E-Government and Democracy in Botswana

Observational and Experimental Evidence on the Effects of E-Government Usage on Political Attitudes

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Online Appendix:

https://www.die-gdi.de/discussion-paper/article/e-government-and-democracy-in-botswana-observational-and-experimental-evidence-on-the-effect-of-e-government-usage-on-political-attitudes/

A: Regression results of the observational analysis

B: Survey design

C: Questionnaire

Abbreviations

BPC	Botswana Power Corporation
BURS	Botswana Unified Revenue Service
BWP	Botswana Pula
EA	enumeration area
ICT	Information and communication technology
PAYE	pay-as-you-earn
RCT	randomised control trials
RI	randomisation inference
WUC	Water Utilities Corporation

Executive summary

This discussion paper assesses the effects of electronic government (e-government) usage in Botswana on citizens' attitudes towards democracy. Electronic governance promises to make state–citizen interactions faster, smoother and more effective. But changes to state–citizen interactions may also affect how democracy itself works. Citizens may think differently about a state or government that interacts with them by digital means. We propose three mechanisms by which e-government may affect citizens' attitudes. The "empowerment mechanism" focuses on the increased accessibility of information provided by these tools and suggests it may empower citizens and incentivise them to become more active participants in a democracy. The "appeasement mechanism" focuses on the increased effectiveness of electronic tools and suggests it may increase citizens' satisfaction with the regime. The "equal treatment mechanism" focuses on the highly standardised procedures of digital tools and suggests that e-government, by decreasing opportunities for the preferential treatment of influential individuals, might increase the level of trust in the system, and in society at large.

The metropolitan area around Botswana's capital, Gaborone, serves as a case study to examine these three hypotheses. Being both highly digitised and democratic, Botswana offers variation in both variables of interest. Should e-government have the liberating effects that we hypothesise, Botswana is a likely case where they should be observable. Implications from this paper may to some degree be transferable to other democracies in southern Africa and the Global South that are at the doorstep of implementing digital administrations.

Empirically, this paper builds on an experimental treatment and a representative survey with more than 2,000 observations in the Greater Gaborone metropolitan area. Jointly with the Botswana Unified Revenue Service, we sent a text message to 68,000 randomly selected taxpayers, encouraging them to file their tax returns electronically. The representative survey allowed us to (1) trace the reactions to this message, (2) collect information on the use and perceptions of digital tools among the respondents as well as (3) collect rich information on their political attitudes with regard to various dimensions. In addition to the experimental analysis, we also analyse observational patterns in the survey data.

We find support for some, but not all, causal linkages suggested by our theory. The most robust evidence obtained from the experimental study confirms that our short message did increase the perception among citizens that the government cares for their needs. Interestingly, the observational analysis reveals that this perception is less widespread among e-government users, as compared to citizens relying on analogue state services. The fact that a minimal intervention such as a short message achieves such a remarkable effect makes us confident that accompanying the introduction of digital administration with outreach measures can be a useful approach to improve state–citizen interactions and increase citizens' levels of satisfaction. As for the empowerment hypothesis, we find e-government users to be politically more active, albeit we cannot exclude self-selection here, that is, more politically active citizens being more likely to adopt digital tools. As for the equal treatment hypothesis, we unexpectedly find a negative correlation between e-government usage and the perception that people are being treated equally before the law. This again may be a self-selection effect, if more distrustful citizens turn to digital means for circumventing suspected discrimination in personal interactions. It might also point at

the fact that trust in the digital procedures cannot be taken for granted, and citizens have to be convinced that the new mechanisms are actually more resistant against corruption.

Our findings imply that the introduction of e-government can affect citizens' attitudes. E-government is not "politically neutral". Contacting citizens and informing them about digital tools may constitute a crucial building block in making e-government attractive and accessible as well as in increasing its usage. To better include citizens in the design of such tools, it is recommended to monitor and evaluate tools and their usage in all implementation phases. Results also imply that e-government policies can be used by governments strategically, and even to manipulate perceptions. This calls for precautions as well as careful analysis and understanding of the motivations for which governments introduce these measures.

Further research is needed to better understand the effects of e-government on democracy. Within Botswana, usage of and reactions to other digital state–citizen interactions could be examined more closely in the future with rigorous means. Accompanying the introduction of new digital tools from the start with surveys would allow for tracing reactions from a pre-treatment baseline. More rural areas of the country should also be included. Other steps to increase the scope of this research will require including other countries in southern Africa and beyond. It would be particularly relevant to accompany the introduction of these tools in both democratic and autocratic contexts, enabling us to understand their conditional effects, but also their reception among the citizenry. Digitalisation, including the expansion of e-government, is unstoppable. We cannot ignore the fact that these processes will affect democracy and how citizens and states interact. Hence, it is crucial to understand how, and we hope this paper is a first step in this direction.

1 Introduction

This discussion paper aims at understanding whether and how the use of electronic government (e-government) services fosters democratic attitudes and social cohesion in emerging democracies. Information and communication technology (ICT) in general, and e-government services in particular, are rapidly being rolled out around the globe. A heated debate around the effects, risks and opportunities presented by ICT has emerged among scholars and practitioners. There is hope that more efficient communication leads to better preference aggregation, lower participation barriers and, broadly, more democratic political systems. But there are also fears that democracy may be compromised by increased surveillance and repression, fake news, interference in elections, sabotage of energy infrastructure and other strategies facilitated by digital tools. We investigate whether a particular type of ICT application – e-government services – affects individual attitudes towards democracy. To the best of our knowledge, this aspect has received little attention in the debates about digitalisation, although we know that citizens' attitudes are crucial for the development and sustenance of democracy (Almond & Verba, 1965).

ICT in general – and e-government in particular – are considered to be, and presented as, a solution to some of the challenges that bedevil liberal democracies (Diamond, 2010). High hopes accompanied the birth of e-government in the 1990s. Since then, its implementation has gained momentum across the world – among developed and developing countries alike. Netchaeva (2002, p. 467) argues that e-government represents a new method of governance that brings far-reaching changes and a different approach to the way government business is conducted. Interacting with government via online forms signals a marked departure from analogue means. Netchaeva further postulates that e-government "can make government institutions more transparent, help citizens to obtain access to public information and broaden their participation in the democratic processes". These are benefits that would improve a democratic polity at its core. Similarly, Meer, Gelders and Rotthier (2014, p. 489) suggest that the adoption of e-government services is meant to "improve the government–citizen dialogue". Evidently, the adoption of e-government has gained traction because of these and many other potential benefits associated with it.

However, Meer et al. (2014, p. 489) also retort that "it cannot be assumed that once the correct e-government technology is developed and in place, and once citizens are given access, benefits will be automatically delivered". They also note that, as much as there is a demand for countries to adopt e-government as a means of improving government and citizen interactions, their assessment of the literature has shown that "the potential of e-government to contribute to the government–citizen dialogue is minimal". Therefore, it cannot be conclusively declared that e-government automatically improves government–citizen interactions. This demonstrates that e-government is not necessarily an answer to the challenges confronting democratic governance (Kardan & Sadeghiani, 2011).

Our paper contributes to this debate on the effects of e-government tools, in particular, as well as to the debate on the future of democracy in a digital world, in general, by exploring the effects of e-government on political attitudes based on the case of Botswana. The majority of current research investigates the potential of ICT to be used as a tool of repression. In contrast, our work looks at the potentially positive effects of e-government that go beyond efficiency and effectiveness gains – issues that have received only little attention in the literature. We examine if there are positive spillover effects for democracy

and social cohesion. In methodological terms, our paper contributes to the discussion on the benefits of applying different methodological instruments – in our case, observational and experimental analyses – to the same object of research (LaLonde, 1986). Our research also yields benefits for the Tswana administration, as it assesses the satisfaction of end-users with e-government. Eventually, our paper in general – and our experiment in particular – can help in understanding how to incentivise people to get involved with e-services and expand their usage. In addition, it showcases methodological approaches that could find more use in the public administration.

Governments introduce e-government measures – the delivery of government information and services using ICT – predominantly for improving efficiency and effectiveness. Where internet access is cheap and widespread, information and services can often be delivered at lower prices with increased reach when using digital technology. E-government, however, has certain traits that may affect citizens' attitudes towards government and other citizens. We examine the effects of e-government on citizens' support for democracy, their satisfaction with the regime and their interpersonal trust. The remainder of this discussion paper subsumes these three attitudes under the label "political attitudes".

For each of the three attitudes analysed – citizens' support for democracy, their satisfaction with the regime and their interpersonal trust – we develop a causal mechanism through which the respective effect materialises. As for supporting democracy, e-government empowers citizens in various ways that may make them appreciate the advantages of democratic governance. It creates transparency by increasing the chances that information becomes public, which facilitates the participation of citizens in governance. As for satisfaction with the regime, the increased efficiency and effectiveness of public services[1] supported by digital tools should increase citizens' levels of satisfaction. Satisfaction with outcomes should appease citizens, even if they are not empowered to participate in political activities. This appeasement mechanism should thus also apply in both democratic and non-democratic settings. As for interpersonal trust, e-government standardises access to public services. In doing so, digital procedures reduce leeway for preferential treatment, which should reduce levels of mistrust and suspicions that fellow citizens might be abusing the system. Individuals and subgroups that enjoy access to gatekeepers in politics and administration will be less likely to benefit from their personal ties. Removing preferential treatment should improve confidence that others are adhering to the rules, and thus increase the degree of general interpersonal trust. We label this last mechanism the equal treatment mechanism.

In order to test these mechanisms, we rely on observational and experimental evidence from Botswana. We draw observational evidence by comparing the usage of different e-services, such as e-payment and electronic tax return filing, with political attitudes. We gain experimental evidence from an information campaign that incentivises the electronic filing (e-filing) of income tax returns, which has been in place for some years and enjoys comparatively high acceptance in Botswana. To implement the experiment, we cooperated with Botswana Unified Revenue Service (BURS) and relied on their infrastructure to encourage inhabitants of the Greater Gaborone area via SMS to file their tax returns

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1   We defined public services as services that the government is delivering to citizens, either directly or via state-owned enterprises.

electronically. Both the experiment and the observational study draw upon data from an original survey that allow us to closely observe political attitudes.

Although we do not identify a substantive general impact of all e-services tested, our survey finds evidence of small but significant relationships for some of them. Furthermore, our paper yields significant results for several of the linkages between the causal steps within our causal mechanisms. We find that e-government can empower citizens to engage in political activities, but also – and in contrast to our expectations – that it can increase the feeling of being treated unequally. In addition, although e-government usage is associated with the perception that government officials are *not* addressing the needs of the citizens, a simple message by the government that reminds citizens of the available e-services in fact makes them feel that their needs are being addressed. This suggests that complementing e-service provision with a more personal note might be a promising and attractive path for governments seeking to introduce them.

2   Theory: Effects of e-government services on political attitudes

For describing the connection between e-services and political attitudes, we develop three causal mechanisms that deal with e-services and political attitudes at the macro level, and change in individual attitudes at the micro level. The causal mechanisms derive from the body of literature dealing with e-government and democracy.

The term "democracy" enjoys a broad variety of definitions in the literature and, hence, requires clarification. We define democracy following Schedler (1998, p. 92), who himself builds on Dahl (1971): "civil and political rights plus fair, competitive, and inclusive elections". We thus focus on what is often labelled as "liberal democracies" or, in Dahl's (1971) words, "polyarchies". Although this brief definition may be sufficient to define the core of democracy, it is insufficient when it comes to assessing democratic consolidation (Schedler, 2001). Here, the role of civil society is crucial. According to Dahl, a supplementing element to polyarchy is pluralism, defined as the diversity of social organisations (Dahl, 1984, p. 232). Pluralism is important for the representation of the diversity within a society and for making governments more easily accountable through the power of many. Diversity and different associations are perceived as positively contributing to the common good through increased competition and display of various opinions. Democracies with diverse civil societies are also expected to be more resilient (Lipset, 1959, p. 97). In a similar vein, individual political attitudes are strongly linked with the development and sustenance of democracies (Almond & Verba, 1965; Claassen, 2019; Lipset, 1959). This is especially true for individual support for democracy (Diamond, 1999), which – if widespread throughout society – may "provide a valuable cushion that help[s] democracies to prevent the emergence of crises, as well as to overcome critical moments as they arise" (Schedler, 2001, p. 75). These individual political attitudes, however, may arise from a wide range of different sources (Schedler, 2001, p. 75). In the following, we focus on e-government usage as such a source.

The usage of the term "e-government" and other related terms is not consistent in the literature and requires clarification. "E-government" is usually considered a rather narrow technical process in the public administration literature, and a more comprehensive governing mechanism in democracy research. In public administration, e-government is a

service-oriented concept that aims to improve efficiency, effectiveness and cost-cutting by digitalising administrative processes (Hofmann, Kersting, Ritzi, & Schünemann, 2019, p. 189). Despite this technical and modernising approach, we find e-government underlined by a normative rationale. In this regard, e-government is seen as a tool to develop and reform the way governments organise their action as well as inform and interact with citizens. E-government is meant to improve transparency in government action and foster its output legitimacy. Accordingly, e-government should help to achieve better governance (Schünemann & Kneuer, 2019, p. 23).

Kneuer (2016, p. 669) comprehends e-democracy as an overarching model for e-participation and e-government. E-democracy describes all activities within a political process that aim to improve the state–citizen relationship, and thus it goes beyond the concept of e-government (Hofmann et al., 2019, p. 189). E-participation, however, means active participation and decision-making by using digital tools (Freeman & Quirke, 2013, p. 143). E-voting for referendums and political elections is potentially the most consequential implementation of e-democracy. However, this process puts high demands on data privacy and protection (Spirakis, Spiraki, & Nikolopoulos, 2010, p. 80). Whereas e-participation and e-voting are interactive forms of e-democracy by definition, e-government may also take non-interactive forms, such as information provision. We examine here e-government usage in the broad sense, but not e-democracy or e-participation activities.

2.1 State of the art: E-government and democracy

ICT is considered to be a potential game changer for how societies organise the interactions between citizens and governments. One major aim of e-government is to reduce "the distance between citizens and governments" (Meer et al., 2014, p. 490). Thus, the rise of e-government was met with "great enthusiasm amidst the promise that ICT might fulfil the demands and expectations for improved democratic governance" (Roman & Miller, 2013, p. 65). However, only a few empirical studies so far explicitly assess the question whether e-government alters citizens' political attitudes in the short run, and democracy in the long run. The most relevant studies for our project are those that examine the effects of ICT on (1) support for democracy, (2) satisfaction with regime performance and (3) trust between citizens and towards government.

Although crucial for democracy, gathering information from state institutions and using public services is often burdensome for citizens. If well-implemented,[2] e-government can ease these tasks by granting citizens an opportunity to become involved in government processes and to inform themselves about new strategies, policies and laws (Jaeger, 2005, p. 704). In a way, e-government establishes an easy way of getting in touch, which may make citizens feel less distant from their government. In other words, e-government has the potential to strengthen the relationship between government and citizens through participatory and customer-oriented means.

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2   If e-government is not working well, obviously no positive effects are to be expected. Thus, all the potential benefits of e-government that are discussed theoretically and examined empirically in this discussion paper assume it to be well-implemented.

Public administration processes are also often costly and time-consuming for the bureaucracy that executes them. Where e-government is implemented, information provision and service delivery require fewer personnel and yield results more quickly. Thus, it can act as a cost-saving mechanism. In addition, citizens obtain the possibility to gather information at any time, day or night. Information and services provided by digital means also cut through traditional hierarchies and administrative routines, which may lead to faster procedures and, subsequently, to gains in effectiveness and efficiency (Jaeger, 2005, p. 703). Citizens may perceive these effects and appreciate an improved use of resources and a reduction in the administrative burden imposed on them. This is likely to increase the level of satisfaction towards their government.

The use of e-government can strengthen "public confidence in governments, which has been declining for several decades in many democratic countries", and tighten the bond among citizens as well as between citizens and governments (Jaeger, 2005, p. 705). With regard to social cleavages, e-government works as a potential unifier and stabiliser. Through digital networks, remote areas and poorer parts of the population gain access to information and services – at least as long as they are included in the digital process. Otherwise, the digital divide may deepen (Kyem, 2016, p. 3; Norris, 2001, p. 6). Furthermore, e-government leads to a standardisation of processes, reduces opportunities for (corrupt) individuals to interfere in these and makes it easier to trace the course of events in cases where something goes wrong. As a result, all citizens can expect to go through the same procedure. This may lead to increased interpersonal trust as well as greater levels of trust towards the government as citizens become aware of the fact that everyone is receiving equal treatment (Roman & Miller, 2013, p. 65; Tolbert & Mossberger, 2006, p. 355).

2.2 Causal mechanisms

We develop three causal mechanisms that delineate the effects of e-government services on democracy at the macro level via an effect on individual political attitudes at the micro level. Most of the literature focuses purely on the macro level. We examine the impact of e-government on the political attitudes of individuals and thereby contribute to an understanding of the microfoundations of the mechanisms. Individual values and attitudes are crucial for the development and sustenance of democracy (Almond & Verba, 1965; Claassen, 2019; Lipset, 1959). According to Schedler, individual political attitudes demonstrate whether an actor's rationality conforms to the requirements of consolidated democracies (Schedler, 2001, p. 75). These attitudes can change according to the experiences that citizens have with their governments and their public services. The general expectation is: "the more democratic the regime, the more supportive its citizens" (Schedler, 2001, p. 76). E-government services, however, may affect political attitudes in various ways. We suggest three mechanisms through which e-government services can have an influence on political attitudes.

Each of the causal mechanisms follows the structure of Coleman's bathtub (Coleman, 1994, p. 8). As Figure 1 shows, the introduction of e-government at the macro level (step A) can affect individual citizens at the micro level (step B). These effects on the individual may lead to changes in citizens' political attitudes (step C). The aggregate effect of these individual changes results in effects on the institutional state of the political system (step D)

and leads us back to the macro level. That way, the macro level-outcome (step D) of macro-level measures (step A) can be explained through effects on the individual level. For this purpose, our theory makes claims about the linkages between the different steps (see the arrows in Figure 1), that is, about how and why the steps are linked to each other.

Figure 1:	Meta-framework for our causal mechanisms

Source: Authors
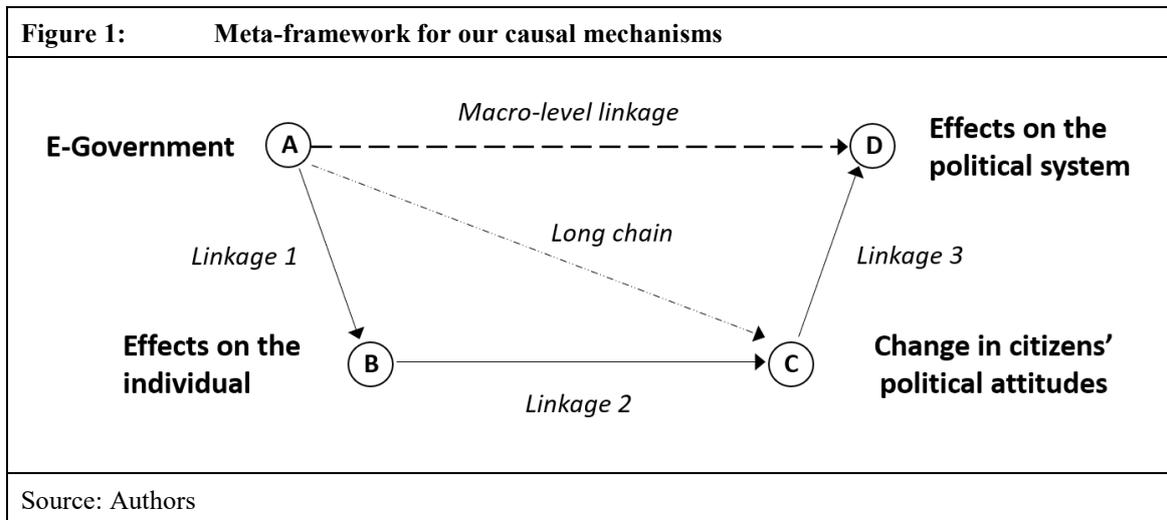
The overarching research topic that we deal with is the effects of e-government on political attitudes, and therefore is located on the macro level. Note, however, that the individual-level survey we conducted does not allow for detecting effects on the macro level. We can therefore only test the relationship between steps A, B and C. The relationship between step A and step C is what we refer to as the long causal chain. Using micro-level evidence, we can still draw conclusions for the macro level based on our theory.

2.2.1 The empowerment mechanism

By implementing e-government systems, governments are able to spread information more easily and to interact with citizens more closely through state institutions (see Figure 2). First, information dissemination is realised more quickly and easily through digital than analogue means. In the analogue world, citizens are required to visit offices or phone public officials within a limited time period, whereas digital information provision is accessible around the clock. Second, by providing information and services in a standardised and universally accessible way, traditional gatekeepers lose leverage in controlling access and siphoning rents. As a result, governments and their agents become more transparent and provide low-threshold access to their services, while citizens gain knowledge about governmental processes or benefits they may be eligible for. This reduces power asymmetries between government and citizens. Official wrongdoing can be better observed and sanctioned if the government's actions and goals are made transparent (Meer et al., 2014, p. 494). All of this, obviously, presumes that governments raise awareness about the new digital means as well as that citizens have access to – and the skills necessary to use – electronic devices.

Figure 2: **Empowerment mechanism**

Source: Authors
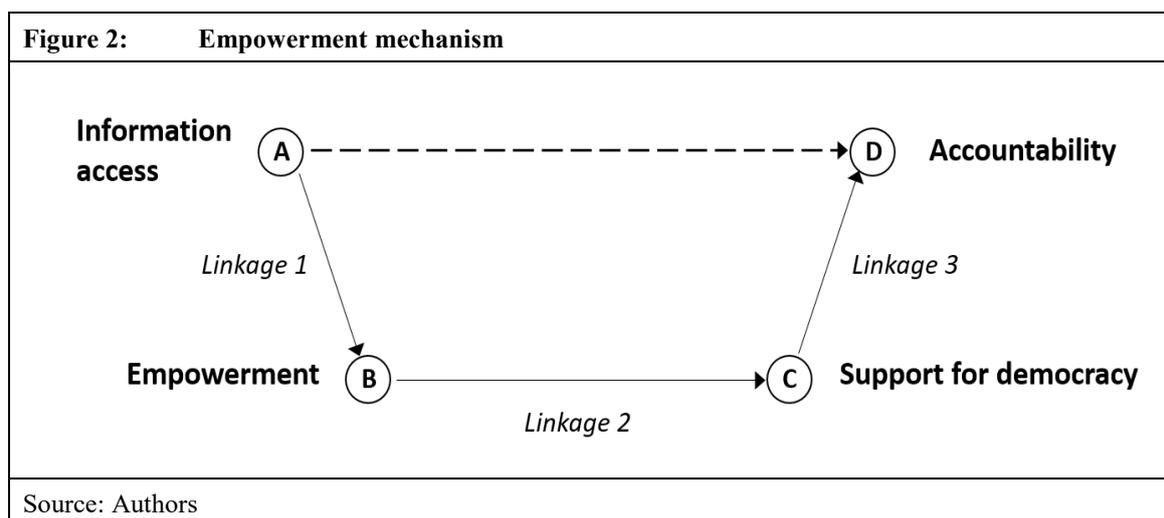
As a result of this increased knowledge (step A), citizens may become more conscious of opportunities to influence decision-making. This may foster a feeling of empowerment (step B) (Jain & Akakandelwa, 2014), which, accompanied by an increased understanding of political debates and processes, may encourage citizens to participate politically in one way or another. Individuals might be more inclined to contact politicians or bureaucrats directly in order to raise demands or complaints. Some may organise themselves in interest groups aiming to influence redistributive processes. Of course, not every empowered citizen will automatically become politically active. The individual way of acting is constrained by, for example, loyalty, trade-offs and personal attitudes. Access to information and empowerment tools therefore has to be offered, taking into consideration the broader political, social and cultural context (Grossman, Humphreys, & Sacramone-Lutz, 2014, 2020). Nevertheless, experiences of effective engagement, in turn, may foster individual support for democracy (Chu, Bratton, Lagos, Shastri, & Tessler, 2008) (step C), especially if the citizens experience that their actions make a difference (Grossman, Platas, & Rodden, 2018).

At the macro level, increased individual participation should lead to a generally more critical and politically active society. Ideas and demands are raised and articulated towards the government more easily and often, which enables the government to obtain more information about their citizens' preferences. And when more citizens realise that the government cares about the requests, comments and concerns raised through digital means, the government is held accountable for its promises and actions to a greater extent. Governments are hence not only able, but also somewhat obliged, to serve as better citizen representatives – at least as long as they aim to gain high vote shares. As a result, government accountability and responsiveness can be expected to increase (step D).

This leads us to the following hypothesis:

H1: Citizens interacting digitally with state institutions to receive services develop more support for democracy.

2.2.2 The appeasement mechanism

Governments have various motives to implement e-government tools. We expect that gains in efficiency and effectiveness (Schuppan, 2009, p. 119) rank among the top motives for embracing these tools (see Figure 3). First, the implementation of many e-government solutions – especially non-interactive ones such as information dissemination – is rather simple. Second, implementing e-government systems usually provides huge benefits for citizens. Where citizens used to spend lots of time applying for a certain document or gathering specific information, e-government tools speed up these processes. Not only do citizens see results faster, information and services are also available around the clock and from anywhere, provided that citizens have access to the internet. In other words, e-government tools enhance efficiency.

For citizens, efficiency and effectiveness gains usually means investing less time in commonly time-consuming and complex administrative processes, such as filing taxes or obtaining a licence (step A). As citizens realise that it saves on time, costs and resources, they feel acknowledged by the government. In addition, on a more emotional level, e-government solutions trigger the idea of availability, suggesting that the government has open channels to the citizens. As a result, citizens can be expected to feel that the regime was responsive to their needs (step B), which may potentially increase their level of satisfaction with the regime (step C).

Figure 3:   Appeasement mechanism

Source: Authors
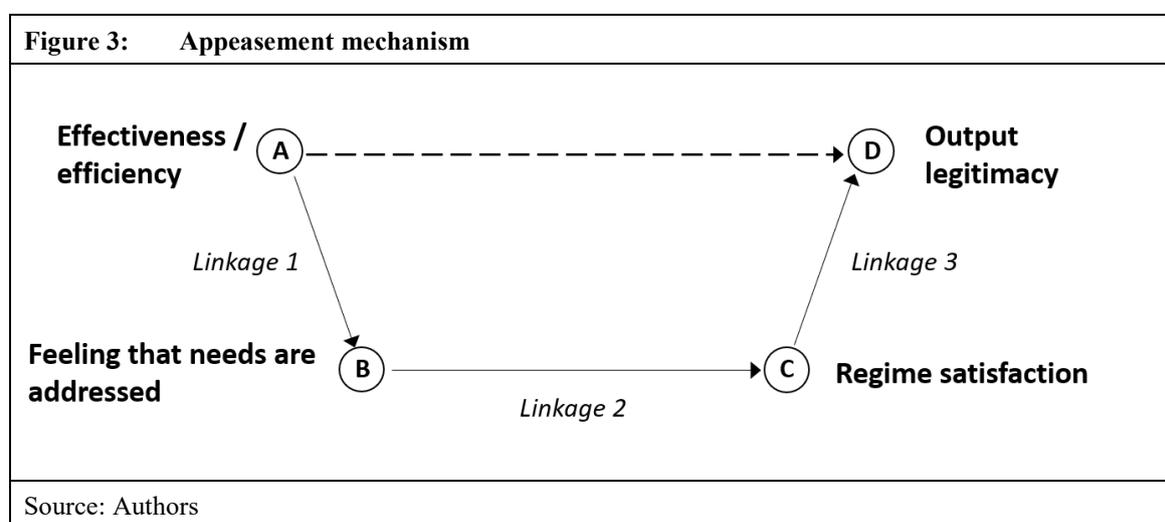
Increased satisfaction with the regime may be visible in higher membership numbers and increased vote shares for the incumbent party or in reduced levels of participation against government decisions, for example demonstrations and strikes. Generally, the appeasement mechanism is expected to have an outcome that fosters and strengthens the political support of citizens for the regime and increases the governments' output legitimacy (step D). It is important to know that this mechanism could work irrespective of the regime characteristics. Both democratic and autocratic regimes could boost their legitimacy through this path. The reasoning above leads us to the following hypothesis:

> H2: Citizens interacting digitally with state institutions to receive services are more satisfied with the current political regime.

2.2.3 The equal treatment mechanism

Standardised digital procedures, in comparison to analogue procedures, enforce the equal treatment of individuals and thus help reduce perceptions of arbitrary case handling (Schuppan, 2009, p. 121). By strengthening the idea that everyone plays by the same rules, this reduction should increase the degree of interpersonal trust[3] (see Figure 4). Analogue procedures tend to have more face-to-face interactions, which facilitate corruption and give weight to personal networks and influence. By contrast, in digital processes, there are fewer opportunities to manipulate procedures or data for personal gain because there are hurdles in terms of technical know-how, and these processes are easier to detect post factum (step A) (Elbahnasawy, 2014).

Citizens that were not – or at least perceived not to be – treated in the same way as others by government officials may feel a sense of rejection, exclusion or dissatisfaction. Such feelings may be widespread, especially in divided societies. Human beings categorise themselves into groups with similar social identities. If within these groups the feeling of being discriminated against is widespread, the sense of community – and particularly trust – could be weakened and, ultimately, social cohesion could be undermined. Yet, when the state is perceived to be more neutral due to interaction via e-government tools, trust in the state and other citizens may spread more easily. Accusations or perceptions of unfair preferential treatment are less likely to occur. We expect individuals to take note of the resulting universally equal application of state institutions' procedures once they have used e-government solutions (step B). The experience and perception of being treated equally is expected to lead citizens to develop more trust. This should be the case regarding trust in the public administration (Roman & Miller, 2013, p. 65; Tolbert & Mossberger, 2006, p. 355), as well as in fellow citizens (Freitag & Bühlmann, 2009) based on the idea that this experience triggers the feeling that personal characteristics are not determinative in how individuals are treated (step C).

Figure 4: **Equal treatment mechanism**

Source: Authors

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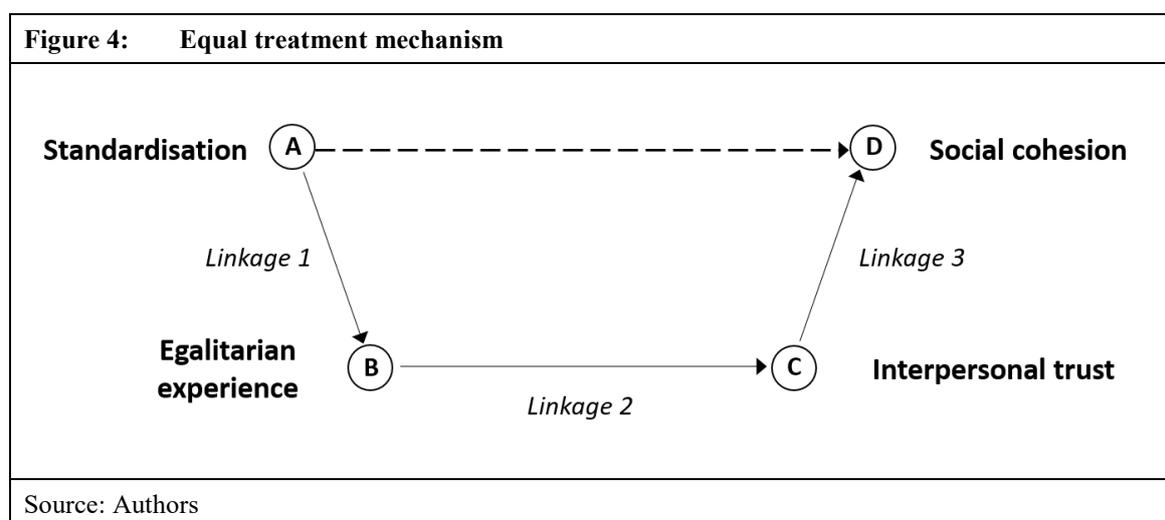
3   We define the term "interpersonal trust" as synonymous with generalised trust, that is, trust in the majority of unknown people.

If more and more citizens develop a sense of belonging, and if trust among them increases, it can foster social cohesion among the society as a whole (Leininger et al., in press) (step D). Social cohesion, in turn, can be regarded a main requisite for the stability and sustenance of societies. Since democracies – in contrast to autocracies – heavily depend on, and are defined by, their societies, increased social cohesion can be seen as strengthening a country's democracy. Hence, we expect the implementation of e-government systems to bolster democracy through an increased sense of fairness based on egalitarian experience and standardisation that leads to increased interpersonal trust and social cohesion.

This leads us to the following hypothesis:

> *H3: Citizens interacting digitally with state institutions to receive services develop higher levels of interpersonal trust.*

3 Research design: Identifying the effects of e-government on political attitudes

Each causal mechanism has observational implications, that is, empirically detectable manifestations that we should be able to trace if our theory's predictions are correct and if our data allow for adequate testing. Extant secondary data would not have allowed us to capture all the relevant observable implications of the mechanisms we have put forward. We thus conducted a survey in Gaborone, the capital of Botswana, that enables us to trace the observable implications for the individual-level components of the developed mechanisms. Using these data in an observational as well as in an experimental design, we can thoroughly test our hypotheses.

3.1 Observable implications

The first mechanism purports an effect of e-government exposure on empowerment, which in turn leads to increased support for democracy. For our hypothesis to be true, we would first need to observe citizens actually using e-government tools. Feeling empowered should translate into individual actions that display the self-confidence and the ability to take matters into one's hand – be it on one's own behalf or on the behalf of others. Individual support for democracy should be observable in individuals' attitudes towards different regime types. The second mechanism argues that, through fostering feelings of being acknowledged by the government, effective digital service provision results in satisfaction with the regime. Again, for our hypothesis to be true, we would first need to observe citizens actually using e-government tools. Feelings of being acknowledged by the government should come along with a certain degree of appreciation for governmental action. In addition, if people are satisfied with the regime, they will most likely think that things are going well in their country. The third mechanism expects a change in interpersonal trust through e-government-induced egalitarian experiences. Once more, for our hypothesis to be true, we would first need to observe citizens actually using e-government tools. If people experience interactions with the state by digital means as egalitarian, they should regard treatment by state officials as being less unequal. Interpersonal trust should translate into higher trust in strangers.

3.2 Case selection

We chose Botswana to study the effect of e-government on political attitudes towards democracy for six interrelated reasons:

(1) Research gap: The political implications of ICT in the Global South have not received sufficient attention. The positive effects of ICT on democracy have mainly been investigated in Western democracies (e.g. Lilleker & Koc-Michalska, 2017), but hardly within the context of the Global South, albeit there is a lot of potential to improve democracy in this part of the world (Emmanuel, 2012; Lynch & Crawford, 2011). Our discussion paper will thus contribute to the overarching question of whether digitalisation can fulfil its promise of being a liberating force that spreads democratic norms and practices beyond the realm of the Organisation for Economic Co-operation and Development (see Diamond, 2010).

(2) Most-likely case: Being a stable democracy, potentially at the verge of becoming a liberal democracy (Bertelsmann Stiftung, 2018; V-Dem Institute, 2019), makes Botswana a particularly receptive candidate for experiencing the liberating effects of e-government on democratic attitudes. In more autocratic settings, we would expect the negative effects of e-government to be more likely to materialise and to dominate any potential positive effects. Botswana thus constitutes a most-likely case to find democracy-strengthening effects.

(3) Variation and exposure: Botswana provides substantial exposure to, and essential variation in, e-government usage within the country. Since we are examining only one country, variation of the explanatory variable within the case is important. In international comparison, ICT is fairly developed in Botswana, which ranks 5th in Africa's regional index of the ICT Development Index 2017. Botswana has been pursuing an ambitious e-government strategy since 2007.

(4) Timing: The fact that most e-government measures have only been introduced recently and are currently expanding provides additional variation over time, which is valuable for assessing causal links.

(5) Feasibility: With a large share of the population clustering in the metropolitan area of Gaborone, politically and economically centralised Botswana provides a feasible setting for conducting a survey with a limited timeline and budget. Gaborone has the highest concentration of available ICT services within the country (Statistics Botswana, 2017, p. 13). All major political and economic activities in Botswana are conducted in the metropolitan area of Gaborone. This gives us access to government officials and service providers.

(6) Role model: Knowledge gained from the case of Botswana may to some degree provide inspiration for the broader region and other stable democracies in the Global South that adopt e-government technology. Studying the country's experiences stands to offer lessons to some countries because this is the direction that emerging democracies – especially those in the Global South – are heading.

3.3 The state of ICT and e-government in Botswana

Over the past years, there has been a steady increase in internet usage in Botswana. According to Statistics Botswana, there were 1,997,322 internet subscriptions at the beginning of 2019, of which more than 1.9 million were mobile internet users and only about 59,000 were broadband users (Statistics Botswana, 2019, p. 9). Percentage-wise, 43.70 per cent of households in Botswana were connected to the internet in 2017 (ITU, 2017). In total, more than 3.2 million mobile telephone subscriptions were reported in 2017, far more than one per inhabitant (Botswana Communications Regulatory Authority, 2017, p. 11).[4] Starting with Botswana's first ICT strategy in 2007, the government aimed at improving ICT access and quality. During the daytime, Gaborone's mobile networks provide fast data-transfer rates; in the evening and during the recent Covid-19 lockdown, however, most networks temporarily stall.

Botswana's latest e-government strategy was supposed to be implemented from 2015 to 2021 in pursuit of the mission to become an integrated government by providing universal access to services (Government Modernization Office, s.a., p. 6). To date, it seems as if the government is no longer implementing that strategy. According to government officials, a new strategy is in motion. However, it is still unclear when it will be implemented. The previous strategy focused on connectivity between government agencies as well as on the relationship between government and civil society as well as businesses. Several e-government services were established, such as online payment systems for water and electricity services; the possibility for individual income or value added tax returns; Botswana e-Laws, which is a website informing about all laws of the republic; and a digital Livestock Identification and Traceback System for cattle. Several ministries also provide information and forms that can be downloaded on their websites, but they do not offer the possibility of submitting them online. The remaining challenges in Botswana's ICT situation are a lack of competition for lowering access prices and unequal territorial and social penetration, especially when it comes to fixed landlines.

3.4 The state of democracy in Botswana

The state of democracy in sub-Saharan Africa, and Botswana in particular, has been a subject of investigation by political scientists ever since the third wave of democratisation. There are a few countries that stand out in sub-Saharan Africa, including Botswana. One of the evident things that separates it from other countries in the region is the stability of its multiparty democracy, having now been sustained for more than 53 years. The moot question, however, is: How was this possible in a region where so many democracies failed? The theoretical literature proposes a positive association between political culture and the survival of democracy (Diamond, 1999; Sheafer & Shenhav, 2012). Studies on Botswana's democracy also affirm the proposition that the country's political culture has strengthened its democracy (Sebudubudu, 2017). Botswana in the main qualifies to be identified as a liberal democracy – its limitations notwithstanding. Despite having functioned as a relative democracy for more than 53 years, its democracy has so far failed to progress to the stage

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4 These numbers might appear surprising since Botswana has only around 2.3 million inhabitants. Note that many people use more than one sim card to combine advantages from different tariff and voucher systems.

of consolidation (Sebudubudu, 2017). In fact, the main concerns are about the quality of its democracy, which has stagnated. As a result, we highlight some deficiencies confronting its democracy.

Section one of the country's constitution proclaims Botswana as a republic. Citizens have the right to decide upon a government of their choice through an election, on a regular basis. The country has so far held 12 multi-party elections. They were all won by the ruling Botswana Democratic Party, hence rendering Botswana, like most countries in the region, a system dominated by one party that has not yet passed the single- or even two-turnover test. The literature advances a number of explanations that account for this one-party dominance in Botswana (de Jager & du Toit, 2012).

In Botswana, elections are organised by the Independent Electoral Commission (previously by the Supervisor of Elections). Although elections in Botswana have not been associated with violence and have been declared as free by election observers, concerns can be raised with regard to the independence of the electoral authority and the fairness of the electoral process. For instance, the Secretary of the Commission is appointed by the President. In terms of the electoral system, Botswana has used the first-past-the-post, or simple majority, electoral system, to date. This electoral system has been criticised for working in favour of the dominant party, and thus disadvantaging the opposition, even with a decline in the popular vote of the main party (Sebudubudu & Maripe, 2013).

In addition to the electoral system working to the advantage of the main party, the playing field is also unbalanced. That is, the ruling party has more access to resources than other parties, slanting the competition in its favour. It also enjoys more coverage from the state media than opposition parties. This is worsened by the fact that there is no public funding of political parties. In this way, Botswana has been a multi-party democracy without any real competition taking place (Sebudubudu & Maripe, 2013).

As the organ that is expected to safeguard the interests of the electorate, the parliament is weak in relation to the executive because the executive has excessive authority. Botswana is a constitutional democracy. The constitution is the supreme authority, and not parliament. The parliament in Botswana is composed of the National Assembly and the President. In terms of the Botswana Constitution, Botswana has an executive presidency, as is the case in most African countries. The President enjoys a wide range of powers, including the power and authority to appoint cabinet members and a number of senior public officers. Members of cabinet are drawn from parliament, and they are appointed and serve at the pleasure of the President. Currently, there are more cabinet ministers than there are ordinary ruling party members in Parliament. This makes the Botswana Parliament weak and subjugated to the executive. Cabinet members are bound by the notion of collective responsibility, and as such they are hamstrung from criticising government initiatives.

As much as Botswana runs a constituency-based system, members of parliament do not enjoy autonomy because they are also bound and controlled by the party caucus decisions and rarely criticise government initiatives. Failure to abide by the party caucus attracts sanctions from the party, including expulsion. As a result, they are cowed into toeing the party line. As much as this, to a certain degree, applies to most democratic systems, the party discipline has far-reaching implications on the independence of individual members of parliament and parliament as a whole, reducing their ability to promote accountability.

As a result, parliament in its role as legislative is not that efficient or effective in holding the executive accountable. With parliament structurally – and in practice – feeble, the potential for checks and balances on executive power rests with the judiciary. The executive, however, in particular the President, plays a critical role in the appointment of judicial officials, closing another path through which the executive could be effectively constrained.

With an unbalanced playing field, the relevant potential for change towards liberalisation rests within civil society. In terms of democratic theory, one of the critical forces that defends democracy is civil society (Rueschemeyer, Stephens, Huber, & Stephens, 1992). This is because the development of democracy cannot be left to leaders. However, in the case of Botswana, things are different. The country has failed to develop and nurture the growth of civil society due to legislative obstacles. Despite these obstacles, a few civil society organisations, such as small private media and public-sector unions, were founded. One other factor that seems to work against the development of civil society is the country's political culture, which preaches submission to authority (Holm, 1996). In terms of the Tswana culture, "elders did most of the talking and their opinion was expected to prevail" (Holm, 1996, p. 99). In sum, Botswana is a relatively functional democracy with several structural flaws.

3.5 Overview of our methodological approaches

In order to assess the effects of e-government usage on political attitudes, we draw upon observational and experimental methods. The explanatory variable e-service exposure is observed through e-payment usage of public service providers as well as the usage of electronic tax filing. In the experimental setup, electronic tax filing was incentivised by the research team in cooperation with BURS. Combining the two sources of observational and experimental evidence allows us to benefit from the advantages of both approaches and mitigate against their respective drawbacks. Observational study designs use naturally occurring events to collect and analyse the resulting data. In contrast to experimental study designs, observational studies cannot control the assignment of the treatment to subjects. The difference in the outcome variable between "treated" and "non-treated" units yields the estimated average causal effect of the treatment if, and only if, we can control all potential confounders that affect both treatment and outcome. Since it is usual – and also in this specific case – that only some confounders can be observed and controlled for, many observational studies produce biased results. Hence, we have to adjust our confidence in the causal nature of the observed differences accordingly. One advantage of observational studies, however, is that they usually have strong external validity, as the treatment occurs among a relevant population in the real world (Imai, 2018, p. 54).

In experimental designs, or randomised controlled trials (RCTs), the subjects of study are randomly assigned to a treatment group and a control group: One group receives a treatment whereas the other does not. The difference in the outcome variables yields an estimated average causal effect that is much less likely to be affected by selection bias (i.e. treatment assignment is affected by certain features of the investigated units) than is the case in observational studies. A randomised selection of the subjects of study into control and treatment groups is essential because, to prevent confounding bias, the groups have to be as similar as possible to each other in every relevant aspect. Thus, if the groups do not differ

on average in their pre-treatment characteristics, we are able to interpret the difference in the outcome variables as the estimated average causal effect of the treatment (Imai, 2018, p. 50). RCTs can lack external validity due to sample selection bias (if the subjects of study are not representative of the target population) or if the environmental setup of the study does not resemble a real-world situation. However, RCTs are very useful for establishing causality, as we can isolate the effects of a treatment and quantify uncertainty (Imai, 2018, p. 48). Hence, if carried out correctly, RCTs yield high internal validity and allow us to rigorously trace attitudinal and behavioural changes.

4   Survey design

Our analysis – both observational and experimental – primarily relies on a face-to-face survey we conducted during our stay in Gaborone. The survey applies a custom-built questionnaire to gauge political attitudes in reaction to the usage of e-government by a representative sample of Batswana. In order to provide data that can be compared with the widely used Afrobarometer data, we use various well-tested questions from Afrobarometer Round 7. We collected information on more than 2,100 individuals.

This section outlines the applied survey design in detail. In order to attain a representative survey, successful randomisation is key. To guarantee the latter, we implemented randomisation procedures at multiple levels: at the level of the enumeration area (EA), the household and the individual level. The selection of survey participants builds upon a clustered sampling of EAs. Cluster sampling is a probability sampling technique in which the population is divided into multiple groups, so-called clusters. Every cluster of the population of interest has a known nonzero probability of being selected. That does not mean that every unit has the same probability of being selected, but rather that the probability of being selected is known in advance or after the selection has been made (Dorofeev & Grant, 2006, p. 8). The EAs of Gaborone were used to cluster the city; subsequently, a random walk technique was used to select households within the EAs. Within the households, participants were selected randomly using software. Based on this random selection of survey participants from all over the city, we can draw representative conclusions from the data that hold for Gaborone as a whole. The questionnaire was programmed for tablet computers to conduct the survey on site.[5]

4.1   Sampling frame

We employed a sampling frame of EAs developed by Statistics Botswana that is also used by Afrobarometer. An EA is a housing unit and comprises approximately 400 inhabitants. A map provided by Statistics Botswana enabled us to locate all 543 EAs in the city of Gaborone, including the suburbs of Mogoditshane and Tlokweng. As the provided map was dated 2010, we had to update a few EAs. We made adjustments according to recent demographic indicators and building developments. Using Google Earth, we estimated EA

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5   In Online Appendix B, the structure and preparation of our questionnaire is explained in detail.

populations according to the appearance of dwelling units on satellite images and cross-validated our results with data from Statistics Botswana.

During the survey, we employed quality checks on a daily basis. We evaluated the raw data, which was forwarded by the research assistants[6] every evening. In addition, by collecting exact GPS coordinates, we checked for adherence and correct notation of the randomly selected EAs and for the correct number of interviews conducted within each EA. Both suspicious and some randomly selected entries were validated by the supervisors by contacting the interviewees again after the interview to ensure high data quality.

4.2   Sampling strategy

In order to fulfil the requirements of a random sampling strategy, we classified three different unit levels of respondent identification (see Table 1). The first level of respondent identification is the EA. In our survey, each EA serves as one sampling unit. Within each EA, one specific survey starting point was chosen randomly. The second level is the dwelling unit, which is also referred to as "place" in our questionnaire. We define a dwelling unit or place as one or more rooms that are entered from a separate house or flat door. The third level is the individual to be interviewed, who was randomly selected from each selected dwelling unit.

Table 1:	Unit levels of respondent identification			
#	Level (coll. term)	Definition	Examples	Use in survey
1	Enumeration area (EA)	Residential housing zones with approx. 400 inhabitants	Extensions	Sampling unit
2	Dwelling unit ("place")	Rooms accessed from a common front door	Flat	Primary counting unit
3	Individual ("person")	Adult human being	Woman, man	Respondent (randomly selected)
Source: Authors				

Within each EA, a group of four research assistants followed a random walk strategy in order to choose households from which interviewees were to be selected. The random walk always started at the survey starting point, and from there each of the four research assistants went in a different direction. Starting to count the first dwelling unit on the right-hand side, every fifth dwelling unit had to be chosen for an interview by counting dwelling units on both the right- and the left-hand sides alternately (see Figure 5).

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6   Interviews were conducted by 24 research assistants. They worked in six groups, each supervised by one research team member.

Figure 5:   Random walk strategy

Source: Authors
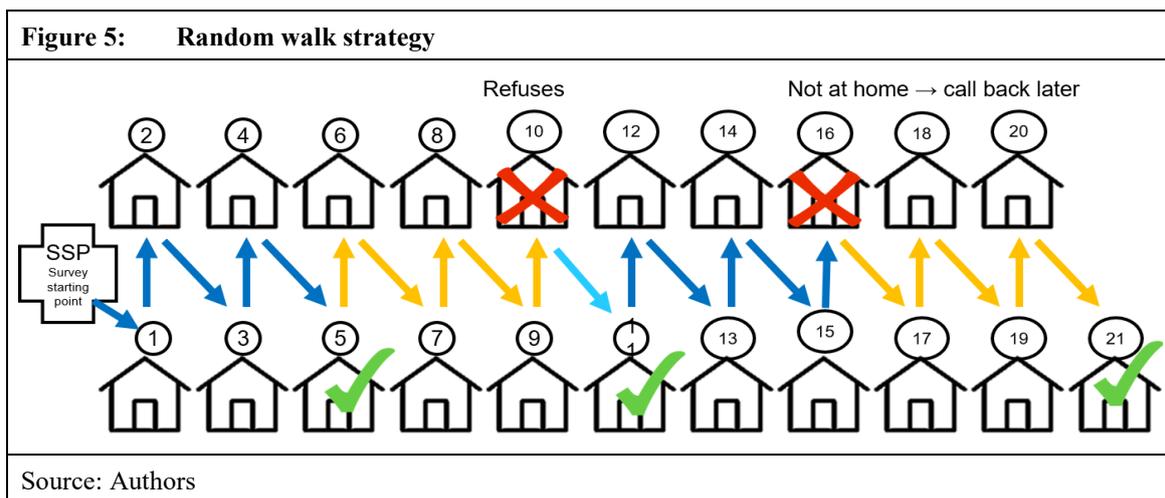
For multi-storey buildings, multi-plots or scattered houses, we identified specific rules. Once a plot was encountered, the research assistants needed to check whether entrance to the plot was allowed or not. Within multi-storey buildings, we started with the walking pattern at the very top floor by again counting on the right- and left-hand sides respectively, starting with the first dwelling unit on the right.

Entering a multi-plot, the walking pattern of selecting every fifth household continued, starting with the dwelling unit on the right-hand side. If entrance was denied, the number of dwelling units had to be estimated from outside or determined by asking other people (e.g. a guard). Only if it was not possible to count dwelling units from outside would the research assistants count a multi-plot as one dwelling unit. If the dwelling units could be counted from the outside, each one needed to be counted; afterwards, we followed our usual walking pattern.

Figure 6:   Random walk in the case of scattered houses

Source: Authors
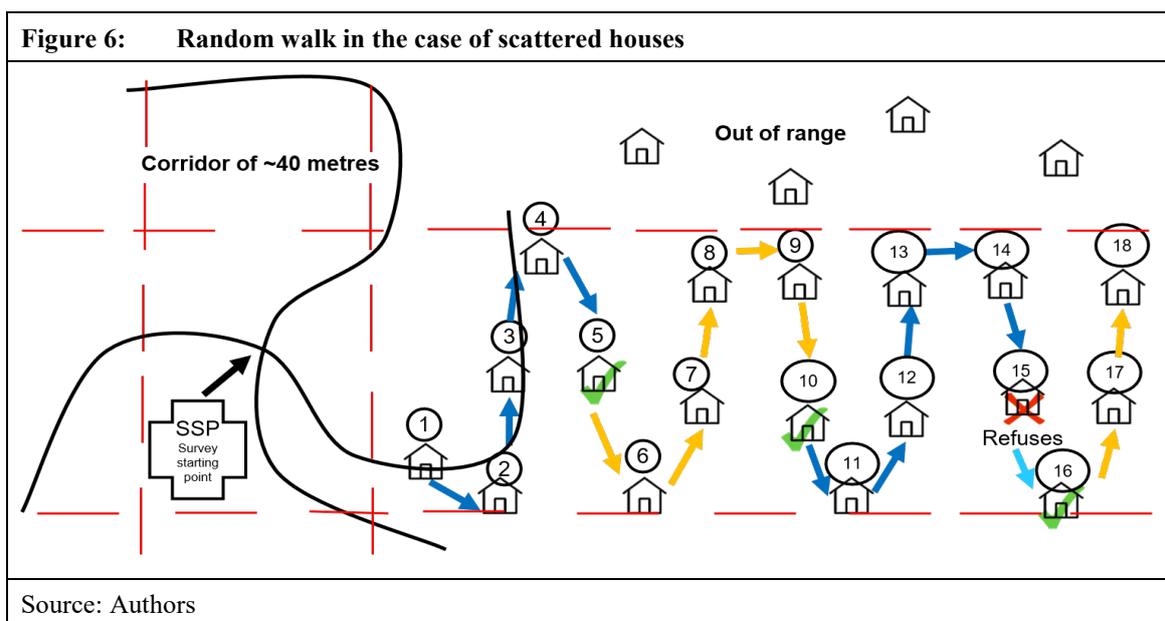
In EAs outside downtown Gaborone, the arrangement of dwellings are often not organised uniformly. For EAs that consist of scattered houses, the following specific rules applied (see Figure 6): From the survey starting point, each of the four research assistants measured a corridor of approximately 40 metres in front of her or him. The rule required counting the

very first house that the research assistant was on a horizontal level with, regardless if it was on the right- or left-hand side, if it was next to an alley (indicated by the black lines in Figure 6) or if it was close or far away, as long as it was within the range of 40 metres.

The third level of respondent identification is at the individual level, where one adult person within a dwelling unit was randomly selected to be interviewed. Every person above the age of 17 was eligible. If more than one adult person lived in the selected dwelling unit, each of them needed to be registered by the research assistant and the software randomly selected one to be interviewed. For cases in which the interview could not be conducted, we established the following rules: If no one was at home, the research assistants were instructed to do one call-back later. If the call-back was not successful, the selected dwelling-unit was substituted with the very next one. If someone was at home but the software randomly selected someone who was not available at that moment, the research assistants were instructed to make a physical or phone appointment for the interview. After two unsuccessful physical or three unsuccessful phone attempts, we substituted the interview with someone in the very next dwelling unit. In case the interviewee refused to be interviewed, did not speak sufficient English or stopped the interview before completion, the interview was also to be substituted with someone in the very next dwelling unit (see Figure 7).

Figure 7:   Call-back strategy

Source: Authors
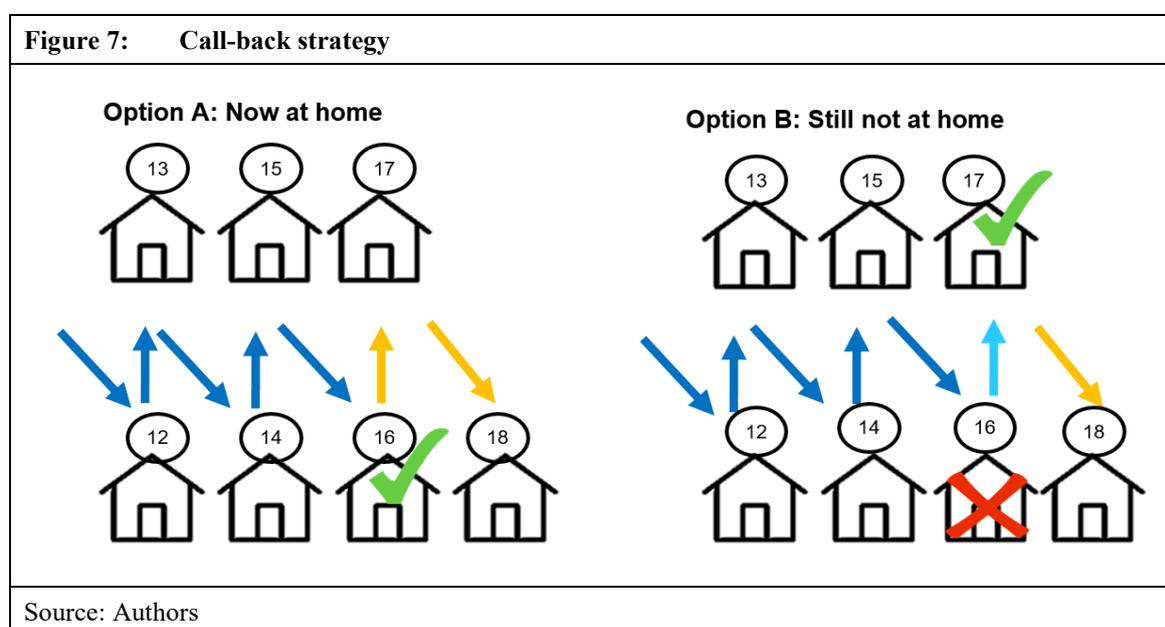
For each EA, we aimed to conduct eight interviews in total, which means two per assigned research assistant. We estimated one interview to take around 25 minutes, and an additional 30 minutes for a research assistant to select a new interview partner. Therefore, we calculated that one interview would take around one hour, which left us with a total of two hours for one EA.

4.3   Questionnaire

We conducted our survey using a custom-built questionnaire (Online Appendix C). Topics covered include political attitudes, digital inclination – especially the use of selected e-government services – as well as basic demographics such as age and income. The questions

are derived from the three causal mechanisms investigated in this study. Some questions focus on the perception of selected public services of state institutions, among them the distribution of water and electricity as well as tax administration.

Several questions are taken over in their exact formulation or are inspired by the established and well-tested Afrobarometer Round 7 survey questionnaire. Additionally, some questions are drawn from other sources for the same reason, for example Asianbarometer.[7]

4.4   Implementation

The questionnaire was converted into an electronic format that allowed the research assistants to record responses on tablet computers. We used the software Survey CTO for programming the questionnaire and conducting the survey offline on site. This allowed for near-real-time quality control by the supervisors, as results were transferred every evening via mobile storage devices. Another advantage of the digital format was the ability to keep the questionnaire adaptable, for example, abort if the respondent is not qualified or skip questions that do not apply.

Our survey took place from 15 February 2020 until 8 March 2020. Since many of our respondents work during the week, we were also in the field in the early evening hours and on weekends. We ran the survey from Tuesday to Friday from 2:15 p.m. until 7 p.m. On Saturdays we were in the field from 8 a.m. until 7 p.m. On Sundays we worked from 1:30 p.m. until 7 p.m., as many people attend church in the morning. We conducted 2,109 interviews, with an average duration of 13 minutes per interview.

5   Observational analysis: The effects of different e-services on political attitudes

For the observational study, we compare political attitudes between individuals with different levels of exposure to e-government services. We use e-payments for governmental services such as water and electricity provision as well as e-filings of income tax returns and the use of mobile money transfer systems as proxies for e-government exposure. In Botswana, the usage of such services is widespread. Thus, our inference can build upon a large number of potential subjects and variation in the sample. The effects of exposure to e-services are measured using political attitudes, which are tracked by the in-person survey described in Section 4. Our survey covers a range of variables concerning e-services and political attitudes. We compare respondents who use e-services to the ones who do not in terms of the different outcome variables regarding political attitudes. We also collect information on a number of variables that might bias our results. These control variables that we collect data for include, for instance, aspects such as a respondent's education level, income and age.

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7   The sources for the respective questions are indicated through footnotes in the full questionnaire (Online Appendix B).

We organise our analysis along steps A, B and C described in our bathtub model (see Figure 1). The connections between the steps are referred to as linkages. First, we estimate the effect of using e-services on political attitudes and call this the "long causal chain". We distinguish between the investigation of the "long chain" on the one hand, and the specific analysis of the two linkages it involves on the other hand. De facto, in doing this, we include an intermediary step (step B), which we expect the effect of the exposure to work through. Consequently, we examine our hypotheses in more detail by tracking the consistency of our postulated causal path. Concretely, this procedure includes the analysis of the direct effect of exposure to e-services on the individual (linkage 1) and the analysis of this effect on the individual on changes in political attitude (linkage 2). For hypothesis 1, for example, the long causal chain represents the analysis of the effect of the use of e-services on support for democracy. In addition, we also analyse the linkages in between, namely, the effect of exposure to e-services on empowerment, and the effect of empowerment on support for democracy. Depending on the level of measurement of the explained variable, we employ either logit models (in the case of binary data) or ordinary least squares (OLS) models (in the case of ordinal scale data).

5.1 E-services in Botswana

Particularly widespread e-services in Botswana are e-payments, specifically payments for public water and electricity supply as well as mobile money transfers and e-filings of tax returns. These services represent basic public services (water and electricity) as well as a core function of the state (taxation). Hence, they are salient topics for all citizens who must deal with these issues. We thus consider these services suitable proxies for individuals' general levels of interaction with the state by digital means.

A large share of Batswana pay their water bills by digital means. In 2017, the Water Utilities Corporation (WUC) launched a self-service platform that enables customers to access WUC services through cell phones. Customers do not need to register for the service; they simply enter their customer contract number and pay their bills using any bank card (Churu, 2016). In June 2018, WUC introduced WUCapp, an application for smartphones via which customers can pay water bills, check their account balance, view their monthly consumption totals, submit metre readings and report pipe bursts or leakages (First National Bank of Botswana Limited, 2018; WUC, 2019). WUC customers can also pay their bills directly through the online banking services of different banks.

The Botswana Power Corporation (BPC) introduced the options for online and mobile payments of electricity bills in 2013. Other online services, such as fault and complaint reporting, can be filed through the website (Botswana Power Corporation, s.a.). Creating an account, which is necessary to use the online services, requires visiting a BPC office in person. Registered customers with commercial bank accounts can complete online payments simply by submitting their contract account numbers for reference. Customers who are registered with the telecommunications providers Orange or Mascom or have a First National Bank Botswana banking account can pay their bills using prepaid credit (Botswana Ministry of Minerals, Energy and Water Resources, 2013).

Mobile money is a cell phone-based payment system allowing customers to transfer money securely without the requirement of having a bank account. Customers can transfer money

from person to person within the country and pay for goods and services where offered. Mobile money transfers are handled by private telecommunications providers in cooperation with commercial banks (Maradung, 2013). Although operated by private telecommunications companies, mobile money is strictly regulated by the state and supervised by the central bank of Botswana. Due to its importance, wide distribution as a means of payment and its strict oversight by the state, we include mobile money as an e-service in our explanatory variable.

BURS is responsible for the administration and collection of taxes. According to the tax legislation of 2011, it is compulsory to register with BURS and file an annual tax return if yearly income exceeds 36,000 Botswana Pula (BWP) (about EUR 2,956) (OANDA, 2019).[8] The annual deadline to hand in tax returns is 30 September (Botswana Unified Revenue Service [BURS], 2013a).[9] As an additional channel for filing tax returns, the app mtax has been available since September 2019.[10]

5.2 Operationalisation

For all three hypotheses, our explanatory variable for the long chain as well as linkage 1 is the usage of e-services, which we operationalise by dichotomising and then indexing questions on the use of mobile money (question B5 Q04), e-payments for water and electricity (B5 Q03) and electronic tax filings (B1 Q07G). The individual services are coded as one if they are used at least once a month (water and electricity) or at least once a week (mobile money). Electronic tax filing was already captured as a binary variable with the value one indicating usage. In cases where respondents did not know whether they were using a specific service, we assume no usage. The index that captures the overall usage of e-services is coded as one if at least two of the services are used (i.e. coded as one), and otherwise as zero. When assessing linkage 2 of each mechanism, the explanatory variable diverges between the three mechanisms (for further details, see Section 5.4). In the same vein, the explained variable differs according to the mechanism and its respective linkage.

To avoid biased results, we include control variables in each of the estimated models. When aiming to measure the effect of an explanatory variable on an explained variable, only variables that are expected to affect both the former and the latter must be included in the model as controls.

For the long chain of the empowerment mechanism (mechanism 1), we decided to control for income (B2 Q07), which is captured in six categories and expected to increase both e-government usage and the preference for democracy. The selection of "satisfaction with democracy" (B3 Q07) – captured in four categories – is also based on the theoretical expectation of increased preference and usage. The frequency of consuming news from different sources (B4 Q03), measured on a five-step scale, is included as another control variable. Linkage 1 of the empowerment mechanism measures the effect of e-service usage on empowerment. In addition to the control variables from the long chain, we also included

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8   The average income can be defined as BWP 49,686 (Average Salary Survey, 2018).

9   Source: Email exchange with a BURS employee in 2019.

10   A more detailed description of the Botswana tax system is reproduced in the experimental analysis.

a binary measure of gender (B1 Q07D), in which women are coded as zero and men as one, as well as age, which is measured in years. Linkage 2 of the empowerment mechanism measures the effect of empowerment on the preference for democracy. The control variables are the same as for the long chain.

The long chain of the appeasement mechanism requires controlling for income as well as education (B2 Q02), which is captured in five categories. Linkage 1 of the appeasement mechanism investigates the effect of e-service usage on the individual feeling that government officials are addressing one's needs. The control variables are the same as for the long chain. Linkage 2 of the appeasement mechanism postulates an effect of the individual feeling that government officials are addressing one's needs on an assessment of whether the country in general is going into the right direction. Selected control variables are education and a rating of the individual living conditions on a five-step scale (B4 Q04).

For the long chain of the equal treatment mechanism, we decided to include income, age and a binary measure of the perceived transparency of the respective services (B5 Q06) as control variables. An index that captures the general perception of e-service transparency is coded as one if at least two of the services are perceived as transparent (i.e. coded as one), and otherwise as zero. Linkage 1 of the equal treatment mechanism investigates the effect of e-service usage on the feeling that people are treated unequally under the law. In addition to the control variables that have been selected for the long chain, we also decided to control for education. Linkage 2 of the equal treatment mechanism investigates the effect of the feeling that people are treated unequally under the law on interpersonal trust. We decided to control for income, age and education.

5.3 Summary statistics

Our sample consists of 2,109 observations in total. Out of these, almost 60 per cent are comprised of women and about 40 per cent of men. Thus, women are slightly overrepresented in our sample. Regarding the age of the respondents, our sample has a mean of 34 years, with a range of 18 up to 91. Furthermore, 30 per cent of our respondents pay income tax, whereas about 69 per cent do not and 29 respondents refused to share this information. Of the 637 people who claim to pay income tax, 603 respondents let us know whether they use e-filing for their tax returns or not; 414 of them stated that they file their tax returns electronically, hence, about 65 per cent of the people who pay income tax use e-filing. Table 2 and Table 3 provide information on the distribution of the educational and income status of the respondents. As Table 2 shows, more than 50 per cent of the respondents have completed secondary school and 45 per cent have a university degree.

Table 2: Distribution of highest educational degree completed

	Frequency	Percentage	Cumulative
No school	7	0.33	0.33
No formal schooling	4	0.19	0.52
Primary school	70	3.32	3.84
Secondary school	1,070	50.76	54.60
University	957	45.40	100.00
Total	2,108	100.00	
Source: Authors			

However, 15 per cent of the respondents declare that they do not have any yearly income, and more than half of the respondents earn BWP 36,000 per year or less. More than 9 per cent earn more than BWP 144,000. In terms of e-service usage, 330 respondents (15.65 per cent) use e-payments provided by WUC, 1,035 (49.08 per cent) people use e-payments provided by BPC and 376 (17.83) people use mobile money. All in all, more than 60 per cent of the respondents use some form of e-service. Nearly 30 per cent use at least two services, which makes them e-service users according to our e-government exposure index.

Table 3: Distribution of income

	Frequency	Percentage	Cumulative
BWP 0	296	14.85	14.85
BWP 1-36,000	1,095	54.94	69.79
BWP 36,001-72,000	228	11.44	81.23
BWP 72,001-108,000	112	5.62	86.85
BWP 108,001-144,000	75	3.76	90.62
>=BWP 144,001	187	9.38	100.00
Total	1,993	100.00	
Source: Authors			

5.4 Empirical analysis

5.4.1 The empowerment mechanism

With reference to hypothesis 1 (see Figure 2), we analyse the relationship between e-government exposure and support for democracy (long chain) as well as the intermediate linkages, namely the relationship between e-government exposure and empowerment (linkage 1) and between empowerment and support for democracy (linkage 2).

Figure 8:   Rope ladder estimates empowerment hypothesis

Note: Coefficient is represented by the dot, whiskers represent 90 per cent confidence intervals.
Source: Authors
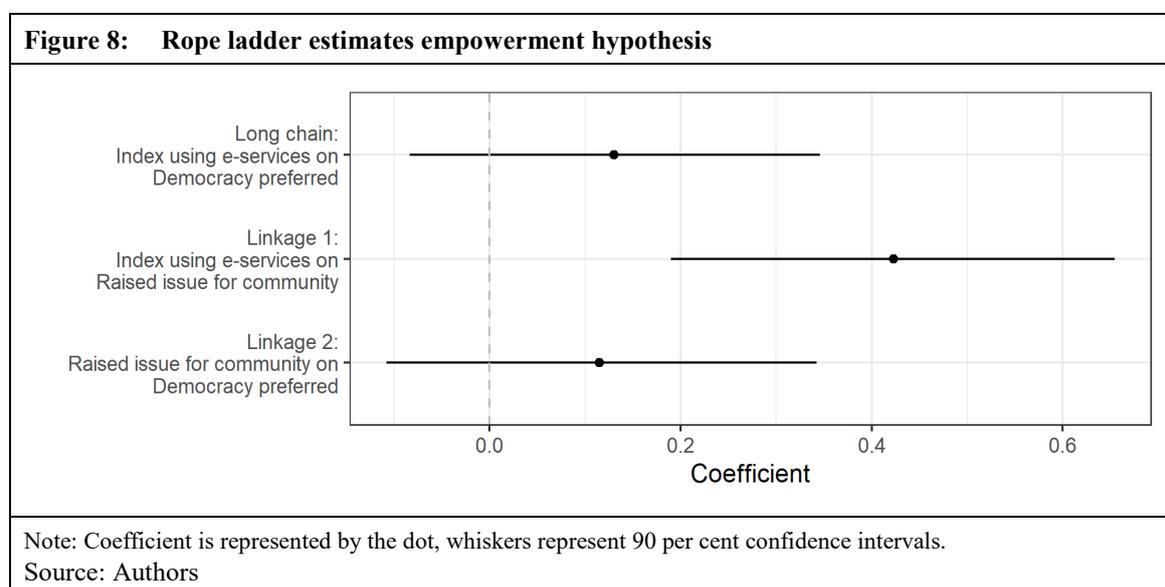
In the following, the estimates for the relationships between these variables are presented. For the variable "empowerment", we choose the question "In the last year, did you join effort with people from other backgrounds to raise an issue that you consider to be relevant for the whole community?" (B3 Q15) as a proxy. The explained variable "support for democracy" is covered by a question that asks whether respondents think that "Democracy is preferable to any other kind of government" (B3 Q03). Both variables are coded as binary. Figure 8 provides a summary of the estimates of the impact of e-government exposure on support for democracy in a rope ladder plot.[11] When referring to our index of e-services, the exposure to e-government services has a positive but non-significant relationship with support for democracy: The point estimate for our coefficient (dot) is in the positive range of the x-axis, but the confidence interval (whiskers) includes zero. Thus, we find no empirical support for our expectation that the index of e-service exposure is linked to increased support for democracy. As expected, control variables on democracy satisfaction and income are linked to higher support for democracy. With regard to news consumption-related control variables, some sources, such as radio, newspapers or conversations with friends, are positively and significantly related to support for democracy, while the internet appears to be negatively associated with support for democracy, and TV as well as social media show no significant relationship at all.

In our theory, we claim that e-government exposure leads to empowerment. Figure 8 shows support for this conjecture: a positive and statistically significant correlation between e-

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11   Detailed results are provided in regression tables in Online Appendix A.

government exposure and empowerment. In substantive terms, the effect of using more than one e-service regularly is an increase of 1 percentage point in the probability of engaging in raising an issue of relevance for the community. It is noteworthy that in terms of control variables, satisfaction with democracy is negative and significant, whereas being male shows a positive and significant relationship. Figure 8 also shows the estimates for the linkage of empowerment and support for democracy. The estimated coefficient for "raised issue relevant for the community" on "democracy preferred" is positive, but it is not statistically significant. There are no surprises in the estimates of the control variables. Again, the estimated coefficients for satisfaction with democracy and income are significant and positive.

Figure 9:   Rope ladder estimates empowerment hypothesis individual services

Note: Coefficient is represented by the dot, whiskers represent 90 per cent confidence intervals.
Source: Authors
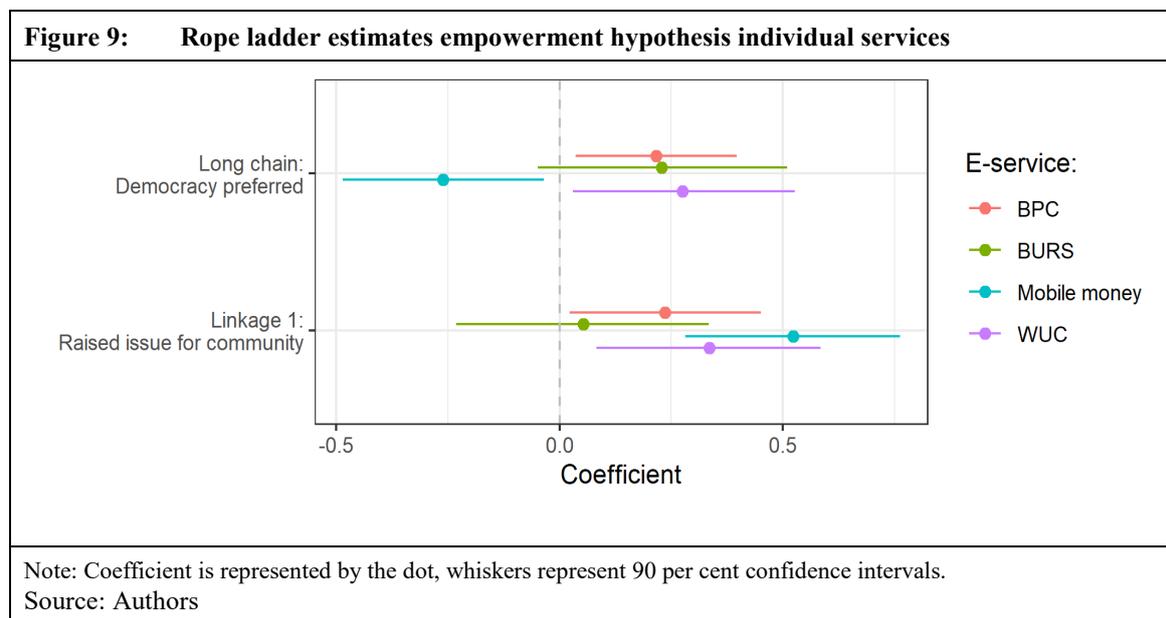
A look at the e-services individually shows some interesting results (see Figure 9). The usage of e-payment services for water and electricity is positively and significantly correlated with support for democracy. By contrast, the usage of mobile money services is linked negatively and significantly to support for democracy. The coefficient for the electronic filing of tax returns is not statistically significant. With regard to the association of usage of e-services with empowerment, the correlation is positive and statistically significant for e-payment of water and electricity services as well as for mobile money. The estimates for electronic tax filing again result in non-significant numbers.

5.4.2   The appeasement mechanism

With reference to hypothesis 2 (see Figure 3), we analyse the relationship between e-government exposure and citizens' satisfaction with the regime (long chain) as well as the intermediate linkages, namely the relationship between e-government exposure and citizens' perceptions of being acknowledged (linkage 1) and between citizens' perceptions of being acknowledged and regime satisfaction (linkage 2). The perception of being acknowledged (step B) is measured by the variable "officials addressing your needs", which is captured by the question "To what extent do you feel that government officials are addressing your needs?" (B3 Q06) and measured on a five-step scale from "Not at all" to "A great deal". Regime satisfaction (step C) is covered by the question "Would you say that

the country in general is going in the wrong direction or going in the right direction?" (B3 Q08) and measured as a binary variable. Figure 10 provides the estimates for the long chain as well as linkage 1 and linkage 2. Using e-government services has a negative but statistically not significant relationship with respondents' perceptions of whether Botswana is going in the wrong or right direction. With regard to the control variables, and in line with our expectations, income has a positive and statistically significant association with the feeling that Botswana is going in the right direction.

Figure 10:	**Rope ladder estimates appeasement hypothesis**

Note: Coefficient is represented by the dot, whiskers represent 90 per cent confidence intervals.
Source: Authors
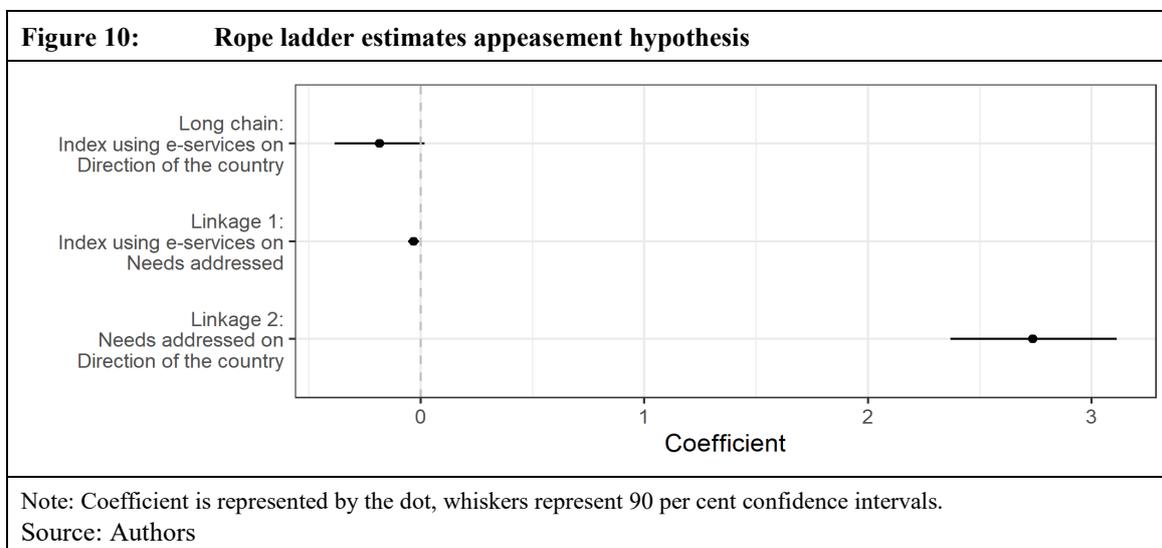
For the linkage of e-government usage and the perception of being acknowledged (linkage 1), we hypothesise that e-government exposure results in a more positive perception of whether the government addresses citizens' needs. Contrary to our expectations, usage of e-services has a slightly negative and statistically significant relationship with the perception of whether needs are being addressed. The same is valid for the control variable education. In contrast, income shows a negative and statistically significant association with "officials addressing your needs". Regarding linkage 2, we postulate that citizens perceiving that officials are addressing their needs think that Botswana is going in the right direction. Here, Figure 10 shows a strong positive and significant relationship. Keeping all other variables in the model at their means, one person stating that the country is going in the right direction is an impressive 15 times more likely if the person thinks that the government addresses his or her needs "A great deal" as compared to "Not at all". With regard to the control variables, a positive assessment of one's living conditions is also positively and significantly related to the feeling that Botswana is going in the right direction. Both observations are in line with our expectations.

Figure 11:   Rope ladder estimates appeasement hypothesis individual services

Note: Coefficient is represented by the dot, whiskers represent 90 per cent confidence intervals.
Source: Authors
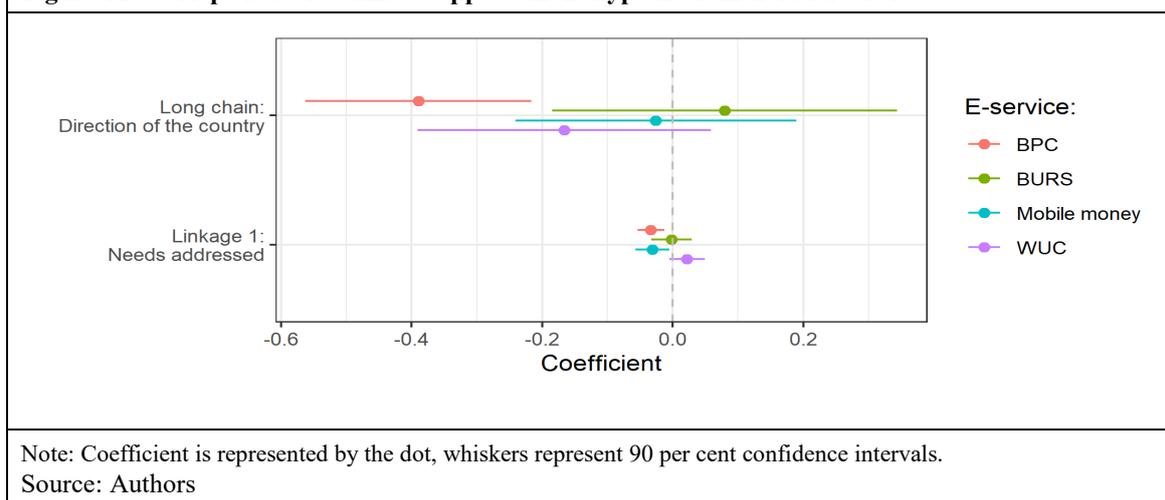
Also with regard to the second hypothesis, there is a lot of variation in the estimated effects of the different e-services (see Figure 11). Using BPC e-services regularly has a negative and significant link with the perception of whether Botswana is going in the right or wrong direction, whereas the other services show no statistically significant relationship. With regard to the feeling that needs are being addressed (linkage 1), using BPC e-services as well as mobile payments shows a slightly negative yet statistically significant relationship.

5.4.3   The equal treatment mechanism

For hypothesis 3 (see Figure 4), we analyse the relationship between e-government exposure and interpersonal trust (long chain) as well as the intermediate linkages, namely the relationship between e-government exposure and egalitarian experience (linkage 1) and between egalitarian experience and interpersonal trust (linkage 2). As a proxy for egalitarian experience (step B), we use a five-step scale that measures respondents' assessments of how often people are treated unequally under the law (B3 Q10), with high values indicating a higher frequency of unequal treatment. The explained variable interpersonal trust (step C) is proxied by the question "Generally speaking, would you say most people can be trusted or that you need to be very careful in dealing with people" (B3 Q12) and is measured binary.

Figure 12 visualises the estimates for the impact of e-government exposure on interpersonal trust. The results for our third mechanism have to be treated with caution. Due to the very small variation in the variable measuring interpersonal trust, our findings cannot be regarded as robust and, hence, cannot be interpreted with a lot of confidence. Only approximately 5 per cent of the sample stated that most people can be trusted. With this caveat in mind, when looking at the results, contrary to our expectations, exposure to e-government services is negatively correlated with interpersonal trust (although the coefficient is not statistically significant). For the control variables "income" and "age", on the other hand, a positive and significant correlation with interpersonal trust is identified.

Figure 12:   Rope ladder estimates equal treatment hypothesis

Note: Coefficient is represented by the dot, whiskers represent 90 per cent confidence intervals.
Source: Authors
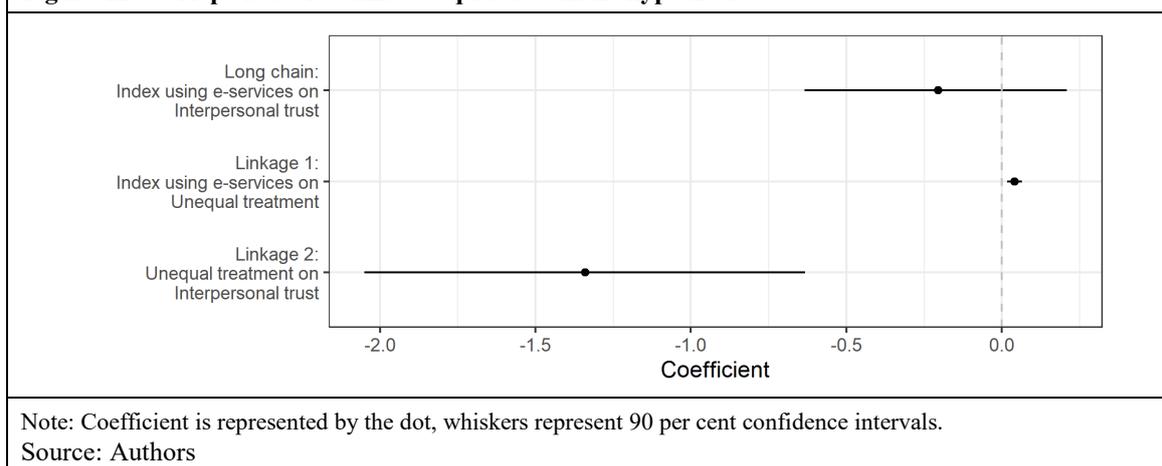
The first linkage investigates the relationship between e-government exposure and the feeling of unequal treatment under the law. The results show that – contrary to our expectations – more often than non-users, e-government users have the perception that people are treated unequally. The second linkage investigates the relationship between unequal treatment and interpersonal trust. This time, in line with our expectations, feeling that people are treated unequally has a strong negative and statistically significant relationship with indicating that people can be trusted. In other words, people who think that, most of the time, people are treated equally tend to trust other people more. The control variables "age" and "income" are positively and significantly related to interpersonal trust here, which means that with increasing income and age, the degree of interpersonal trust increases.

Figure 13:   Rope ladder estimates equal treatment hypothesis individual services

Note: Coefficient is represented by the dot, whiskers represent 90 per cent confidence intervals.
Source: Authors
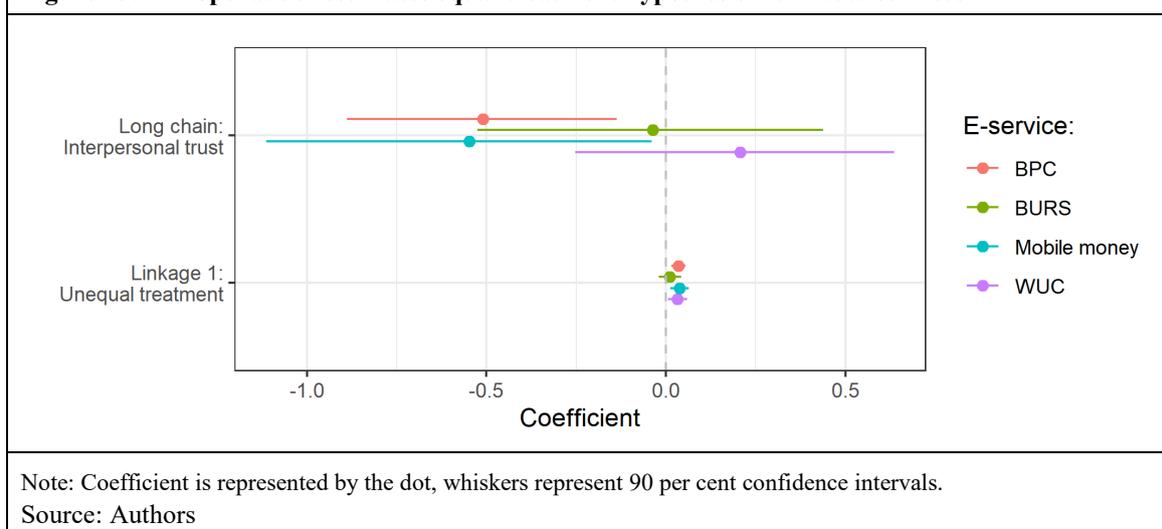
Again, the picture varies when looking at individual e-services (see Figure 13). Using e-payments for electricity and using mobile money are both negatively correlated in a statistically significant way with interpersonal trust. However, using e-payments for water, electricity and mobile money are linked with an increase in the perception of unequal treatment.

5.5   Summary

The first conclusion that we can make is that our analysis partly confirms hypothesis 1, especially with regard to the long chain and linkage 1. For the long chain, the estimates for the impact of e-payments for water and electricity on support for democracy show a positive and significant relationship. Yet, it is unclear whether the differences between the individual services are due to different experiences while using them (i.e. the design or quality of the services), or whether differences already played out in the process of deciding which service people wanted to use. If different services speak to different people, they may attract different groups of users. The fact that mobile money is negatively linked with support for democracy may, for example, be due to the fact that mobile money is handled by private companies. The estimates for linkage 1 indicate that empowerment represented by engagement in activities for the community is positively associated with e-government usage. As we had expected, people who use e-services are more likely to engage in activities for the community. Yet, since the probability of taking such action increases by only one percentage point, the "practical significance" (i.e. how substantive the differences actually play out) of this finding is limited. With the exception of electronic tax filing, the positive relationship holds for all the individual services.

In terms of our second hypothesis, the appeasement mechanism, the estimates – if anything – only partially support our theory. Although e-government usage does not appear to be significantly related to regime satisfaction (long chain), the feeling that officials are addressing one's needs shows a very strong positive association (linkage 2). Thus, at least linkage 2 of the appeasement mechanism holds, albeit we cannot observe that this is actually initiated by e-government usage. The fact that there is no robust relationship for the long chain may, at least in parts, be explained by the finding for linkage 1: To our surprise, e-government usage is actually associated with a decline in the feeling that needs are being addressed. Differentiating the individual services reveals that this tendency is driven by the negative correlation with e-payments for electricity and mobile money. Again, this might be due to different user experiences.

As we mentioned before, the results for the third mechanism – the equal treatment mechanism – have to be treated with caution, as the distribution of answers for interpersonal trust are very unbalanced. For the long chain, no robust relationship has been detected. With regard to linkage 1, however, we find that e-government usage is actually associated with an increased perception of unequal treatment, which clearly contradicts our expectations. Since the perceived transparency of the respective services as a control variable is not significant, this relationship is probably not due to unequal experiences when using the services themselves. Instead, the results may be explained by selection bias: Those individuals who feel that people are treated unequally may resort to e-services as an attempt to avoid being treated unequally themselves. In contrast, the findings for linkage 2 are clearly in line with our expectations: Unequal treatment is associated with lower levels of interpersonal trust, and thus equal treatment is associated with higher levels of interpersonal trust.

Irrespective of the algebraic sign in front of it, it comes as no real surprise that, at least for hypotheses 2 and 3, the effect estimates for linkage 1 are much smaller in magnitude than the ones for linkage 2. Occasionally occurring actions such as electronic tax filings or e-payments for water and electricity constitute only a small share of state–citizen interactions, and thus they cannot be expected to cause major shifts in perceptions of state officials'

responsiveness or the general perception of (un)equal treatment. Even small effects may, however, cumulate over time and in conjunction with other factors, so that in the long run they might become more and more evident.

6 Experimental analysis: The effects of incentivising electronic tax filing on political attitudes

The experiment we conduct shall provide a causal estimate of the effects of exposure to e-government on attitudinal changes. It induces exposure to e-government by incentivising taxpayers to use an electronic filing option for their tax returns. Taxation constitutes one of the most profound types of interaction between the state and citizens. It should thus be an area where the effects of e-government on political attitudes can be observed.

The practical implementation of our experiment, done in cooperation with BURS, did not allow us to identify in advance those taxpayers who so far had used analogue or digital means to file their tax returns. Therefore, 1) the experimental population is all taxpayers in the metropolitan area of Greater Gaborone.[12] This population was quasi-randomly separated into treatment and control groups, with a short message from BURS to file income tax returns digitally being the treatment. 2) Members of the treatment group received this incentivising message irrespective of whether they were already using this service. The selection was based on a randomised probability sampling and implemented by BURS, which agreed to cooperate on this with us. This experimental set-up allows us to rigorously assess the impact of the respective treatment on attitudinal changes of individuals. The difference in the outcome between the treatment and control groups yields the estimated average causal effect.

6.1 Electronic tax return filing in Botswana

Many taxpayers in Botswana are already using e-services for filing their income tax returns, whereas others still prefer handing in paper tax return documents. The online procedure is much faster. The paper-based submission procedure can take more than a week, since citizens must get account confirmation at the bank and need to hand in all documents in person at a BURS office. The online procedure takes only around 25 minutes on average.[13] Thus, analogue taxpayers waste a lot of time travelling and queuing. Expanding and deepening the usage of e-filing might not only benefit customers, but also improve the tax administration system. Through e-filing the tax administration saves time on bureaucratic

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12 According to BURS, Greater Gaborone comprises the following locations: Artesia, Boatlaname, Boatle, Bokaa, Botlhapatlou, Ditshegwane, Dutlwe, Gabane, Gaborone, Gakuto, Hatsalatladi, Kgomodiatshaba, Khudumelape, Kopong, Kumakwane, Lentsweletau, Lephephe, Leshibitse, Mabalane, Maboane, Magagaripa, Mahetlwe, Matebeleng, Metsemotlhaba, Mmamashia, Mmankgodi, Mmathubudukwane, Metsemotlhaba, Mmopane, Mochudi, Modipane, Mogobane, Mogoditshane, Mokolodi, Molepolole, Mololwane, Morwa, Moshaweng, Mosomane, Motokwane, Ngware, Oliphants Drift, Oodi, Otse, Pilane, Ramokana, Ramotlabaki, Ramotswa, Rasesa, Salajwe, Shadishadi, Sikwane, Sojwe, Takatokwane, Taung, Thamaga, Thebephatshwa, Tloaneng, Tlokweng, Tsetseng, Tshwane.

13 Source: Conversation and email exchange with a BURS employee in 2019.

procedures, facilitates monitoring and thereby might motivate more citizens to file their tax returns electronically.

The taxation of individual incomes as well as the filing of income tax returns are common practice in Botswana. The administration and collection of taxes is organised centrally at BURS. Local councils are only responsible for the collection of property taxes (Kampamba & Mosha, 2018, p. 28). Since 2011 it is a requirement that all citizens have to register with BURS if their yearly incomes exceed BWP 36,000, which amounts to about EUR 3,000 (OANDA, 2019). It is compulsory for all citizens above this income threshold to file tax returns, even if the income has already been taxed based on the pay-as-you-earn (PAYE) tax system via the employer (BURS, 2013c). The tax year in Botswana runs from 1 July to 30 June. The deadline for Batswana employers for PAYE deductions is the 15th of each month (BURS, 2013b).

Any person earning taxable income has to register for tax returns at BURS – in person or online. Since 2016, the tax form can be accessed and handed in online (Pinielo, 2016). If income is taxed at the source via PAYE, the tax form requires a withholding tax certificate, which is facilitated by the employer and provides an overview of one's earnings and tax payments for the respective year (BURS, 2013a). Online user accounts are available for citizens, non-citizens and companies. The tax form requires the attachment of several certified copies of the following documents: a National Identity Card (Omang) or passport, a residence permit and a work permit.[14] The annual deadline to file tax returns is 30 September (BURS, 2013c).[15] As an additional channel for filing tax returns, the app mtax has been available since September 2019.

6.2 Experimental setup: Incentivising electronic tax filing

The experiment induces exposure to e-government by incentivising taxpayers to use one of the two e-filing options for tax returns. We implemented the experiment in cooperation with BURS in Greater Gaborone. The focus on Gaborone allows us to efficiently treat and survey a high number of taxpayers. Citizens were contacted through a short message to their cell phones sent directly by BURS. This incentivising message constitutes the treatment. We chose short messages as a means of contact because BURS regularly uses this channel to contact taxpayers. Almost all taxpayers have a mobile number registered at BURS. Short messages are thus much more reliable than contacting taxpayers via physical mail – a channel of communication that often provides imprecise physical addresses in Botswana. The randomisation strategy was based on the last digit of the telephone number of registered taxpayers. Taxpayers registered with a phone number ending with a digit between 0 and 4 received the treatment. All taxpayers in Gaborone registered with a telephone number ending with a digit between 5 and 9 did not receive the message. As the last digit of the phone number is extremely likely to be completely unrelated to e-filing and political attitudes, this assignment yielded a quasi-random treatment. In total, 67,850 taxpayers were assigned to the treatment; 68,000 were selected for the control group and did not receive a message.

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14 Source: Email exchange with a BURS employee in 2019.

15 Source: Email exchange with a BURS employee in 2019.

Figure 14:   Venn diagram for population and treatment identification

Universe of respondents   Treatment identification

A

Self-reported
taxpayers

C

B

Income >36.000
BWP

D

Self-reported
message received

F

E

Phone number

Legend
A+B+C: Potential
message receivers
D+F: Self-reported
E+F: Phone number
F: Both

Source: Authors
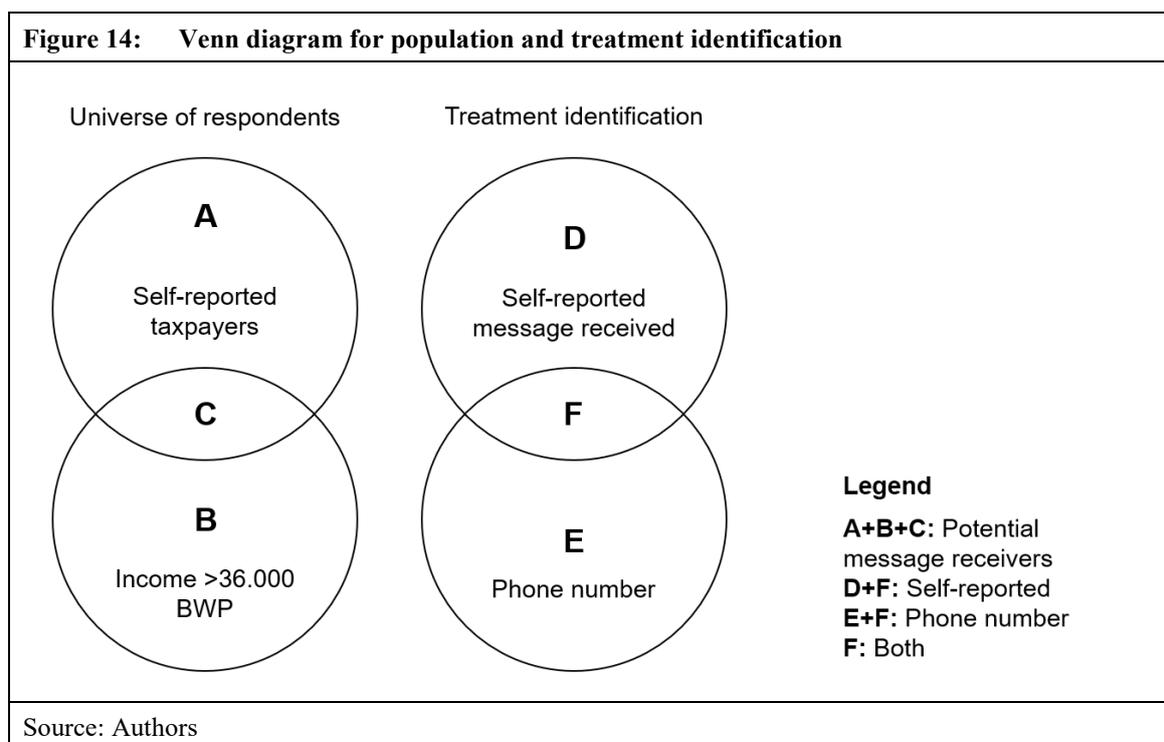
The message sent to the treatment group contained information about the possibility of e-filing and the possibility of using the mtax app for this service.[16] The message reminded taxpayers of these services and that they facilitate bureaucratic procedures through digital solutions. The information campaign was conducted on 17 February 2020. Their effects were assessed through the survey we implemented in February and March – we collected the last digits of the phone numbers that respondents were registered with at BURS (if at all) and collected information on whether they had received a short message on their phones from BURS within the last four weeks suggesting that they start filing electronic income tax returns.

Our representative in-person survey enabled us to assess whether our incentivisation to file taxes digitally has an effect on the political attitudes of individuals. We first define the set of people that should have received our message. This group includes all the people registered with BURS and who live in an area defined by BURS as Greater Gaborone. Our survey area is completely covered by BURS' definition of Greater Gaborone. According to the Botswana Population and Housing Census from 2011, implemented by Statistics Botswana, the message covered an area with a population of 631,300 people, while the survey covered an area with a population of 326,031[17] (Statistics Botswana, 2012). The anonymised list of 138,000 taxpayers used by BURS did not cover all taxpayers in the survey area, but it did cover a large share of them. About 30 per cent of the country's economic activity occurs in the informal sector (Medina & Schneider, 2018, p. 47), and thus remains untaxed.

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16   The message text read: "Good day! BURS kindly reminds you of the possibility to file tax returns online. Filing online makes life easier. Please register & use mtax or e-services."

17   This number includes the population within the areas of Gaborone, Mogoditshane and Tlokweng.

For identifying our set of people that BURS could have addressed the message to (our "universe of respondents" for the tax experiment), we employ two criteria: the income threshold and self-reported taxpayer status. Removing 283 interviews that took place before the message was sent (17 February 2020) leaves 792 respondents out of the originally conducted 2,109 interviews as sample for the experiment. In Figure 14, a Venn diagram visualises the subset: All people who earn above BWP 36,000 a year and/or report that they pay taxes constitute the sample for the experiment and were theoretically eligible to be randomly assigned to receiving the SMS (i.e. to the treatment group). We can distinguish if a person was treated or not according to three levels of treatment identification displayed in the Venn diagram: self-reporting to have received the message (D + F), the phone number – dependent on the last digit of their phone number being between 0 and 4 (E + F) – or a match of both indicators (F only). Our control groups are defined by the different treatment groups and do not include "Do not know" answers, which are not considered as being part of any group. The control group can either consist of people who claim to not have received the message, whose last digit is between 5 and 9 or consist of those who do not fulfil both indicators.

6.3 Balance checks

Table 4:	Balance check age								
	Treatment identification								
	Self-reported			Phone number			Both		
	C	T	p-value	C	T	p-value	C	T	p-value
Age	38.84	41.48	.00*	40.30	39.73	.57	39.23	41.39	.05*
Obs	449	237		243	233		536	119	
Note: * p < .1 Source: Authors									

To ensure that randomisation was successful, we conducted balance checks, which show the differences between the means of the treatment and control groups for several relevant pre-treatment indicators, providing an indication of whether these differences are statistically significant. Except for gender (see Table 5), none of the variables are balanced across all treatment identification groups (see Table 6, Table 7, Table 8). Table 4 and Figure 15 show the balance across the control and treatment groups for age. There are no significant differences between the treatment and control groups identified based on the phone number; the treatment identifiers "Self-reported" and "Both" show slightly, yet significantly higher mean ages for the treatment group. With regard to electronic tax filing (see Table 6), for the treatment identification groups "Phone number" and "Both", disproportionately more members of the treatment group file their tax returns electronically. When it comes to income (see Table 7), in the treatment identification groups "Self-reported" and "Both", the members of the treatment group claim to have higher revenues. In a similar vein, in the treatment identification groups "Self-reported" and "Both", members of the treatment group are much more likely to have a university degree (see Table 8). The results for the treatment

identification group "Both" are in all cases probably driven by the significant differences in the other treatment identification group ("Self-reported" for age, income and education, "Phone number" for e-filing).

Figure 15:   Visual balance check age

Source: Authors
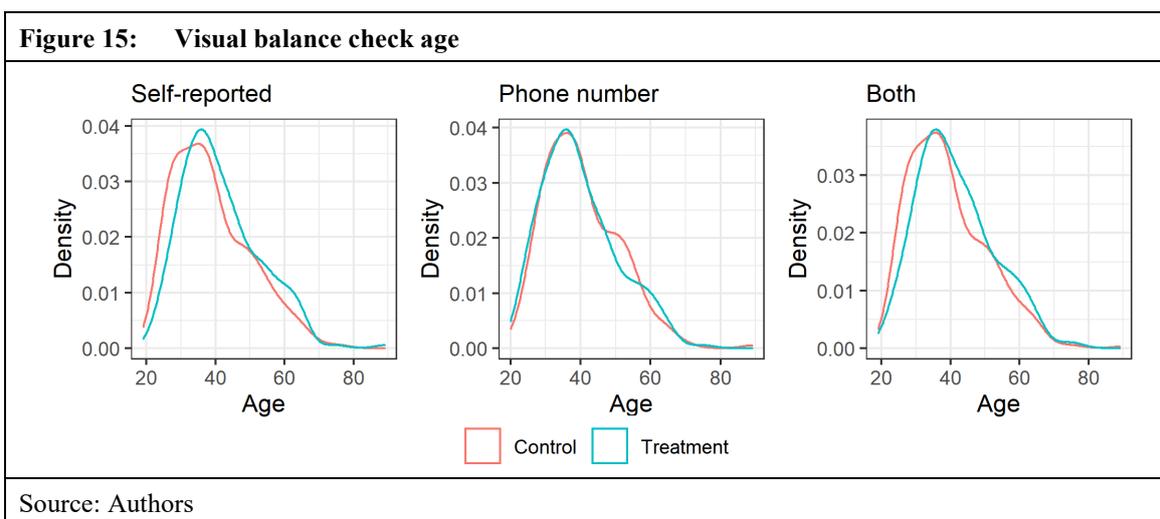
People who report to have received the message also claim to be older, financially well-off and better educated. One explanation is that people claim to have received the message for prestige and also to comply with social norms of appreciation. In this regard, it also seems logical that these people would claim to have higher wages and to be better educated. This group of people might, in general, tend to give false information in order to embellish their own position in the eyes of the recipient, who is a research assistant working for a university with a high reputation and a German research institute. A possible explanation for why this group of respondents claims a higher age could also be rooted in the fact that older people receive more respect in the Tswana context compared to younger ones, creating an incentive to make oneself older. Further, it is also possible that older people have received more messages from BURS during the last months and years, and therefore they claim to have received the message, even though we specified the time frame within our question. Due to these reasons, we do not merely rely on people's self-reporting but double-check by using the last digit of their phone numbers.

Table 5:   Balance check gender

	Treatment identification					
	Self-reported		Phone number		Both	
	C	T	C	T	C	T
Female	230	119	128	120	276	58
	(.51)	(.50)	(.53)	(.52)	(.51)	(.49)
Male	219	118	115	113	260	61
	(.49)	(.50)	(.47)	(.48)	(.49)	(.51)
Chi-squared	.03		.03		.20	
p-value parametric	.86		.87		.66	
p-value RI	.80		.87		.64	

Note: Column shares in parentheses.
Source: Authors

Table 6:   Balance check electronic tax filing

	Treatment identification					
	Self-reported		Phone number		Both	
	C	T	C	T	C	T
Analogue tax filing	109	57	71	45	136	20
	(.32)	(.28)	(.33)	(.21)	(.33)	(.19)
Electronic tax filing	229	150	147	167	280	87
	(.68)	(.72)	(.67)	(.79)	(.67)	(.81)
Chi-squared	1.13		6.46		7.32	
p-value parametric	.29		.01*		.01*	
p-value RI	.24		.01*		.00*	

Note: Column shares in parentheses; * $p < .1$
Source: Authors

Table 7:   Balance check income

	Self-reported		Phone number		Both	
	C	T	C	T	C	T
<= BWP 36,000	72	32	30	38	82	18
	(.18)	(.14)	(.13)	(.17)	(.17)	(.16)
BWP 36,001-72,000	147	51	50	45	161	21
	(.36)	(.23)	(.22)	(.20)	(.33)	(.19)
BWP 72,001-108,000	45	43	37	35	66	19
	(.11)	(.19)	(.17)	(.16)	(.13)	(.17)
BWP 108,001-144,000	39	27	33	24	53	10
	(.10)	(.12)	(.15)	(.11)	(.11)	(.09)
>= BWP 144,001	107	69	74	78	132	43
	(.26)	(.31)	(.33)	(.35)	(.27)	(.39)
Chi-squared	18.03		2.75		11.33	
p-value parametric	.00*		.60		.02*	
p-value RI	.01*		.73		.03*	

Note: Column shares in parentheses; * $p < .1$
Source: Authors

The incentive for a respondent to lie about the last digit of their phone number is very limited, and therefore the last digit seems to be a reliable indicator. Still, it might be the case that people have several phone numbers and that maybe the number they recall is not the one that is registered at BURS. Yet, such inaccuracies can reasonably be assumed to be distributed randomly across people with a last digit lower than 5 as well as 5 and higher. Hence, no systematic bias is to be expected. The overrepresentation of e-filing users in the

treatment group as identified by the phone number might be due to the fact that taxpayers who own a cell phone (and thus can be identified by their phone number) are more likely to file their tax returns digitally than taxpayers without a cell phone. Overall, despite the treatment identification groups "Self-reported" and "Both" showing significant differences for several variables, we feel comfortable assuming that randomisation has been successful since the treatment is balanced across almost all of the variables for the treatment identification group "Phone number".

Table 8: Balance check education						
	Self-reported		Phone number		Both	
	C	T	C	T	C	T
Primary school or less	10	4	1	2	11	2
	(.02)	(.02)	(.00)	(.01)	(.02)	(.02)
Secondary school	141	42	60	45	160	19
	(.31)	(.18)	(.25)	(.19)	(.30)	(.16)
University	298	191	182	186	365	98
	(.66)	(.81)	(.75)	(.80)	(.68)	(.82)
Chi-squared	15.51		2.31		9.74	
p-value parametric	.00*		.31		.01*	
p-value RI	.00*		.28		.00*	
Note: Column shares in parentheses; * p < .1 Source: Authors						

6.4 Empirical analysis

In order to test the effect of the BURS message, we run several significance tests with indicators representing steps in our causal mechanisms. Given that past behaviour cannot be influenced by our treatment, the analysis should be restricted to questions that refer to current perceptions or intended behaviour rather than past behaviour.[18] For the purpose of better comparison, we standardised all ordinal-scaled variables to a range of 0 to 1. We test if the treatment shows an effect on step C (long chain) and step B (linkage 1). Analytically, we organise our tests in three stages. We first apply classical (parametric) chi-square tests. Then we apply randomisation inference (RI) tests. RI simulates all potential combinations of the outcome to assess the probability that the observed outcome occurs, thus providing a p-value without distributional assumptions. In the end, we go through all the hypotheses of our causal mechanisms and compare the p-values of the classical and RI tests.

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18   For empowerment (step B, mechanism 1), our survey does not provide a suitable proxy that meets this requirement. We use the question "In the last year, did you join effort with people from other backgrounds to raise an issue that you consider to be relevant for the whole community?" (B3 Q15).

6.4.1 The empowerment mechanism

Table 9: Empowerment hypothesis (long chain) – preference for democracy						
	Treatment identification					
	Self-reported		Phone number		Both	
	C	T	C	T	C	T
Do not agree	109	66	65	54	130	33
	(.25)	(.29)	(.27)	(.24)	(.25)	(.29)
Agree	331	165	174	175	396	82
	(.75)	(.71)	(.73)	(.76)	(.75)	(.71)
Chi-squared	.95		.63		.59	
p-value parametric	.33		.43		.44	
p-value RI	.29		.40		.40	
Note: Column shares in parentheses. Source: Authors						

With reference to hypothesis 1, we analyse if the treatment shows an effect on support for democracy and on empowerment (again, measured by raising an issue for the community). As displayed in Table 9 and Table 10, we cannot find any differences between the treatment and control groups that are statistically significant – neither when using the classic chi-square test, nor when resorting to RI. This applies to all three strategies for identifying the treatment group, that is, self-reporting, phone number and both criteria at once.

Table 10: Empowerment hypothesis (linkage 1) – raised issue relevant for the community						
	Treatment identification					
	Self-reported		Phone number		Both	
	C	T	C	T	C	T
No	339	169	170	168	398	84
	(.76)	(.72)	(.70)	(.73)	(.75)	(.72)
Yes	108	65	72	63	136	33
	(.24)	(.28)	(.30)	(.27)	(.25)	(.28)
Chi-squared	.88		.25		.25	
p-value parametric	.35		.62		.62	
p-value RI	.34		.61		.57	
Note: Column shares in parentheses. Source: Authors						

6.4.2 The appeasement mechanism

With regard to hypothesis 2, we assess the effect of the treatment on citizens' perceptions of whether Botswana is going in the right or wrong direction (long chain) and on citizens' perceptions of whether their needs are being addressed by the government (linkage 1). As displayed in Table 11, for the long chain, we cannot find any statistically significant differences between the treatment and control groups and, hence, no effect of our treatment.

Table 11: Appeasement hypothesis (long chain) – direction of the country						
	Treatment identification					
	Self-reported		Phone number		Both	
	C	T	C	T	C	T
Wrong direction	151	64	75	72	172	30
	(.41)	(.34)	(.39)	(.37)	(.39)	(.32)
Right direction	219	124	115	123	264	64
	(.59)	(.66)	(.61)	(.63)	(.61)	(.68)
Chi-squared	2.13		.17		1.56	
p-value parametric	.14		.68		.21	
p-value RI	.15		.67		.20	
Note: Column shares in parentheses. Source: Authors						

For linkage 1 the picture is different. When looking at self-reported treatment identification, the parametric chi-square test yields statistically significant differences between the treatment and control groups, as Table 12 shows. For the treatment identification based on the phone number, the RI-based p-value suggests a statistically significant difference between the treatment and control groups. In the treatment group, a higher share of respondents feels that their needs are being addressed by the government. The differences between the parametric and the RI-based p-values indicate that the data might not meet the distributional assumptions of the parametric chi-square test. Since the simulation-based randomisation inference does not depend on the distributional features, its results should be more trustworthy in such cases. Therefore, we can be confident that this finding can be interpreted as a causal effect of our treatment.

Table 12: Appeasement hypothesis (linkage 1) – needs being addressed by officials						
	Treatment identification					
	Self-reported		Phone number		Both	
	C	T	C	T	C	T
None at all	76	28	38	26	87	13
	(.17)	(.12)	(.16)	(.11)	(.17)	(.11)
Not very much	179	109	107	105	220	54
	(.40)	(.48)	(.45)	(.46)	(.42)	(.47)
Somewhat	119	50	64	53	138	24
	(.27)	(.22)	(.27)	(.23)	(.26)	(.21)
Quite a lot	34	27	18	28	45	16
	(.08)	(.12)	(.08)	(.12)	(.09)	(.14)
A great deal	34	15	11	16	37	7
	(.08)	(.07)	(.05)	(.07)	(.07)	(.06)
Chi-squared	8.78		6.19		6.32	
p-value parametric	.07*		.19		.18	
p-value RI	.59		.08*		.47	
Note: Column shares in parentheses; * p < .1 Source: Authors						

6.4.3   The equal treatment mechanism

Table 13: Equal treatment hypothesis (long chain) – people can be trusted						
	Treatment identification					
	Self-reported		Phone number		Both	
	C	T	C	T	C	T
Must be very careful...	410	214	222	212	491	106
	(.93)	(.92)	(.94)	(.92)	(.94)	(.91)
Most people can be trusted	29	19	15	18	34	11
	(.07)	(.08)	(.06)	(.08)	(.06)	(.09)
Chi-squared	.34		.20		.85	
p-value parametric	.56		.65		.36	
p-value RI	.50		.59		.33	
Note: Column shares in parentheses. Source: Authors						

For hypothesis 3, we analyse if the treatment affects interpersonal trust (long chain) and the perception of unequal treatment under the law (linkage 1). As Table 13 and Table 14 reveal, the outcome variables are not significantly different between the treatment and control groups.

Table 14: Equal treatment hypothesis (linkage 1) – unequal treatment under the law						
	Treatment identification					
	Self-reported		Phone number		Both	
	C	T	C	T	C	T
Never	26	17	12	15	32	8
	(.06)	(.08)	(.05)	(.07)	(.06)	(.07)
Rarely	48	26	27	24	59	13
	(.11)	(.12)	(.12)	(.11)	(.12)	(.11)
Sometimes	207	117	115	124	251	62
	(.48)	(.53)	(.51)	(.55)	(.49)	(.54)
Often	100	34	51	36	113	15
	(.23)	(.15)	(.22)	(.16)	(.22)	(.13)
Always	46	26	22	28	53	16
	(.11)	(.12)	(.10)	(.12)	(.10)	(.14)
Chi-squared	5.86		4.15		5.36	
p-value parametric	.21		.39		.25	
p-value RI	.22		.81		.81	
Note: Column shares in parentheses. Source: Authors						

6.5   Summary

Our three hypotheses were tested based on the data that we captured during the implementation of our experiment using an in-person survey with a relatively small sample of the population as well as rigorous group definitions and testing methods. As the treatment, we had sent out one short message in the beginning of our survey. Obviously, one single short message is unlikely to have a large effect on citizens' political attitudes. Effects were thus expected to be small. Our balance checks indicate that the randomisation of the treatment implemented by BURS was successful, even though, given the legal restrictions, we had to reconstruct who was treated because we did not have direct access to that information. Of course, we cannot be completely sure that everyone who should have received the message actually did. This can, for example, be explained by outdated or wrong registered phone numbers of individuals by BURS. Yet, by drawing on both self-reporting and phone numbers, we increase the robustness of identifying our treatment group.

Overall, we can observe just one significant effect in one linkage, namely for the question about "officials addressing your needs". This means that the message had a positive effect on the recipients' perceptions of how well the state is serving the citizens, which makes sense, because receiving a message from the government can reasonably lead to an enhanced feeling of appreciation. Still, the finding is remarkable, given the low intensity of the treatment.

For governments interested in introducing e-government solutions, our results imply that providing such services may not be enough. Rather, they should also get in touch with their citizens and remind them of what is available. As our experiment has shown, this should foster citizens' feelings of being acknowledged by the government. Given the positive relationship between this perception and regime satisfaction that our observational analysis has revealed, this appears as a reliable strategy for governments to increase their output legitimacy.

To better investigate small effects like those identified here, larger sample sizes are needed. It would be interesting to see whether an analysis with an increased sample size reveals significant effects in hypotheses where our analysis did not. In other words, it remains to be seen whether we find an effect in only one instance because there is no other causal relationship to reveal, or because of the small sample size. However, the one effect we have identified should encourage further research.

7   Synthesis and discussion

By applying observational and experimental approaches to testing the empirical implications of our theory, we obtain a more holistic picture of the impact of e-government on political attitudes (see Table 15). The observational analysis, on the one hand, has shed light on how the use of a wider set of digital services is related to the evaluation of governmental action and societal realities. The experiment, on the other hand, allowed us to rigorously trace the effect of incentivising a randomly selected group of people to file tax returns electronically.

The observational study shows how exposure to e-government is linked to the empowerment of citizens. More precisely, people who use e-government show a slightly higher likelihood of joining efforts with people from other backgrounds to raise issues they

consider to be relevant for the whole community. Hence, despite the small magnitude of this relationship, this evidence supports our theory that, through e-government, citizens may increase their degree of knowledge, become more involved in political issues and feel encouraged to organise and participate in interest groups. The fact that the experiment found no such evidence can be attributed to measurement problems, namely that our measure of empowerment refers to a period before the treatment had occurred. It may also be due to the short time lag between the treatment and the survey, and to the fact that only a very mild treatment was applied once. Under such circumstances, obviously, the treatment simply cannot have a substantial impact on the outcome variable. With regard to the entire mechanism, however, evidence is a bit less clear, also from the observational perspective. The results on the relationship between e-payments for water and electricity and support for democracy support our first hypothesis. Citizens who use these e-services are more likely to support democracy, fostered by a feeling of empowerment. Yet, in terms of mobile money, this pattern does not hold; the usage of this service seems to be negatively associated with support for democracy. As mobile money is not an actual state service, but rather a service that is strictly regulated by the state and is used for many state–citizen transactions, we are not surprised that we do not find a positive connection between its usage and support for democracy. The fact that no effects have been detected in the experimental analysis might simply be due to the low intensity of the treatment. However, one could question the suitability of "engagement in activities relevant for the community" as our proxy for empowerment. Standing up and taking action for the community is probably one of the most extreme and most visible implications of empowerment. Many people that do not take action will still feel empowered, yet just not enough to take such a step – or they may simply not see any urgency to get involved. All in all, while the results of the observational study do not fully support hypothesis 1, a closer look nevertheless reveals some evidence in favour of core elements of the purported mechanism.

Especially with regard to hypothesis 2 and the appeasement mechanism, observational and experimental analysis complement each other well. Although we found no support for the postulated long causal chain, robust evidence was revealed for linkages 1 and 2 – although not always in the expected direction. The observational study has shown that e-government usage is actually associated with a decline in the feeling that needs are being addressed. When looking at the individual services, it becomes apparent that this result is mainly driven by the negative correlation with e-payments for electricity and mobile money. This might be due to selection bias: More critical citizens might be more inclined to adopt new technology. Our experiment circumvents this issue and finds the incentivising message has a positive effect on e-filing. The negative correlation in the observational data might also be due to different user experiences with different services. Maybe the impersonal nature of e-services and the lacking interaction with officials reduces the feeling that there is someone who cares, irrespective of the quality of the services or savings in cost and time. This could also explain the positive effect that our e-filing message has regarding the feeling that officials are addressing one's needs: Only when the provision of a service with no direct contact to government officials is complemented by a more personal form of interaction (e.g. a personal message) will citizens feel that their needs are being addressed by government officials. Given that the observational study found a very strong and positive relationship between the feeling that one's needs are being addressed and regime satisfaction, such a complementation of e-service provision with a more personal note might be a promising and attractive path for governments seeking to introduce e-services. In a wider sense, these findings point towards the relevance of how services are actually

designed and implemented and, as a result, how these aspects affect users' experiences. If a low-cost measure such as a simple message can induce such an effect, there should be ample potential and incentive to improve the provided services.

Table 15: Overview results		Long chain		Linkage 1		Linkage 2
		obs.	exp.	obs.	exp.	obs.
H1 (empowerment mechanism)	Index	—	—	√	—	—
	BPC	√		√		
	WUC	√		√		
	BURS	—		—		
	Mobile money	X		√		
H2 (appeasement mechanism)	Index	—	—	X	√	√
	BPC	X		X		
	WUC	—		—		
	BURS	—		—		
	Mobile money	—		X		
H3 (equal treatment mechanism)	Index	—	—	X	—	√
	BPC	X		X		
	WUC	—		X		
	BURS	—		—		
	Mobile money	X		X		

Note: Results in line with our expectations are marked with a √, whereas X signals that we find a significant relationship in the opposite direction of what we had expected. – indicates no significant finding at all. Columns with "obs." contain the results of the observational analysis; columns with "exp." show the results of the experiment.

Source: Authors

As for the equal treatment mechanism, we have to treat our findings with caution, as the distribution of answers for interpersonal trust is very unbalanced. A more robust but unexpected pattern emerges for the effect of e-government usage on the feeling of unequal treatment under the law. We find a positive significant relationship, which contradicts our expectations. A possible explanation is that individuals who feel that people are treated unequally may resort to e-services as an attempt to avoid being treated unequally when using analogue services themselves. The results referring to linkage 2, which indicate that the perception of unequal treatment is associated with lower levels of interpersonal trust, are in line with our expectations. Given the imbalance of the variable on interpersonal trust, these results have to be taken with a grain of salt. The experiment yields no significant effects for the equal treatment mechanism. Since a short reminder message by a state agency to use a certain e-service is unlikely to affect individuals' perceptions of (un)equal treatment and the trustworthiness of other citizens, this does not come as a surprise.

To sum up, we can say that we find evidence supporting our first and second mechanisms – the empowerment and appeasement mechanisms – even if only for some of the e-services under investigation, and sometimes only for some of the linkages within the mechanisms (see Table 15). The e-services of WUC and BPC yield significant results for the long causal chain of the empowerment mechanism, supporting our theory that e-service usage positively influences attitudes towards democracy. Furthermore, we find support for particular linkages within the three mechanisms. The observational part of the study provides evidence

for linkage 1 of the empowerment mechanism. For linkage 1 of the appeasement mechanism and linkage 1 of the equal treatment mechanism, the findings of the observational analysis are equally robust, yet they point in the opposite direction of what we expected. In the experiment, however, we find support for linkage 1 of the appeasement mechanism. Linkage 2 can only be investigated in the observational analysis, where the results for the appeasement and equal treatment mechanisms are as expected. Yet, given the imbalance of the "interpersonal trust" variable, the findings for the equal treatment mechanism should be treated with caution.

Further studies should focus on the long-term effects of interventions such as the one implemented in our experiment – if a message was sent several times over a longer period of time as well as with more specific content, we might see more or stronger effects. Repeating our survey later in 2020 would have been a promising step. We obtained permission from 66 per cent of our respondents to contact them again. The Covid-19 pandemic, however, interfered, and a follow-up survey was not possible. Extending our survey to a panel would have been particularly valuable if carried out after the tax filing period in September 2020. At this point, one could have observed whether more people did file tax returns electronically after receiving the message and whether political attitudes had changed after individuals observed the advantages of e-services. In addition, our general observations could have gained more robustness through a long-term observation, too. This would have facilitated observing not only political attitudes, but also changes in the behaviour of respondents regarding their usage of e-government services. Further evidence is needed, particularly on the relationship between e-government and interpersonal trust. Additionally, our survey was restricted to Gaborone. Hence, we need to be cautious when making generalising statements for Botswana as a whole or beyond.

The usage of e-government services and receiving an incentivising message can have positive effects on regime satisfaction and support for democracy. Our discussion paper contributes to the literature on the effects of ICT on political attitudes. We find that improving and expanding e-services could help increase the degree of political participation of citizens, strengthen support for democracy and enhance satisfaction with the regime. More than 89 per cent of our respondents would like to use more e-services, which points to a high demand in the population.

8   Conclusion

This paper examines the effects of e-government usage on political attitudes. We hypothesise that the usage of e-government has empowering and appeasing effects on individuals and enhances the perception that citizens are treated equally. In order to assess these conjectures, we conducted a representative in-person survey in Gaborone. We also carried out an experiment in cooperation with the tax agency of Botswana, incentivising individuals to use more e-services. Our survey results allow us to both trace the effects of this incentive and to make observational conclusions about the relationship between e-government usage and individual political attitudes. We find evidence for the impact of some of the e-services and for several of the linkages between the causal steps within our causal mechanisms.

The observational study reveals a statistically significant relationship between e-government exposure and empowerment, confirming our expectations. Concerning the appeasement

mechanism, observational data suggests the opposite of what we expected: E-government usage is associated with a lower likelihood of stating that officials are addressing one's needs. We ascribe this to selection bias, as, in contrast, the experimental analysis confirms our hypothesis. The incentivising message sent out by BURS significantly increased the feeling that one's needs are being addressed by officials. For linkage 2, the observational study yields a statistically significant and strongly positive relationship: Citizens who perceive that their needs are being addressed by the government tend to think that the country is going in the right direction. For the equal-treatment mechanism, we treat the results with caution, as there is not enough variation in the variable "interpersonal trust". The first linkage is not affected by these measurement problems and yields a statistically significant relationship between the usage of e-services and the feeling that people are treated equally, albeit again contrary to what we had expected: E-government users feel treated unequally more often. In contrast, the evidence for the second linkage is strong and confirms what we had expected: A perception of equal treatment is associated with higher levels of interpersonal trust.

Especially the results for the appeasement mechanism yield interesting policy implications: Digital tools alone are not able to foster regime support. But in combination with a more personal form of interaction (for example a personal message), they can be a powerful tool to influence individual political attitudes and increase the degree of output legitimacy. Given the relevance of political attitudes for the consolidation and survival of democracies, introducing e-government solutions with such a personal touch could play an important role in strengthening democracies in the Global South. Such citizen-oriented digitalisation is likely to be more successful the more user-friendly digital tools are designed. As it is impossible to build perfect tools from scratch, monitoring and evaluation must accompany implementation.

Several issues that we touch upon in this discussion paper need further elaboration and research. One easy follow-up would be tracking the effect of the message on uptake of e-filing in the next tax filing period. Another helpful supplement for further research would be expert interviews to gather important details on people's perceptions and develop a better understanding of potential specificities of the context in Botswana. Due to the Covid-19 pandemic, however, neither of the two options were possible to actually implement.

Still, we consider that this paper represents a relevant contribution to a nascent field of analysis that we expect to – and hope will – evolve during the years to come. A large number of questions related to the effects of digitalisation and digital services remain open. There are even more questions when referring to effects that go beyond effectiveness and efficiency considerations and aim at understanding changes in citizens' political and social perceptions. Testing our hypotheses in another context would be key to gain confidence in the results and also analyse under which conditions the effects actually materialise – and when they do not. For this purpose, and as a future avenue for establishing the generalisability of our findings, we suggest to conduct additional case studies and complement these with a cross-country time-series approach to increase external validity. This way, a more consistent and reliable understanding of the degree to which e-government usage affects political attitudes could be gained. Given the foreseeable expansion of e-government, it is crucial that our societies and decision-makers understand its impact on democracy.

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