax compliance game were much higher than self-reported rates in the survey, which ranged from 85% to 95%, depending on the sample. One potential explanation for this disparity is that survey respondents over-reported the socially desirable behavior of tax compliance. Another is that lab participants viewed the game as disconnected from the real-world exercise of paying taxes, and so evaded their taxes at a higher rate than they would have outside the lab. Unfortunately, we cannot disentangle these possibilities; however, in focus groups conducted after the behavioral games, most participants seemed to connect the experiment directly to the realities of taxation and tax compliance.

B. *Summary of Results*

Overall, our results suggest that exposure to foreign aid and investment does not weaken and may even enhance Liberians' perceptions of their own government, and of the quality of democracy in their country. These null or even positive effects are generally consistent across samples (urban versus rural), across approaches to measurement (AidData versus self-reports versus vignettes for the independent variable, behavior versus self-reports for the dependent variable), and identification strategies (selection on observables versus random assignment to treatment). We find some evidence that exposure to Chinese projects erodes perceptions of the perceived quality of democracy in Liberia, but these effects appear to be strongest among respondents who live farthest from the nearest project, raising the possibility of confounding. Exposure to US aid and investment, in contrast, is associated with improvements in the perceived quality of Liberian democracy in both the urban and rural samples.

ALTERNATIVE EXPLANATIONS

Is it possible that our failure to identify any robust deleterious effects of Chinese aid and investment on tax compliance and perceptions of government might be an artifact of flaws in our research design—a lack of statistical power, for example, or systematic measurement error in our proxies for exposure to Chinese donors and investors? As with any study emphasizing null effects, concerns about Type II errors (*i.e.*, "false negatives") loom large.

While we cannot conclusively rule out these possibilities, there are several reasons to believe they do not explain our null results. First and perhaps most important, the null effects on tax compliance are consistent across multiple measurement and identification strategies, suggesting that neither statistical power nor systematic measurement error is likely to explain them (unless all of our measurement and identification strategies are equally flawed in these ways).

Second, while we find little evidence to suggest that exposure to Chinese aid and investment damages perceptions of government or diminishes tax compliance, we do find that exposure seems to improve perceptions of Chinese donors and investors themselves, as we show in Table 4 in Appendix B. While intuitive, these correlations are important because they suggest that lack of statistical power is unlikely to explain our null results, and because they belie the conventional wisdom that China has fomented backlash among those most affected by its presence. Interestingly, but unsurprisingly, these correlations are strongest for more direct forms of exposure, as measured in the survey rather than AidData. More surprisingly, while exposure to US projects is not correlated with improved perceptions of China, exposure to Chinese projects is correlated with improved perceptions of the United States. This difference may be because Liberians tend to be more critical of the hiring and management practices of Chinese contractors relative to their US counterparts, and exposure to the former may heighten support for the latter.[14]

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[14] For example, 73% of urban respondents believe Chinese contractors abuse their Liberian employees, and only 20% believe they pay their Liberian employees a living wage. The corresponding figures for US contractors are 57% and 41%, respectively. The disparities are similar among rural respondents.

Third, as we show in Table 5 in Appendix B, respondents who live close to Chinese investment and development projects (as recorded by AidData) are much more likely to report exposure to those projects in the survey. For the most part they are not, however, any more or less likely to report exposure to US aid and investment.[15] This difference suggests that respondents' answers to our survey questions indeed capture exposure in a meaningful, empirically verifiable way, and that systematic measurement error is therefore unlikely to account for our results.[16]

CONCLUSION

In this paper, we assess the effects of Chinese aid and investment projects on the perceived legitimacy of African states, operationalized as citizens' perceived obligation to pay their taxes as well as their perceptions of government fairness and transparency. Using multiple sources of data, multiple approaches to measurement, and multiple identification strategies at multiple units of analysis, we find that exposure to Chinese projects has few detectable effects on citizens' views of their own government, or on their belief that they are obligated to pay taxes. These results are consistent across urban and rural settings within Liberia and are robust to changes in our measurement and identification strategies. We show that these null effects are unlikely to be artifacts of insufficient statistical power or systematic measurement error. Their consistency and robustness suggests they are "true negatives," rather than Type II errors caused by limitations in our research design.

Together these results seem to belie the conventional wisdom that China's ever-expanding presence in developing countries like Liberia has diminished tax morale or damaged perceptions of government. Our results suggest that fears about the adverse effects of foreign aid and investment on state legitimacy may be overblown. Conversely, of course, they also suggest that hopes for a beneficial effect may be overblown as well. These findings are relevant not only to the academic literature on foreign aid and investment (and to the small but growing literature on Chinese aid and investment specifically), but also to the more practical question of how best to deliver assistance to weak, underdeveloped, and war-torn states. In particular, while we do not find evidence of beneficial effects on state legitimacy here, it is plausible that foreign donors and investors could simultaneously enhance their own and recipient governments' reputations through, for example, more careful co-branding. Co-branding would allow recipient governments to claim some (more than their "fair share") of the credit for projects implemented largely or entirely by foreign donors and investors. While assessing this possibility is beyond the scope of this paper, we view this as a promising avenue of exploration for both researchers and policymakers in future.

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[15] The only exception is the 30km bandwidth. We believe this may be picking up more urban areas that are near a variety of aid projects, and we interpret results using this bandwidth with caution.

[16] In principle, it is possible that our survey-based proxies for exposure are correlated with our AidData-based proxies because both are measured with error, and the error itself is positively correlated. Given that these two sets of proxies are susceptible to very different forms of measurement error, we view this explanation as unlikely.

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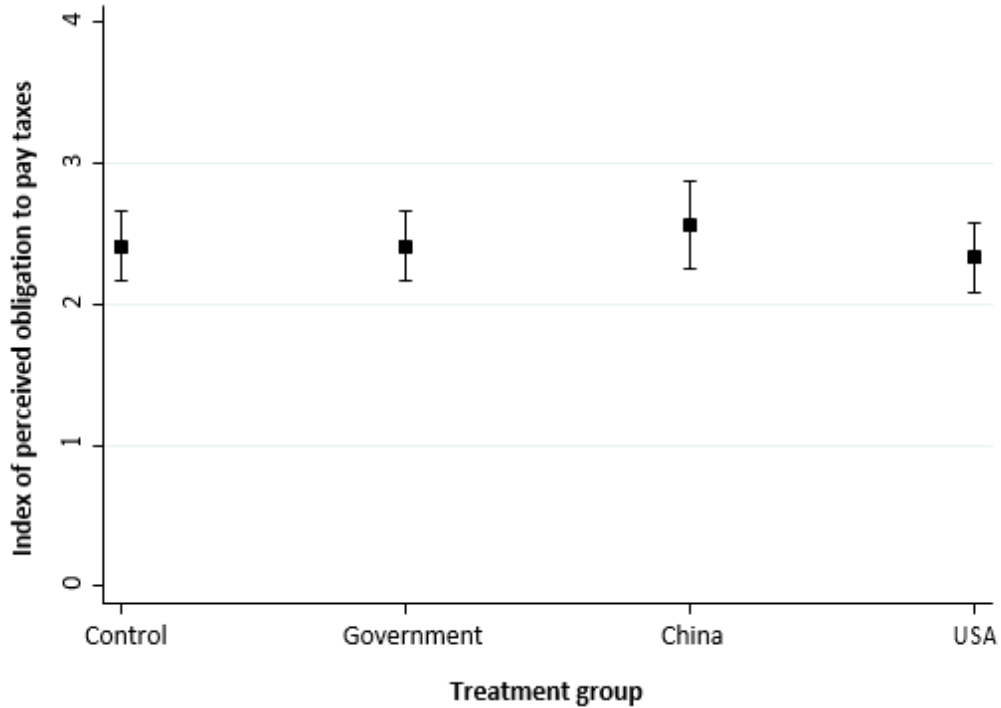Herbst, Jeffrey. 2000. *States and Power in Africa*. Princeton: Princeton University Press.

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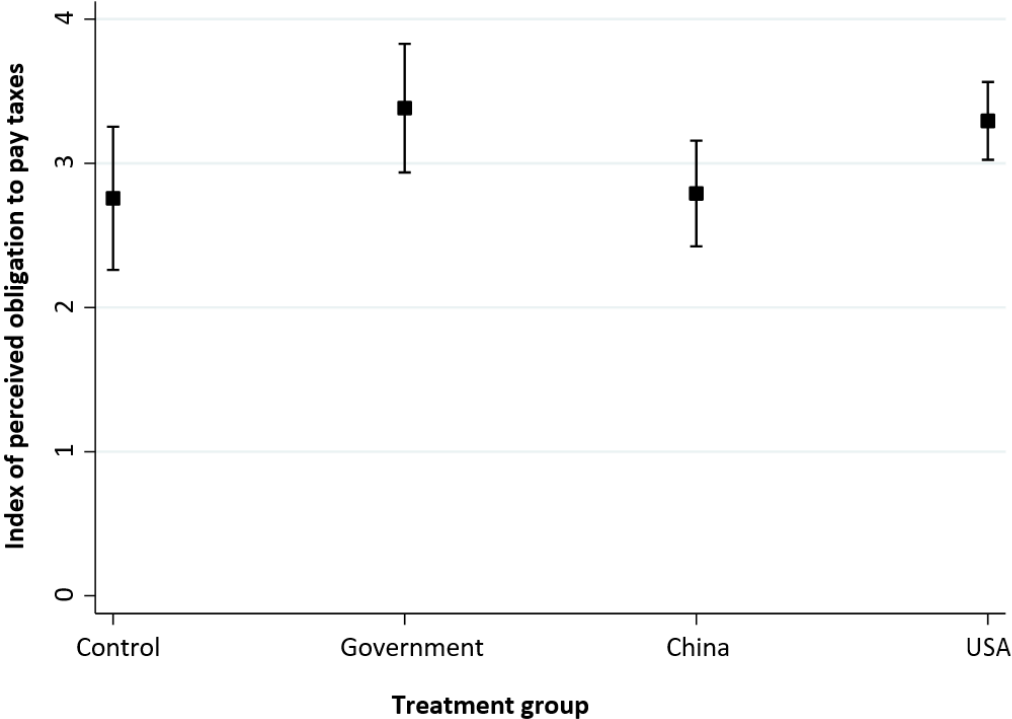
Figure 1: Average Treatment Effects for Survey Experiment in Rural Liberia

Notes: Average treatment effects of vignettes in the survey experiment on respondents' perceived obligation to pay taxes (indexed from 0 to 4). Omitted individual-level controls include gender, age, education, occupation, wealth, and religion. Omitted community-level controls include population, cell phone coverage, an indicator for whether or not there is a police station in the community, and an index of health and education facilities available in the community. Standard errors are clustered by community. The squares denote marginal effects with all controls held at their means; the lines denote 90% confidence intervals.

Figure 2: Average Treatment Effects for Survey Experiment in Urban Liberia
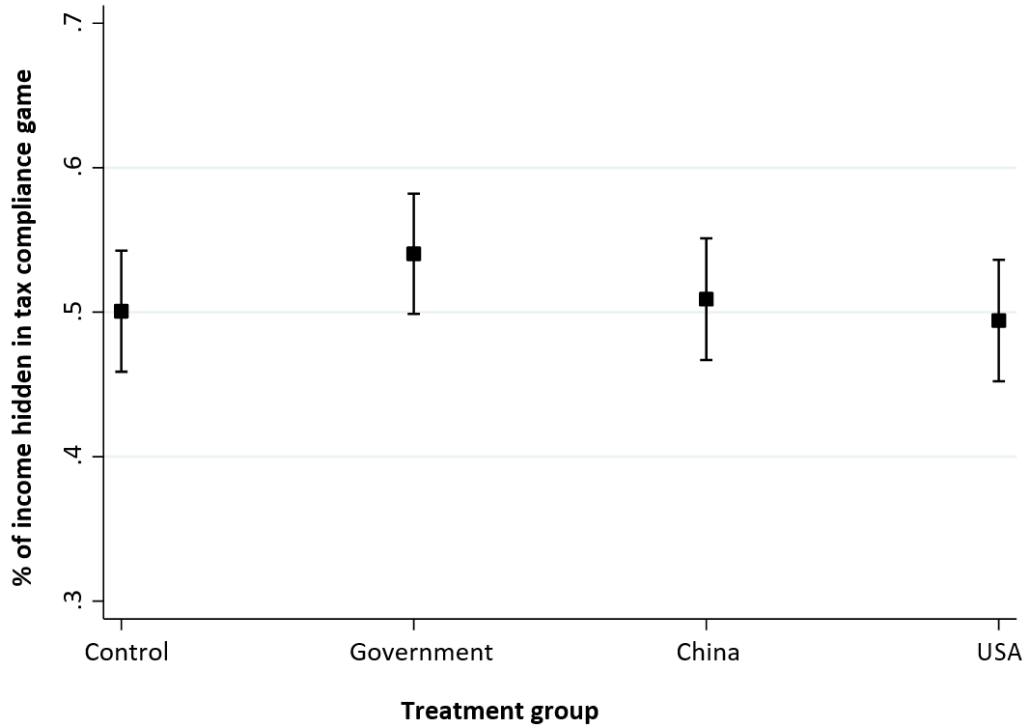

Notes: Average treatment effects of vignettes in the survey experiment on respondents' perceived obligation to pay taxes (indexed from 0 to 4). Omitted individual-level controls include gender, age, education, occupation, wealth, and religion. Standard errors are clustered by neighborhood in Gbarnga. The squares denote marginal effects with all controls held at their means; the lines denote 90% confidence intervals.

Figure 3: Average Treatment Effects for Tax Compliance Game in Urban Liberia

Notes: Average treatment effects of vignettes in the tax compliance game on the total share of their income that participants failed to report over all rounds of the game. Omitted individual-level controls include gender, age, education, occupation, wealth, and religion. The squares denote marginal effects with all controls held at their means; the lines denote 90% confidence intervals.

Table 1: Descriptive Statistics

	Rural survey			Urban survey		
	Mean	SD	N	Mean	SD	N
Exposure to foreign aid and investment	0.36	0.48	732	0.74	0.44	196
Used Chinese projects	0.32	0.47	732	0.83	0.38	196
Worked for Chinese company	0.02	0.14	732	0.06	0.24	196
Friends or family worked for Chinese company	0.14	0.35	732	0.32	0.47	196
Knows US projects	0.35	0.48	732	0.49	0.50	196
Used US projects	0.32	0.47	732	0.50	0.50	196
Worked for US company	0.05	0.22	732	0.13	0.34	196
Friends or family worked for US company	0.13	0.33	732	0.27	0.44	196
Perceptions of government						
Believes government treats all Liberians equally	0.86	0.35	674	0.77	0.42	194
Believes government is open and transparent	0.55	0.50	673	0.42	0.49	194
Believes government is free from corruption	0.30	0.46	674	0.17	0.38	194
Perceived obligation to pay taxes						
Obligated even if government makes bad policies	0.51	0.50	665	0.68	0.47	192
Obligated even if taxpayers are poor	0.54	0.50	665	0.74	0.44	192
Obligated even if government is corrupt	0.63	0.48	665	0.84	0.37	192
Obligated even if donors provide most public goods	0.75	0.43	665	0.84	0.37	192

Table 2: Foreign Aid and Investment and Perceived Legitimacy in Rural Liberia

	(1)	(2)	(3)	(4)	(5)
	Perceptions of government (index)	Believes quality of democracy is high	Has ever refused to pay taxes	Believes government has right to tax	Believes it is easy to avoid paying taxes
Index of exposure to Chinese projects	0.10 [0.04]**	0.00 [0.02]	-0.01 [0.01]	-0.01 [0.01]	0.01 [0.02]
Index of exposure to US projects	0.01 [0.04]	0.04 [0.02]**	0.00 [0.01]	0.00 [0.01]	-0.02 [0.02]
Distance to nearest Chinese project (10 km)	0.00 [0.01]	-0.02 [0.01]***	0.00 [0.00]	0.00 [0.00]	0.00 [0.00]
# of Chinese projects within 30km radius	0.20 [0.10]*	0.05 [0.06]	-0.04 [0.03]	-0.03 [0.03]	-0.02 [0.04]
# of Chinese projects within 40km radius	-0.06 [0.08]	-0.09 [0.05]*	0.00 [0.02]	-0.03 [0.02]*	-0.01 [0.03]
# of Chinese projects within 50km radius	-0.08 [0.07]	-0.13 [0.04]***	0.00 [0.02]	-0.01 [0.02]	-0.01 [0.03]
Observations	673	732	664	674	664
Individual-level controls	Y	Y	Y	Y	Y
Community-level controls	Y	Y	Y	Y	Y

Notes: Coefficients from OLS regressions of respondents' perceptions of government and taxation on various proxies for exposure to foreign aid and investment. The top panel reports results using self-reported exposure; the remaining panels report results using AidData data. Omitted individual-level controls include gender, age, education, occupation, wealth, and religion. Omitted community-level controls include population, cell phone coverage, an indicator for whether or not there is a police station in the community, and an index of health and education facilities available in the community. Standard errors, clustered by community, are in brackets. *** p<0.01, ** p<0.05, * p<0.

Table 3: Foreign Aid and Investment and Perceived Legitimacy in Urban Liberia

	(1)	(2)	(3)	(4)	(5)
	Perceptions of government (index)	Believes quality of democracy is high	Has ever refused to pay taxes	Believes government has right to tax	Believes it is easy to avoid paying taxes
Index of exposure to Chinese projects	0.04 [0.07]	0.00 [0.03]	-0.01 [0.04]	0.02 [0.02]	-0.02 [0.04]
Index of exposure to US projects	0.05 [0.08]	0.05 [0.02]**	0.00 [0.02]	0.01 [0.02]	-0.01 [0.02]
Observations	194	196	186	186	186
Individual-level controls	Y	Y	Y	Y	Y
Community-level controls	N	N	N	N	N

Notes: Coefficients from OLS regressions of respondents' perceptions of government and taxation on self-reported exposure to foreign aid and investment. Omitted individual-level controls include gender, age, education, occupation, wealth and religion. Standard errors, clustered by neighborhood are in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 4: Foreign Aid and Investment and Perceptions of Foreign Donors and Investors in Liberia

	(1)	(2)	(3)	(4)
	Rural respondents		**Urban respondents**	
	Perceptions of China (index)	Perceptions of US (index)	Perceptions of China (index)	Perceptions of US (index)
Index of exposure to Chinese projects	0.70 [0.06]***	0.32 [0.09]***	0.62 [0.19]***	0.49 [0.22]**
Index of exposure to US projects	0.08 [0.06]	0.99 [0.06]***	0.02 [0.09]	0.87 [0.10]***
Distance to nearest Chinese project (10 km)	-0.03 [0.03]	-0.05 [0.03]		
# of Chinese projects within 30km radius	-0.59 [0.16]***	-0.30 [0.36]		
# of Chinese projects within 40km radius	-0.11 [0.17]	-0.42 [0.21]*		
# of Chinese projects within 50km radius	-0.28 [0.17]	-0.47 [0.17]***		
Observations	732	732	196	196
Individual-level controls	Y	Y	Y	Y
Community-level controls	Y	Y	Y	Y

Notes: Coefficients from OLS regressions of respondents' perceptions of foreign aid and investment on various proxies for exposure to foreign aid and investment. Columns 1 and 2 report results for the rural sample; columns 3 and 4 report results for the urban sample. For the rural sample, the top panel reports results using self-reported exposure; the remaining panels report results using AidData data. Omitted individual-level controls include gender, age, education, occupation, wealth, and religion. For the rural sample, omitted community-level controls include population, cell phone coverage, an indicator for whether or not there is a police station in the community, and an index of health and education facilities available in the community. Standard errors, clustered by community (for the rural sample) or neighborhood (for the urban sample), are in brackets. *** p<0.01, ** p<0.05, * p<0.