Asking What the People Want: Using Mobile Phone Surveys to Identify Citizen Priorities

Benjamin Leo and Robert Morello

Abstract

Using an experimental design, we assess the feasibility of interactive voice recognition (IVR) surveys for gauging citizens' development priorities. Our project focuses on four low-income countries (Afghanistan, Ethiopia, Mozambique, and Zimbabwe), which exhibit significant differences in mobile penetration rates and linguistic fractionalization. In this paper, we consider sensitivities of using a single mobile phone-based survey instrument to solicit citizens' development priorities for a host of actors operating within the country. We analyze whether people's stated priorities change based on the specified executing actor, timeframe, or question format. A separate Center for Global Development (CGD) working paper provides detailed analysis on a range of methodological issues, including: survey design, implementation, sample weighting, response incentives, and national representativeness.

We find that mobile phone-based approaches may be an effective tool for gathering information about citizen priorities. In terms of the specific research questions, we find that people's priorities rarely change based on the specified actor (e.g., national government or external partners). There also is only a modest timeframe effect on citizens' revealed concerns, which is limited to less frequently cited development themes and priorities. Lastly, it appears that a closed-ended question format may adequately capture citizen's priorities compared to open-ended formats. Although, this finding is preliminary and should be tested further due to several methodological challenges in this study. Overall, these findings suggest that a single survey may be an appropriate tool for multiple development actors' usage – such as bilateral donors, multilateral agencies, and the national government – across multiple contexts.

JEL Codes: O33, O14, O55, D78, F35

Keywords: mobile phone surveys, mobile phones, priority setting, zimbabwe, ethiopia, mozambique, afghanistan

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I. Introduction

Through successive high-level forums over the last decade, donor governments and multilateral organizations have made increasingly expansive commitments to promote local ownership over development policies and programs. Among other aspects, this includes greater engagement with intended beneficiaries throughout program lifecycles, such as identifying priorities, designing projects, and then evaluating results. Yet, traditional data collection models, such as household surveys or consultative roundtables, present a range of practical challenges. By design, household surveys are comprehensive and representative tools for establishing baselines. Yet, they are expensive, less flexible, and time consuming to complete. Consultative forums, such as those used to develop national development plans or poverty reduction strategy papers, are faster and more flexible for engaging intended beneficiaries and stakeholders, but they often are not representative of the targeted population. Therefore, development agencies increasingly have an operational need for supplemental techniques for gathering broad-based input about program and policy priorities in a rapid, accurate, flexible, and cost-efficient manner.

In this context, the exponential rise in mobile phone penetration rates throughout developing countries provides a potentially powerful citizen engagement platform. However, there has been little research into whether mobile phone-based surveys are a reliable and representative tool across a broad range of developing country contexts. Using an experimental design, we assess the feasibility of interactive voice recognition (IVR) surveys for gauging citizens' development priorities. Our project focuses on four low-income countries (Afghanistan, Ethiopia, Mozambique, and Zimbabwe), which exhibit significant differences in mobile penetration rates and linguistic fractionalization. In this paper, we consider sensitivities of using a single mobile phone-based survey instrument to solicit citizens' development priorities for a host of actors operating within the country. We analyze whether people's stated priorities change based on the specified executing actor, timeframe, or question format. A separate Center for Global Development (CGD) working paper provides detailed analysis on a range of methodological issues, including: survey design, implementation, sample weighting, response incentives, and national representativeness.[1]

We find that mobile phone-based approaches may be an effective tool for gathering information about citizen priorities. In terms of the specific research questions, we find that people's priorities rarely change based on the specified actor (e.g., national government or external partners). There also is only a modest timeframe effect on citizens' revealed concerns, which is limited to less frequently cited development themes and priorities. Lastly, it appears that a close-ended question format may adequately capture citizen's priorities

[1] Ben Leo, Robert Morello, Jonathan Mellon, Tiago Peixoto, and Stephen Davenport. 2015. "Do Mobile Phone Surveys Work in Poor Countries?" CGD Working Paper 398. Washington, DC: Center for Global Development.

compared to open-ended formats. Although, this finding is preliminary and should be tested further due to several methodological challenges in this study. Overall, these findings suggest that a single survey may be an appropriate tool for multiple development actors' usage – such as bilateral donors, multilateral agencies, and the national government – across multiple contexts.

This paper is organized as follows. Section II provides a brief summary of development organizations' historical commitments concerning country ownership and citizen engagement principles. In section III, we outline our primary research questions, hypotheses, and tests. In section IV, we briefly summarize several methodological considerations, including: pilot country selection; the mobile phone survey technique; translation and language selection issues; national representativeness; survey costs; and the citizen priority questionnaire. Section V presents our findings and section VI concludes with potential policy implementations.

II. Country Ownership Declarations, National Development Strategies, and Donor Practices

Over the last decade, the international development community has repeatedly committed to promote country ownership principles and practices. These efforts have recognized the need to focus more donor resources on recipient country's priorities as well as having local organizations implement the respective project or program. Through the 2003 Rome Declaration on Harmonization, more than 40 development agency leaders committed to ensure that assistance is delivered in accordance with partner country priorities. In turn, partner country governments were "encouraged" to design harmonization action plans.[2] Under the 2005 Paris Declaration on Aid Effectiveness, partner countries committed to exercise leadership in developing and implementing national development strategies through broad consultative processes. In turn, donor governments committed to align their assistance with these national development strategies.[3] In 2008, the Accra Agenda for Action broadened the scope of country ownership by emphasizing developing country governments' accountability to domestic constituents – including parliaments, political parties, local authorities, the media, academia, social partners and civil society.[4] In 2011, donor and partner countries committed to deepen, extend and operationalize the democratic ownership of development policies and processes.[5] These commitments, coupled with several other initiatives[6], have helped to accelerate the centrality of national development strategies as guiding blueprints for donor activities.

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[2] See http://www.oecd.org/development/effectiveness/31451637.pdf.

[3] See http://www.oecd.org/development/effectiveness/34428351.pdf.

[4] Ibid.

[5] See http://www.oecd.org/dac/effectiveness/fourthhighlevelforumonaideffectiveness.htm.

[6] For example, the Heavily Indebted Poor Countries initiative (HIPC) required that countries develop poverty reduction strategy papers (PRSPs).

In practice, national development strategies are highly comprehensive documents that encompass nearly every possible development issue, sector, and theme.[7] These guiding documents are often hundreds of pages long and represent a political compromise amongst politicians, government bureaucrats, civil society groups, businesses, and external stakeholders.[8] As a result, they are not particularly instructive for identifying the country's most pressing problem(s) or for prioritizing donor resources on specific issues. Put differently, donor governments can support country ownership in a very broad sense even though there is little practical need to limit programmatic focus areas beyond what they would already support.

Using public attitude survey data from Sub-Saharan Africa and Latin America, Leo (2013) found a stark misalignment between citizen priorities and external actors' activities.[9] For instance, only 16 percent of U.S. assistance has focused on what Africans cite as their most pressing problems. Despite the magnitude of this apparent mismatch, some researchers and policymakers question whether the underlying Afrobarometer and Latinbarometer surveys are an accurate and reliable measure of citizens' development priorities. Within Africa, the nationally representative surveys ask respondents about the "most pressing problem" that *their national government* should address (emphasis added).[10] Therefore, some posit that citizens might exhibit different preferences *for external actors*, such as donor governments and non-governmental organizations. Moreover, they note that citizens' priorities might focus on meeting immediate needs or desires at the expense of higher impact, long-term investments.[11]

A second set of actors may accept that many development agencies' interventions are only moderately aligned with citizen priorities. Yet, they challenge the feasibility of using citizen surveys as a practical, supplemental input for improving future alignment. Specifically,

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[7] By illustration, Kenya's Vision 2030 includes three pillars (economic, social, and political), six priority economic sectors (tourism, agriculture, wholesale and retail trade, manufacturing, IT-enabled services, and financial services), six priority social sectors (education and training, health, environment, housing and urbanization, gender, and youth), and five priority political themes (rule of law, electoral process, democracy and public service delivery, transparency and accountability, and security and conflict management). Put differently, the Vision 2030 priorities essentially cover every single assistance category that is tracked and reported through the OECD-DAC Creditor Reporting System.

[8] For example, Uganda's 2010 Poverty Reduction Strategy Paper totaled 449 pages while the Republic of Congo's 2012 Poverty Reduction Strategy Paper was 432 pages long.

[9] Benjamin Leo (2013). "Is Anyone Listening? Does US Foreign Assistances Target People's Top Priorities?." CGD Working Paper 348. Washington, DC: Center for Global Development. http://www.cgdev.org/publication/anyone-listening-does-us-foreign-assistance-targetpeoples-top-priorities-working-paper

[10] While Latinbarometer surveys also ask about respondents' most pressing problems, they do not reference either the respective national government or external actors.

[11] Banerjee, Abhijit and Esther Duflo (2011). *Poor Economics: A Radical Rethinking of the Way to Fight Global Poverty*, Public Affairs.

existing survey techniques to gather citizens' preferences may be costly, time consuming, and inefficient.[12] By illustration, face-to-face enumerated national surveys can take four to six months to implement and cost several million dollars.

III. Primary Research Questions

In light of these critiques, we piloted the use of mobile phone surveys to solicit citizen priorities. We explore whether the framing of the questions leads to demonstrably different response patterns. Specifically, whether respondents' views change significantly in relation to: (1) different executing actors (e.g., national government and external partners); (2) different time horizons; and (3) open-ended and closed question formats. We outline the substantive research questions, tests, and hypotheses below.

A. Executing Actor

One way to render a survey gathering citizens' development priorities more cost effective is the use of a single survey for multiple actors. This leads us to ask if citizens' priorities differ based upon the executing actor (e.g., national government and external partners).

Prior research has demonstrated that this concern may be valid. Citizens' opinions concerning public goods vary on many factors beyond their preferences. For example, respondents' willingness to pay for public goods fluctuates on who conducts the interview and how respondents' perceive the interviewers.[13] In an African context, although not looking specifically at development priorities, Adida et al (2015) find that respondents' answers changed depending on the interviewers' ethnicities.[14] In this research, we introduced ourselves as "an independent research institution." See Appendix I for the complete survey instrument.

Further, Milner, Nielson, and Findley (2015) find that Ugandans are more likely to voice and demonstrate support for projects funded by foreign aid agencies than for those that are not.[15] They find this result through a fielded survey experiment. Using the accompanying survey questions, they identify that respondents are more likely to support foreign aid projects if they believe that the government is corrupt or clientelistic, or are not members of

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[12] In addition, there may be concerns about utilizing citizen input, even if it is nationally representative of the broader population, instead of working solely with the developing country government to identify development priorities. This concern is described in Leo (2013) in greater detail.

[13] See for example Laughland, Andrew, Wesley Musser, and Lynn Musser. "An Experiment in Contingent Valuation and Social Desirability." *Agriculture and Resource Economics Review*, 1994, vol. 23, issue 1.

[14] Adida, Claire, Karen Ferree, Daniel Posner, and Amanda Robinson. "Who's Asking? Interviewer Coethnicity Effects in African Survey Data." *Afrobarometer* Working Paper No. 158. June 2015.

[15] Milner, Helen, Daniel Nielson, and Michael Findley. "Citizen Preferences and Public Goods: Comparing Preferences for Foreign Aid and Government Programs in Uganda." Forthcoming. Draft dated March 13, 2015.

the ruling party. Thus, these respondents view public goods funded by foreign aid agencies less likely to be subject to the perceived lack of delivery because of corruption or clientelism.

However, to our knowledge, there are no publicly-available studies examining whether citizens, if given the opportunity, would cite different priorities for their national government than for relevant external actors. Nonetheless, this literature indicates the possibility that citizens' preferences may be actor-dependent. For instance, they may believe that certain functions are reserved solely for government action, such as public safety.

- ✓ Research Question: Does the actor targeted for addressing the problem materially impact citizens' revealed priorities?

- ✓ Test: We determined if the actor addressing the problem affects the respondents' priorities by asking about both governments and external actors.

    - ✓ In your opinion, what could *the government* do to most improve your standard of living?
    - ✓ In your opinion, what could *international actors, like foreign aid agencies and NGOs,* do to most improve your standard of living?

- ✓ Hypothesis: We hypothesized that respondents' priorities will not change based upon the executing actor identified, in part driven by the inherent scarcity of public goods in a developing context.

B. Inter-Temporal Preferences

Several studies suggest that people may sharply discount the value and importance of long-term issues.[16] For example, citizens may prioritize activities that will have an immediate impact on their standard of living (e.g., a job or consumption), while de-emphasizing issues that could improve their prospects over a longer time horizon (e.g., education and health). This is especially relevant since national governments and donor organizations must balance investments with either short or longer time horizons. Therefore, the survey examined whether there is a significant difference in citizens' revealed inter-temporal priorities.

- ✓ Research Question: Are citizens' preferences different in the long term?

- ✓ Test: We used a priming experiment to examine this effect. We primed respondents to consider the long-term and compare these responses to a control group, which did not receive the prime.

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[16] Banerjee, Abhijit and Esther Duflo (2011). *Poor Economics: A Radical Rethinking of the Way to Fight Global Poverty*, Public Affairs

- ✓ In your opinion, what could be done to most improve your standard of living?
- ✓ In your opinion, what could be done to most improve your standard of living *over the next 5 years*?

- ✓ Hypothesis: We hypothesized that the timeframe will not materially affect respondents' stated priorities. Although researchers observe discounting the long-term with respect to personal consumption patterns, we do not expect that the preferences for public goods are similarly affected.

C. Open Response versus Closed Response

Survey instruments with closed response options provide a number of benefits, such as reduced costs and faster turnaround times. Open-ended questions, which must be translated and coded, can require a significantly greater investment of financial and human resources. However, they may be superior in terms of flexibility, accuracy, and legitimacy for gauging citizen views. Therefore, the survey examined whether respondents cite different priorities when asked open-ended or closed questions.

- ✓ Research Question: Does the type of question, open or closed, have an impact on the respondents' stated priorities?

- ✓ Test: We asked an open-ended version of our question to 10 percent of the sample. This subset received the open-ended question before the closed-ended question to mitigate respondent priming concerns. Asking both questions allowed us to directly compare answers for the same respondent.

- ✓ Hypothesis: We expected that there would be no material difference between the priorities identified in the open-ended and closed question.

IV. Survey Methodology

Leo et al (2015) details the survey methodology and analytical findings related to whether the results were nationally representative. Therefore, we only briefly summarize several considerations below, including: (a) pilot country selection; (b) the mobile phone survey technique; (c) translation and language selection issues; (d) response rates; (e) national representativeness; and (f) survey costs. Then, we describe the design for the citizen priorities questionnaire (sub-section g).

A. Pilot Country Selection

Our scope is confined to low-income countries (LICs) and lower-middle income countries

(LMICs), as defined by the World Bank.[17] Recognizing that the surveys could be relevant for both national government and development assistance spending priorities, we applied three initial filters as proxies for: (1) development needs (Human Development Index), (2) the relative importance of development assistance (ODA/GNI ratios), and (3) public sector resource availability (government spending per capita). Based on these filters, there were 30 prospective pilot countries.[18] Of these, we selected two countries with a high feasibility for implementing mobile phone surveys and two with a low feasibility.[19] These include: Afghanistan (high feasibility), Ethiopia (low feasibility), Mozambique (low feasibility), and Zimbabwe (high feasibility).

B. Mobile Phone Survey Technique

We utilized interactive voice recognition (IVR) in these surveys. IVR technology uses a recording to ask the survey questions, and the survey participants respond by pressing a number on the phone dial pad. The system then records the selected number through dial tone sensing (DTMF) technology. We selected this technique for two reasons. First, IVR arguably is more appropriate for low literacy populations than SMS-based techniques. Second, it provides cost savings compared to using a live call center.

The survey operator, Voto Mobile, uses a random number generation system to obtain a sample of potential mobile users.[20] More specifically, it randomly generates a list of numbers that conform to the target countries' mobile number formations. It calls these numbers in turn, moving to the next number when the dialed number is found to be inactive. The system continues to call down the list until the desired number of responses is obtained. Therefore, the list of all possible telephone numbers served as our sampling frame.

C. Translation and Language Selection

Due to financial constraints, we were unable to conduct the survey in all official and local languages. Instead, we first identified the spoken languages in the four pilot countries from a variety of sources.[21] Then, we sought to maximize the percent of the population covered within a few constraints. First, the total number of languages was capped at five per country.

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[17] The World Bank classifications include: (1) low-income countries (gross national income per capita ≤ $1,045); and (2) lower-middle income countries (gross national income per capita between $1,046 and $4,125).

[18] These countries include: Afghanistan, Benin, Burkina Faso, Burundi, Central African Republic, Chad, Comoros, Democratic Republic of Congo, Cote d'Ivoire, Eritrea, Ethiopia, Gambia, Guinea, Guinea-Bissau, Haiti, Liberia, Madagascar, Malawi, Mali, Mozambique, Myanmar, Nepal, Niger, Rwanda, Senegal, Sierra Leone, Tanzania, Togo, Uganda, and Zimbabwe.

[19] Mobile phone survey feasibility is based upon penetration rates and linguistic fractionalization.

[20] VOTO Mobile is a Ghana-based social enterprise with staff in Ghana, Zimbabwe, Canada, and the United States. For additional details, see https://www.votomobile.org.

[21] This included sources such as included the CIA World Factbook, Ethnologue: Languages of the World, and the most recent Afrobarometer survey in the country.

Second, we recognized the low marginal returns of incorporating an additional language, especially after 80 percent of the population was covered. Taken together, this process produced 15 different languages across the four pilot countries.[22] With only one exception, the survey instrument was translated from English into the local languages through a double blind technique.[23] Leo et al (2015) describes the impact of linguistic fractionalization on survey responses and completion rates.

D. Response Rates

In order to obtain a completed survey, calls passed through several stages. First, the survey operator randomly generated and placed calls to a large batch of phone numbers. Only a fraction of these numbers actually connected.[24] Second, after the call is connected, the respondent hears the language selector question. We encountered some survey attrition at this phase.[25] Once a respondent selects a language, we are sure that the call has resulted in a real human respondent with functioning technology. From this universe of respondents, we find that completion rates of the survey range between 23 percent in Ethiopia to 51 percent in Zimbabwe.

Figure 1 – Response Rates by Pilot Country

Country	Calls Attempted	Calls Connected	Answered Language Selector	Complete	Percent Complete of Answered Language Selector
Afghanistan	191,845	28,549	7,078	2,123	30%
Ethiopia	280,820	54,806	9,938	2,258	23%
Mozambique	314,389	62,620	5,820	2,229	38%
Zimbabwe	180,450	56,605	4,274	2,192	51%

[22] These include: (1) Afghanistan (Dari and Pashto); (2) Ethiopia (Amharic, Oromo, Sidamo, Somali, and Tigrayan); (3) Mozambique (Changana, Chuabo, Makua, Portuguese, and Sena); and (4) Zimbabwe (English, Shona, and SiNdebele).

[23] In Ethiopia, the survey implementer was able to identify only one Sidamo translator for this project.

[24] Numbers did not connect for several reasons, such as: (i) the phone number was not assigned to an actual subscription; (ii) the number was assigned but was not active at the time of the call, for instance, the SIM card was not in the phone or phone was out of coverage at the time of the call; (iii) the phone rang but the owner was unable to answer; or (iv) the phone was answered by an automated message or voicemail system and the survey operator terminated the call.

[25] These calls could have ended for one of five reasons: (i) the call inadvertently connected to an automated message, such as an undetected voicemail or carrier message; (ii) the respondent attempted to select a language but the dial tone function did not operate properly; (iii) the respondent chose not to participate upon hearing the language selector; (iv) the respondent desired to participate but was unable to navigate the keyboard functionality; or (v) respondents were unable to find their language. Unfortunately, we are unable to identify which one of the five reasons led to survey respondents' failure to select a language.

E. National Representativeness

The questionnaire began with six demographic questions covering location (urban/rural), income level, gender, age, and education level.[26] This information was collected to assess whether the survey was nationally representative. The demographic variables were used to weight the country samples to reflect known population parameters.[27] After these weighting procedures, we approximate the sample errors by calculating loss of precision from the weight's design effect. We find the following sampling errors: Afghanistan (+/- 5.3 percent); Ethiopia (+/- 7 percent); Mozambique (+/- 4.7 percent); and, Zimbabwe (+/- 2.8 percent). In the case of Ethiopia, the sample imprecision is much higher than a typical phone-based public opinion survey in most developed countries. Even with this imprecision, some meaningful information still can gathered from the survey data, such as relative development priorities (see section V below for details).[28]

F. Survey Cost Considerations

Survey implementation costs totaled between $8,000 and $17,000 per country, or roughly $5-6 per response. The airtime cost per minute is the primary driver of country cost differences. Random digit dialing added approximately $1,600 per country in charges for calling non-existent phone numbers.[29] This cost could be avoided if comprehensive and accurate listings of phone numbers were identified. Translation, audio recording, and transcription of open-ended responses averaged another $1,000 per country. We also spent a small amount on survey completion incentives to experimentally test ways of increasing response rates. Future research could avoid this cost.

Figure 2 – Survey Costs by Pilot Country

	Afghanistan	**Ethiopia**	**Mozambique**	**Zimbabwe**
Completed Surveys	2,123	2,258	2,232	2,192
Price/Min	$0.22	$0.22	$0.18	$0.45
Airtime	$5,247	$10,070	$8,618	$14,045
Not Connected Calls	$1,637	$1,431	$1,612	$1,800
Incentives	$270	$873	$430	$390
Translation + Audio	$350	$715	$1,190	$600
Transcription	$743	$173	$160	$227
TOTAL	$8,247	$13,261	$12,010	$17,062
Total per Respondent	*$3.88*	*$5.87*	*$5.38*	*$7.78*

[26] For the income level, the instrument included two country-specific questions about asset ownership. For additional details, see Leo et al (2015).

[27] The most recent Demographic and Health Survey was used to establish the population parameters.

[28] The use of weighted data inflates variance and subsequent standard errors. Importantly, statistical tests with weighted data are less likely to produce statistically significant results due to the larger standard errors. We warn against conflating the surveys' approximated sampling errors with standard errors; however, any reported population proportions should be considered with the sampling errors in mind.

[29] Some of these numbers could have been temporarily unavailable because they were outside the service network or turned off at the time of the call.

G. Citizen Priorities Questionnaire Design

After responding to the standard set of demographic questions, survey participants received two or three variants of a question that assessed their development priorities. The variants are based on a single base question, "In your opinion, [*closed only: "of the following options"*], what could [*actor*] do to most improve your standard of living [*timeframe*]?" There were eight variants:

(1) In your opinion, of the following options, what could the government do to most improve your standard of living?
(2) In your opinion, of the following options, what could international actors, like foreign aid agencies and NGOs, do to most improve your standard of living?
(3) In your opinion, of the following options, what could the government do to most improve your standard of living over the next five years?
(4) In your opinion, of the following options, what could international actors, like foreign aid agencies and NGOs, do to most improve your standard of living over the next five years?
(5) In your opinion, what could the government do to most improve your standard of living?
(6) In your opinion, what could international actors, like foreign aid agencies and NGOs, do to most improve your standard of living?
(7) In your opinion, what could the government do to most improve your standard of living over the next five years?
(8) In your opinion, what could international actors, like foreign aid agencies and NGOs, do to most improve your standard of living over the next five years?

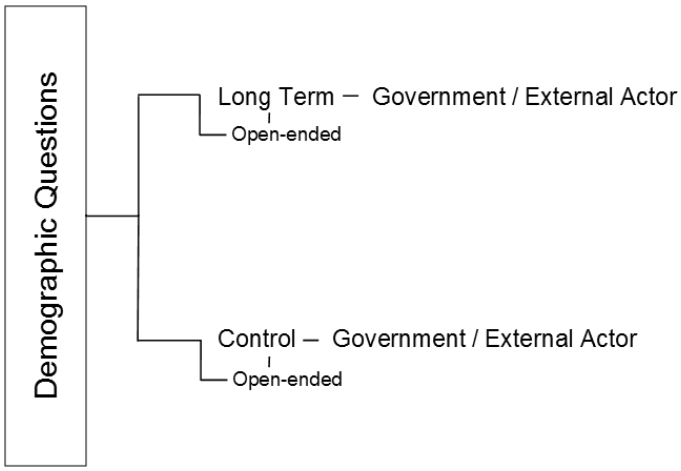
Each variant reflects a slight shift in wording to collect data on one of our research questions. The variation between questions one and two is the actor, either "government" or "international actors, like foreign aid agencies and NGOs." Every respondent received both of these variations in a random order. The second variation is the timeframe, shown in questions three and four. Half the respondents received the phrase "over the next five years" in both the government and external actors questions. The other half did not hear this phrase. These two variations combine to create the first four options: (1) government – long term; (2) government – control; (3) external actors – long term; and (4) external actors – control.[30]

The third variation is an open-ended question, which 10 percent of respondents received. They heard this question before any closed-end questions (variants 1-4). The phrase "of the

[30] By asking each respondent two question variations, the government and external actors versions, we use a with-in experimental design, where the same respondents are used multiple times for different treatments. We chose this design to maximize the number respondents for each question. However, we acknowledge that using this design may have led to a "carry-over", whereby the first question potentially affects the results of the second question. However, we attempted to mitigate this effect by randomizing the order of the questions.

following options" is removed from these questions. They otherwise have the same structure as questions one through four. Following the open-ended question, respondents received two closed-ended questions. These closed-ended questions had the same timeframe as the open-ended question, and the actor matched one of the questions.

Figure 3 – Experimental Design of Questionnaire



In response to the closed-ended question, respondents first selected the theme of their development priority from a list of five options: (1) economic issues, (2) infrastructure, (3) crime and security, (4) social services, or (5) land use and protecting the environment. After selecting this thematic category, respondents then chose a more detailed priority from a list of up to six options (see figure 4 below). We recognize that several of the thematic categories may be more specific and tangible than others. For instance, "economic issues" could encompass a broad range of underlying issues while "social services" may be more tangible for survey respondents. For the purposes of this study, we were primarily focused on assessing whether respondents' stated priorities change based upon different factors or timeframes, as noted above. Nonetheless, the aforementioned thematic categories could be adjusted for future research and/or data collection by development agencies and national governments.

Figure 4 – Response Options for Development Themes and Priorities

Economic	Infrastructure	Crime and Security	Social Services	Environment
• Unemployment	• Roads	• Street crime	• Health	• Drought
• Cost of goods	• Electricity	• Domestic violence	• Education	• Food shortages
• Access to credit	• Water	• Instability	• Support for orphans, street children, and the elderly	• Land ownership
• Wages	• Housing	• Discrimination		• Deforestation
• Taxes		• Bribes and corruption		• Pollution
		• Ability to get justice through courts		

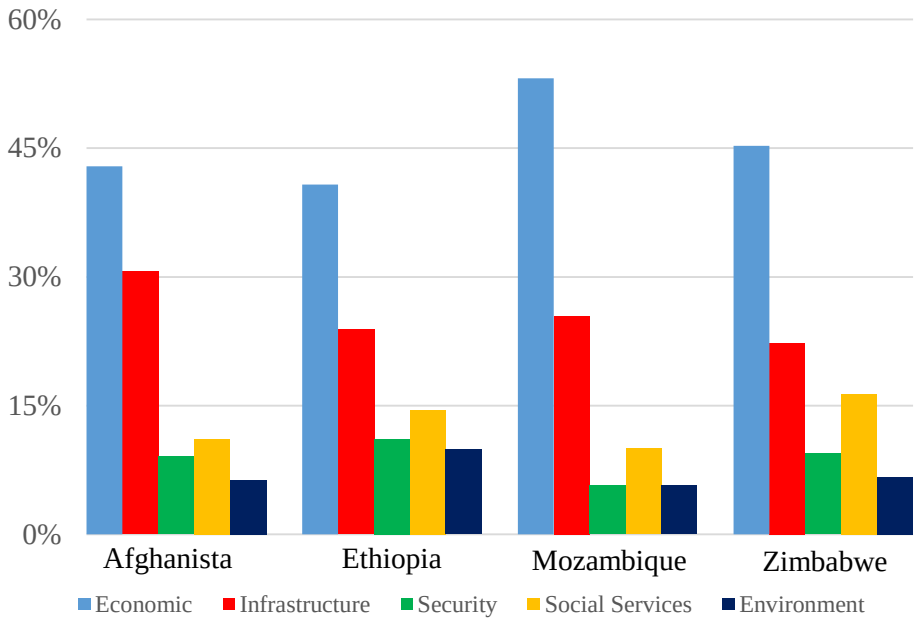
V. Data Analysis

We now turn to respondents' development priorities in the four pilot countries. Since our primary research motivation concerns development agencies' activities, we first discuss findings related to these organizations. In subsection B, we detail how citizens' priorities for their government largely mirror these results. After this overview, we explore the findings for each of the two remaining research questions. See appendix II for a full table of responses by country.

A. Citizens' Development Priorities for External Actors

Across the four pilot countries, respondents most frequently cite economic issues as their top thematic priority for external actors. This accounts for between 41 percent and 53 percent of responses. The second most popular theme is "infrastructure, such as roads, electricity, and water," representing between 22 percent and 31 percent of responses. Taken together, these two issues account for 65 percent to 79 percent of survey responses within Afghanistan, Ethiopia, Mozambique, and Zimbabwe. These two themes are followed by: social services, crime and security, and the environment. These results are broadly consistent with past research on citizen priorities.[31]

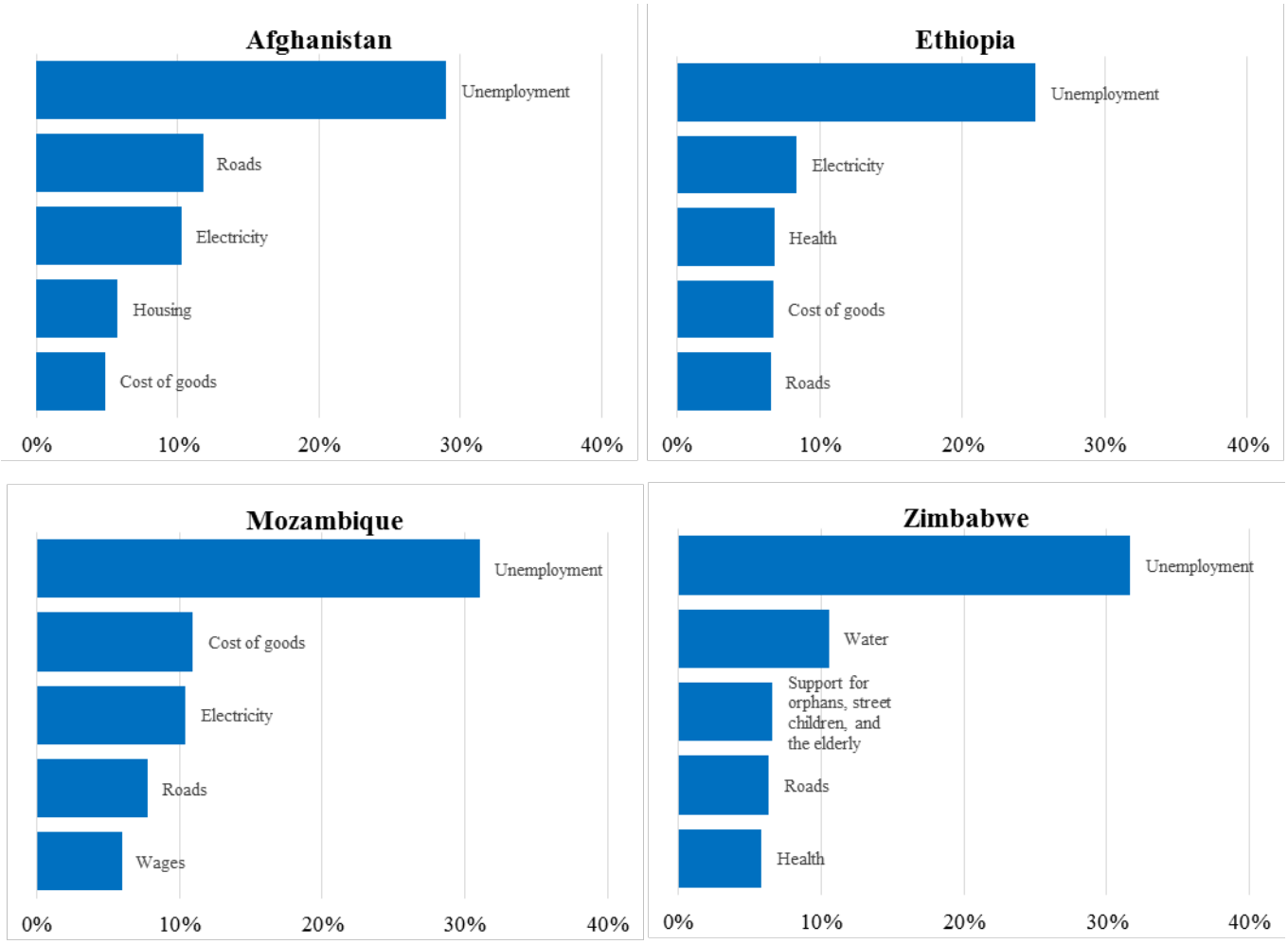
Figure 5 – Citizen Development Themes for External Actors, % of Responses



[31] Benjamin Leo, Robert Morello, and Vijaya Ramachandran (2015). "The Face of African Infrastructure: Service Availability and Citizens' Demands." CGD Working Paper 393. Washington, DC: Center for Global Development. http://www.cgdev.org/publication/face-african-infrastructure-service-availability-and-citizensdemands-working-paper-393

At the specific priority level, unemployment is by far the most frequently cited issue across all of the pilot countries. Between one-quarter and one-third of respondents identified this as their top priority. In comparative terms, this is roughly three times larger than the second most frequently cited priority within each country.[32] Beyond this stark contrast, other top priorities include: different types of infrastructure, such as roads, water, and electricity; cost of goods; and social services, particularly health and support for vulnerable groups (e.g., orphans street children, and the elderly). Interestingly, education does not appear as a top five priority in any of the pilot countries.

Figure 6 – Top 5 Development Priorities for External Actors by Country



[32] In Afghanistan, 29 percent of respondents cite unemployment, followed by roads (12 percent) and electricity (10 percent). In Ethiopia, 25 percent of respondents cite unemployment, followed by electricity (8 percent), health (7 percent), cost of goods (7 percent), and roads (7 percent). In Mozambique, 31 percent of respondents cite unemployment, followed by cost of goods (11 percent), electricity (10 percent), roads (8 percent), and wages (6 percent). In Zimbabwe, 32 percent of respondents cite unemployment, followed by water (11 percent), support for vulnerable groups (7 percent), roads (6 percent), and health (6 percent).

B. Does the Executing Actor Affect Citizens' Development Priorities?

All respondents were asked two nearly identical questions, "In your opinion, of the following options, what could the government do to most improve your standard of living?" and "In your opinion, of the following options, what could international actors, like foreign aid agencies and NGOs, do to most improve your standard of living?" The only language difference between the two questions is the executing actor.

We first explore the potential effects at the respondent-level. In all four countries, roughly 50 percent of respondents cited the same thematic issue for both their government and external actors. Moreover, between 22 percent and 30 percent of respondents chose the same specific priority, such as 'cost of goods' or 'roads'.

Next, we look at country-level effects. Respondents may have chosen different priorities because they could have felt obligated to select a different answer or name their second development priority upon hearing a similarly worded question. Since we alternated the order of the actor-related question, we are able to isolate the effect of the specified executing actor at the distribution level. Using a Pearson chi-squared test, we find that distributions of themes and priorities in all four countries are not statistically significantly different.[33] Thus, we initially conclude that the executing actor does not impact citizens' development priorities.[34]

Comparing the entire distributions aggregates the statistical effect of each category. Thus, if a single theme or priority varies from its comparison group, this effect could be muted in the aggregation. By observation, we suspect that this may be the case for some themes or categories. To isolate the effects of each category, we compare each category's proportion of responses from the government version to the external actors' version. After calculating the weighted means, we use an adjusted Wald test.[35] This procedure is analogous to a paired t-test with un-weighted data.

Looking at each category at the country-level, we again find evidence to support our initial conclusion that executing actor does not impact citizens' development priorities. However, we find a few development themes or priorities that are statistically different based on the

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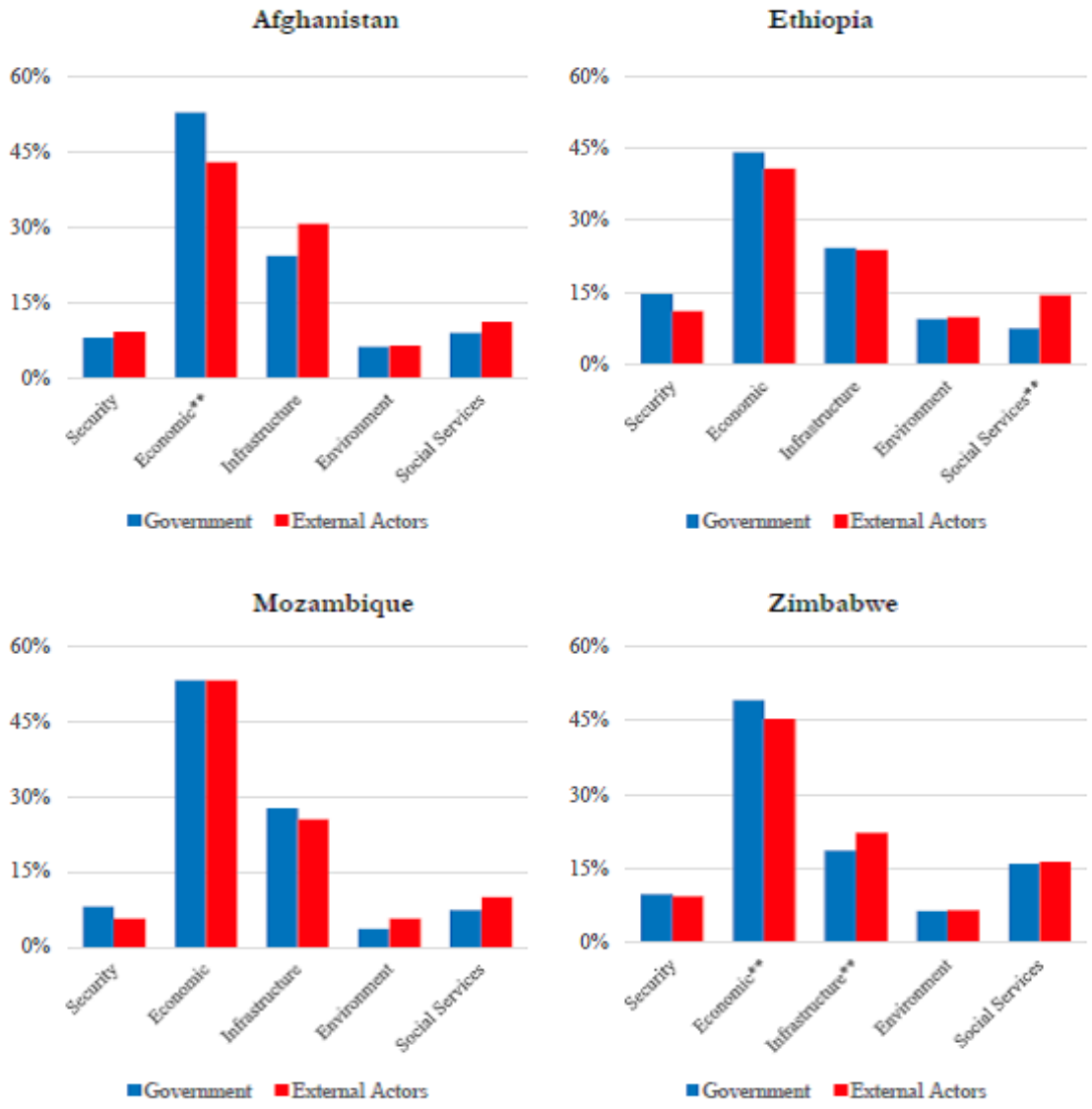
[33] This Pearson chi-squared test compares two tests of categorical data to evaluate if the differences in observed values happened by chance. We define statistical significance as p-values of less than 0.05.

[34] We find that the Afghanistan theme distribution is significant at the 0.1 level, with a p-value of 0.07. In addition, in Zimbabwe, the priorities distribution is also significant at this level with a p-value of 0.057.

[35] The adjusted Wald test with survey data uses an approximate F statistic $(d-k+1)W/(kd)$, where W is the Wald test statistic, k is the dimension of the hypothesis test, and d = the total number of sampled PSUs minus the total number of strata. Under the null hypothesis, $(d-k+1)F/(kd) \sim F(k, d-k+1)$, where $F(k, d-k+1)$ is an F distribution with k numerator degrees of freedom and $d-k+1$ denominator degrees of freedom.

specified executing actor.[36] There are a total of only four thematic exceptions in Afghanistan, Ethiopia, and Zimbabwe (see details below). In Mozambique, we found no statistically significant differences between executing actors in either the development themes or specific priorities.[37] We consider each of these differences in turn by country.

Figure 7 – Country Development Themes by Cited Executing Actor



*** 95 percent confidence in the adjusted Wald test*

[36] Statistically significant differences are reported at the 0.05 level. Appendix IV also reports differences at the 0.10 level for the respective development themes and priorities.

[37] In Afghanistan, Ethiopia, and Zimbabwe, we suspect that these categories with statistical differences are leading the distributions to be statistically differ from each other. In Mozambique, we find several categories with fairly high p-values. For instance the environment theme has a p-value of 0.14 and social services of 0.17. Combined these lead to a statistically significant result for chi-squared test for frequency distribution.

In Afghanistan, survey respondents believe that their national government should focus on economic issues more than external actors.[38] This result is statistically significant. Interestingly, we do not find any underlying economic-related priorities that drive this difference (e.g., unemployment, cost of goods, access to credit, wages, or taxes). Put differently, Afghans apparently do not believe that their government should focus on unemployment or the cost of goods more than external actors in a statistically significant way. Instead, they simply want their government to prioritize economic issues more than external actors in a generalized sense. Among the other thematic issues, we did not find a statistically significant difference between the underlying priorities by executing actor.

In Ethiopia, we find a statistically significant difference related to social services. Respondents are two times more likely to say that external actors should focus on social services (14 percent of responses versus only 7 percent for the Ethiopian government). This difference seems to be driven by respondents who believe that external actors should focus on "support for orphans, street children, and the elderly." It is possible that many Ethiopians may associate these types of activities with international NGOs, and thus selected this option. This observed difference impacts the relative order of thematic priorities in Ethiopia.[39] Specifically, social services are the third most frequently cited thematic category for external partners while it is the fifth most frequently raised category for the Ethiopian government. There are no other statistically significant differences among Ethiopians' stated themes or priorities based upon the cited executing actor.

In Zimbabwe, we find two statistically significant differences within the five thematic issues.[40] First, 49 percent of Zimbabweans want their government to focus on economic issues while 45 percent believe that external actors should help to address them. Conversely, 22 percent of respondents want external actors to focus on infrastructure, while 19 percent want the government focusing on these issues. While the absolute differences appear modest, both are statistically significant. Although, neither of these differences change the relative order of the thematic and priority preferences for each of the executing actors. In both cases, Zimbabweans cite economic issues most frequently, followed by infrastructure.

When we compared each theme and priority to identify individual effects, we ran the risk of finding statistical significance when none actually exists (e.g., type I errors). Because we set the significance level at 0.05, we would expect by chance that 5 percent of results would be statistically significant. Since we originally hypothesized that there would be no difference

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[38] Of Afghan respondents, 53 percent think the government should be focused on economic issues, while only 43 percent think that external actors should focus on them.

[39] Economic issues and infrastructure are cited as the first and second most frequent thematic issue for both external actors and the national government.

[40] At the priority level, we also find that more Zimbabweans want external actors focusing on roads than their national government (6 percent versus 4 percent). In addition, 3 percent of respondents want the government helping to address droughts compared to only 1 percent for external actors' support. Although the Zimbabwean sample has the most statistically significant differences, many of them are modest in absolute terms.

between the groups, this approach is the most conservative, partially because of this risk of falsely detecting a statistically significant result. In practice, the potential for falsely identifying statistical significance further strengthens our conclusion that there is little difference between the respective results for each actor. Nonetheless, we report the results here to be transparent and conservative in our presentation.

C. Does the Timeframe Affect Citizens' Development Priorities?

We used a survey priming experiment to analyze whether individuals' development priorities change based upon different timeframes. Half of the country samples were asked to cite a thematic issue and a specific priority that would most improve their standard of living "over the next 5 years." The control group question did not reference any timeframe. The assumption is that respondents would consider immediate or short-term priorities in this case. However, the possibility exists that respondents by default think about a longer time horizon than 5 years, and the prime inadvertently caused the respondents to think about nearer term issues.[41] For ease of explanation, we refer to the question version with "next five years" as the long term and the other version as the control or near-term.

To assess the treatment effect, we use a Pearson chi-squared test. With this test, we posit that there should be an equal distribution of observations between the control and treatment for each theme or priority.[42] Before discussing the test results, we note a shortcoming in the data. This priming experiment requires that the control and treated samples are essentially identical. However, previous research using this data has found that the survey implementation failed to properly randomize the treatment and control group assignments in two of the pilot countries.[43] In Ethiopia and Mozambique, we identified demographic attributes with statistically significant differences between the two sample groups.[44] We believe that the survey was properly randomized in Afghanistan and Zimbabwe. See appendix III for an alternative analysis that addresses these sample balance concerns.

Using a chi-squared test, we compare the entire distribution of responses to the theme and the priorities questions for each actor in each country. We find very little evidence that the timeframe prime caused different response patterns. However, we find a statistically

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[41] Including an "immediate" treatment, in order to prime respondents to think about the immediate future, would have better isolated the effect of "the next five years" prime. However, we failed to include this treatment and recommend that future survey efforts include this reference.

[42] The results of the chi-squared test are unreliable when expected the number of observations falls below 5. Because of the large sample size, we do not have expected values less than 5 in a cell.

[43] See Ben Leo, Robert Morello, Jonathan Mellon, Tiago Peixoto, and Stephen Davenport. 2015. "Do Mobile Phone Surveys Work in Poor Countries?" CGD Working Paper 398. Washington, DC: Center for Global Development. http://www.cgdev.org/publication/do-mobile-phone-surveys-work-poor-countries-workingpaper-398

[44] The Ethiopian control sample was better educated than the treatment group, while the Mozambican control sample had more 15-25 year olds than the treatment. Therefore, appropriate caution is required when interpreting the results for Ethiopia and Mozambique.

significant difference on the priorities for the government and for external actors in Ethiopia.[45] Like in the previous section, we consider each paired category individually to identify any instances of differences.

Considering themes and priorities individually, we find little evidence that development themes change according to different timeframes. However, there are a few counter-intuitive results among less frequently cited development themes. For instance, in Afghanistan and Zimbabwe, we find a statistically significant decrease between the control and treatment groups with respect to respondents stating that their government should focus on the environment and land use issues. In both countries, only 4 percent selected the environment as a long-term thematic concern, while roughly 10 percent of respondents selected this theme in the control group. This result seems to suggest that respondents may be less concerned with environmental issues over the longer term. We are unable to explain this seemingly counterintuitive result with our existing survey data.

At the level of specific priorities, we find a possibly slightly more nuanced story. Across all countries, there were 183 potential tests of priorities between the treatment and the control.[46] For the overwhelming majority of priorities (83 percent), there is no statistical difference in response patterns (see appendix IV for details). We suspect that the cases that exhibit a statistical significance between the long-term and the control are mainly spurious correlations.[47] They concentrate on 12 different priorities (31 cases across countries and actors). The majority of these cases relate to respondents citing the respective priority more frequently in the control.[48] The remainder is more frequently cited as longer-term priorities, such as water for the government in Ethiopia (8 percent in the long term and 2 percent in the control) and education for external actors in Zimbabwe (5 percent in the long term and 3 percent in the control).

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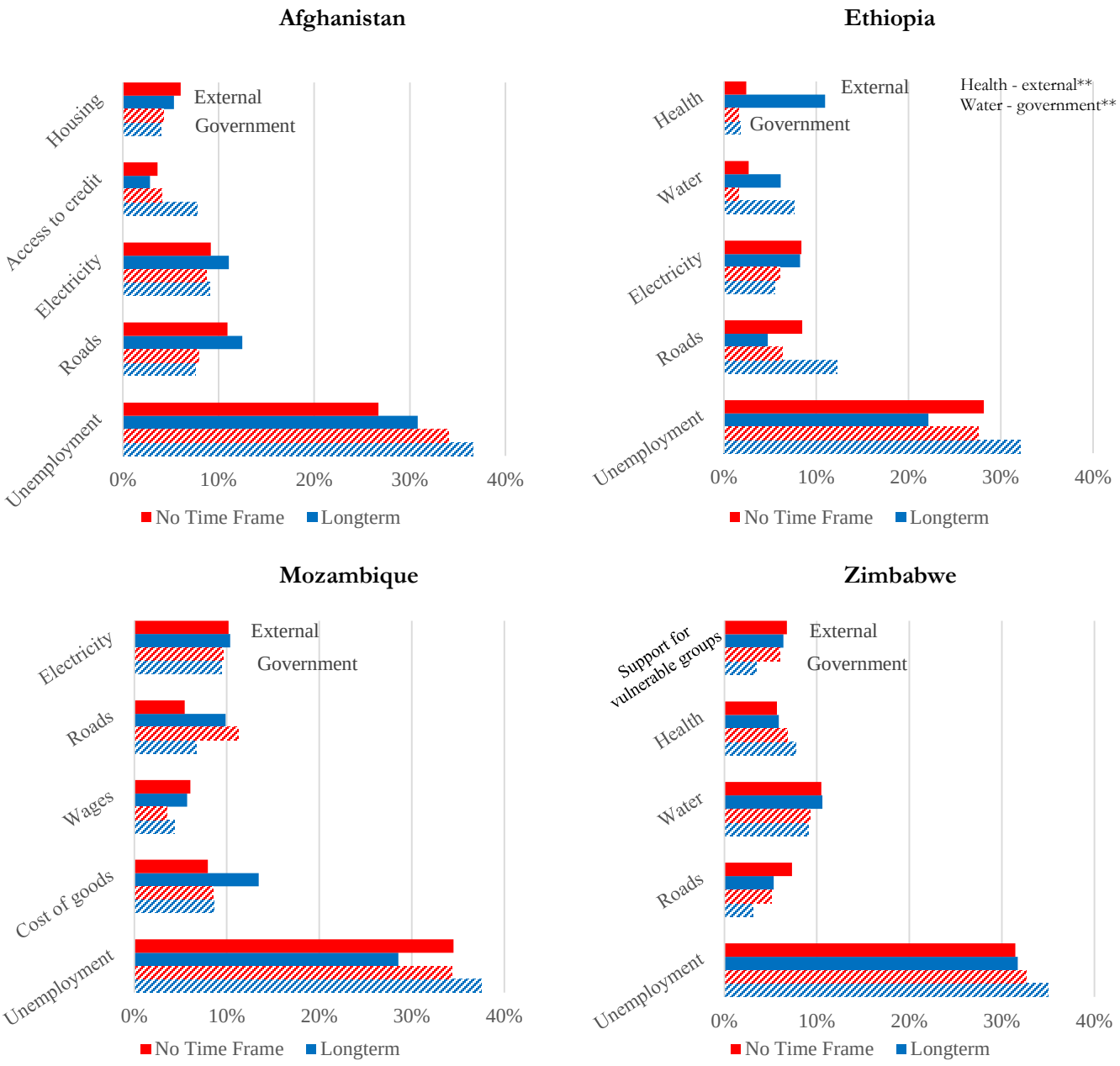
[45] Again, we define statistical significance at the 0.05 p-value level.

[46] There are 23 options for priorities in response to the government and the external actors versions of the question, totaling 46 tests for four countries. Hence, there are 184 potential tests. In Zimbabwe, no respondents chose food shortages as the priority on the government version, either in the control or long-term tests. Thus, we do not test this combination.

[47] These tests were significant at the 95 percent confidence level.

[48] These include: "Ability to get justice through courts" for external actors in Afghanistan, Mozambique, and Zimbabwe; and for the government in Afghanistan. "Cost of goods" for external actors in Afghanistan. "Deforestation" for external actors in Ethiopia and Zimbabwe; and for the government in Afghanistan and Zimbabwe. "Domestic violence" for external actors in Afghanistan and Zimbabwe. "Drought" for external actors in Afghanistan, Mozambique, and Zimbabwe; and for the government in Ethiopia and Mozambique. "Education" for external actors in Afghanistan, Ethiopia, and Zimbabwe; and for the government in Zimbabwe. "Health" for external actors in Ethiopia. "Land ownership" for external actors in Mozambique; and for the government in Afghanistan and Zimbabwe. "Pollution" for the government in Afghanistan. "Street crime" for the government in Afghanistan and Ethiopia. "Support for orphans, street children, and the elderly" for external actors in Afghanistan and for the government in Afghanistan and Mozambique. "Water" for the government in Ethiopia.

Figure 8 – Timeframe Effects on 5 Most Popular Development Priorities, by Country



With one exception, the issues with apparent timeframe affects are lower relative priorities at the country-level. Put differently, they are second- or third-tier issues, with each accounting for only 2 percent of country-level responses on average. The one exception is health in Ethiopia. Ethiopians appear more likely to want external partners to focus on health in the long term than in the control (11 percent of all respondents versus 2 percent).

Considering each theme and priority individually, as with the actor-related question, increases our risk of a type I error. This risk is especially significant when running 183 tests.

This further supports our suspicion that most of the tests showing statistical significance are spurious correlations.

D. Open-Ended Response versus Closed Response

Our third research question concerns whether closed questionnaire formats lead to demonstrably different citizen responses compared to more flexible, open-ended formats. Our project design included an open-ended question, which 10 percent of respondents would receive before the closed version.[49] Unfortunately, we encountered several practical problems that dramatically reduced our sample sizes. First and foremost, we experienced significant attrition with the open survey format. We suspect that respondents had more difficulty answering the open question, particularly after a series of closed demographic questions.[50] We also found that a significant proportion of the recorded audio files were blank, inaudible, or irrelevant to the question. Due to these challenges, we have only 190 usable responses across the four countries where the respondent provided a relevant answer and completed the subsequent closed-ended questions.[51]

Through the coding process, we noticed that some respondents identify more than one development priority.[52] These individuals cite two, three, or even four different priorities during a brief recorded response. In these cases, we identified the primary priority of the respondents and also coded their secondary priorities. Even with these efforts, we coded the primary priority as "multiple" in several cases.

Only a modest proportion of the coded, open-ended answers match the respondents' closed-ended responses (roughly 18 percent). Under a looser definition, 30 percent of the open-ended responses potentially could match.[53] It appears that some demographics may be correlated with matching responses. Approximately three-quarters of respondents with matching answers have more than a primary education. They also tended to be younger and

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[49] The two questions use the exact same language wording. The only difference is that the closed question included a fixed set of options for development themes and priorities as well as the phrase "of the following options" in the question's wording.

[50] To counter this problem, the survey implementer attempted more open surveys. They also operationally defined a complete open survey as simply answering the open-ended question and not necessarily answering the following closed-ended questions.

[51] This includes: Afghanistan (28 responses), Ethiopia (15 responses), Mozambique (76 responses), and Zimbabwe (71 responses).

[52] In order to identify these 190 usable responses, we coded each of 682 English transcriptions of the open-ended responses in a double blind process. Professional translators, hired by the survey implementer, produced these transcriptions. We independently read the respondents' answers and coded them into the five thematic categories and the 23 possible priorities. Our coding was consistent 92 percent of the time. Due to their small number, we did not arbitrate the differently coded responses. Instead, we compared both codes to the respondents' own answers to the closed-ended response.

[53] This looser definition allows for the priority to match either one of the codes or a secondary priority, as described above.

more male. This may indicate that the ability to successfully navigate both an open- and closed-ended question is connected with respondents' technological familiarity. Given the very small sub-sample size, it is not possible to rigorously test this possible hypothesis. Yet, if it were true, then using open-ended questions with a random digit-dialing (RDD) frame could render the sample unrepresentative of the national population.

As with the executing actor question, there are several likely explanations for the low proportion of matching responses. First, respondents may be citing their second priority instead of naming a single priority multiple times. Second, they may have felt obligated to select a different answer when a very similarly worded question was posed. Again, due to the small sample size, we are unable to observe these trends at an aggregate level, as we do with the executing actor analysis.

We also consider if respondents cited a priority that did not correspond to one of the five thematic categories or 23 potential priorities. We find little evidence of this concern. However, in Zimbabwe, we find three respondents who describe "social safety nets" as their development priority. Additionally, we have two respondents who identified "farming inputs." Subsequent iterations of the closed questionnaire may wish to include these as response options.

There are several lessons from this experience that may be useful for future researchers using mobile phone surveys. Open-ended questions allow for more qualitative data richness. For instance, many respondents seemingly have multiple development priorities. The transcriptions may also be useful for communications and advocacy purposes. At the same time, they require a significant investment of human and financial resources. The survey implementer had to utilize multiple translation firms, even within a single country, given the breadth of languages involved. This led to significant delays in receiving the transcription files. Beyond this delay, we spent considerable time reading and coding the transcriptions in a double blind process. This investment was particularly discouraging due to the very small number of usable responses.

Future researchers likely have two options to effectively gather a large sample size with an open-ended question. For an IVR-based survey, they should plan on very high levels of non-completion, which entails significantly higher costs. The other alternative, which is likely superior, is to use a call center. With this approach, the live enumerator could help to navigate the respondent through the questionnaire, which would increase survey completion rates.

VI. Conclusion

In light of existing concerns with using mobile phone-based surveys for gathering information about citizens' development priorities, we analyze whether people's stated priorities change based on the specified executing actor, timeframe, or question format.

Using survey data from four low-income countries, we outline a number of analytical findings and lessons. These include:

- ✓ Executing Actors Rarely Affect Citizens' Thematic Priorities: At the country-level, we find little statistical difference in respondents' development themes or priorities based upon the specified executing actor (government or external partners). Moreover, the small number of differences does not change the top thematic concerns or priorities within the focus countries. By illustration, more Afghans believe that their government should focus on economic issues than external partners (53 percent of responses versus 43 percent of responses). However, economic issues are still the most frequently cited thematic category for both the Afghan government and external partners. Despite this, we find evidence that these differences may impact the relative prioritization of less frequently cited issues in Ethiopia.[54] For instance, Ethiopians raise social services as the third highest priority for external actors (14 percent of responses), while it appears as the fifth priority for their government (7 percent of responses).

- ✓ Different Timeframes Only Modestly Impact Response Patterns: There is little respondent-level evidence that development themes change due to timeframe effects. We also fail to find a statistically significant difference between the treatment and control groups for the overwhelming majority of more detailed development priorities. In addition, the priorities that exhibit possible timeframe effects appear as second- or third-tier issues, with each accounting for only 2 percent of country-level responses on average. The only exception is health in Ethiopia, which respondents cite more frequently as a long-term priority for external partners (11 percent of total responses).

- ✓ Close-Ended Question Response Options May Be Sufficient: We are unable to definitively assess whether respondents provide demonstrably different answers depending on the questionnaire format (e.g., closed or open-ended). This is due to high survey attrition rates and the significant number of unusable responses for the open-ended survey samples. However, the small samples do suggest that our close-ended response options adequately captured people's development themes and priorities. In light of our implementation challenges, researchers and policymakers who prefer open-ended questionnaires may wish to utilize call centers instead of IVR techniques.

[54] We also find a similar trend in Mozambique, whereby social services are the third most frequently cited thematic category for external partners and the fourth most frequently cited category for the government. However, the underlying difference in survey responses is not statistically significant.

Overall, we find that mobile phone-based surveys may be a promising tool for gathering information about citizens' top development priorities. Moreover, our findings suggest that a single survey instrument may be adequate for different actors' usage, such as bilateral donors, multilateral agencies, and national governments. However, our results do suggest that appropriate caution is still required. This is particularly the case for analyzing less frequently cited priorities that may be more prone to timeframe or executing actor effects. In this manner, mobile surveys should be viewed as a flexible, low-cost *supplement* to more comprehensive household surveys – not as a permanent replacement.

Appendix I

Survey Instrument

I. Language Selection

If you would like to continue in [language], press 1.
If you would like to continue in [language], press 2.
If you would like to continue in [language], press 3.

II. Introduction

Hello. You have been randomly selected to participate in a survey representing [countrymen]. We're an independent research institution, and your answers will help inform important decisions for your country. The survey is only [ten] questions long and should only take 4 minutes to complete.

[*Insert incentive: 33 percent no incentive sentence, 33 percent guaranteed airtime; 33 percent lottery*]

[If you complete the whole survey, we will put 4 minutes of airtime on this mobile.]
[If you complete the whole survey, you will have a chance to win two hours of airtime on this mobile.]

Please know that your answers will be kept strictly confidential.

III. Targeting Information

(1) Do you live in a village or in a city?
(2)
If you live in a rural area or village, press one
If you live in an urban area or city, press two.

(2-3) Asset Questions (Country Specific)

[*Afghanistan*]

(2 – Afghanistan) What best describes your home's type of floor?

If your floor is finished, for example a tile or cement floor, press one.
If your floor is not finished, for example a sand or dirt floor, press two.

(3 – Afghanistan) Do you or anyone at home own a radio?

If you or anyone at home owns a radio, press one.

If you or anyone at home does not own a radio, press two.

[*Ethiopia*]

(2 – Ethiopia) What best describes your home's type of roof?

If your roof is finished, for example a metal, tile, or cement roof, press one.
If your roof is unfinished, for example a thatch or mud roof, press two.

(3 – Ethiopia) Do you or anyone at home own a chair?

If you or anyone at home owns a chair, press one.
If you or anyone at home does not own a chair, press two.

[*Mozambique*]

(2 – Mozambique) What best describes your home's type of floor?

If your floor is finished, for example a tile or cement floor, press one.
If your floor is not finished, for example a sand or dirt floor, press two.

(3 – Mozambique) What best describes the toilet at your house?
If you have somewhere you only use as a toilet, like a pit latrine or flush toilet, press one.
If you do not have a place you only use as a toilet, press two.

[*Zimbabwe*]

(2 – Zimbabwe) What best describes the type of floor you have at your house?

If your floor is finished, for example tile or cement floor, press one.
If your floor is not finished, for example a sand or dirt floor, press two.

(3 – Zimbabwe) Do you or anyone at home own a radio?

If you or anyone at home owns a radio, press one.
If you or anyone at home does not own a radio, press two.

IV. Other Demographic Information

(4) Are you a man or a woman?
If you are a man, press one.
If you are a woman, press two.

(5) How old are you?

If you are 15-24 years old, press one.
If you are 25-34 years old, press two.
If you are 35-55 years old, press three.
If you are more than 55 years old, press four.

(6) How much schooling did you attend?

If you attended no formal schooling, press one.
If you attended some primary school, press two.
If you finished primary school, press three.
If you attended some secondary school, press four.
If you completed secondary school, press five.
If you attended more than secondary school, press six.

V. Citizen Preference and Information

[Option A (no timeframe) 50 percent / Option B (long-term timeframe) 50 percent]

Survey Option A – No timeframe

[Randomize order of questions 7 and 8]

(7/8A) In your opinion, of the following options, what could the government do to most improve your standard of living?

(7/8A) In your opinion, of the following options, what could international actors, like foreign aid agencies and NGOs, do to most improve your standard of living?

[Note: Survey Option A1 – Open-ended, 5 percent]

[*2.5 percent*] In your opinion, what could the government do to most improve your standard of living?

[*2.5 percent*] In your opinion, what could international actors, like foreign aid agencies and NGOs, do to most improve your standard of living?

Survey Option B – Long-term timeframe

[Randomize order of questions 7 and 8]

(7/8B) In your opinion, of the following options, what could the government do to most improve your standard of living over the next five years?

(7/8B) In your opinion, of the following options, what could international actors, like foreign aid agencies and NGOs, do to most improve your standard of living over the next five years?

[*Note: Survey Option B1 – Open-ended, 5 percent*]

> [*2.5 percent*] In your opinion, what could the government do to most improve your standard of living over the next five years?
>
> [*2.5 percent*] In your opinion, what could international actors, like foreign aid agencies and NGOs, do to most improve your standard of living over the next five years?

[Options part 1 for 7 and 8]

Economic issues, such as unemployment and cost of goods, press one.
Infrastructure, such as roads, electricity, and water, press two.
Crime and security, such as personal safety and discrimination, press three.
Social services, such as health and education, press four.
Land use and protecting the environment, such as rivers, forests, and farms, press five.

[Options part 2 for 7 and 8]

[If economic issues] Thinking of specific economic issues, please select the area that you think should be focused on most.

> Unemployment, press one.
> Cost of goods, press two.
> Access to credit, press three.
> Wages, press four.
> Taxes, press five.

[If infrastructure] Thinking of specific infrastructure, please select the area that you think should be focused on most.

> Roads, press one.
> Electricity, press two.
> Water, press three.
> Housing, press four.

[If crime and security] Thinking of crime and security, please select the area that you think should be focused on most.

> Street crime, press one.

Domestic violence, press two.
Instability, press three.
Discrimination, press four.
Bribes/corruption, press five.
Ability to get justice through courts, press six.

[If social services] Thinking of specific social services, please select the area that you think should be focused on most.

Health, press one.
Education, press two.
Support for orphans, street children, and the elderly, press three.

[If land use and environment] Thinking of land use and the environment, please select the area that you think should be focused on most.

Droughts, press one.
Food shortages, press two.
Land ownership, press three.
Deforestation, press four.
Pollution, press five.

Appendix II

Development Priorities Responses for Government and External Actors by Country

Table 1 – Afghanistan: Results by Actor

Topic	Government	External Actors	Statistical Difference
Theme: Economic	**53%**	**43%**	**
Priority: Unemployment	36%	29%	
Priority: Cost of goods	5%	5%	
Priority: Access to credit	6%	3%	
Priority: Wages	4%	4%	
Priority: Taxes	2%	2%	
Theme: Infrastructure	**24%**	**31%**	
Priority: Roads	8%	12%	
Priority: Electricity	9%	10%	
Priority: Water	3%	3%	
Priority: Housing	4%	6%	
Theme: Security	**8%**	**9%**	
Priority: Street crime	2%	2%	
Priority: Domestic violence	0.8%	1%	
Priority: Instability	3%	3%	
Priority: Discrimination	0.2%	0.1%	
Priority: Bribes and corruption	1%	2%	
Priority: Ability to get justice through courts	1%	1%	
Theme: Social Services	**9%**	**11%**	
Priority: Health	3%	4%	
Priority: Education	4%	4%	
Priority: Support for orphans, street children, and the elderly	2%	3%	
Theme: Environment	**6%**	**6%**	
Priority: Drought	0.8%	1%	
Priority: Food shortages	2%	2%	
Priority: Land ownership	0.9%	1%	
Priority: Deforestation	0.8%	0.4%	
Priority: Pollution	2%	2%	

** $p<0.05$; * $p<0.1$

Table 2 – Ethiopia: Results by Actor

Topic	Government	External Actors	Statistical Difference
Theme: Economic	**44%**	**41%**	
Priority: Unemployment	30%	25%	
Priority: Cost of goods	7%	7%	
Priority: Access to credit	4%	5%	
Priority: Wages	0.6%	2%	*
Priority: Taxes	2%	2%	
Theme: Infrastructure	**24%**	**24%**	
Priority: Roads	9%	7%	
Priority: Electricity	6%	8%	
Priority: Water	5%	4%	
Priority: Housing	4%	4%	
Theme: Security	**15%**	**11%**	
Priority: Street crime	3%	0.9%	
Priority: Domestic violence	4%	2%	
Priority: Instability	2%	2%	
Priority: Discrimination	1%	3%	
Priority: Bribes and corruption	2%	2%	
Priority: Ability to get justice through courts	3%	1%	
Theme: Social Services	**7%**	**14%**	**
Priority: Health	2%	7%	*
Priority: Education	4%	4%	
Priority: Support for orphans, street children, and the elderly	2%	4%	**
Theme: Environment	**9%**	**10%**	
Priority: Drought	2%	2%	
Priority: Food shortages	0.9%	2%	
Priority: Land ownership	3%	1%	
Priority: Deforestation	2%	4%	
Priority: Pollution	1%	0.9%	

** $p<0.05$; * $p<0.1$

Table 3 – Mozambique: Results by Actor

Topic	Government	External Actors	Statistical Difference
Theme: Economic	**53%**	**53%**	
Priority: Unemployment	36%	31%	
Priority: Cost of goods	8%	11%	
Priority: Access to credit	3%	4%	
Priority: Wages	4%	6%	
Priority: Taxes	1%	0.8%	
Theme: Infrastructure	**28%**	**25%**	
Priority: Roads	9%	8%	
Priority: Electricity	10%	10%	
Priority: Water	5%	5%	
Priority: Housing	3%	2%	
Theme: Security	**8%**	**6%**	
Priority: Street crime	1%	1%	
Priority: Domestic violence	2%	2%	
Priority: Instability	1%	1%	
Priority: Discrimination	1%	0.3%	
Priority: Bribes and corruption	0.3%	0.4%	
Priority: Ability to get justice through courts	2%	1%	
Theme: Social Services	**7%**	**10%**	
Priority: Health	4%	4%	
Priority: Education	2%	2%	
Priority: Support for orphans, street children, and the elderly	2%	4%	*
Theme: Environment	**4%**	**6%**	
Priority: Drought	2%	2%	
Priority: Food shortages	0.7%	1%	
Priority: Land ownership	0.4%	0.3%	
Priority: Deforestation	0.4%	1%	
Priority: Pollution	0.6%	1%	

** $p<0.05$; * $p<0.1$

Table 4 – Zimbabwe: Results by Actor

Topic	Government	External Actors	Statistical Difference
Theme: Economic	**49%**	**45%**	**
Priority: Unemployment	34%	32%	*
Priority: Cost of goods	4%	4%	
Priority: Access to credit	4%	3%	
Priority: Wages	5%	5%	
Priority: Taxes	2%	0.9%	*
Theme: Infrastructure	**19%**	**22%**	**
Priority: Roads	4%	6%	**
Priority: Electricity	4%	4%	
Priority: Water	9%	11%	
Priority: Housing	2%	1%	
Theme: Security	**10%**	**9%**	
Priority: Street crime	1%	1%	
Priority: Domestic violence	2%	1%	
Priority: Instability	2%	2%	
Priority: Discrimination	1.0%	1%	
Priority: Bribes and corruption	3%	3%	
Priority: Ability to get justice through courts	0.8%	1%	
Theme: Social Services	**16%**	**16%**	
Priority: Health	7%	6%	*
Priority: Education	4%	4%	
Priority: Support for orphans, street children, and the elderly	5%	7%	*
Theme: Environment	**6%**	**7%**	
Priority: Drought	3%	1%	**
Priority: Food shortages			
Priority: Land ownership	0.5%	0.3%	
Priority: Deforestation	2%	2%	
Priority: Pollution	1%	2%	*

** p<0.05; * p<0.1

Appendix III

Development Priorities Affects by Timeframe, Alternative Analysis

The use of a priming experiment relies on the assumption that the control and treated samples are identical. Through randomization, researchers ensure that all characteristics, both observable and unobservable, are balanced across the two groups. However, we believe that our survey randomization design may have been compromised during the implementation phase.[55]

For this analysis, we check for any statistically significant differences in the demographic compositions between the two groups, using a difference in means test. In Ethiopia, the control group was better educated than the treatment group. For example, 57 percent of the treatment group does not have a formal education while only 39 percent of the control exhibits this characteristic. In Mozambique, we found that the control sample had more 15-25 year olds than the treatment. We did not find any statistically significant dissimilarity in the Afghanistan and Zimbabwe samples. Importantly, these are only differences in the observable characteristics between the control and treatment groups. Other unobservable and potentially unbalanced characteristics may still exist between the groups.

In order to address these imbalances, we used an alternative analysis strategy. We construct a logistic regression. In this model, our dependent variable is the specific theme or priority, and our primary independent variable is whether the respondent received the long-term treatment. We also insert dummy variables for each our demographic measures to control for potential differences.[56]

This alternative analysis is a robustness check for the Pearson chi-squared results in section 5c of the paper. In only a few instances, we found that the result detected in the chi-squared test is not robust to the logistic regression that controls for demographics. In two cases, the logit model was unable to converge because of the very small number of respondents that cite the respective development priority. In these cases, we are unable to comment on the robustness of the chi-squared test results.

In Afghanistan, we find that most of the statistically significant results are robust in the alternative analysis. These results logically follow the lack of imbalances between the control and treatment in this data set. However, we find that statistical significance drops out with

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[55] See Ben Leo, Robert Morello, Jonathan Mellon, Tiago Peixoto, and Stephen Davenport. 2015. "Do Mobile Phone Surveys Work in Poor Countries?" CGD Working Paper 398. Washington, DC: Center for Global Development. http://www.cgdev.org/publication/do-mobile-phone-surveys-work-poor-countries-workingpaper-398

[56] The demographics control were gender: female (male is excluded as the comparison); locality: rural (urban is excluded as the comparison): wealth: asset one and asset two; age by response categories: 25-34 years, 35-55 years, and 55 or more year (15-24 years is excluded as the comparison); and, education: some primary, primary complete, some secondary, secondary complete, more than secondary education (no formal education is excluded as the comparison group).

one priority – government efforts to address 'street crime'. With two other priorities, domestic violence and ability to get justice through courts, statistical significance drops from the 95 percent to the 90 percent confidence level. Interestingly, we find a statistically significant difference with the theme of social services in the logistic regression, while we did not find one in the chi-squared test. This is the only case where we found a statistically significant difference in the logit model and not in the chi-squared test across the four pilot countries.

Table 1 – Afghanistan, Robustness Check

Actor	Topic	Long term	No Timeframe	Chi-Squared	Logit
External	Priority: Cost of goods	3%	6%	**	**
Government	Priority: Street crime	2%	1%	**	
External	Priority: Domestic violence	1%	2%	**	*
External	Priority: Ability to get justice through courts	2%	1%	**	*
Government	Priority: Ability to get justice through courts	2%	1%	**	**
External	Theme: Social Services	9%	14%		**
External	Priority: Education	3%	6%	**	**
External	Priority: Support for orphans, street children, and the elderly	1%	4%	**	**
Government	Priority: Support for orphans, street children, and the elderly	1%	2%	**	**
Government	Theme: Environment	4%	9%	**	**
External	Priority: Drought	2%	0.3%	**	**
Government	Priority: Land ownership	0.4%	1%	**	**
Government	Priority: Deforestation	0.3%	1%	**	**
Government	Priority: Pollution	1%	3%	**	**

In Ethiopia, we similarly find that most of the relationships are robust in the logistic regression, controlling for demographics differences. Only one priority (government focusing on 'street crime') is not robust.

Table 2 – Ethiopia

Actor	Topic	Long term	No Timeframe	Chi-Squared	Logit
Government	Priority: Water	8%	2%	**	**
Government	Priority: Street crime	1%	5%	**	
External	Priority: Health	11%	2%	**	**
External	Priority: Education	1%	7%	**	**
Government	Priority: Drought	0.5%	4%	**	**
External	Priority: Deforestation	6%	1%	**	**

In Mozambique, we find that two of the priorities identified as statistically significant in the chi-squared test are also identified as statistically significant in the logistic regression. The government focusing on 'drought' is only statistically significant at the 90 percent level in the robustness check. Unfortunately, the logit model was unable to converge with two of the priorities. Therefore, we are unable to comment on their robustness.

Table 3 – Mozambique

Actor	Topic	Long term	No Timeframe	Chi-Squared	Logit
Government	Priority: Support for orphans, street children, and the elderly	3%	1%	**	**
Government	Priority: Drought	3%	0.4%	**	*
External	Priority: Drought	0.4%	3%	**	**
External	Priority: Ability to get justice through courts	0.3%	2%	**	*convergence not achieved*
External	Priority: Land ownership	0.1%	1%	**	*convergence not achieved*

Again, most of the priorities in Zimbabwe are robust in the logit model. Seven of the nine priorities are statistically significant in both analyses. We find that one model for the priority of the "ability to get justice through courts" was unable to converge. And, the priority of deforestation was only found to be statistically significant at the 90 percent level.

Table 4 – Zimbabwe

Actor	Topic	Long term	No Timeframe	Chi-Squared	Logit
External	Priority: Domestic violence	1%	2%	**	**
External	Priority: Ability to get justice through courts	2%	0.5%	**	*convergence not achieved*
Government	Priority: Education	5%	3%	**	**
External	Priority: Education	5%	3%	**	**
Government	Theme: Environment	4%	8%	**	**
External	Priority: Drought	1%	2%	**	**
Government	Priority: Land ownership	0.2%	1%	**	**
External	Priority: Deforestation	1%	3%	**	*
Government	Priority: Deforestation	1%	2%	**	**

Appendix IV

Development Priorities Responses by Timeframe and Actor

Table 1 – Afghanistan: Results by Timeframe and Actor

	Government			External		
Topic	Long term	Control	Statistical Significance	Long term	Control	Statistical Significance
Theme: Economic	**54%**	**51%**		**43%**	**42%**	
Priority: Unemployment	37%	34%		31%	27%	
Priority: Cost of goods	5%	6%		3%	6%	**
Priority: Access to credit	8%	4%		3%	4%	
Priority: Wages	3%	5%	*	4%	3%	
Priority: Taxes	2%	2%		2%	2%	
Theme: Infrastructure	**25%**	**23%**		**32%**	**29%**	
Priority: Roads	8%	8%		12%	11%	
Priority: Electricity	9%	9%		11%	9%	
Priority: Water	4%	3%		3%	2%	
Priority: Housing	4%	4%		5%	6%	
Theme: Security	**10%**	**7%**		**9%**	**10%**	
Priority: Street crime	2%	1%	**	3%	2%	
Priority: Domestic violence	1%	1%		1%	2%	**
Priority: Instability	3%	3%		2%	3%	
Priority: Discrimination	0%	0%		0%	0%	
Priority: Bribes and corruption	1%	1%		1%	2%	
Priority: Ability to get justice through courts	2%	1%	**	2%	1%	**
Theme: Social Services	**7%**	**11%**		**9%**	**14%**	
Priority: Health	3%	3%		4%	4%	
Priority: Education	3%	5%		3%	6%	**
Priority: Support for orphans, street children, and the elderly	1%	2%	**	1%	4%	**
Theme: Environment	**4%**	**9%**	**	**7%**	**6%**	
Priority: Drought	1%	1%		2%	0%	**
Priority: Food shortages	1%	2%		2%	2%	
Priority: Land ownership	0%	1%	**	1%	1%	
Priority: Deforestation	0%	1%	**	1%	0%	
Priority: Pollution	1%	3%	**	1%	2%	

** $p<0.05$; * $p<0.1$

Table 2 – Ethiopia: Results by Timeframe and Actor

	Government			External		
Topic	**Long term**	**Control**	**Statistical Significance**	**Long term**	**Control**	**Statistical Significance**
Theme: Economic	**44%**	**43%**		**37%**	**44%**	
Priority: Unemployment	32%	28%		22%	28%	
Priority: Cost of goods	6%	7%		6%	7%	
Priority: Access to credit	4%	5%		5%	5%	
Priority: Wages	1%	0%	*	2%	3%	
Priority: Taxes	1%	3%		2%	1%	
Theme: Infrastructure	**29%**	**19%**	*	**25%**	**23%**	
Priority: Roads	12%	6%		5%	8%	
Priority: Electricity	6%	6%		8%	8%	
Priority: Water	8%	2%	**	6%	3%	
Priority: Housing	3%	5%		6%	3%	
Theme: Security	**15%**	**16%**		**11%**	**11%**	
Priority: Street crime	1%	5%	**	1%	1%	
Priority: Domestic violence	2%	5%		2%	2%	
Priority: Instability	3%	1%		3%	1%	
Priority: Discrimination	1%	1%		2%	4%	
Priority: Bribes and corruption	2%	2%		2%	2%	
Priority: Ability to get justice through courts	4%	2%		1%	1%	
Theme: Social Services	**5%**	**10%**		**15%**	**14%**	
Priority: Health	2%	2%		11%	2%	**
Priority: Education	1%	7%	*	1%	7%	**
Priority: Support for orphans, street children, and the elderly	2%	1%		3%	4%	
Theme: Environment	**7%**	**11%**		**12%**	**8%**	
Priority: Drought	0%	4%	**	3%	1%	
Priority: Food shortages	1%	1%		1%	2%	
Priority: Land ownership	4%	1%		1%	2%	
Priority: Deforestation	1%	4%		6%	1%	**
Priority: Pollution	1%	1%		1%	1%	

** p<0.05; * p<0.1

Table 3 – Mozambique: Results by Timeframe and Actor

Topic	Government			External		
	Long term	Control	Statistical Significance	Long term	Control	Statistical Significance
Theme: Economic	**54%**	**52%**		**54%**	**53%**	
Priority: Unemployment	38%	34%		29%	35%	
Priority: Cost of goods	9%	9%		13%	8%	*
Priority: Access to credit	2%	3%		5%	3%	
Priority: Wages	4%	4%		6%	6%	
Priority: Taxes	1%	2%		0%	1%	
Theme: Infrastructure	**24%**	**31%**		**27%**	**24%**	
Priority: Roads	7%	11%		10%	5%	*
Priority: Electricity	9%	10%		10%	10%	
Priority: Water	5%	6%		4%	5%	
Priority: Housing	3%	4%		2%	3%	
Theme: Security	**7%**	**9%**		**6%**	**6%**	
Priority: Street crime	1%	1%		2%	0%	
Priority: Domestic violence	3%	2%		1%	2%	*
Priority: Instability	0%	2%	*	2%	1%	
Priority: Discrimination	1%	2%		0%	0%	
Priority: Bribes and corruption	0%	0%		0%	0%	
Priority: Ability to get justice through courts	2%	1%		0.3%	2%	**
Theme: Social Services	**9%**	**6%**		**9%**	**11%**	
Priority: Health	5%	2%		3%	5%	
Priority: Education	2%	2%		2%	2%	
Priority: Support for orphans, street children, and the elderly	3%	1%	**	4%	3%	
Theme: Environment	**6%**	**3%**		**5%**	**7%**	
Priority: Drought	3%	0%	**	0%	3%	**
Priority: Food shortages	2%	1%		1%	1%	
Priority: Land ownership	0%	1%		0%	1%	**
Priority: Deforestation	0%	1%		1%	1%	
Priority: Pollution	1%	1%		2%	1%	

** $p<0.05$; * $p<0.1$

Table 4 –Zimbabwe: Results by Timeframe and Actor

	Government			External		
Topic	**Long term**	**Control**	**Statistical Significance**	**Long term**	**Control**	**Statistical Significance**
Theme: Economic	**51%**	**47%**		**46%**	**44%**	
Priority: Unemployment	35%	33%		32%	31%	
Priority: Cost of goods	5%	4%		5%	4%	
Priority: Access to credit	5%	4%		4%	3%	
Priority: Wages	4%	5%		5%	5%	
Priority: Taxes	2%	2%		1%	1%	
Theme: Infrastructure	**18%**	**20%**		**22%**	**23%**	
Priority: Roads	3%	5%	*	5%	7%	
Priority: Electricity	4%	4%		4%	4%	
Priority: Water	9%	9%		11%	10%	
Priority: Housing	2%	1%		2%	1%	
Theme: Security	**11%**	**9%**		**9%**	**9%**	
Priority: Street crime	2%	1%		1%	1%	
Priority: Domestic violence	2%	2%		1%	2%	**
Priority: Instability	2%	1%		2%	2%	
Priority: Discrimination	1%	1%		1%	1%	
Priority: Bribes and corruption	3%	3%		3%	2%	
Priority: Ability to get justice through courts	1%	1%		2%	0%	**
Theme: Social Services	**16%**	**16%**		**17%**	**15%**	
Priority: Health	8%	7%		6%	6%	
Priority: Education	5%	3%	**	5%	3%	**
Priority: Support for orphans, street children, and the elderly	4%	6%	*	6%	7%	
Theme: Environment	**4%**	**8%**	**	**5%**	**8%**	
Priority: Drought	2%	4%		1%	2%	**
Priority: Food shortages	0%	0%		0.6%	1%	
Priority: Land ownership	0%	1%	**	0.3%	0.2%	
Priority: Deforestation	1%	2%	**	1%	3%	**
Priority: Pollution	1%	1%		2%	2%	

** p<0.05; * p<0.1