

Does Information Technology Flatten Interest Articulation?

Evidence from Uganda

Guy Grossman* Macartan Humphreys[†] Gabriella Sacramone-Lutz[‡]

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Abstract

We use a field experiment to study how the availability and cost of political communication channels affect the efforts constituents take to influence their representatives. We presented sampled constituents in Uganda with an opportunity to send a text-message to their representatives at one of three randomly assigned prices. This allows us to ascertain whether ICTs can “flatten” interest articulation and how access costs determine who communicates and what gets communicated to politicians. Critically, contrary to concerns that technological innovations benefit the privileged, we find that ICT leads to significant flattening: a greater share of marginalized populations use this channel compared to existing political communication channels. Price matters too, as free messaging increase uptake by about 50%. Surprisingly, subsidy-induced increases in uptake do not yield further flattening since free channels are used at higher rates by both marginalized and well- connected constituents. More subtle strategic hypotheses find little support in the data.

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[†]Columbia University

[‡]Columbia University

1 Introduction

The quality of democratic institutions as a tool of political representation depends on interest articulation: the opportunity and willingness of voters to communicate their needs and preferences to their representatives in government. What politicians think and what they prioritize depends in part on what they hear from constituents. But in many low-income countries, voters often have limited channels of communication with their representatives. Communication is often unidirectional, clustered around election periods, and tapers off during legislative periods. Moreover, there is inequality in who can access politicians: men are often more likely to have access to politicians than women, wealthier constituents are more likely to have access than poor constituents and so on.

The goal of our study is to examine how the availability and cost of communication with politicians affects *who* gets to be heard and *what* gets communicated. Generally assessing the role of technology on political communication is rendered difficult because the existence and costs of new communication technologies are likely to be correlated with features of a political system that may independently determine political participation. To overcome this problem we implement an experiment in two senses. First we introduce a novel text-messaging based Information Technology (IT) system that provides an avenue for voters to communicate directly with their representatives. Second, to assess how the representativeness of political communication depends on the cost of communication, we experimentally vary the price for using the IT system. The experiment is implemented with voters in all constituencies in Uganda, making this, to our knowledge, one of the first nation wide experiments on the role of technology on political communication.

Our findings confirm the widely held perception that populations often classified as politically marginalized, such as women and the poor, are less likely to use existing forms of political engagement and have more limited access to their political representatives. Encouragingly, our results also suggest that opening a new IT communication channel has a potential of flattening political access, with marginalized populations more likely to take advantage of a low-cost, impersonal, alternative technology to contact representatives. We do not however find evidence that the priority issues for ICT users are closer to those of the

general population than are those of groups exhibiting high levels of political engagement via traditional communication channels.

Turning to the impact of price on uptake, we find, as expected, that prices matter, even when the differences in the cost of political communication are quite small. Providing a subsidy increases uptake considerably, though this effect depends on *full* subsidization (i.e., offering access to the system for free) and not on partial subsidization. This is especially important given the fact that the ICT system has resulted in greater representation of marginalized groups.

Strikingly however—and contrary to both our expectation and to survey findings from a pilot study conducted by the National Democratic Institute (NDI) in Uganda—we do not find that applying a subsidy to communication has a significantly stronger effect on uptake by more marginalized citizens. In other words, making access to the technology free increases uptake, but it does not increase the *relative uptake* of more marginalized constituents. One explanation for this is that more marginalized populations enjoy fewer alternative channels of access and so are less price-sensitive than populations that can substitute between new and traditional forms of political access.

Strategic considerations provided little purchase in assessing patterns of communication. In particular voter engagement was not related in expected ways to likely correlates of politician responsiveness nor were the types of communications sent related to the volume of messaging in ways suggested by strategic considerations.

Overall our results suggest modest but encouraging effects of ICTs. Concerns that ICT channels privilege the already privileged are not borne out. Marginalized populations use ICTs at higher rates than less marginalized populations even (in fact especially) when they have to pay to do so. New technologies expand access in particular to poorer populations, to more remote populations, and to women. Flattening of interest articulation, however, is more a function of technology than of cost.

The remainder of this paper proceeds as follows. In the next section we consider arguments drawn from decision and strategic theory regarding how technologies and the costs of political access are likely to affect who gets to communicate and what gets communicated

to politicians. Our research design is described in section 3 and results are provided in section 4. Section 5 concludes.

2 Who speaks?

Though democratic forms of governance are now common in many low-income countries, the quality of elected governments, as measured by corruption levels and quality of public services, is low. One leading explanation—together with the dominance of clientelism (Wantchekon, 2003) and the weakness of electoral institutions (Ichino and Schündeln, 2012)—is the effect of information deficits. Whereas studies of the determinants of good governance overwhelmingly focus on the lack of information in the hands of citizens (Pande, 2011), the starting point of this study is the idea that lack of information in the hands of politicians may be just as important.

With limited information on the priorities and preferences of citizens, politicians have little ability to serve as representatives, and parties may be less likely to differentiate themselves based on policy-positions (Wantchekon and Fujiwara, 2011). Moreover, politicians may have little incentive to act in a representative manner when they know that their constituents know that they have such poor information (Ashworth, 2012). Instead, politicians who are unable to assess public opinion may be more likely to respond to the demands of powerful interest groups (Bartels, 2008) or serve as rubber-stamps for the executive branch (Barkan, 2009). This logic provides one explanation for why African parliaments are generally considered weak vis-à-vis the executive (Barkan, Mattes, Mozaffar, and Smiddy, 2010). The adverse effects of limited information in the hands of politicians also provides the basis for our theoretical expectation that citizens have an interest in taking advantage of new channels of communication to articulate their needs, preferences and priorities.

Critically, communication structures can affect not just how much information politicians receive but also whose voice gets heard and what issues people focus on. As in rich industrialized countries, there is inequality in who can access the political process. Indeed, not all citizens can equally make their voice heard. In this study we focus on two indicators of political empowerment: (a) *access*—the extent to which channels exist to communicate

with politicians if need or want arise, and (b) *engagement*—the extent to which individuals use existing paths to participate in political processes. As we demonstrate below, there exist large and significant differences between the poor and non-poor, and male and female citizens with respect to both political access and political engagement, at least in Uganda. These measures of access and engagement also correlate with each other suggesting that communication depends not just on the desire to communicate but also on the costs of communication. In this context, we seek to assess how technologies for political communication alter preexisting patterns of representation. To do so we draw on two literatures that provide insight into how political communication structures the behavior of constituents.

2.1 The technologies of access

In recent years there has been a growing interest in the role information technology might play in affecting political communication (Bimber, 2001; Pierskalla and Hollenback, 2013). ICTs can potentially contribute to democratic processes by facilitating group interaction and rapid accumulation and dissemination of information. ICTs can also allow citizens to engage in debate on political matters, and become familiar with opinions and events that affect their communities (Oates, 2003). Indeed by some accounts, access to ICTs likely has a causal effect on national levels of democracy (Shirazi, Ngwenyama, and Morawczynski, 2010). Given these potential benefits there has been a recent surge in innovations to exploit ICTs to enlarge access to politics. In Africa alone innovations include the Africa Technology and Transparency Initiative and the African Electronic Governance for Research Initiative. The growing role of ICTs in political communication, nevertheless, raises important questions about whether ICT initiatives can genuinely alter representative-constituent relation and whether ICTs are increasing access to marginal groups.

On one hand, there are some reasons to assume that marginalized groups would adopt ICTs at higher rates compared to non-marginalized groups. In many low-income countries existing channels of communication with representatives are highly personal, and thus commonly require traveling to meet one’s representative or his/her staff in person. Thus existing channels of communication likely entail significant investments in time and money. For this reason, women who are less likely to travel outside their village for both cultural and

costs reasons, may value the ability to contact representatives through mobile technologies, which eliminate the need to travel.¹ In addition, marginalized populations such as poor and women may find the impersonal aspect of ICT system rather appealing.² On the other hand, there is a genuine concern that the groups that have the weakest access to political processes are also the least likely to access and use ICT systems. While ICTs may enlarge access to political communication, “ICT has [also] the power to create new inequities, as well as exacerbate existing ones” (Thompson, 2008, p. 822)

Focusing, for example, on the alleged technological gender divide, Hafkin and Huyer (2007) find that women in low-income countries are significantly less likely than men to use ICTs. Similarly, Park (2009) and Hilbert (2011) find a gender divide in developing countries, which applies to both access and to the frequency of usage. These findings suggest that there exists a pressing need to critically assess the case for “technological optimism” in the area of politics and governance. Whether ICT innovations can play a role in facilitating good governance and whether they increase or decrease political access to marginal populations are key questions our study seeks to address.

The above discussion leads to a core, pressing question: Does the introduction of an ICT system result in representative information on constituency needs and preferences? We assess this question by focusing on two hypotheses, one regarding the representativeness of user *demographics* and one regarding the representativeness of user *preferences*.

$H_{1.1}$ Technology Induced Flattening 1: The share of ICT based communication from marginalized groups is greater than it is for traditional channels of communication.

$H_{1.2}$ Technology Induced Flattening 2: The priority issues for ICT users are closer to those of the general population than are those of groups exhibiting high levels of political engagement via traditional communication channels.

¹Many Ugandan MPs, for example, have an office in their constituency, in which they (or their assistants) meet with constituents in person. In addition, most rallies and consultation meetings with MPs take place at the sub-county or parish level, rather than at one’s village. However, due to poor roads and dearth of personal and public transit options, transportation costs in Sub-Saharan Africa are notoriously high. Local and regional transportation costs for the typical African country are thought to be at least twice those of the typical Asian country (Kessides, 2005).

²In most African countries, SIM cards can be purchased without providing any identification information. SMS communication is, thus, anonymous unless the sender decides to proactively signal his/her identity.

2.2 The cost of access

All political communication comes with a cost. Such cost can have significant implications for the *level* of communication, for *who* communicates, and for *what* gets communicated. Ultimately the price of political communication can determine which constituents and what views get better represented. Decision theoretic considerations suggest that political access satisfies the law of demand. We state this expectation using the following hypothesis:

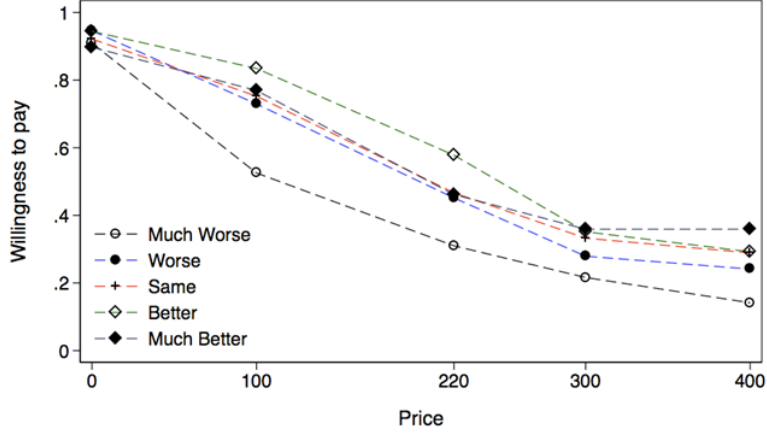
H_2 Demand: Less expensive communication results in greater levels of communication.

Beyond its affect on the quantity of communication, price is likely to affect *whose* voice gets to be heard. Specifically, marginalized populations may be more reluctant to raise their voice when the cost of political communication is high. Data gathered by the National Democratic Institute (NDI) suggests that such patterns are likely to hold in Uganda. In 2010, NDI conducted a small pilot study in Uganda to examine the willingness of survey respondents to send a text-message to their members of parliament (MPs) as a function of *hypothetical* prices. NDI found that less educated and poorer constituents reported less willingness to send a text-message to their MP at all positive price levels. Critically the patterns NDI reports suggest that in the absence of a subsidy, higher prices likely generate messaging (interest articulation) that is more reflective of the needs and preferences of wealthier constituents. It is, nonetheless, an open question whether actual behavior is consistent with the sort of self-reported hypothetical behavior examined in Figure 1.³ Access to alternative channels of communication plays a similar though perhaps more counterintuitive role. More advantaged individuals may be *more* sensitive to prices if they enjoy the option to substitute to more traditional channels of political communication. We assess these questions in terms of heterogeneous demand effects:

$H_{3.1}$ Price Induced Flattening 1: The subsidy effect (difference in uptake between higher and lower prices) will be stronger for (a) poorer constituents and (b) constituents with alternative channels of access to politicians.

³More broadly more work needs to be done on comparing hypothetical and actual behavior, especially since a growing number of political science studies employ survey experiments that do not require subjects to take real action but merely state possible actions under various hypothetical scenarios. See Barbas and Jerit (2010) for a discussion of external validity concerns of survey experiments.

Figure 1: Survey data on price sensitivity by relative economic position



Note: Source: NDI pilot data. Almost all respondents express willingness to contact their MPs when a full *hypothetical* subsidy is offered. At higher prices better-off respondents are more than twice as willing as worse-off respondents. The cost of SMS at the time of NDI's pilot was about 220 Shillings (UGX); prices dropped to 100 UGX when we conducted our experiment in 2011.

$H_{3.2}$ Price Induced Flattening 2: Lower prices result in a greater representation of marginalized populations.

Though price variation has been examined in the context of consumer goods and health products, to our knowledge, this is the first study to experimentally vary the cost of contacting one's representative in parliament. If price variation affects both the type of people sending messages as well as the content of the messages, then different price schemes can affect the representativeness of the IT-based communication platform. This will be the case, for example, if people who cannot afford to pay a full price have different needs and priorities than those who can afford to make use of the system even in the absence of a subsidy. In the end, the relative benefits of various levels of subsidization of communication systems depend on (1) the elasticity of demand with respect to price, (2) the variation in preferences and priorities of public goods as a function of income, and (3) the number of messages that need to be reached in order to induce a representative to action. To the extent that the representativeness of the ICT platform may, in turn, alter MPs' attitudes and behavior— understanding the effects of the cost of messages (i.e., cost of contacting one's MP) is of great theoretical and policy relevance.

2.3 Strategic Considerations

The analysis so far is based on a conceptualization of voters as facing a simple decision theoretic problem, to engage or not. But the decision to engage in politics is a strategic decision and the value of participation can depend on expectations of the actions of other voters and of politicians.

Treating the participation problem as a collective action problem suggests two simple patterns.⁴

First, strategic considerations can provide a second rational for why price reductions may reduce participation. We generally expect that offering a valuable service at a subsidized cost will increase demand. Somewhat counter-intuitively, however, subsidizing goods and services can reduce demand. One reason is that price subsidies can increase the number of participants and exacerbate the collective action considerations in political messaging. This might arise, for example, if the messages for public goods act as strategic substitutes. We describe this logic more formally in the online appendix (Sec. 1). If this strategic consideration dominates then we should witness the opposite effect to the one stated in Hypothesis H_2 .

Strategic considerations also have implications for the *content* of communication (conditional on who communicates). Under one logic, for example, citizens may be relatively more likely to send messages with public goods content (rather than with demands for private goods) when prices are low. The core insight is that when there is no cost, one can expect many others to contact their representative. In this case, the marginal benefits from seeking private goods, for which there is substitution, declines relative to the marginal gains from seeking public goods, from which there can be complementarities. When the cost of sending messages is high, senders may assume that competition over the resources of the politician is relatively small, and hence it is relatively more prudent to request private, or clientelistic, goods. We illustrate the core logic using a full-information normal form game presented in the online appendix (Sec. 2).

⁴In this paper we focus solely on the behavior of constituents (uptake and message type) as a function of the cost of contacting one's MP via SMS. We note, however, that we are currently collecting data for a companion paper in which we focus on the behavior of MPs.

In addition, providing a significant subsidy for political communication may encourage a more public spirited usage if it is interpreted as a signal that politicians are genuinely interested in citizen input.⁵ Formally, we expect that when the cost of contacting representatives decreases (through a subsidy), citizens will be more likely to send more *public* requests rather than private ones.

H_4 Voter-voter Strategic Effects: Less expensive communication results in greater focus on public goods issues rather than private issues.

The discussion so far has focused on voters as the only relevant actors, but a focus on the political economy of communication suggests that the engagement of citizens—especially costly engagement—depends on the *incentives politicians have to react* to the information provided. Thus, in addition to examining heterogeneous effects based on citizens’ attributes, we focus on constituency and MP characteristics that are likely associated with greater responsiveness and thus likely to affect uptake conditional on price. A fuller specification of a political economy logic linking citizen demands for clientelistic goods to MP behavior is provided in the online appendix (Sec. 3).

We focus on four conditions. The first relates to MP power: voters plausibly expect that *government* MPs are better able to respond to requests, compared with opposition MPs. In the Uganda case the critical issue is whether MPs are part of the ruling NRM party. Second, responsiveness likely depends not just on party but also on *partisanship*; classic literatures emphasize the competing demands on MPs to provide services for their base and for swing voters.⁶ Third, consistent with the existing literature we expect that MP responsiveness is increasing in the level of *political competition* (Besley and Burgess, 2002). We operationalize political competition as the percentage point difference between the vote share of the winning candidate and the runner up, and hypothesize that the effect of subsidies will be increasing in levels of political competition (as voters will have less

⁵Social psychology studies point to some reasons for why free messaging may generate more public requests. Shampianer, Mazar, and Ariely (2007) and Heyman and Ariely (2004) have shown, for example, that though costly options invoke market exchange norms, free products and services may invoke norms of social exchange. Applying this logic to our context, there is a possibility that offering free messaging would signal an expectation that the IT system should not be used for selfish reasons.

⁶We note that, in practice, given the impersonal nature of SMS-text messaging, constituents might have to explicitly signal partisanship for this to matter.

reason to expect responses when margins are large and so have weaker incentives to deploy resources engaging with politicians in relatively safe seats). We note that in practice competitiveness, party and partisanship are all likely to interact and in particular that competitiveness would magnify all effects. Finally, to the extent that voters can expect *younger* MPs to be more comfortable using a new ICT platform (Butler and Broockman, 2011), then the effect of subsidies will be strongest for older MPs.

H_5 Voter-politician Strategic Effects: The subsidy effect will be weaker for government MPs, co-partisans, MPs in competitive constituencies, and younger MPs.

Table 1 summarizes the hypotheses under examination; the next section describes how we seek to test these hypotheses.

Table 1: **Hypotheses Summary**

#	Hypothesis	Test type
$H_{1.1}$	Technology Induced Flattening 1: The share of ICT based communication from marginalized groups is greater than it is for traditional channels of communication.	Observational
$H_{1.2}$	Technology Induced Flattening 2: The priority issues for ICT users are closer to those of the general population than are those raised by traditional high engagement groups.	Observational
H_2	Demand: Less expensive communication results in greater up-take across all groups.	Experimental (Price)
$H_{3.1}$	Price Induced Flattening 1: The effect of decreasing prices will be stronger for (a) poorer constituents and (b) constituents with alternative channels of access to politicians.	Heterogeneous Effects (Voter side)
$H_{3.2}$	Price Induced Flattening 2: Overall, lower prices result in a greater representation of marginalized populations	Heterogeneous Effects (Voter side)
H_4	Voter-voter strategic effects: Less expensive communication results in greater focus on public rather than private issues	Experimental effect
H_5	Voter-politician strategic effects: The effect of subsidies on voter actions will be weaker for government MPs, co-partisans, MPs in competitive constituencies, and younger MPs.	Heterogeneous Effects (Politician side)

Note: Summary of hypotheses on the effects of the introduction of ICT based access to politicians.

3 Research Design

To assess the effects of ICT on political communication, we implemented a field experiment in Uganda in which we made an ICT platform available to a random sample of

constituents at randomly determined prices. The experiment took place several months after the February 2011 Presidential and parliamentary elections. Ugandan MPs are elected in one of two ways; though *constituency* level majoritarian races where candidates of both sexes can participate and *district* level majoritarian races in which only women candidates can compete. Universal adult suffrage applies in both types of races. Currently there are 238 constituency representatives, 112 District woman MPs and both elected and appointed representatives of the youth, the army, the workers, and people with disabilities.

There are some good reasons to choose Uganda as our research site. First, claims to external validity are strengthened by the fact that Uganda shares characteristics with many low-income countries on some critical dimensions. It is ranked 162 in the latest HDI ranking (low human development countries are ranked between 143 and 188) and in the mid-range of the World Bank's Lower-middle-income economies (1,026 to 4,035) in terms of GDP per capita. It has a weak democracy (a centrist score of -1 in polity IV scale) with a strong executive branch⁷ and a relatively weak parliament, a characteristic common to many developing countries in Africa and beyond.⁸

Second, some features of Uganda's political landscape make it a theoretically interesting place to examine whether there exists a latent demand for citizens to communicate their preferences to their representatives in parliament when democratic institutions are rather weak. On one hand, a single party, the ruling NRM, which won 70% of the seats in the last election, dominates the Ugandan parliament. In addition, competitiveness (defined as the percentage point difference between the winner and the runner up) is relatively low: on average 0.22 for constituency races and 0.26 for district races. On the other hand, we argue that Uganda is not simply nominally democratic (turnout of 59% in the last elections that were considered relatively free and fair according to domestic and international observers), it is also in some ways functionally democratic (Kasfir and Twebaze, 2009).

For example, Humphreys and Weinstein (2012) find that even star performers in the House are unlikely to be re-elected if they do not dedicate enough time to improving services in the constituency. Recent interviews that the PIs conducted with MPs reveal that MPs

⁷Yoweri Museveni, the leader of the NRM, has been the president of Uganda for 26 years.

⁸Uganda is ranked high, however, in terms of ethnic heterogeneity. According to the most recent census (2002), the share of the nine largest ethnic groups combined is about 70% of the entire population.

themselves interpret the loss of races by prominent incumbents in the most recent election as a sign that it is becoming increasingly hard for Ugandan MPs to be divorced from their constituents and win.⁹

Third, Ugandan politicians have very limited information on the preferences of voters. For example, over a third of Uganda’s MPs admitted that when they vote on a bill or a motion, most of the time they do not feel that they have sufficient information on the way their constituents would like them to vote.¹⁰ In addition, less than 50% of constituents surveyed for this project knew of any opportunities to meet their constituency or district MP over the past year. This suggests that existing forms of communication between constituents and their representatives in parliament are far from seamless.¹¹

3.1 Marginalized Populations and Political Empowerment in Uganda

Beginning in late April 2011, the research team led a group of Ugandan researchers in conducting interviews with randomly sampled respondents in each of Uganda’s 238 electoral constituencies. Cluster randomized sampling was used to select 4 villages in distinct sub-counties within each constituency. Within each village we conducted interviews with 8 villagers, for a total of 7,582 survey respondents.

We focus on two indicators of political empowerment: (a) *access*—the extent to which channels exist to communicate with politicians if need or want arise, and (b) *engagement*—the extent to which individuals participate in political processes. We operationalize both *access* and *engagement* by grouping a number of related measures into a summary index,

⁹MPs that were vocal in the House but did not make it back in the 9th parliament include Prof. Ogenga Latigo, Lands Minister Omara Atubo, Aggrey Awori, Livingstone Okello Okello, Isha Otto, Oduman Okello, Michael Mabikke and William Oketcho.

¹⁰Based on a survey the research team conducted with Ugandan Members of Parliament, which we use in a companion paper.

¹¹An additional reason to select Uganda as the research site is that previous work by this study’s PIs provided us with a unique access to Ugandan MPs as well as interest by the Ugandan parliament to roll out a large ICT study at the national level. Following the experiment we report here, we have partnered with the National Democratic Institute and the Ugandan Parliament to develop and implement an innovative IT platform to improve the quality of MP/constituent communication. The joint effort has resulted in the introduction of the Parliamentary Call System (PCS), which allows constituents in randomly selected constituencies to send messages to their MP via SMS or a voice call to a call center. Incoming messages are processed and posted into the PCS through a Casework management system. Radio and person-to-person marketing strategies are being used to promote the PCS to Uganda’s voting-age population. This pilot, expected to end in Summer 2013, will be the basis of several companion papers.

following Anderson (2008).¹² For some analyses we divide the population into groups by dichotomizing the summary indices. We relate these measures to traditional indicators of *marginalization* in African polities: poverty, gender (female and cogender with MP), and ethnicity (being a non co-ethnic of one’s MP) and remoteness; these measures are also aggregated into a *marginalization* index.

We operationalize *access* to existing communication channels using variables that capture existing technologies that individuals could use to contact politicians: (1) an indicator of respondent’s phone access; (2) a continuous measure capturing the frequency of SMS usage and (3) an indicator of respondent’s access to a computer. In addition we have two measures of physical barriers to connecting with politicians: (4) an indicator of whether the respondent travels ten kms or more from the place where he or she lives now, at least a few times a month; and (5) a continuous variable measuring the geodetic distances from the respondent’s home to the district capital.¹³ We emphasize that our index captures existing access *technologies* available to voters and does not capture social channels such as family or ethnic ties; in addition we note that the access and the marginalization index are not independent since they both include data on physical remoteness.

In Table 2 we illustrate our operationalization of the access index and how it, and each of its constituent variables, relate to traditional indicators of marginalization in African politics (except remoteness, to which it is analytically related). Two important findings stand out. First, on all measures except coethnicity, marginalized voters are significantly less able to access their representative through existing channels of communication. Second, our data points to the untapped potential of mobile technology to connect between citizens and their representatives in parliament. Whereas only 8% of survey respondents have *ever* used a computer, and a third rarely travel outside their village, 65% report that they use a mobile phone regularly and 86% report that they could personally be able to access a phone in the village if they had to make an important call (even though only 48% of respondents report to personally own a mobile phone).

¹²The summary index is a weighted mean of several standardized outcomes, where the weights—the inverse of the covariance matrix of standardized variables—are used to maximize the amount of information captured by the index. The index is then standardized for a more intuitive interpretation of results.

¹³In the table we report descriptive statistics for a binary variable that is dichotomized at the median, where zero is assigned to the bottom half who live furthest way from the district capital.

Table 2: Access to Existing Communication Channels

	(1)	(2)	(3)	(4)	(5)	(6)
	Phone Access	SMS Access	Computer Access	Travel outside village	Proximity	Access Index (std)
	(q44)	(q47)	(q38b)	(q38d)	(GIS)	(1-5)
Poorer half	0.82	0.66	0.03	0.64	0.53	-0.21
Richer half	0.92	1.99	0.15	0.69	0.47	0.21
Difference	0.11*	0.66*	0.12*	0.06*	0.06*	0.42*
Female	0.84	1.04	0.06	0.60	0.5	-0.10
Male	0.89	1.60	0.12	0.72	0.5	0.10
Difference	0.05*	0.08*	0.05*	0.12*	0	0.19*
Noncogender	0.86	1.15	0.08	0.64	0.50	-0.04
Cogender	0.87	1.50	0.10	0.68	0.50	0.04
Difference	0.01	0.35*	0.02*	0.04*	0	0.08*
Noncoethnic	0.87	1.41	0.10	0.66	0.55	0.07
Coethnic	0.87	1.29	0.08	0.67	0.48	-0.02
Difference	0	-0.11	-0.01	0.01	-0.07*	-0.09*
Sample mean	0.86	1.32	0.08	0.66	0.5	0

Note: * $p < 0.05$. The access index is standardized (mean equals zero and standard deviation equals one). Number of observations: 7582

We operationalize *engagement* using ten indicator variables. These measures, which appear in Table 3, include: (1) active membership in any political party, (2) membership in the village governance committee, (3) attending a community meeting several times in the past year, (4) raising political issue with others at least once in the past year, (5) attending demonstrations and protest marches at least once in the past year, (6) attending elections rallies at least once in the past year, (7) writing letters to a newspaper or calling a radio show at least once in the past year, (8) voting in recent parliamentary elections, (9) attending at least one MP organized meeting in the past year, and (10) personally talking to one’s MP in the past year. We then use these variables to construct a summary index of political “engagement”, which appears in the last column.

As we demonstrate below, at least in Uganda, there exist large and significant differences between the poor and non-poor, and male and female respondents with respect to both political access and political engagement.¹⁴ The difference between non-cogender and

¹⁴To construct the wealth measure we average between objective and subjective wealth measures. To generate a ‘subjective’ measure of wealth, survey respondents were asked to place themselves on a five-category wealth scale using the following question: “How would you compare your overall economic situation to those of other Ugandans?” Respondents were coded 1 if placed themselves at the lowest category (“much lower,” 51% of respondents), and 0 otherwise. To generate a measure of ‘objective’ wealth we use a battery of questions that capture the respondents’ purchasing power. These include: (a) number of radios owned by

cogender respondents is somewhat smaller yet significant at the 95% level. However, and in contrast to classic accounts of the political economy of African development, neither access (defined in terms of technologies of access) nor political engagement is structured around ethnic lines (see Table 2 and Table 3).

Figure 2 shows how the measures of political engagement, access, and marginalization, relate to each other. As expected, engagement rises with political access and wealth and declines with marginalization, strengthening our confidence in the reliability of our measures. The negative relationship between marginalization and engagement is powerful, variation in marginalization accounts for about 10% of the variation in engagement, with a one standard deviation increase in marginalization associated with a 0.1 standard deviation decline in engagement (t -stat= -8.68) Engagement is highest for voters in middle age ranges and declines for the youth and the elderly.

members of the household; (b) number of televisions; (c) number of bicycles; (d) number of motor vehicles; (e) number of cell-phones; (f) a computer; (g) years of education; (h) material used in the construction of the respondent's house; (i) access to clean drinking water; (j) time to nearest protected water source; (k) whether the respondent has a job that pays a cash income; and (l) monthly income estimate. All variables were grouped into a summary index as in Anderson (2008). To create a binary measure of poorer and richer respondents we use the median of the continuous wealth index as cutoff point.

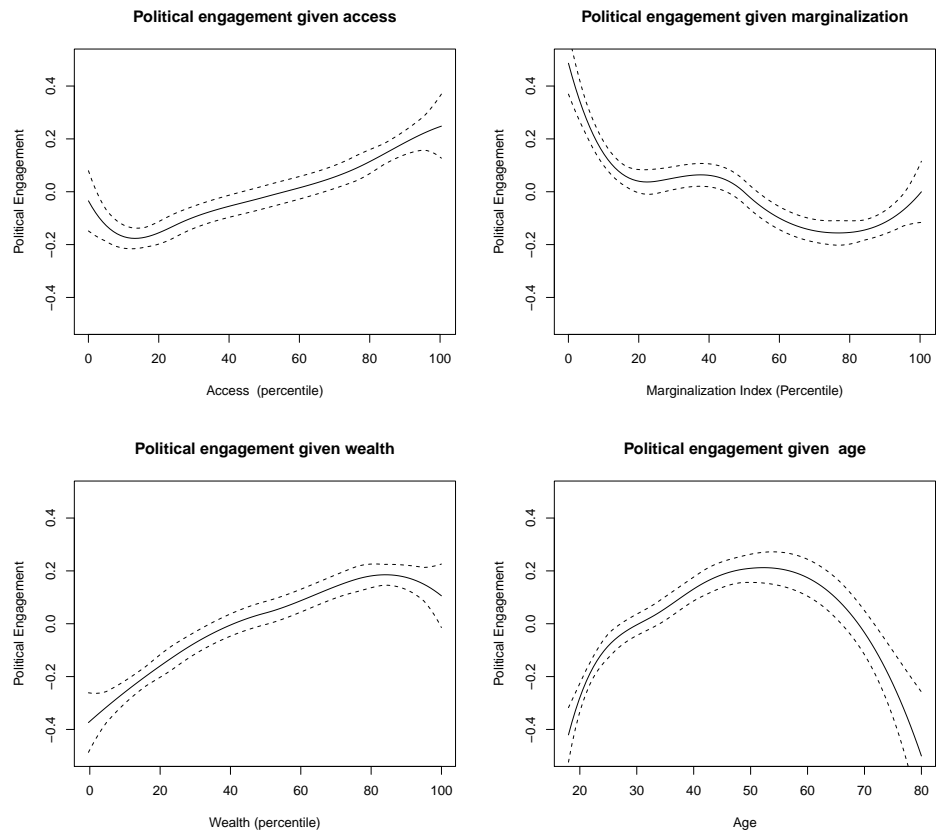


Figure 2: Traditional political engagement, wealth and age as a function of measures of access and marginalization. No. of observations: 7582

Table 3: Politically Engaged

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Party Member (q52)	Village Committee (q53a)	Community Meetings (q55a)	Raise sue (q55b)	Protest March (q55c)	Election Rally (q55d)	Write Letter (q55e)	MP meeting (q56)	Voted elections (q66)	Talked to MP (q109)	Engaged Index (1-10)
Poorer half	0.17	0.23	0.55	0.62	0.05	0.76	0.07	0.24	0.94	0.20	-0.13
Richer half	0.24	0.26	0.54	0.66	0.07	0.79	0.16	0.30	0.95	0.26	0.13
Difference	0.08*	0.04*	-0.01	0.04*	0.02*	0.03*	0.09*	0.05*	0.01	0.06*	0.26*
Female	0.15	0.20	0.48	0.58	0.05	0.73	0.08	0.23	0.93	0.17	-0.23
Male	0.26	0.29	0.60	0.71	0.07	0.82	0.15	0.32	0.95	0.29	0.23
Difference	0.11*	0.09*	0.12*	0.13*	0.02*	0.09*	0.08*	0.09*	0.02*	0.12*	0.45*
Noncoethnic	0.19	0.23	0.52	0.62	0.05	0.76	0.11	0.25	0.94	0.19	-0.10
MP Cogender	0.22	0.26	0.57	0.66	0.07	0.79	0.13	0.29	0.95	0.27	0.10
Difference	0.03*	0.04*	0.05*	0.04*	0.02*	0.02*	0.02*	0.04*	0.01*	0.08*	0.19*
Noncoethnic	0.21	0.26	0.51	0.63	0.08	0.76	0.13	0.27	0.93	0.24	-0.01
MP Coethnic	0.20	0.24	0.56	0.65	0.05	0.79	0.13	0.27	0.95	0.23	0.01
Difference	0.01	-0.01	0.05*	0.02	-0.03*	0.03	-0.02*	0	0.02*	-0.01	0.02
Long distance	0.21	0.25	0.58	0.65	0.05	0.79	0.11	0.28	0.95	0.23	0.03
Sh. distance	0.20	0.24	0.51	0.64	0.07	0.76	0.12	0.26	0.93	0.24	-0.03
Difference	0.01	-0.01	-0.07*	-0.01	0.02*	-0.03	0.01	0.01	-0.02*	0.01	-0.05

Note: * $p < 0.05$. No. of observations: 7582.

3.2 Treatment Assignment: Price Variation

To test the study’s hypotheses, in each village in the study area 4 respondents were offered the chance to SMS their MP at a price level which was randomly pre-assigned. In total 3,790 subjects participated in our experiment. Random assignment guaranteed balance across the 3 treatment price groups within each constituency: (a) **Full price** (100 shillings); (b) **Partial subsidy** (50 shillings), and (c) **Full subsidy** (free).¹⁵ We provide a test of covariate balance in the appendix, Figure 9.¹⁶ The service was introduced with the following script:

We would like to offer you an opportunity to send your new (**constituency/ district**) MP a message using SMS. It is a chance to tell your incoming MP about issues that are important to you, or things you feel he/she should work on. This service is not associated with any political party or government agency. The service is (**free/50sh/100sh**).

In addition, experimental subjects were given a flyer that provided additional instructions of how to access the ICT system and send a text message to one’s MP.¹⁷ An example of such a flyer is presented in the Appendix, Figure 10.

3.3 Outcome Variables

Our two key estimands are (a) uptake: the propensity to send any message and (b) the propensity to send messages of a given type (“private” or “public”). In total we received 243

¹⁵At the time the experiment, 100 shillings (UGX), approximately 5 US cents, was the average cost of a SMS. In 2011, GDP per capita in Uganda was \$1300 (PPP), and the exchange rate was about 2,200UGX for the dollar, which amounts to daily income of 7,835 UGX, on average. This means that in purchasing power, the full subsidy of 100 UGX amounts, on average, to about 1.2% of our respondents’ daily income. This would be equivalent to a subsidy of \$1.7 in purchasing power in the USA in 2011. To fix ideas, Ugandans could buy a pack of gum, a small packet of peanuts, or a single vegetable for 100 UGX. An ear of roasted corn on the street is about 300-500 UGX, and a package of biscuits or a mug of tea are in the 200-400 range. Thus, though not insignificant, 100 UGX does not go very far in terms of purchasing power.

¹⁶In addition to the price variation and the MP mandate variation, a third variation was introduced in which a random set of respondents were read examples of public goods messages collected during the NDI pilot in order to assess whether messaging is subject to complementarities. This second treatment is not the subject of the present analysis.

¹⁷The ICT platform, which is based on the open-source software FrontlineSMS, was customized to serve our needs with the outstanding help of Joseph Kaizzi.

Table 4: **Types of Messages**

Type	Description	Obs
0. Personal messages.	General greetings and praises.	4
1. Private requests.	Messages intended to benefit the individual sender or their family only. Examples include senders asking directly for money for home construction, school fees, funerals, or support finding work.	13
2. Local geographic group benefit messages.	Message intended to benefit a geographic group below the constituency level. The group can be defined by gender, location (“village residents”) and profession (“farmers”). Note that messages that do not indicate a particular subgroup within the constituency, but that say “we need” are treated as local geographic group benefit for the purposes of coding. Examples include messages on the need for electricity in a village, or the need for infrastructure or equipment in subcounties.	85
3. Large geographic group messages.	Messages that make requests or provide information on behalf of geographic groups corresponding to the constituency or district.	48
4. Large non-geographic group messages.	Message intended to benefit a group such as women, veterans, and farmers, beyond the constituency level.	8
5. Public messages.	Messages with an unrestricted beneficiary group. This category includes items such as corruption, inflation, presidential term limits, cost of living and other features related to national policies.	11
Total		169

messages, out of which 41 were dropped since participants failed to enter their identifying code and 29 messages dropped since they were the second, third or fourth message sent by the same participant.¹⁸ Since 4 messages were blank, we are left with 173 identified message senders and 169 valid messages. A classification of those messages into five types is presented, above, in Table 4.

We note that a large number of messages are requests for local public good, especially water and electricity supply, health services, roads and education. Consistent with findings from recent studies (e.g., Weghorst and Lindberg (forthcoming)), Ugandan voters view the lobbying for provision of community-level (club) goods as one of the key areas of respon-

¹⁸One participant sent 4 messages, four participants sent 3 messages, and ten sent 2 unique messages. A unique time stamp allowed us to maintain the first message that a participant sent.

sibility of their representatives in parliament. MPs are increasingly expected to represent their constituents by lobbying for them in parliamentary committees, line ministries, and local government council meetings. Though not experimental, we note that the fact that most SMS-messages address what voters view as a core MP activity is consistent with the view that IT communication, as a platform for interest articulation, can alter the nature of substance of political demands and serve as a vehicle to increasing the accountability of MPs in low-income countries, such as Uganda.

After our initial classification, we further collapsed the more detailed measure into a simple binary measure of public messaging, such that 0, 1 and 2 were coded as private messages and categories 3, 4, 5 were coded as public messages. This cutoff point is consistent with Lindberg (2010) that distinguishes between *core duties of MPs*—such as legislation, executive oversight and constituency representation—that have an inherent public good component, and *constituency services* in the form of personal favors and community development that have a private or club good component. It is also consistent with the work of Cammett and Issar (2010) that view investments in village-level health and education services through a clientelistic framework and with Smith, LaGatta, and Bueno de Mesquita (2012) that demonstrate that equilibrium behavior in lopsided elections is driven by voters competing to win preferential treatment for their community. Finally, this cutoff point also has the additional benefit of maximizing the variance of the measure. General uptake broken down by private/public is reported in Figure 3 along with simple cross tabulations of the types of voters that send these different types of messages. From the table we see that messaging rates are higher in general among the more educated, the more engaged, and those voters more *distant* from district capitals. Differences between subgroups are largely similar for public and private messaging.

3.4 Estimation

Estimation strategies were developed in advance in a detailed pre-analysis plan that we posted on the Experiments in Governance and Politics (EGAP’s) Design Registration web page, prior to analysis [Note that registered design is not anonymized; an anonymized version is included in submitted materials]. The plan specified the measures of variables

and econometric specifications that we would use for testing the study’s hypotheses. The core specifications include no controls; analysis of experimental effects is done using design based inference and all tests are implemented using randomization inference. In the online appendix we describe deviations from the pre-analysis plan and the rationales for these.

4 Results

4.1 The flattening effect of ICT

We saw above (Tables 2 and 3) that marginalized groups are significantly less engaged in political life across a broad range of political participation indicators. For example, compared to their male counterparts, women are about 11% less likely to be members of political parties, 12% less likely to attend community meetings and 10% less likely to report writing a letter to a newspaper or calling in a radio show. Can an opening of a new ICT channel, based on mobile technology, flatten access to national assembly representatives?

The first hypothesis we examine is that the composition of SMS message senders is more heavily weighted towards politically marginalized groups than is typical for other types of access to politics (even if overall messaging is more likely among less marginalized groups). Figure 4 illustrates the observed flattening. The left panel shows the relation between marginalization and political engagement that we saw before, emphasizing the negative correlation between these constructs. The right panel shows the analogous relationship between marginalization and the propensity to send an SMS message; broadly this relationship is flatter and the broad correlation is weakly positive rather than negative.

To test hypothesis $H_{1.1}$ more formally, we use a set of seemingly unrelated linear regressions to compare the share of marginal respondents among the SMS sender population to the share of marginal respondents among politically engaged types (those who report using traditional strategies of engagement). For this analysis and the next we define the “most engaged” types as those scoring in the top 5% of the engagement index—thus the pool is set to be approximately the same size as the pool of SMS senders.¹⁹ Results, shown

¹⁹In our pre-analysis plan we dichotomized the engaged type at the median; the disadvantage of that approach is that by construction the 50% most engaged types are more representative than the 5% of SMS

in Table 5, indicate that the share of marginal respondents is about 42% higher in the ~5% of subjects that sent SMS messages, compared to the 5% of population that are most engaged using traditional channels of communication.

Table 5: **Flattening Participation: Test of Hypothesis 1**

Share of marginal respondents among the highly engaged types	0.38
Share of marginal respondents among the SMS sender population	0.54
Difference	0.15
(p)	0.004
(N)	3,790

Note: p value estimated using χ^2 test from seemingly unrelated regressions.

In the online appendix (Sec. 6) we report a similar test broken down by various types of marginalization, including the subcomponents of our overall index measure. The results suggest that, consistent with our initial hypothesis, opening a direct channel between citizens and their MPs using text-messaging is especially beneficial to poorer villagers, women and to citizens living in remote areas. As discussed above, this likely reflects the fact that those populations are significantly less likely to travel to the district capital to meet their representative or his/her parliamentary assistant in person.

From a theoretical perspective it is of great interest to investigate, in addition, uptake within the middle class, which historically has served as a catalyst for democratization processes. In Figure 4 we can see that there is a slight rise in SMS uptake among constituents with middling scores on our marginalization index. This pattern can be seen more strongly in the relation between wealth and uptake, though the non-monotonicity is only on the border of statistical significance. Figure 5 shows fitted values from a logit model in which take-up is regressed on a linear and quadratic term; the figure demonstrates the stronger estimated effect for the middle class but also shows the statistical imprecision of this relationship.

We have found robust evidence that the share of politically marginalized respondents among SMS-users is larger than their share among the engaged types. This fact, however, does not alone tell us whether the priority issues for ICT users are closer to those of the senders. Under that construction the patterns of these analysis are similar though effects are weaker.

general population than are those raised by traditional high engagement groups ($H_{1.2}$). To further deepen our inquiry into whether ICTs have a potential of being more representative than existing traditional political communication channels we first elicited the political priorities of our sample of constituents.

Figure 6 provides information on the top priorities of all respondents against the priorities of two groups of interest: (a) experimental subjects choosing to use the SMS system to contact their MP, and (b) subjects that are located at the top half of the politically engagement summary index. Figure 6 shows that there exists little difference in the distribution of top priorities of the more politically engaged subjects and those of the general population (the complete sample of experimental subjects), and a slightly larger discrepancy between the preferences of SMS users and the general population. For example, compared to the general population, SMS users are more likely to prioritize infrastructure and less likely to prioritize taxes. These differences likely reflect the fact that poorer constituents are over-represented in the SMS users group.

To test $H_{1.2}$ more formally, we construct a measure of the non-representativeness of preferences of engaged constituents relative to preferences of the population and a measure of the non-representativeness of SMS senders relative to preferences of the population and compare these two quantities. Our “non-representativeness statistic” (NRS) measures the distance between the distribution of responses from subpopulation A and subpopulation B (not necessarily distinct) as:

$$NRS(A, B) = \frac{1}{2} \sum_{k=1}^m (\alpha_k^A - \alpha_k^B)^2$$

where α^j denotes the vector of share of members of group j selecting different options. The NR statistic is calculated then as half the sum of squared deviations of shares in each of m categories. The maximum deviation is 1, which would arise if the message sending group all valued one area but others valued another.

To estimate the significance of differences in non-representativeness across the engaged and SMS-users groups we set the values of the non-SMS sending non-engaged group as

the references distribution. We then estimate a multinomial logit model of sector choice as a function of group membership and using the estimated distribution of parameters, simulate a distribution of NR statistics relative to the reference distribution as well as a distribution of differences in NRS's relative to the reference distribution both for non-SMS (and non engaged) populations and non-engaged (but SMS sending) populations.²⁰ This analysis suggests that although the NRS statistic is higher for the SMS group (0.0022) than the Engaged group (0.0007), the difference between these deviations is small and the probability of such a difference arising by chance if the two distributions were equally different from the population is close to 1 (See online appendix, Sec. 4).

We conclude that though opening a new channel of IT-based communication can increase the voice of marginalized populations relative to existing (traditional) communication channels, this does not translate, in itself, to the inclusion of a pool of citizens with priorities that are necessarily closer to those of the general population.

4.2 The costs of access

New technologies can expand access, but how much does this depend on the price of these technologies? The key patterns can be seen in the top panel of Table 6, which gives a description of uptake by price category. Table 6 suggests that messaging uptake decreases in price, and that the shift from free to some positive price is more consequential than the shift from a partial subsidy to a full price. This non-linear demand curve induced by zero price is consistent with findings reported by Cohen and Dupas (2010) in the case of bed nets and by Kremer and Miguel (2007) in the case of deworming pills in Kenya.

To test hypotheses H_2 more formally, we estimate price effects on SMS uptake.²¹

²⁰Letting x_1 denote membership in the SMS group and x_2 in the engaged group, we estimate a multinomial logit model under the assumption that $Pr(y = k|\beta) = \frac{e^{\beta_{k0} + \beta_{k1}x_1 + \beta_{k2}x_2}}{\sum_{k=1}^m e^{\beta_{k0} + \beta_{k1}x_1 + \beta_{k2}x_2}}$ (where we set $\beta_{1j} = 0$). We estimate $\hat{\beta}$ using ML and use draws from the resulting distribution of $\hat{\beta}$ to estimate the distributions of $(\alpha|x_1 = 1, x_2 = 0)$ and $(\alpha|x_1 = 0, x_2 = 1)$ from which we estimate a distribution of NR statistics.

²¹In the pre-analysis plan we treated the treatment effect as a price effect; i.e., calculating the change in uptake when prices go up from low to high. Here we modify the analysis such that the treatment effect captures the subsidy effect: change in uptake when prices move from high to low. Though this change does not affect the significance or magnitude of results it has the advantage of allowing a more intuitive interpretation of results, but also has a more natural meaning from a policy perspective: no intervention is full-price, whereas the relevant policy intervention is providing a subsidy for message senders.

ATEs are calculated as mean difference, whereby coefficients and p-values are derived using randomization inference, while taking account of the structure of blocking in the randomization scheme by using the experimental subjects' constituency as strata. To generate a summary measure of effects we report, in addition, the linear trend in which the dependent variables are regressed on a three-category treatment variable. Linear trend (coefficients and p -values) are similarly derived using randomization inference linear model in which blocks are introduced as fixed effects. Key results are presented in the bottom panel of Table 6.

Our findings provide support for H_2 : less expensive communication results in greater uptake. Specifically, moving from a partial subsidy to a free price or from a full price to a free price results in an increase in uptake of about 2%. Interestingly, we do not find that a partial subsidy has a significant impact on uptake.

Table 6: **Price Effects**

Treatment	Effect	(1) Any	(2) Public	(3) Private	(4) H_4 test (+) (Col 2 - Col 3)
Full (N=1268)	Level	0.0410	0.0260	0.0142	
Subsidy (N=1267)	Level	0.0379	0.0189	0.0174	
Free (N=1255)	Level	0.0582	0.0327	0.0247	
Subsidy vs. Full Price	ATE	-0.0015	0.0031	-0.0052	
	(p)	(0.865)	(0.577)	(0.421)	
	(N)	2512	2512	2512	
Free vs. Subsidy	ATE	0.0214	0.0094	0.0127	
	(p)	(0.022)	(0.132)	(0.079)	
	(N)	2495	2495	2495	
Free vs. Full Price	ATE	0.0198	0.0104	0.0092	
	(p)	(0.035)	(0.083)	(0.222)	
	(N)	2513	2513	2513	
Linear Trend	ATE	0.0096	0.0054	0.0043	0.001
	(p)	(0.012)	(0.015)	(0.161)	(0.256)
	(N)	3760	3760	3760	(3760, 3760)
		H_2 test (+)			

Note: ATEs estimated using linear regression, p -values estimated using randomization inference (taking into account blocked assignment). N. simulations: 5,000.

4.3 Heterogeneous price effects

One of the key goals of this study is to deepen our understanding of how the cost of political communication affects who engages politically. We therefore turn to examine heterogeneous effects of price on uptake, focusing on the subsidy effects and the *differences in subsidy (linear) effects* for wealthier and poorer constituents and for those with greater and poorer access (as defined above).

Recall that we expect that the difference in uptake when moving from higher to lower prices (subsidy effect) will be larger for poorer constituents than richer constituents. Similarly we expect that a subsidy will result in increased use of the system by individuals with greater alternative channels of access. Since wealthier constituents also tend to have, on average, higher levels of political access, we examine the effects of poverty on the subsidy effect *conditional* on political access and vice versa. The key results are shown in Table 7.

We find, contrary to our expectations, that the subsidy effect on the uptake of poorer constituents (0.007)—defined as subjects who are located at the bottom half of the standardized wealth index—is not significantly different than the subsidy effect on the uptake of richer constituents (0.01). This suggests that poorer constituents are no more price-sensitive than richer constituencies when interest articulation is at stake. Turning to political access, as hypothesized, we find that the conditional difference in uptake as a function of price between high and low access constituents is positive. However, the subsidy effect difference is relatively small and not significantly different than zero (p -value 0.314).

Table 7: **Price induced flattening (1)** ($H_{3.1}$)

	Rich	Poor	All	Difference	(Poor-Rich)
Any Access	0.01 (0.059)	0.007 (0.109)	0.01 (0.010)	H3.1a (+)	-0.003 (0.623)
Low Access	0 (0.481)	0.009 (0.109)	0.01 (0.050)		0.009 (0.236)
High Access	0.017 (0.042)	0.011 (0.131)	0.014 (0.009)		-0.005 (0.591)
Difference (High-Low)	0.017 (0.161)	0.002 (0.464)	H3.1b (+)	0.005 (0.314)	

Note: Estimated marginal effect of a price subsidy. p values from a one sided test, that take into account the blocking strategy, are estimated using randomization inference. Number of simulations: 5,000. See also online appendix (Sec. 7) for heterogeneous effects by message type.

Given these weak effects, price subsidization can contribute to flattening only if the gains in flattening from increased demand among the marginalized outweigh the reductions in flattening from demand increases among the less marginalized. Table 8 reports the overall effect of price on flattening using the same measure of marginalization used to assess H_1 (Table 5) but this time comparing the share marginalized within high price and low price sending groups. For this analysis p values are estimated using randomization inference under the null that price is unrelated to the composition of the sending population. Contrary to expectations we find that the share of the population of SMS users that is marginalized is *higher* under the high price condition, at 56% compared to 51%. This difference is not significant however at conventional levels; the associated p value for this difference is large however—0.82 given our original one sided test of the hypothesis of greater flattening from subsidization, and 0.43 on a two sided test). The 51% share of marginalized in the low price condition, though lower than that in the high price condition, is however still higher (and significantly so) than the share marginalized among the most engaged group (see Table 5). This suggests that there is flattening even under the low price condition but that the estimated effect of flattening is lower when messaging is free.

Table 8: **Price induced flattening (2): Test of $H_{3,2}$**

Share of marginal respondents among full price senders	0.558
Share of marginal respondents among partial subsidy price senders	0.562
Share of marginal respondents among full subsidy (free) senders	0.507
Trend from high price to free	0.054
(p (one sided positive)) $H_{3,2}$	0.822
(p (two sided))	0.4304

Note: p value estimated using randomization inference. N. simulations= 5,000. The number of SMS users in the full-price treatment is 52, in the partial subsidy price treatment is 48, and in the free price treatment is 73.

4.4 Strategic effects

We have found that the cost of political communication alters the distribution of those who get heard by increasing the share of marginalized constituents articulating their interests. Strategic logics suggest however that price may affect not just the quantity of

communication but the *type of message sent* (H_4).

Returning to the analysis of Table 6 we see that when using a binary variable to measure message type, the difference in the subsidy effect on the increase in public messages relative to private messages is small and no different than zero. This suggests that an increase in price excludes potential users who opt out of contacting their MP, but without a significant change in the types of messages that get communicated. This result is, however, partially dependent on how public/private is defined. For example, using a continuous measure of publicness—using all 5 categories of message type—we find a positive relationship between price and private messaging, as originally hypothesized. Note, however, that this finding is driven largely by the extremes and, in particular, a somewhat higher incidence of national messages in the free price treatment condition. Figure 7 provides information on the full distribution of message types by price levels. We conclude that there is no robust evidence suggesting that citizens are using information on the price of messaging strategically to tailor the content of their messages to expectations regarding uptake by others.

There are other ways, however, in which constituents may be strategic regarding the usage of the IT system to contact their representatives in parliament. The simplest possible strategic logic would suggest that voters send messages as a function of expected MP responsiveness. In the final part of our analysis we, therefore, turn to examine whether voter choices depend on constituency and MP characteristics. To answer this question, we estimate the effects of subsidies and the *differences in subsidy effects* for constituents under different political conditions. Recall, we expect that the difference in messaging (uptake) when moving from higher to lower prices (subsidy effect) will be larger for (a) constituents represented by opposition MPs, (b) non-copartisans (c) voters in noncompetitive constituencies and (d) constituencies represented by older MPs (H_5).

We measure political competition at the constituency level using the percentage point difference between the vote share of the winning candidate and the runner up in the 2011 parliamentary election. Partisanship is a binary measure calculated using a self-reported party ID measure.²² The age and the party affiliation of MPs were assembled from the

²²The partisanship measure uses subjects' response to the following question: "Which party do you feel closest to?"

Ugandan Parliament’s website. Results shown in Table 9 do not support these expectations. In fact, we find that MP (and constituency) characteristics hardly mediate the impact of price on uptake.

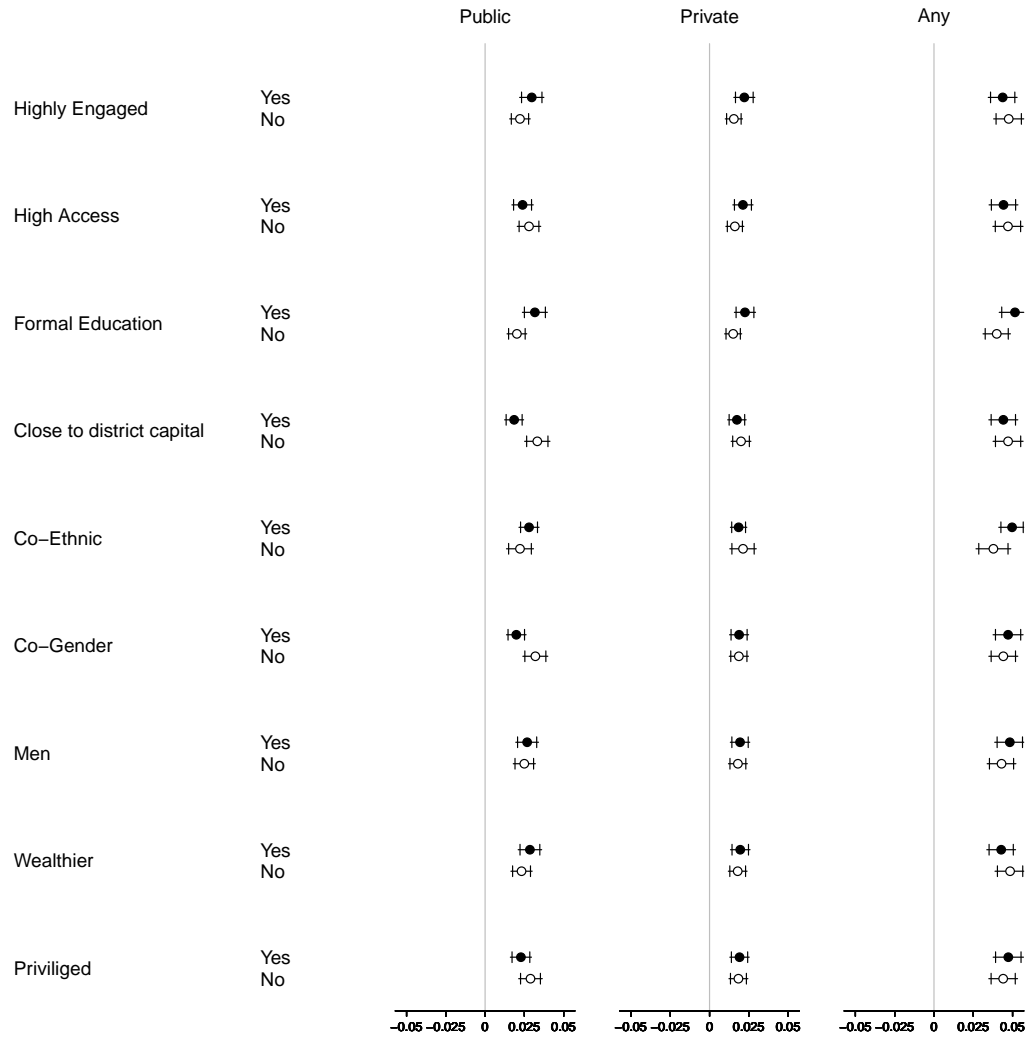
One possible explanation for the lack of evidence for strategic behavior is that the likelihood of getting a response from their MP simply did not factor into our subjects’ decision-making process. This could be the case for example if communicating general priorities and preferences to one’s MP is an expressive more than an instrumental political action. Alternatively it may be that MP’s partisanship, age, and constituency’s characteristics are poor indicators of responsiveness, though we cannot assess that possibility with available data. It is also possible that voters are strategic, but that different voters consider MP and constituency characteristics differently. For example, it may be that some voters assume that younger MPs are more likely to respond to ICT messaging, but others assume that younger MPs are less influential. Similarly, it may be that voters are strategic, but the relevant political unit for voters is above the constituency level. Figure 8 provides some evidence that uptake might be related to historical political trajectories at the regional level— very low uptake in the marginalized areas of the north east (Karamoja region) and the north (Acholi region), against relatively high uptake in the more affluent central (Baganda) region in the western region, from which president Museveni originates. We conclude this analysis by pointing that better understanding of voters’ expectations of MP responsiveness is a promising avenue for future work.

Table 9: **Constituency and MP Characteristics (H_5)**

		No	Yes	ATE Difference
NRM MP	Uptake	0.041	0.041	
	ATE	0.005	0.012	0.007
	(p)	(0.3002)	(0.0082)	(0.8238)
Copartisan MP	Uptake	0.047	0.037	
	ATE	0.004	0.012	0.008
	(p)	(0.3038)	(0.0128)	(0.8512)
Competitive Constituency	Uptake	0.05	0.033	
	ATE	0.01	0.01	-0.001
	(p)	(0.0622)	(0.0314)	(0.521)
Younger MP	Uptake	0.048	0.034	
	ATE	0.011	0.008	-0.003
	(p)	(0.0244)	(0.1042)	(0.2884)

Note: Estimated marginal effects (and differences in marginal effects) of price subsidy are estimated using regression. p values from a one sided test, reported in parentheses, are estimated using randomization inference (5,000 simulations). Uptake measures the percent of SMS senders at the full-price treatment.

Figure 3: **Private and Public Messaging by Group**



Note: Figure shows uptake (mean and 95% confidence intervals) by type of text-messages (public/private) and by type of constituents. Engaged, access and ‘privileged’ (inverse of marginalization) are summary indices, dichotomized here using the median as cutoff point.

Figure 4: **Flattening**

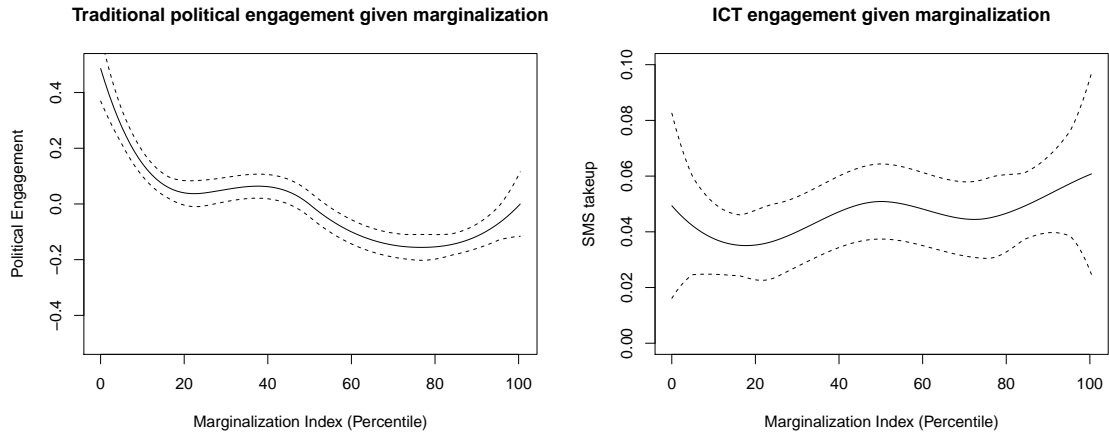
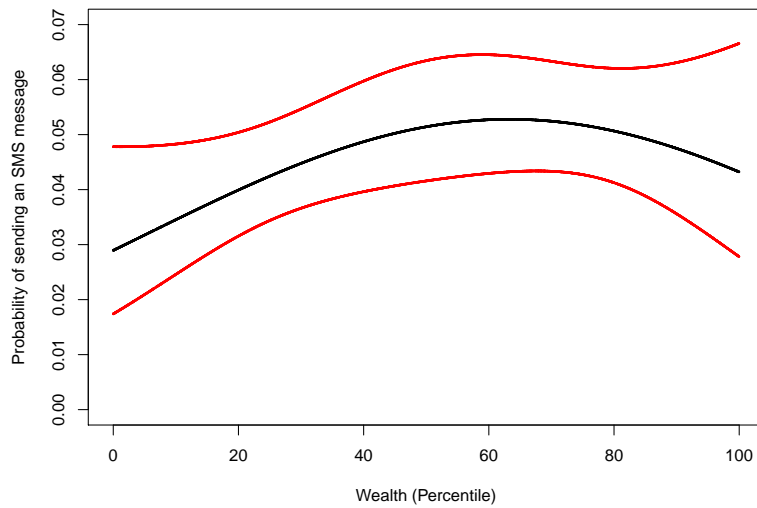


Figure 5: **Middle Class Messaging**



Note: Dependent variable: SMS messaging. Predicted values estimated using logit regression. Number of observations: 3782.

Figure 6: **Patterns of Representativeness of Messaging** ($H_{1.2}$)

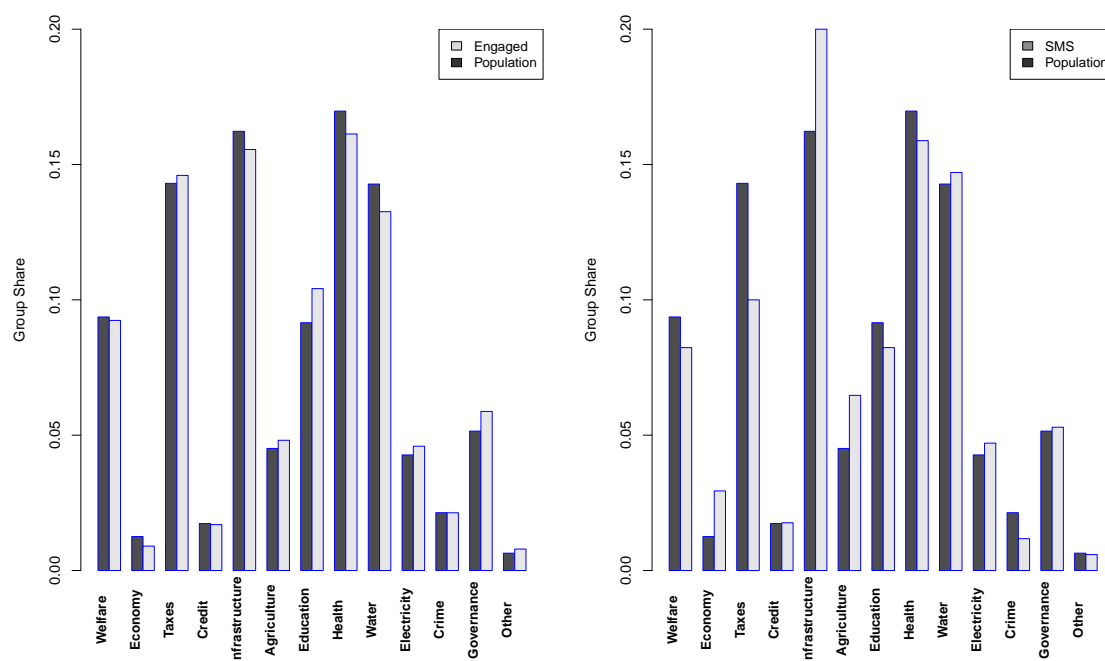
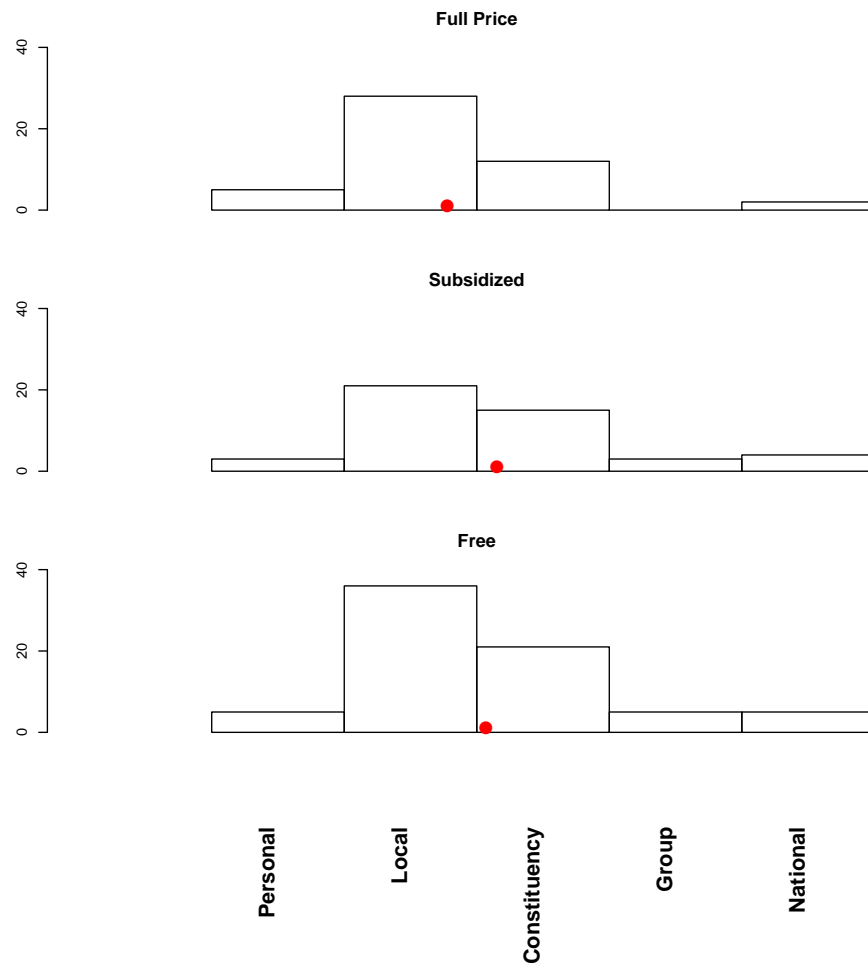


Figure 7: Message Content and Pricing



Percent SMS Senders by Constituency

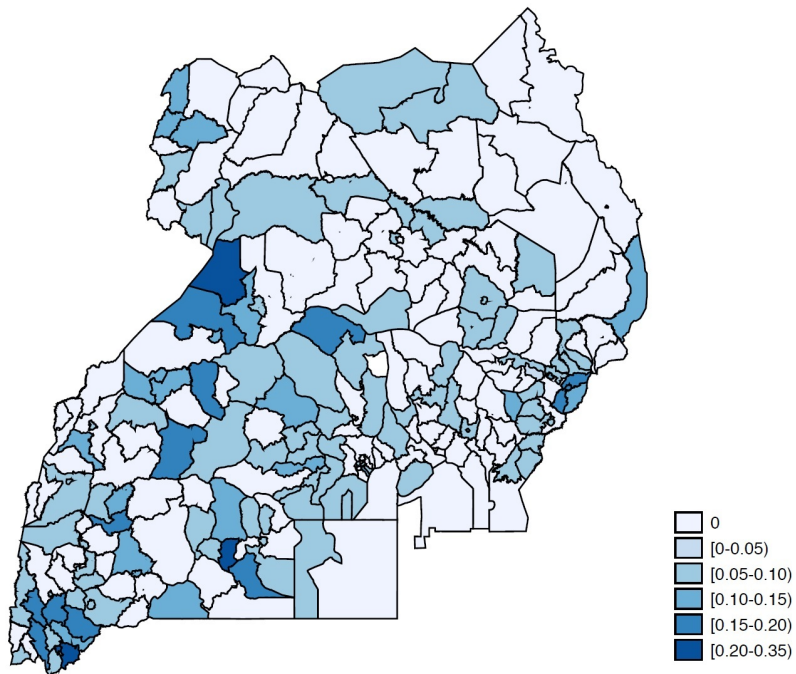


Figure 8: Uptake by Constituency

5 Conclusion

To assess how information technologies affect the nature of political interest articulation, we provided a representative sample of constituents with access to a communication platform akin to those being developed by national parliaments and nongovernmental organizations. As part of the experiment we introduced variations in the prices faced by constituents.

The experiment allows us to assess a concern raised by many: that new technologies will only exacerbate existing inequalities in access to politics. Our results suggest that this concern is misplaced. We find that opening a new low cost IT communication channel can flatten political access, as uptake among marginalized populations outpaces that by non-marginalized groups.

The experiment also allows us to assess the role played by prices. Simple logics suggest that higher prices could alter not just the quantity of messaging but also the type of messaging. To assess effects on message type we focused especially on whether higher pricing would lead to a selecting out of poorer constituents and a decreased focus on issues of concern to them and a general shift towards communication relating to the provision of more private rather than public goods. We find, as expected, that providing a full-subsidy for messaging increases uptake—by as much as 42% compared to communication at market prices. However subsidization does not lead to greater flattening. Contrary to our expectations, more marginalized voters are *less* price-sensitive than more connected voters. These combined findings have important policy implications as more governments are contemplating the introduction of ICT innovations.

Our finding that poorer constituents are not more price-sensitive than richer constituents when interest articulation is at stake contrast results generated from survey data, discussed above. NDI finds that voters' self-reported *intention* to contact their MP using SMS-messaging has significant heterogeneous *hypothetical* price effects by voters' income-level. Our findings reaffirms the importance of measuring costly behavior rather than simply relying on survey responses, which are more likely to be affected by various biases. In comparing survey responses to a field experiment results under similar conditions, this paper contributes also to the debate concerning the external validity of survey experiments.

We find only very weak evidence that price affects the *type* of messages that get communicated. Making access to the communication technology free increases uptake across all populations of interest, but it does not necessarily encourage the participation of populations with different set of priorities, compared to existing communication channels. Moreover we do not find a strong effect of price on the types of communication undertaken by constituents. Though we find some evidence that information received when prices are low is of a more public nature, this result is hardly robust. In sum, our findings suggest that subsidizing the price of using ICT systems will likely result in politicians facing more demands, in more marginalized constituents making their voice heard, but the nature of these demands is not likely to fundamentally change.

We close with a comment on external validity. Ours is a case study of political communication in Uganda, and like all results derived from single case studies we need to be cautious regarding the implications for other sites. Ultimately confidence in the generality of the findings will depend upon replication elsewhere. We note however that our analysis of heterogeneous effects suggested that the patterns that we found here did not depend sharply on features such as the competitiveness of constituencies or attributes of politicians; nor did price effects depend strongly on the wealth of voters or their existing channels of access. These patterns suggest that these results may not be very sensitive to features of the case at hand. External validity depends however not just on the case but also the form of the intervention studied. In our case we delivered a technology directly to a nationally representative sample of voters. Since our sample was representative we have grounds to expect that the sample treatment effects examined here extend to the population. However the fact that the technology was delivered individually, and in private, to voters may have implications for external validity. First, the private delivery mechanism may not induce the common knowledge conditions or the opportunities for coordination that may be needed for strategic logics to take effect. Second, in employing a design with individual delivery, we provided voters with both a technology and a personal invitation to use it. For marginalized voters this personal invitation may provide an incentive to engage that is not typical of broadcast campaigns. Whether technology can flatten interest articulation in the absence of an invitation to politics of this form is an open question.

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Appendices

A Summary Statistics

Variable	n	Min	Mean	Median	Max	IQR	#NA
MP Age	7488	19.0	47.4	46.0	78.0	15.0	94
Women MP Age	7548	24.0	44.4	43.0	69.0	12.0	34
Margin of Victory	7515	0.0	0.2	0.2	0.9	0.3	67

Table 10: Summary Statistics II: Table of MP Covariates

Variable	n	Min	Mean	Median	Max	IQR	#NA
POOR	7553	-5.3	0.0	0.2	2.21	1.3	29
Radio ownership	7578	0.0	0.9	1.0	2.0	0.0	4
Television ownership	7578	0.0	0.1	0.0	1.0	0.0	4
Bicycle ownership	7579	0.0	0.5	0.0	1.0	1.0	3
Car Motorbike ownership	7579	0.0	0.1	0.0	1.0	0.0	3
Mobile phone ownership	7581	0.0	0.9	1.0	2.0	1.0	1
Computer ownership	7572	0.0	0.1	0.0	1.0	0.0	10
Education	7569	0.0	2.8	2.0	9.0	2.0	13
House material	7527	1.0	1.9	2.0	3.0	2.0	55
Drinking water	7222	0.0	0.7	1.0	1.0	1.0	360
Distance to water	7500	-180.0	-23.0	-15.0	0.0	25.0	82
Employment status	7582	0.0	0.9	1.0	2.0	2.0	0
Time spent working	3704	0.0	133772.9	56000.0	1500000	142080.5	3878
ACCESS	7582	-4.9	0.0	0.1	12.7	0.9	0
Frequency of travel	7582	0.0	0.7	1.0	1.0	1.0	0
Computer access	7582	0.0	0.1	0.0	1.0	0.0	0
Phone use	7579	0.0	0.9	1.0	1.0	0.0	3
Frequency SMS usage	7548	0.0	1.3	0.0	105.0	1.0	34

Proximity to district capital	7582	-169.5	-22.8	-17.1	0.0	19.5	0
ENGAGED	7582	-3.1	0.0	0.0	3.7	1.3	0
Talked to MP	5474	0.0	0.2	0.0	1.0	0.0	2108
Political party engagement	7582	0.0	0.2	0.0	1.0	0.0	0
Engagement with LC1	7582	0.0	0.2	0.0	1.0	0.0	0
Community meeting attendance	7577	0.0	0.5	1.0	1.0	1.0	5
Raise issues at community meetings	7582	0.0	0.6	1.0	1.0	1.0	0
Attend demonstrations	7550	0.0	0.1	0.0	1.0	0.0	32
MARGINALIZATION	7582	-2.0	0.0	0.0	5.4	1.4	0
Poor	7553	-5.3	0.0	0.2	2.7	1.3	29
Woman	7582	0.0	0.5	0.0	1.0	1.0	0
NonCoethnic	7335	0.0	0.3	0.0	1.0	1.0	247
NonCogender	7582	0.0	0.5	0.0	1.0	1.0	0
Distance to district capital	7582	0.0	22.8	17.1	169.5	19.5	0
Education	7569	0.0	2.8	2.0	9.0	2.0	13

Table 11: Table of Citizen Covars

B Balance

We report covariate balance across the three treatment groups for wealth (continuous), gender (binary), age (continuous) and education (ten category variable). In addition, we test the balance of the our access and engagement indicators. In Figure 9, for each variable we provide (a) standardized mean deviations by treatment, which allows us to use a similar scale for all covariates (row 1), and (b) the full distribution of the variables in their original scale by treatment status (rows 2-4).

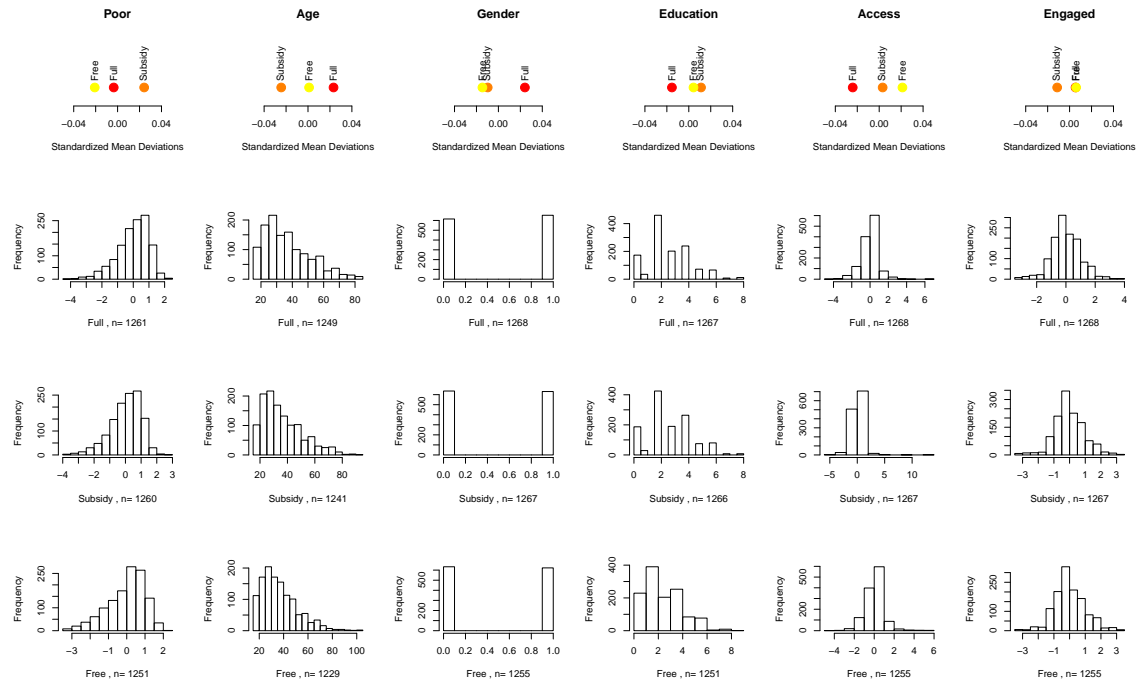


Figure 9: The distribution of key pretreatment covariates broken down by each price range (treatment groups). The top row shows means for each group in units of standard deviation of the covariate in question.


C Treatment

Figure 10: User Instruction Flyer (Free SMS Condition)

Use your phone to send a message to your MP!

1 WRITE YOUR MESSAGE!

Your Message has to include your code before the body of the message.



2 PRIVACY

If you would like to keep your mobile number private, so it can't be seen by your MP, put an "X" at the end of your message.

3 SEND IT TO THE NUMBER FOR YOUR NETWORK

Airtel	0759097410
MTN	0789113094
Orange	0791718601
UTL	0718535801
Warid	0704320855

4

message cost the same as a standard SMS

5 CONFIRMATION MESSAGE


You will receive an SMS showing you that we received your message and that your airtime will be sent shortly.

EXAMPLE 1 .

- My code is XXXX.
- I compose a message directed to my MP with all relevant information: "XXXX Hospitals in West Nile Nebbi are not getting enough drugs."
- I am on Warid, so I send to 0704320855.
- I will receive a confirmation message and an airtime reimbursement soon.

EXAMPLE 2.

- My code is XXXX.
- I don't want my contact information to be shared. I compose a message directed to my MP with all relevant information: "XXXX Primary education in Mbale is poor, we need better teachers. X"
- I am on Airtel, so I send to 0759097410.
- I will receive a confirmation message and an airtime reimbursement.



Note: Messages sent will only be shared with the research team and your MP. If you use an "X" to indicate you want your phone number to remain private, we will not share it with your MP. If you do not have a code, send a message including your full name and village. If you do not receive an airtime reimbursement, call the number you sent the original SMS to. We will call you back.

"Send a Message to Your MP" is part of a research project being implemented by Columbia University.