Taxation, Loss Aversion, and Accountability: Theory and Experimental Evidence for Taxation's Effect on Citizen Behavior

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Abstract

While improving government performance is a key challenge for state development, we still know little about what factors affect citizens' toleration of poor performance by government officials. This paper argues that taxation is a significant predictor of citizens' demands, detailing and formalizing a micro-level theory of how taxation affects citizens' preferences over accountability. By taking away earned income, taxation pushes loss-averse citizens below their reference point, increasing the utility citizens lose from non-accountable government behavior and making them more likely to enact costly sanctions against officials. Laboratory experiments, conducted in Uganda, find that in a single-shot game taxation increases citizens' willingness to punish leaders by 12% overall, and by 30% among the group who has the most experience paying taxes in Uganda. Additional experiments confirm that this effect is driven by the loss aversion mechanism, and a survey experiment demonstrates that taxation increases politically-active Ugandans' willingness to punish corruption.

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1 Introduction

After decades of state-building efforts, many African countries still suffer from poor public services and high corruption, with government funds misused for private benefit rather than spent on the policies citizens prefer. One possible constraining factor is low citizen demand for improvement; citizens often fail to punish leaders who embezzle public funds or spend them in ways not valued by citizens. Yet, there are few variables that consistently explain when citizens will demand better government performance, and few accountability-building interventions have been successful, even in the short term.[1] Absent such demands, corruption and mismanagement lower the resources available for public services, and may lead to lower overall economic growth (Bardhan, 1997). This paper develops and tests a theory for how taxation can increase citizens' willingness to punish governance failures, improving leader's incentives to provide citizens' preferred policies and services. By changing expectations, taxation makes citizens less tolerant of corruption or poor service provision and increases the benefit of punishment relative to the cost. The paper introduces a formal theory to describe how taxation changes citizens' behavior and the first experimental evidence that taxation increases citizens' propensity to punish leaders.

A large literature suggests that governments' funding sources matter for accountability. Oil revenues may be detrimental to both democracy and accountability (Ross, 2001; Vicente, 2010; Tsui, 2011); foreign aid may likewise worsen a number of governance outcomes (Svensson, 2000; Remmer, 2003; Bräutigam and Knack, 2004). Non-earned revenues furthermore lower the government's willing-

[1]This paper follows Fearon (1999) in defining an accountable government as one that provides citizens with their preferred policies and public goods, efficiently and without theft or misuse of funds. Non-accountable governments are those that shirk; spend funds inefficiently; or are corrupt, defined as the abuse public office for private gain.

ness to tax its citizens (Ross, 2001; Collier, 2006; McGuirk, 2013).

In contrast, cross-national evidence shows that higher reliance on taxation is associated with democratization (Ross, 2004), executive constraints (Besley and Persson, 2013), and higher public goods provision (Timmons, 2005); similar patterns are evident for subnational units within Brazil and the United States (Brollo et al., 2013; Gadenne, 2015; Fisman and Gatti, 2002). Sub-Saharan Africa, which forms the focus for this paper, exhibits both low tax effort and high corruption relative to other regions (Mansour, 2014; OECD, 2015; Transparency International, 2014). Within Africa, tax-reliant countries are less corrupt (Baskaran and Bigsten, 2013).

The political economy literature proposes two mechanisms through which taxation improves accountability. First, tax bargaining theories argue that citizens, by threatening non-payment, can force tax-reliant governments to bargain for quasi-voluntary compliance in return for democratic institutions or policy concessions (Schumpeter, 1991; Bates and Lien, 1985; North and Weingast, 1989; Levi, 1989; Moore, 2004; Torgler, 2007). Tax bargaining undoubtedly takes place in some contexts, including in sub-Saharan Africa today. However, the bargaining explanation cannot explain why citizens fail to use other forms of leverage, such as elections, to sanction governments when not taxed. Additionally there are cases, such as Uganda's Graduated Tax, in which taxation did not involve bargaining and yet its elimination reduced citizens' demands.[2]

Second, taxation may affect whether citizens have or seek the information they need to sanction poor government performance. This could be by signaling the size of the budget (Sandbu, 2006; Gadenne, 2015; Brollo et al., 2013), or by indicating to citizens which level of government should be held responsible (Rodden, 2005). While there is no direct evidence that taxation conveys infor-

[2]See Section 2.

mation to citizens, Paler (2013) shows that taxation makes Indonesian citizens more willing to pay for information about government performance.

This paper theorizes and tests an alternative but complementary mechanism through which taxation can impact accountability: taxed citizens have a lower tolerance for poor government performance and are more likely to punish low-performing leaders. Individuals receive a non-economic "expressive benefit" from taking punitive action against bad leaders, and taxation increases this benefit relative to the costs of action, inducing citizens to more readily punish governments for their behavior. Previous work suggests most individuals are loss averse, caring more about recovering losses than obtaining gains (Kahneman and Tversky, 1979). By removing earned income, taxation shifts citizens into the realm of losses, increasing the utility citizens lose due to corruption, mismanagement, or other policies that differ from citizens' most-preferred allocation of government resources.

If the utility an individual loses from government malfeasance or mismanagement is tied to his willingness to punish, taxation will decrease citizens' tolerance for poor performance and increase the likelihood that citizens punish such offenses. As the threat of punishment is a key step in improving government accountability, leaders may then be more likely to efficiently provide the services citizens desire when taxation is present. This theory accords with the intuition of many observers, as well as case studies on perceptions of citizen engagement, but the author is unaware of any direct evidence that it exists.[3]

The loss aversion mechanism was first suggested in Sandbu (2006), which

[3]Moore (2004) argues "the absence of direct taxes reduces the likelihood that citizens will...engage in politics" (307); Persson and Rothstein (2015) show that tax cuts in Uganda have lowered perceived citizen engagement, arguing that taxation increases citizens' sense of government ownership. See also Ross (2001, 2004); Moore (2007).

argues that endowment effects should induce citizens to care more about government spending. However, that paper does not explain how loss aversion affects citizens' cost-benefit analysis of engaging in political action, or provide a formal model or evidence for the proposed effect. Paler (2013), which provides the only known test of the loss aversion hypothesis, does not find that taxation induces citizens to be more politically active, although in low-information environments citizens who are already political active are more likely to sanction the incumbent when taxed.

In this paper I provide the first detailed explication of the loss aversion mechanism, and the first experimental evidence that taxation increases citizens' willingness to punish government behavior. I use a formal model to demonstrate that taxation increases citizens' utility losses from low government transfers and show why this increases citizens' willingness to punish leaders, even absent economic incentives to do so. I test the model using a set of novel laboratory-in-the-field experiments conducted in Uganda. In these experiments, a "Citizen" must decide whether to pay to punish a "Leader" based on how he allocates a group fund, which is either unearned or derived from a tax on the Citizen. I find that the taxation treatment increases Citizens' willingness to punish the Leader by 13% overall, and by 30% for the subgroups with the most experience with taxation. Additional experiments rule out alternative mechanisms. Qualitative data from experiment participants and evidence from a conjoint survey experiment in Uganda provide external validity for the experimental results; the survey experiment also links the effect of taxation to citizens' willingness to punish corruption more specifically.

This mechanism has several advantages. First, it can operate even when taxation is coercive and therefore tax bargaining is not feasible.[4] This is especially

[4]Taxation is coercive when voluntary compliance is low and revenue collection uses ha-

important in African countries, where few examples of tax bargaining have been documented (Juul, 2006; Bräutigam, 2008; Eubank, 2012).

Second, a behavioral effect of taxation can help to explain when and why tax bargains can be maintained.[5] Because taxation increases citizens' willingness to take costly punishment actions, citizens can credibly commit to punishing any deviations from a bargain, improving the government's incentives. By increasing the personal benefits from taking part in collective action, the proposed mechanism also has the potential to lessen the coordination problems facing citizens.

Finally, this paper adds to debates on how to build and sustain citizens' political engagement in fledgling democracies. Poor accountability, including corruption, is a principal-agent problem, occurring when citizens are either unable or unwilling to monitor and sanction politicians' behavior (Bardhan, 1997). A number of randomized interventions—typically focused on creating institutions such as community meetings and overcoming collective action problems—have shown that it is difficult to sustainably increase citizens' willingness or ability to monitor in practice (Olken, 2007; Casey, Glennerster and Miguel, 2012). Providing information to citizens has successful in at least some cases, but only increases citizens' ability to hold governments accountable, not their underlying propensity to do so (Reinikka and Svensson, 2005).

Existing theories of citizen engagement focus on institutional and individual-level factors. For example, Tavits (2007) argues that fixed institutions such as federalism and presidentialism affect citizens' ability to sanction through their effects on "clarity of responsibility," while Cameron et al. (2009) argue that institutions explain cross-country differences in willingness to punish corruption. At the individual level, education is positively associated with voting, and with

rassment and forcible asset confiscation.

[5]This potential effect is not tested in this paper.

willingness to punish corruption, while wealth increases participation and willingness to punish corruption in some settings, but decrease it in others (Mattes and Bratton, 2007; Kuenzi and Lambright, 2010; Weitz-Shapiro and Winters, 2013).

All of these theories typically take government institutions as given, and examine citizen engagement across or within countries. Beyond these fixed factors, governments may be able to manipulate fiscal institutions to change the accountability pressures they face from citizens. Extensions of the formal model can explain when taxation-induced demands by citizens will lead to an improvement in citizen welfare, as opposed to a decrease in taxation or even a decrease in transfers. This can help to explain government behavior in countries, such as Uganda, that have reduced taxation in the lead-up to elections, reducing their access to resources in return for fewer citizen demands. However, in other cases, taxation has the potential to be a self-sustaining mechanism for improving citizen engagement: if governments do have an incentive to keep taxing citizens, the theory presented here suggests that citizens will continue to monitor and punish poor performance; additional evidence is needed to prove that this is indeed the case.

2 Taxation and Accountability in Uganda

The theory developed in this paper is a general one, intended to apply to a broad range of settings. However, identifying an effect of taxation has the most policy relevance in regions, such as sub-Saharan Africa, that currently combine low taxation with corruption and poor accountability. For this reason, the paper focuses on evidence from one such country, Uganda. Uganda collects only 12.95% of GDP in taxes (Ministry of Finance, 2014), and since the Graduated

Tax was abolished in 2006, poor Ugandans currently pay virtually no virtually direct taxes. Meanwhile, Uganda ranks 142 of 174 countries for good governance (Transparency International, 2014), and even basic public services are difficult to obtain. Yet, there is little concrete outrage about poor governance.

Despite low overall levels of taxation in Uganda, taxation is highly salient for urban citizens. It is also a setting in which taxation, particularly the now-abolished graduated tax, has historically been enforced through coercion not bargaining. Noncompliance with the tax, paid by all adult men, was punishable with jail time; it was eliminated only when it became a rallying point for the opposition (Therkildsen, 2006). A common view among local observers is that the abolition of the tax severed a critical link between citizens and government: a decrease in taxation led to decreased citizen engagement even absent tax bargaining (Persson and Rothstein, 2015). This makes Uganda an excellent place to test taxation's effect on citizen behavior.

A recent scandal demonstrates Ugandan citizens' disconnect from non-earned revenue. In 2012, a corruption investigation found that almost US$20 million in aid had vanished from accounts in the Office of the Prime Minister. Within two months foreign donors had cut US$300 million in payments, almost 7% of the government's 2012-2013 budget. Puzzlingly, the citizen response to the scandal was muted, despite heavy media coverage. Contemporary media accounts do not report any scandal-related protests, and there have been no serious consequences for the NRM regime. This compares strikingly to protests in 2014 over a ban on mini-skirts: Ugandans are willing and able to protest, but simply chose not to do so over an aid scandal.

Where taxation is still present in Uganda, accountability demands are higher. The anti-corruption Black Monday coalition frequently uses taxation to mobilize citizen outrage, framing protests in terms of "the taxpayer's burden" (Red

Pepper, 2013). A more local example comes from the town of Lira. As in many towns, vendors there pay fees to sell in the local market – such fees are a key source of local tax revenue. In 2012, the city had stopped collecting the market's trash, creating unsanitary conditions that kept customers away. Vendors protested, arguing that their taxes were not being well spent. They dumped buckets of stinking refuse in front of City Hall, threatening to do the same to city council members' houses if the situation was not rectified. Garbage collection quickly resumed (Uganda Radio Network, 2012).

3 A Model of Taxation and Punishment

An illustrative model demonstrates how taxation affects citizens' "demand side" of accountability; the online appendix presents equilibrium outcomes. Consider a state consisting of a government and a group of citizens, with the citizens represented as a continuum of mass one. I compare two fiscal regimes with equal budgets derived from different sources. In one regime the government collects a mandatory, exogenously set, proportional tax, t, on each citizen's income, y. Taxation is non-distortionary and collection is costless. In the other regime, $t = 0$; government is funded solely by non-earned sources such as foreign aid or oil. In both regimes the government receives total revenue T and must allocate it between a public good, G, and a private good, p, with $G + p = T$. Citizens only receive utility from the public good, which could represent education, infrastructure, or any other good valued by citizens. Government receives utility only from the private good, which represents money that is embezzled or used for another good less valued by citizens.[6] All that is required for these results to

[6]Money spent on clientelism may provide utility to both citizens and government; see discussion in Section 8.

hold is that citizens prefer G to p, while the government prefers p to G.[7]

Citizens' utility has two components: an economic payoff, which citizens evaluate in relation to their expectations (reference point), and the payoff from any punitive action taken against the government. First, consider a citizen's economic utility, $u(x)$, where

$$x = y(1-t) + G - r. \tag{1}$$

In the equation above $y(1-t)$ is post-tax income, G is the level of the public good, and r is the citizen's reference point. When $x > 0$ a citizen's economic payoff exceeds his reference point: the citizen is in the realm of gains. When $x < 0$ the citizen is below his reference point and is in the realm of losses. I argue that the reference point $r = y$: citizens evaluate their utility in reference to pre-tax income assuming no public goods are provided.[8] If citizens are not taxed they expect to receive only their private income, regarding utility from any public goods as an unexpected "gain." However, if citizens are taxed, their utility when $G = 0$ is now below the reference point. The function $u(x)$ must meet the criteria of loss-averse functions defined by Kahneman & Tversky (1979):

1. $u(x)$ is monotonically increasing; $u(0) = 0$
2. $u(x)$ is concave for all $x > 0$, and convex for all $x < 0$
3. $u(x) < -u(-x)$ for $x > 0$
4. $u'(x) < u'(-x)$ for $x > 0$

Figure 1 depicts one such function.

[7]I collectively refer to spending on p as "rent-seeking;" this encompasses corruption and any other non-optimal spending.

[8]This maps onto the experiments below, where the respondent's in-game endowment is a logical reference point. Individuals are typically perceived as "owning" their pre-tax income (Murphy and Nagel, 2002).

A citizen's full utility function is

$$V_C = u(x|G, r, t) + s_i(\beta_i * \Delta u(x|G, r, t) - c)\,. \tag{2}$$

The first term is economic utility given the reference point r and levels of public good G and tax t; the second term represents utility derived from punishing the government. The citizen's decision of whether to punish the government is $s_i \in \{0, 1\}$: punishment in this context might involve taking part in elections or protests in order to sanction government leaders. If $s_i = 1$ the citizen pays a cost c that includes collective action and opportunity costs and in return receives a psychological, non-economic benefit $\beta_i * \Delta u(x|G, r, t)$. The first part of the benefit, $\beta_i > 0$, is an individual-specific factor drawn from some distribution $F(\cdot)$. Citizens with higher values of β_i can be understood as having a higher propensity for political engagement, either because they care more about accountability, or because they simply enjoy engaging in political action. This individual factor is then multiplied by $\Delta u(x|G, r, t)$, the *amount of economic utility the citizen has lost due to rent-seeking*. This loss is defined as

$$\Delta u(x|\hat{G}, r, t) = u(x|T, r, t) - u(x|\hat{G}, r, t), \tag{3}$$

which can be understood as the gap between citizens' economic utility given the government's actual public goods provision $G = \hat{G} \in [0, T]$ and the level of utility citizens would receive if the entire budget was devoted to public goods provision (i.e. $G = T$). In equilibrium each citizen punishes (sets $s_i = 1$) only when his losses from rent-seeking are sufficiently high that the benefits of punishment exceeds the costs, i.e. when:

$$\Delta u(x|G, r, t) > \frac{c}{\beta_i}. \tag{4}$$

Provided the costs of taking action (c) are not prohibitively high, and that an individual receives sufficient utility from political engagement[9], there will be some point $G^* \in (0, T)$ at which a given citizen is indifferent between punishing and not punishing. This occurs when:

$$\Delta u(x|G^*, r, t) = \frac{c}{\beta_i}. \tag{5}$$

As the economic loss from rent-seeking $\Delta u(x|G, r, t)$ becomes smaller as G increases, a citizen prefers to punish the government only if $G < G^*$; that is, when the government fails to provide citizens' desired level of the public good. I define this cut-point value G^* as the *punishment threshold*; this is the main outcome of interest in the experiments below.

3.1 Taxation's Effect on the Punishment Threshold

As citizens expect to receive at least their reference utility $r = y$ (pretax income), taxation pushes citizens into the realm of losses. Because the utility function $u(x)$ is by assumption steeper below the reference point, a taxed citizen therefore loses more utility from a given level of rent-seeking compared to a non-taxed citizen—formally, for any $G < T$, $\Delta u(x|G, r, t)$ is higher under taxation. This directly implies that taxation increases the punishment threshold G^*: citizens demand higher government transfers when they are taxed.

To see this more clearly, Figures 1 and 2 graph citizen utility with and without taxation. Each graph marks citizen utility under full public goods provision—$u(x|T, r, t)$—and citizen utility given that the government actually provides some lower level of public good $\hat{G}$—$u(x|\hat{G}, r, t)$. The vertical distance between $u(x|\hat{G}, r, t)$ and $u(x|T, r, t)$ on each graph represents the citizen's utility

[9]If these conditions do not hold, the result below does not hold.

loss from rent-seeking, $\Delta u(x|\hat{G}, r, t)$. In Figure 1, the citizen is not taxed and if $G = 0$ the citizen's utility is at the origin. Any positive level of the public good represents a gain; utility is highest when $G = T$. Figure 2 depicts citizen utility under taxation. Now $u(x|T, r, t)$ is at the origin, as the citizen requires full public goods provision to regain his loss of yt. For any partial public goods provision $G < T$ the citizen's utility is still below the reference point.

Let $\Delta_t u(x|G, r, t)$ and $\Delta_0 u(x|G, r, t)$ be the losses from rent-seeking with and without taxation, respectively. In the graphs, the slope of the utility curve between full and actual public goods provision—that is, between $u(x|T, r, t)$ and $u(x|\hat{G}, r, t)$—is steeper for the taxed citizen, implying that $\Delta_t u(x|\hat{G}, r, t) > \Delta_0 u(x|\hat{G}, r, t)$: a taxed citizen loses more utility from any given level of partial public goods provision than a non-taxed citizen. The online appendix contains a formal proof that this holds for any loss-aversion function $u(x)$ and any level of public goods $G \in [0, T)$. As the rent-seeking loss $\Delta u(x|G, r, t)$ decreases as G increases, citizens will demand more transfers, and thus have a higher punishment threshold, when they are taxed: $G_t^* > G_0^*$. This is the critical implication tested in the experiments below.[10]

3.2 Taxation and variation in the propensity for punishment

The model's second prediction concerns the degree to which taxation will increase a citizen's willingness to punish rent-seeking. Recall that a higher punishment threshold indicates that a citizen is more willing to punish rent-seeking. This occurs because the expressive benefits of punishment are higher, relative to the costs. Taxation increases the punishment threshold, but it is also a function of the parameter β_i, which can be understood as a citizen's personal propensity for civic

[10]Taxation also increases punishment if citizens are not reference-dependent and $u(x)$ is globally concave. The experiments control for such income effects.

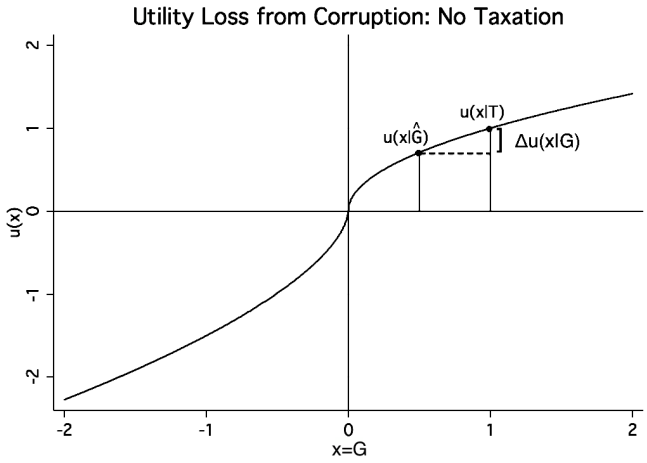

Figure 1: *Economic utility for a non-taxed citizen.* The origin represents utility when $G = 0$. The two points mark utility if $G = T$—full public goods provision—and utility given that the government actually provides $G = \hat{G}$. The vertical distance between the points is $\Delta_0 u(x|\hat{G})$, the economic utility an untaxed citizen loses from rent-seeking.

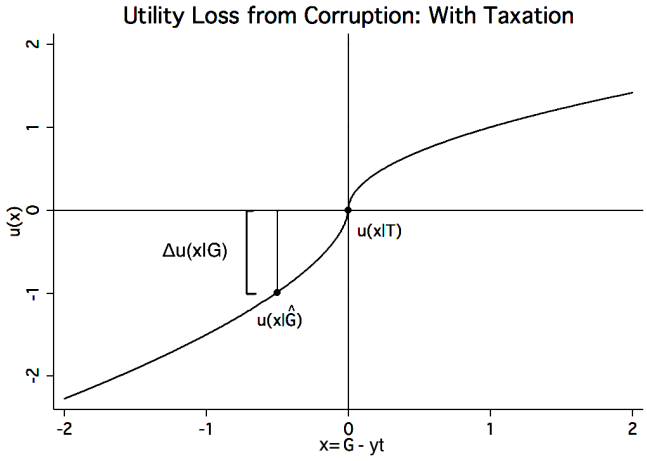

Figure 2: *Economic utility of a taxed citizen.* For all $G < T$ the citizen is in the realm of losses. The two points mark utility if $G = T$—full public goods provision—and utility given that the government actually provides $G = \hat{G}$. The vertical distance between the two points is $\Delta_t u(x|\hat{G})$, the economic utility a taxed citizen loses from rent-seeking.

engagement. As β_i increases, a citizen's expressive benefit from punishing the government increases; this raises the punishment threshold G^*. However, there is also an interaction effect between taxation and β_i, and so the degree to which taxation increases willingness to punish will be a function of a citizen's underlying propensity for engagement. The model predicts that, as β_i increases and citizens care more about punishment, taxation will at first have an increasingly large effect on citizens' willingness to punish, but at some point the effect of taxation will peak, and among citizens with a higher propensity to punish an increase in β_i leads to a smaller effect of taxation on punishment, although the effect always remains positive.

To see this more clearly, Figure 3 plots a citizen's punishment threshold G^*, with and without taxation, as a function of her propensity for punishment β_i. The punishment threshold is increasing in β_i, and is always higher under taxation. However, the vertical distance between the two curves—the effect of taxation on a citizen's punishment threshold—is not constant.

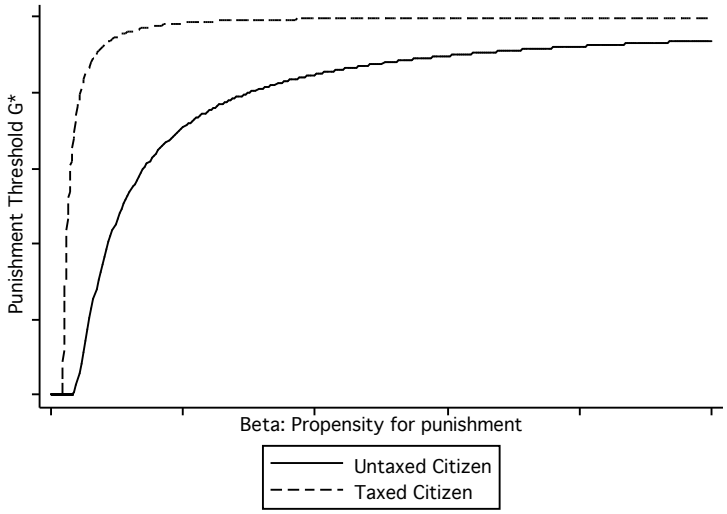

Figure 3: *Citizens' Punishment Thresholds With and Without Taxation: Heterogeneity in* β_i. A functional form was chosen for $u(x)$; c, y, and T match the experimental values.

Figure 4 graphs $\Delta G^* = G_t^* - G_0^*$, the difference between a citizen's punishment

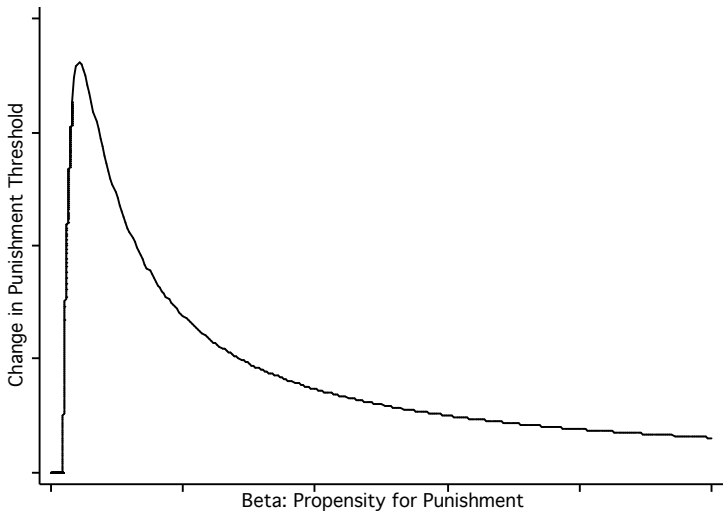

Figure 4: *Heterogeneity in taxation's effect on punishment as a function of* β_i.

threshold with and without taxation, as a function of β_i. For a given β_i, this is the vertical distance between the two lines in Figure 3. Citizens with a very low β_i never punish with or without taxation: $G_t^* = G_0^* = 0$, and taxation has no effect on punishment. The next segment of the parameter space represents individuals with slightly higher propensity for punishment β_i: without taxation they never punish and $G_0^* = 0$, but with taxation G_t^* is positive and is increasing β_i increases. The treatment effect of taxation therefore increases as β_i increases.[11] Past a certain level of β_i, both G_t^* and G_0^* are positive, such that citizens punish at least some levels of corruption with or without taxation. In this part of the parameter space the effect of taxation on the punishment threshold is at first increasing in β_i. However, it soon reaches a threshold $\bar{\beta}$ such that, for all $\beta_i > \bar{\beta}_i$, the effect of taxation *decreases* as β_i increases, asymptoting towards zero. The online appendix contains a proof that, for any loss-averse function $u(x)$, this turning point will occur for β_i such that $G_0^*(\bar{\beta}_i) \in (0, \frac{T}{2})$.[12] Thus for

[11] In the experiments, $< 1\%$ of respondents fall into the first two categories.

[12] It also proves that ΔG^* will take the shape described here.

the experimental sample below, we should expect the effect of taxation to first increase and then decrease as β_i increases. A natural interpretation of this is that those who care strongly about rent-seeking (high β_i) already punish at high levels, so taxation moves them only slightly, while those who care very little about rent-seeking (low β_i) are likewise difficult to move; it is those in the middle who are most affected by taxation.

3.3 Alternative Mechanisms

Behavioral economics has shown that individuals punish behavior that is perceived as unfair (Fehr and Schmidt, 1999; Fehr and Gächter, 2000). This suggests a potential alternative mechanism to loss aversion – there may be a stricter societal fairness norm regarding how tax dollars should be spent. This mechanism, tested in Section 6, would require a slightly different model. Instead of multiplying the expressive parameter β_i by the utility lost from taxation, assume instead that it is multiplied by $\frac{T-G}{T}$, the percent of the budget that is misused. In this alternative model, taxation affects behavior by increasing the expressive benefit β_i a citizen receives from punishment; this represents a shift in fairness norms that increases the citizens' punishment threshold G^*.[13] This model predicts that citizens will be more likely to punish when they are taxed. However, the implication derived in Section 3.2 does not hold: while the loss aversion model predicts that the effect of taxation is increasing then decreasing over the parameter space in which β_i induces $G_0^* > 0$, the fairness model predicts a monotonically decreasing effect of taxation over the same range.

[13]Formally, $G^* = T(1 - \frac{c}{\beta_i(t)})$.

3.4 Discussion

The loss aversion mechanism demonstrates how taxation can increase citizens' demands even in the absence of formal bargains between citizens and governments.[14] It generates two testable predictions: first, that taxation increases punishment thresholds—inducing citizens to demand higher transfers from leaders when they are being taxed—and, second, that taxation should raise this threshold the most for individuals who punish only high levels of corruption without taxation; the treatment effect will be smaller for individuals who already punish even mild deviations without taxation.

Rigorously testing this theory necessitates finding exogenous variation in taxation and isolating the behavioral effect of taxation from other proposed mechanisms through which taxation affects accountability. While these issues are difficult to overcome using observational data, it is possible to isolate the effect in a laboratory setting. This paper now introduces laboratory experiments designed to test whether taxation increases citizens' willingness to punish, even absent an economic benefit from doing so. These experiments, conducted in Kampala, Uganda, provide the first micro-level evidence that taxation induces citizens to demand higher levels of accountability from government leaders.

4 Methodology

These experiments build on existing evidence that individuals are willing to take costly actions to impose sanctions on fellow players in varied settings (Henrich et al., 2006); that individuals punish in part to relieve negative emotions induced

[14]Tax bargaining and loss aversion may also interact: Fehr, Hart and Zehnder (2011) argues that contracts can serve as reference points. If tax bargains act as contracts, they may influence citizens' reference point regarding acceptable government allocations.

by others' behavior (Fehr and Gächter, 2000); and that laboratory experiments can be used to measure political preferences (Grossman, 2014).

4.1 Experimental Design

The experiments were designed to separate the proposed behavioral mechanism from other potential effects of taxation. To eliminate the possibility of bargaining, taxation in the experiments is exogenously set and mandatory – citizens cannot threaten leaders with non-payment. To avoid information effects, the government's budget is held constant across treatments and is observed by citizens. To prevent citizens from using punishment as a signal to leaders in future rounds, the experiments are single-shot interactions.[15] As Fehr and Schmidt (1999) shows that punishment is due in part to inequity aversion, this is held constant across the two treatments below. Finally, citizens face no uncertainty about punishment; they make an ex ante punishment decision rule which is always enforced.

The experiment consisted of the "Tax" and "Grant" games, each played between one Citizen and one Leader.[16] In both games, the Leader is given a group fund to divide between himself and the Citizen. The Citizen can then pay to fine the Leader if she is dissatisfied with the allocation. The games differ in the source of the group fund. In the Tax game, the Citizen is given a wage of 10 money units (MU). Half of that money is taken as a tax, doubled (to 10 MU), and given to the Leader. In the Grant game, the Citizen receives wages of 5 MU, and 10 MU is given to the Leader as a non-earned group fund (similar to foreign aid or oil revenue). In both games, at the time the Leader makes his allocation decision the Citizen has 5 MU and the Leader has 10 MU; the decision trees

[15]The impact of using single-shot games on external validity is discussed in Section 8.

[16]During enumeration, both roles were played by Ugandan citizens who were randomly assigned to a role.

are then identical. In both games, if the Citizen decides to punish the Leader, he pays 1 MU and 4 MU is removed from the Leader. For implementation purposes 1 MU was set at 100 Ugandan Shillings (UGX); real coins were used in all experiments.[17] Table 1 describes the stages of each game.

Stages	**Tax Game**	**Grant Game**
1.	Citizen given a wage of 10 MU.	Citizen given a wage of 5 MU.
2.	Citizen taxed 5 MU - this is doubled to 10 MU and given to Leader as the group fund.	Leader given 10 MU as the group fund.
3.	Leader allocates the 10 MU between himself and Citizen.	
4.	Citizen observes Leader's decision and decides whether to pay 1 MU to have enumerators remove 4 MU from Leader.	

Table 1: *Timing of Tax & Grant Games*

As no one receives the money taken away in punishment, and as this is a single-shot interaction, the unique subgame-perfect Nash equilibrium of both games is for the Leader to offer 0 MU to the Citizen, who never punishes. Punishment is never economically rational, but rather a purely expressive action by the Citizen. The decision tree and payoffs are constant across both games; the only difference between the games is the framing effect created by having the group fund previously owned by the Citizen. Any differences in gameplay between the Tax and Grant games must therefore be due to a behavioral effect activated by taxing the Citizen. Calling the Leader's 10 MU the "group fund" eliminated the possibility that, in the Grant game, the Citizen would think that he had no right to the Leader's money.

While this experiment was designed to directly test the predictions of the

[17] 1,000 UGX is about US$0.40, a significant amount of money for the sample population.

formal theory, there are some necessary differences in the precise nature of the transfers between citizens and leaders. Instead of allocating the group fund (budget) between private rents and public goods, the Leader allocates between his own payoff and a monetary transfer to the citizen. This tests the relationship between taxation and citizens' demands for "something back", but cannot test demands for public goods explicitly. This limitation is necessary to precisely estimate and isolate the effect of taxation on citizens' punishment behavior. To at least partially address this gap, Section 7 uses a survey experiment to tie taxation to citizens' willingness to punish corruption more explicitly, in a context in which funds are being diverted from public goods.

4.2 Implementation

The experiments were conducted in three low-income Baganda neighborhoods of Kampala, Uganda in 2012. Kampala has seen significant political mobilization around taxation in recent years, making it likely that the experiment would activate respondents' relevant norms and expectations. While the proposed theory is expected to apply to a broad range of settings, contextual differences can have large effects on how individuals behave in such experiments (Henrich et al., 2006).[18] Conducting the experiments in Uganda therefore increases the likelihood that the findings will transfer to similar low-income countries with low taxation and high corruption. The sample used here is therefore discussed in reference to the validity for sub-Saharan African countries where the effects of taxation are most pertinent for policy analysis.

Enumeration consisted of 18 sessions of approximately 20 respondents each, for a total sample of 371 respondents. All respondents were recruited from spec-

[18]However, as loss aversion has been documented in many settings, this mechanism should apply widely.

ified neighborhoods near the enumeration sites. Upon arrival each participant was randomly assigned to a role and pairings in the games. Respondents in each session played both treatments, randomizing which game was played first. Due to ordering effects, the analysis relies only on the first game played. To increase statistical power, deception was used in role assignment – while respondents believed equal numbers were assigned to each role, only 20% of the sample was assigned to be Leaders, and each Leader was matched with four Citizens, resulting in 296 Citizens.[19] All respondents received 3,000 UGX for participation, plus their earnings from one randomly-selected round of each game.[20]

To ensure comprehension, enumerators verbally explained each game to the entire session, then again to each individual using coins and asking questions to gauge comprehension.[21] Each respondent was then told whether he was a Citizen or Leader and played the same single-shot game (either Tax or Grant) five times: each interaction is referred to here as a round. All pairings were anonymous, and respondents knew they had a different partner in each round. In rounds 2-5 respondents were told the results from their own previous pairing only, minimizing the ability of respondents to signal to the entire group.

To increase statistical power enumerators used the strategy method, eliciting Citizens' punishment preferences for every possible decision the Leader could have made.[22] From this the outcome variable was constructed: the threshold below

[19]To calculate Leader payouts, one of the four matched Citizens was randomly chosen.

[20]The average payout was 4,575 UGX (US$1.83); sessions lasted 3 hours. The author has no reason to believe that only paying out one round affected gameplay, however, any effect should result in less strategic behavior by respondents, making it more difficult to detect an effect of taxation.

[21]All examples used the same values, altering only the funding source.

[22]Enumerators stopped once they reached the threshold at which the Citizen would no longer punish the Leader; this reduced respondent fatigue.

which the Citizen would be willing to pay to punish the Leader. For example, if a Citizen would punish if the Leader passed back 300 UGX or less, the punishment threshold is 400 UGX. This is equivalent to G^* in the model, which predicts that taxed citizens will have higher thresholds.

The sample was 72% male and the average age was 22.7 years; a significant portion, 45%, was age 18 or 19. As a majority of countries in sub-Saharan Africa have a median age of 20 or less, this does not make the sample unrepresentative of the region (*The C.I.A. World Factbook*, 2014). About 43% of participants reported zero earnings over the previous four weeks; among wage-earners, the median monthly income was 110,000 UGX (US$45). Balance tests confirm that the samples for the Tax and Grant games are well-balanced.[23] I expect the taxation treatment to have the strongest effect among the employed, men, and older Ugandans, as their greater exposure to taxation allows them to draw on relevant experiences and emotions when making decisions.

5 Results

The key outcome for each round is the Citizen's punishment threshold, defined as the smallest acceptable transfer from the Leader to the Citizen; this punishment threshold was one of the eleven 100-UGX increments between 0 and 1,000 UGX. The analysis uses the average of a respondent's choices across the five single-shot rounds as a dependent variable.[24] If taxation makes citizens more likely to punish leaders, the average punishment threshold for citizens should be higher in the Tax game than the Grant game. The analysis focuses on the decisions of Citizens, as the use of ordinary Ugandans as Leaders significantly reduces the

[23]See online appendix.

[24]This allows for individuals who adjusted their strategy across rounds. Dropping the first two rounds yields similar results.

external validity for these results.[25]

5.1 Main Results

The results indicate a strong effect of taxation on respondents' willingness to punish leaders. Figure 5 presents kernel density estimates for the average Citizen punishment threshold in each treatment condition. Both curves are roughly normally distributed, with a clear shift to the right in the distribution of the Tax responses; the vertical lines show that, as predicted, the mean punishment cutoff is significantly higher for the Tax distribution. The regression results in Table 2 support this interpretation. Column 1 presents the bivariate result: taxation increased the average Citizen's punishment threshold from 408 UGX (out of 1,000) to 460 UGX - an increase of 12.7%. Column 2 adds site and enumerator fixed effects (FE) and standard errors (SE) clustered at the session level, while Column 3 adds demographic and economic controls; the estimates are stable and significant at the 5% level across specifications.[26]

These results are robust to alternative specifications, including using ordered probit; treating each single-shot round as a separate observation; dropping any one round from the average; and using different sets of control variables.[27]

5.2 Heterogeneity in β_i

Figure 5 demonstrates significant variation in Citizens' punishment thresholds. I argue that this heterogeneity is due to variation in β_i, an individual's personal expressive benefit from punishment. The model predicts that the effect of taxation

[25]There are no significant differences in Leader behavior between the two treatments, alleviating concerns that such differences are driving the results – see online appendix.

[26]Due to missing data, there are 272 observations when controls are added.

[27]See online appendix.

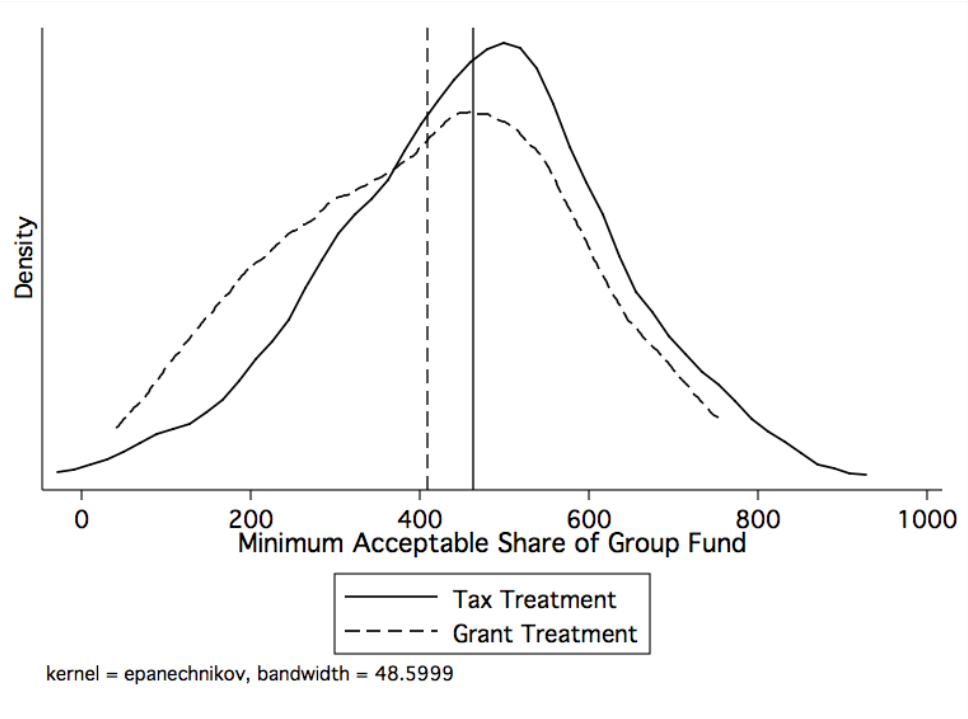

Figure 5: *Distribution of Average Citizen Punishment Thresholds.* Outcome is the 5-round average punishment threshold for each Citizen. Vertical lines depict group means.

VARIABLES	(1)	(2)	(3)
Taxation	54.18**	54.25*	56.37*
	(19.10)	(22.44)	(21.52)
Constant	408.3***	413.2***	181.8
	(13.86)	(24.32)	(181.9)
Controls	N	N	Y
FE	N	Y	Y
Observations	296	296	272
R-squared	0.027	0.089	0.142

Standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05

Table 2: *Tax & Grant Game Results: Average Citizen Punishment Threshold (OLS).* The dependent variable is a Citizen's average punishment threshold. Columns 2 and 3 include enumerator and site FE and SE clustered by session; Column 3 includes controls for age, gender, education, income, social capital, and voting.

on an individual's punishment threshold should at first increase as β_i increases, then decrease over most of the parameter space, as shown in Figure 4. This implication is not predicted by the fairness mechanism, or by a reference-dependent model in which $u(x)$ is globally concave; both predict a monotonically decreasing effect of taxation as β_i increases over the range in which $G_0^* > 0$.

I test this prediction using quantile regressions, estimating how taxation affects different points in the distribution of responses. The critical assumptions for this analysis are that the distribution of β_i is balanced across Citizens in the Tax and Grant games, and that if $\beta_i > \beta_j$, $G_i^* > G_j^*$: a respondent's average punishment threshold G^* is a proxy for the level of expressive benefit β_i.[28] Figure 6 plots the estimated coefficients from quantile regressions run for quantiles 5 to 95, along with the estimated curve for the coefficients.[29] The effect of taxation is always positive and, as predicted, the coefficient on taxation first rises, then declines as the quantile increases further. This suggests that the taxation treatment has a larger impact on respondents who are less politically engaged.[30]

5.3 Subgroup Analysis

I expect that treatment effects will be strongest when taxation is highly salient for respondents, as the treatment can better activate the relevant norms. In the Ugandan sample, three potential sources of treatment heterogeneity are gender, age, and income. Ugandan women were exempt from the graduated tax, reducing its salience. Teenagers and the unemployed may similarly be less exposed to

[28]The first assumption is met by random assignment. As a wide range of covariates fail to predict in-game behavior, the second assumption seems reasonable.

[29]All regressions included fixed effects.

[30]As the highest punishment threshold in the Grant game is 76% of the maximum, ceiling effects are not a concern.

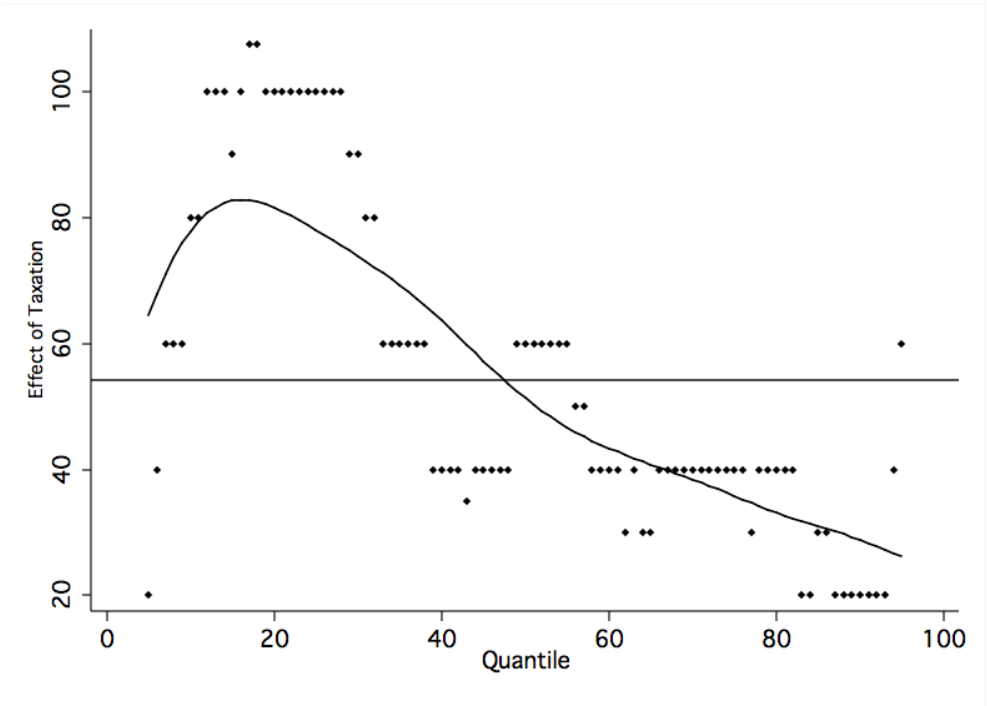

Figure 6: *Estimated Quantile Effects of Taxation on Punishment Thresholds.* Dots depict regression coefficients of taxation at quantiles 5 to 95. The horizontal line depicts the treatment effect of taxation on the distribution's mean; the curved line shows the smoothed values for the pattern of coefficients.

taxes; their overrepresentation in the sample also makes it important to check that they are not driving the results.[31] Isolating the effect of taxation on adult, wage-earning men tests the group of Ugandans where a treatment effect is likely strongest, but also provides a sample that may be closer to the relevant population in other countries. Table 3 shows the heterogeneity results. For comparison, Column 1 reports the full-sample results. Columns 2-4 test each potential source of heterogeneity, and Column 5 includes all three interactions.

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Baseline	Gender	Income	Age	All
Taxation	56.37*	61.72**	79.54*	95.41**	115.4***
	(21.52)	(19.84)	(28.57)	(32.67)	(28.25)
Female		-24.77			-16.82
		(25.27)			(25.44)
Taxation*Female		-20.46			-47.25
		(53.36)			(46.95)
No Income			43.22		23.03
			(38.86)		(41.95)
Taxation*No Inc			-53.00		-13.08
			(44.60)		(52.70)
Teenager				58.67	59.17
				(31.53)	(31.25)
Taxation*Teen				-87.22*	-92.33
				(39.96)	(43.80)
Constant	216.3	213.2	181.0	115.1	93.41
	(180.4)	(178.6)	(192.5)	(202.3)	(213.3)
Observations	272	272	272	272	272
R-squared	0.142	0.142	0.149	0.158	0.164

Robust standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05

Table 3: *Treatment Heterogeneity in Political Tax & Grant Games (OLS).*Column 1 reports the baseline treatment effect of taxation. Columns 2-5 report results for heterogeneity by gender, income, age, and all three. All specifications include controls, enumerator and site FE, and SE clustered by session.

[31] *Teens* are those ages 18 and 19. *No Income* refers to those reporting zero wages in the past four weeks.

Age is the strongest source of heterogeneity – taxation's treatment effect on teenagers, who typically lack prior exposure to taxation, is close to zero, while the effect for adults is almost 100 UGX. The results for Female and No Income are weaker; while both interaction terms are negative and substantively large, the effects are imprecisely estimated. The No Income measure may be unable to distinguish between the long-term unemployed, for whom taxation is not salient, and short-term unemployed who expect to pay taxes in the future.

The treatment effect of taxation is largest among adult, wage-earning men – exactly the group with the most exposure to taxation in Uganda. Running the basic specification on men, age 20 or older, who reported positive wages shows that the average punishment threshold moves from 362 UGX in the Grant game to 470 UGX in the Tax game, an increase of 29.8%.

6 Testing the Mechanism

The results thus far demonstrate that taxation increases the demands citizens make of leaders. It remains to show that the effect is due to loss aversion, rather than the alternative argument that taxation activates stricter fairness norms. The loss aversion mechanism can still hold if citizens punish in part because of fairness, provided fairness does not differ across the two treatments. Understanding the mechanism has important policy implications. As norms can be changed, the fairness mechanism suggests that education campaigns might be able to increase citizens' willingness to punish how non-earned revenues are used, alleviating the resource curse. If the loss aversion mechanism is correct, however, it suggests that citizens must be given a stake in government budgets for demands to increase.

Following Fehr and Fischbacher (2004), I differentiate between loss aversion and fairness norms using third-party punishment (3PP) games. In these games

respondents were randomly placed into groups of three—a Citizen, a Leader, and an Observer. In the 3PP Tax game, the Observer and Citizen were each given wages of 10 MU. The enumerator then taxed the Citizen 5 MU, doubled it, and gave it to the Leader. The Leader allocated this group fund between his own salary and the Citizen, and the Observer decided whether to pay 1 MU to reduce the Leader's salary by 4 MU. This game is identical to the original Tax game other than the locus of punishment. The Leader's decision is the same, and the Observer is not directly affected by either taxation or the group fund. The 3PP Grant game changes only the funding source; Table 4 shows the stages for each treatment.

Stages	**3PP Tax Game**	**3PP Grant Game**
1	Citizen receives wage of 10 MU; Observer receives stake of 10 MU.	Citizen receives wage of 5 MU; Observer receives stake of 10 MU.
2	Citizen is taxed 5 MU; this is doubled and passed to Leader as the group fund.	Leader is given 10 MU as the group fund.
3	Leader allocates the 10 MU between himself and Citizen.	
4	Observer sees Leader's decision and decides whether to pay 1 MU to have enumerators remove 4 MU from Leader.	

Table 4: *Timing for Third-Party Punishment Tax and Grant Games.*

If stricter fairness norms apply to taxes, the Observers in the 3PP Tax game should have higher punishment thresholds than Observers in the 3PP Grant game. If the behavioral effect of taxation is due to loss aversion, there should be no difference between punishment thresholds in the two games, as the Observer is not taxed. The 3PP games were run in 2013 on a sample of 649 Kampalans;

the sample is comparable to that of the previous games.

Table 5 presents the OLS regression results for taxation's effect on an Observer's average punishment threshold; the point estimate is consistently small and insignificant. This presents a striking contrast to the experiments in which the locus of punishment is with the Citizen, and rules out the fairness mechanism.

VARIABLES	(1) Observer Threshold	(2) Observer Threshold	(3) Observer Threshold	(4) Citizens Fair Dist.
Taxation	-3.018	-5.162	-4.510	54.29
	(14.21)	(16.05)	(15.68)	(37.48)
Constant	392.8***	292.4***	275.9**	406.6***
	(10.16)	(24.37)	(86.92)	(63.71)
FE	N	Y	Y	Y
Clustered SE	N	Y	Y	Y
Controls	N	N	Y	N
Observations	649	649	624	70
R-squared	0.000	0.082	0.106	0.086

Standard errors in parentheses
*** p<0.001, ** p<0.01, * p<0.05

Table 5: *Results from 3PP Experiment (OLS).* Columns 1-3 show the effect of taxation on the Observer's punishment threshold. Column 4 reports the difference in the allocations Citizens reported as most fair.

The behavior of Citizens in the 3PP experiments also supports the loss aversion mechanism. As Citizens made no strategic decisions, they were instead asked for each round to select the "most fair" way to divide the group fund between themselves and the Leader. Column 4 of Table 5 shows the difference in this perceived most fair allocation in the 3PP Tax and Grant games. While the analysis is underpowered, the point estimate is almost identical to that in the original experiment. This increases confidence that the null effect for the Observers is due to a lack of a treatment effect, rather than noise or measurement problems. It also suggests that while citizens may understand their preferences in terms of fairness, the losses from taxation have a real impact on their behavior.

Two aspects of the original Tax and Grant games also indirectly support the loss aversion mechanism. First, the heterogeneity results involving β_i (Section 5.2) are predicted by the loss aversion model, but not the fairness norms argument. Second, in each session, respondents played both the Tax and Grant games, randomizing which came first.[32] When respondents played the Tax game first, taxation only increases the average punishment threshold by 2 UGX (p=.82). However, when playing the Grant game first, taxation increased Citizens' average punishment threshold by 31 UGX (p=.03). Once taxation pushed citizens into the realm of losses, the effects persisted into the Grant game, while moving from the Grant to the Tax game did shift Citizens into the realm of losses, changing expectations and increasing punishment thresholds.

7 External Validity

The experimental results show that taxation increases citizens' willingness to punish. This section presents additional qualitative and experimental evidence that the results shown above are meaningful measurements of citizens' preferences over taxation, and links these results to preferences over corruption more explicitly.

7.1 Qualitative Evidence

In a subset of sessions, enumerators asked Citizens to explain their in-game decisions (N=80). These data provide compelling evidence that the treatments activated relevant political experiences. Thirty-six percent of Citizens listed distributive or fairness concerns when justifying their choices, often citing differing expectations on citizens and leaders. Several of these respondents specifically

[32]Only the first game's results are reported above, due to ordering effects.

cited the tax in their explanation. One respondent said that "...since my money was taken as a tax, I want to earn more than the leader." Another explained that "because it's tax money [the leader] has to give back more."

An additional 24% of respondents cited opinions about real political leaders to justify their decisions.[33] One taxed respondent explained that "[the leader] has to give me more because he gets money from different sources." Respondents in the Grant game, in contrast, justified low demands in terms of political leaders' responsibilities, saying that "Leaders should even take more [than citizens] because they do a lot;" another demanded little "because the leader has many responsibilities." In fact, the leaders were fellow citizens who lacked any responsibilities or access to outside resources, suggesting that participants structured their behavior in reference to how they might behave in actual political scenarios.

7.2 Experimental Evidence on Taxation and Corruption

To provide additional support for the findings outside of a laboratory setting, I conducted a conjoint survey experiment on citizens in nine Ugandan districts. This experiment also demonstrates that taxation affects the perceived severity of *corruption*, something that could not be directly tested in the laboratory experiments. In the conjoint experiment, respondents were shown pairs of hypothetical government officials, each of whom was accused of embezzling government funds. Each official had 5 attributes concerning his identity and supposed crime; each of these was independently and randomly assigned from a set of possible levels. One attribute varied whether the official had stolen citizens' taxes, central transfers, or donor funds.[34] Respondents saw four pairs of corrupt officials; for each

[33]The remaining respondents cited economic motivations (16%), or stated other reasons.

[34]The results suggest that central transfers, which are largely comprised of grants, are seen as similar to donor funds. These results are omitted here.

pair, they were asked to select which official they would rather see prosecuted and punished for his behavior, and to rank the severity of each official's crime on a five-point scale.[35]

Because the attributes of each official are independently randomized, regression analysis can be used to estimate the effect of revenue source on the likelihood an official is punished. The results show that officials who stole donor funds were punished 42% of the time, compared to 62% of the time for officials who stole citizens' taxes (p=.000). Profiles in which citizens' taxes were misused are also 12 percentage points more likely to be ranked as "most severe"—the highest category—and the average severity ranking for such officials is 0.257 points higher on the 5-point scale (p=.000). The results show that citizens do indeed judge corruption as worse when tax funds are stolen, and are more willing to punish officials who steal tax funds. This concurs with the behavioral experiments, and links those findings more directly to preferences over corruption, rather than low transfers more generally.

8 Conclusion

This paper formalizes and tests a mechanism for how taxation can affect citizens' demands on government officials in a wide range of settings, including when tax bargaining is not possible. The mechanism posits that taxation pushes citizens into the realm of losses, increasing the expressive benefit that individuals receive from imposing sanctions on a leader who fails to provide sufficient benefits to citizens. Laboratory experiments, implemented in Uganda, support the theory: taxation significantly increases the level of transfers citizens demand from lead-

[35]See online appendix for experimental protocols. See Hainmueller, Hopkins and Yamamoto (2012) on conjoint methodology.

ers, and this effect is strongest among those with more experience paying taxes. Further experiments show that loss aversion is a key component of the mechanism, and that taxation increases citizens' willingness to punish corruption more specifically, even outside of the laboratory setting.

Extrapolating effect sizes from laboratory experiments to real-world taxation is fraught with peril, but very rough calculations can be made. Since Uganda abolished primary school fees in 1996, school expenditures, including teacher salaries, have been paid for almost entirely by central grants, and accountability in the education sector is weak at best. A 2013 study estimated that only 43% of teachers were actually in their classrooms (Uganda Inspectorate of Government, 2014), a comparable percentage to the 40% demanded by those in the Grant game. Assuming a similar treatment effect of taxation in this setting would imply that funding salaries through local taxes has the potential to increase teacher attendance by 13%, to approximately 49%, which implies that an average teacher would be in the classroom for an additional 15 days a year. This would amount to an additional 1.2 terms of instruction for each primary student over seven years, potentially significantly improving student learning.[36]

Additional research is needed to further refine some of the findings. First, the experiments used single-shot games to isolate the effect of taxation on punishment behavior, while political interactions typically take place in a repeated framework. As citizens punish due in part to the short-term psychological benefits of doing so, there are theoretical reasons for expecting the effect to persist. However, additional experimental evidence is needed to fully test this hypothesis.

Second, additional work is needed to determine the types of transfers that gov-

[36]Based on Uganda's 259-day academic calendar. If adult men are the ones paying school fees, the experiments suggest an even larger effect, equivalent to 0.9 years of additional instruction per student over primary school.

ernments can use to satisfy citizens' demands. The model and discussion thus far have been primarily framed in terms of citizens demanding public goods. However, in some cases rent-seeking governments may be able to satisfy citizens using individual transfers via clientelism and patronage. As the experiments include only one citizen, it is not completely clear whether Citizens view the transfer from the Leader as a private transfer or a public good; more work is needed to decipher which is the case, and the extent to which private transfers could realistically be used to compensate citizens and allow rent-seeking to remain unchecked. Theoretically, we might expect that governments will prefer public goods to clientelism when it is less costly, or has external benefits on other citizens' support; using clientelism to "buy off" a large group of citizens may be prohibitively costly in some settings. Future work will explore this issue.

Despite these reservations, these findings have methodological and substantive implications for the study of accountability. In the general equilibrium of the formal model, the increased demand for accountability under taxation will translate into an increased supply of accountability under certain conditions – namely when citizens can exact a sufficiently high punishment on leaders, at a sufficiently low cost to citizens. More work is needed to explore when leaders will respond to citizen pressures by increasing accountability, rather than by reducing or eliminating taxes, as the Ugandan government did with the graduated tax. However, these findings suggest at least two applications.

First, they suggest that aid professionals should seriously consider the role of taxation when designing interventions. Adding community contributions to aid programs could give beneficiaries more ownership over projects and make them more likely to hold local leaders accountable for how funds are spent, improving leaders' incentives to honor citizens' preferences. Second, the theory presented here can also add to our understanding of tax bargaining by explaining how and

when bargains can be sustained between citizens and government, as well as how favorable those bargains will be to citizens. By improving citizens' ability to demand accountability under coercive taxation, the behavioral effect of taxation increases citizens' reservation payoff when bargaining. This may increase the quality of the bargain, and may reduce the potential for leaders to gain by breaking the bargain.

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NOTE: The following appendices are not intended for publication.

A Proofs

A.1 Proof that taxation increases citizens' punishment threshold

Recall that citizens punish the government if and only if $\Delta u(x|G,r,t) > \frac{c}{\beta_i}$.

Assume that $\Delta_t u(x|G=0,r,t) > \frac{c}{\beta_i}$, and so $G_t^* > 0$, where $\Delta u(x|G^*,r,t) = \frac{c}{\beta_i}$. As $\Delta u(x|G,r,t)$ is decreasing in G, taxation will increase the punishment threshold G^* if, for all $G \in [0,T)$, $\Delta u(x|G,r,t)$ is larger for a taxed citizen: $\Delta_t u(x|G,r,t) > \Delta_0 u(x|G,r,t)$.

These parameters are defined as:

$$\Delta_0 u(x|G) = u(y+T-y) - u(y+G-y) = u(T) - u(G) \tag{6}$$

$$\Delta_t u(x|G) = u(y(1-t)+T-(y(1-t)+T)) - u(y(1-t)+G-(y(1-t)+T)) = u(0) - u(G-T). \tag{7}$$

The condition for taxation to increase G^* is therefore

$$u(0) - u(G-T) > u(T) - u(G). \tag{8}$$

Note that the horizontal difference is the same for both sides of the equation: $T-G$. If the first derivative with respect to G is larger for every point on the left-hand side of the equation, this implies that the total utility difference on the LHS is also larger. From the characteristics of loss-averse utility functions, $u'(x) < u'(-x)$. Therefore $u(-T) - u(-G) > u(T) - u(G)$.

For all $x < 0$, $u(x)$ is strictly convex, and so, $u'(-T) < u'(-T+G)$, and $u'(-G) < u'(-G+G)$. The same holds for all values in between. Therefore $u(-T) - u(-G) < u(-T+G) - u(-G+G)$.

Together this implies: $\Delta_0 u(x|G) < u(-T) - u(-G) < \Delta_t u(x|G)$ and so $\Delta_t u(x|G) > \Delta_0 u(x|G)$ for all $G < T$ and $G_t^* > G_0^*$ for all individuals with $\beta_i > \frac{c}{-u(-T)}$.

A.2 Proof that the effect of taxation is heterogeneous in β_i

Section 3 above shows that the effect of taxation on the punishment threshold ($\Delta G^* = G_t^* - G_0^*$) is zero for very low values of β_i, increases for intermediate levels, but decreases and asymptotes to zero as $\beta_i \to \infty$. This section provides proofs for these results.

First, consider low β_i such that the Citizen never punishes the leader even when taxed and $G_t^* = G_0^* = 0$. This implies that $G_t^* = u^{-1}(-\frac{c}{\beta_i}) + T \leq 0$, or: $\beta_i \leq \frac{c}{-u(-T)}$. For this range of β_i, $\Delta G^* = 0$.

Next, consider β_i such that $G_0^* = 0$ but $G_t^* > 0$. Over this range, an increase in β_i implies an increase in G_t^* while G_0^* remains at zero, and so $\frac{\partial \Delta G^*}{\partial \beta_i} > 0$. As $G_0^* = u^{-1}(u(T) - \frac{c}{\beta_i})$, this holds when $\frac{c}{-u(-T)} < \beta_i \leq \frac{u(T)}{c}$.

Finally, consider all $\beta_i > \frac{u(T)}{c}$; here both taxed and non-taxed citizens punish at least some level of corruption. Note that

$$\Delta G^* = G_t^* - G_0^* = u^{-1}(-\frac{c}{\beta_i}) + T - u^{-1}(u(T) - \frac{c}{\beta_i}) \tag{9}$$

For this range,

$$\frac{\partial \Delta G^*}{\partial \beta_i} = \frac{c}{\beta_i^2} * ((u^{-1})'(-\frac{c}{\beta_i}) - (u^{-1})'(u(T) - \frac{c}{\beta_i})) \tag{10}$$

which by the properties of inverse functions is equivalent to

$$\frac{c}{\beta_i^2} * (\frac{1}{u'(u^{-1}(-\frac{c}{\beta_i}))} - \frac{1}{u'(u^{-1}(u(T) - \frac{c}{\beta_i}))}). \tag{11}$$

Substituting back in G_t^* and G_0^* using the above definitions:

$$\frac{c}{\beta_i^2} * (\frac{1}{u'(G_t^* - T)} - \frac{1}{u'(G_0^*)}). \tag{12}$$

Therefore $\frac{\partial \Delta G^*}{\partial \beta_i} > 0$ only when $u'(G_t^* - T) < u'(G_0^*)$.

First, consider the threshold case where $G_0^* = 0$, $G_t^* > 0$ and so Equation 12 is positive, as $u'(0) > u'(G_t^* - T)$. As $u'(x)$ is continuous, this implies that $\frac{\partial \Delta G^*}{\partial \beta_i} > 0$ for some range of sufficiently small $G_0^* > 0$, and so for some portion of this range, the effect of taxation is still increasing in β_i.

Next, consider the case where $G_0^* \geq \frac{T}{2}$, and so $G_t^* > \frac{T}{2}$. From the properties of loss averse functions, the following inequalities must hold:

$$u'(G_t^* - T) > u'(-\frac{T}{2}) > u'(\frac{T}{2}) \geq u'(G_0^*) \tag{13}$$

and so $\frac{\partial \Delta G^*}{\partial \beta_i} < 0$ when $G_0^* \geq \frac{T}{2}$. By the intermediate value theorem, there must therefore be some $\hat{\beta}_i$ such that $\frac{\partial \Delta G^*}{\partial \beta_i}$ is zero at $\hat{\beta}_i$, positive below $\hat{\beta}_i$, and negative above $\hat{\beta}_i$. This inflection point must occur at some $G_0^* \in (0, \frac{T}{2})$.[37]

The above shows that the effect of taxation, $\Delta G^* = G_t^* - G_0^*$, has the following characteristics:

1. For all $\beta_i \leq \frac{c}{-u(-T)}$, taxation has no effect because $G_t^* = G_0^* = 0$.
2. For all $\beta_i \in (\frac{c}{-u(-T)}, \frac{u(T)}{c}]$, the effect of taxation is positive and *increasing* in β_i.
3. For $\beta_i \geq \frac{u(T)}{c}$, the effect of taxation is positive. There exists $\hat{\beta}_i^*$ such that the effect of taxation is *increasing* for $\beta_i \in [\frac{u(T)}{c}, \hat{\beta}_i^*)$ and *decreasing* for all $\beta_i > \hat{\beta}_i^*$.

[37] This holds if ΔG^* is single-peaked over the range of β_i such that $G_0^* > 0$.

B General Equilibrium of the Model

B.1 Equilibria

This section describes the set of general equilibria for the model introduced in Section 3. It outlines the government's utility function, describes the possible equilibria, and discusses the scope conditions under which taxation will increase accountability. For simplicity, I assume here that all citizens have the same expressive benefit β from punishment, and so either all citizens punish or none do. This punishment decision is denoted $\bar{s} \in \{0, 1\}$. The timing of the game is as follows:

1. The Government receives revenue T, derived from either an exogenously-set tax t on citizen income y or from an outside non-earned source such as foreign aid, resource rents, or other grants.
2. The Government allocates the revenue between the public good G and rents p, choosing (p, G) subject to $p + G \leq T$.
3. Citizens observe the allocation and make a punishment decision $\bar{s} \in \{0, 1\}$; payoffs accrue.

I solve for subgame perfect Nash equilibria in pure strategies. Section 3 showed that a citizen's best response is:

$$\bar{s} = \begin{cases} 1 & \text{if } G < G^*_{Cit} \\ 0 & \text{otherwise} \end{cases} \tag{14}$$

where $G^*_{Cit} = G^*_0 = \max\{0, u^{-1}(u(T) - \frac{c}{\beta})\}$ if the citizen is not taxed, and $G^*_{Cit} = G^*_t = \max\{0, T + u^{-1}(\frac{-c}{\beta})\}$ if the citizen is taxed.

B.1.1 The Government's decision

The government receives utility from any rents it can extract, and loses utility if the citizens choose to sanction. Let q be the cost the government incurs if the citizens punish ($\bar{s} = 1$). The government's utility function can be written

$$V_{Gov} = p - \bar{s} * q = T - G - \bar{s}q \tag{15}$$

The government's best response will be to either provide no public good ($G = 0$) or to provide the minimum necessary level of public good to avoid citizen sanctions ($G = G^*_{Cit}$, the citizen's punishment threshold).[38] The government's equilibrium response will therefore depend on whether it is more costly to endure punishment or grant concessions to citizens[39]:

$$G^*_{Gov} = \begin{cases} G^*_{Cit} & \text{if } G^*_{Cit} \leq q \\ 0 & \text{if } G^*_{Cit} > q \end{cases} \tag{16}$$

B.1.2 The Effect of Taxation on Public Goods Provision

For any given set of parameters, and given the strategies described above there is an unique SPNE. This section describes the equlibria for the game with and without taxation across the parameter space. In the below, G^*_t and G^*_0 refers to the citizens' punishment thresholds with and without taxation, respectively. Note

[38] If the government provides any other $G < G^*_{Cit}$, the government can strictly increase its payoff by deviating to $G = 0$. If the government provides any other $G > G^*_{Cit}$, it can strictly increase its payoff by deviating to $G = G^*_{Cit}$.

[39] I assume here that when $G^*_{Cit} = q$, the government prefers $G = G^*_{Cit}$ to $G = 0$. If instead $G = 0$ in these cases, there are additional equilibria below. Discussion of these is omitted, as they only apply to knife-edge cases.

that $G_t^* > 0$ if and only if $-u(-T) > \frac{c}{\beta}$, and $G_0^* > 0$ if and only if $u(T) > \frac{c}{\beta}$.[40]

Case 1: $\frac{c}{\beta} > -u(-T)$.

In this case the costs of action are too high relative to the benefits, and $G_t^* = G_0^* = 0$: the citizens will never punish the government, even when $G = 0$. The government's unique best response in both games is to provide no public goods. In equilibrium, $\bar{s}^* = 0$ for all $G \in [0, T]$ and $G_{Gov}^* = 0$, with or without taxation.

Case 2: $-u(-T) > \frac{c}{\beta} > u(T)$

The citizen now only demands a positive level of public good when taxed: $G_t^* > 0 \geq G_0^*$. There are two subcases, depending on the relationship between G_t^* and q:

Case 2a: $G_t^* > q$

When this condition holds, the costs citizens can impose on the government are too small (relative to the demanded level of G_{Cit}^*) to generate accountability. Equilibrium strategies with and without taxation are $(G_{Gov}^* = 0,\ \bar{s}^* = 1 \text{ iff } G < G_t^*)$ and $(G_{Gov}^* = 0, \bar{s}^* = 0\ \forall\ G \in [0, T])$, respectively.

Case 2b: $G_t^* \leq q$

When this condition holds, citizens have enough leverage over governments for taxation to increase accountability. Equilibrium strategies with and without taxation are $(G_{Gov}^* = G_t^*,\ \bar{s}^* = 1 \text{ iff } G < G_t^*)$ and $(G_{Gov}^* = 0, \bar{s}^* = 0\ \forall\ G \in [0, T])$, respectively: taxation increases the level of public good provided.

Case 3: $u(T) > \frac{c}{\beta}$

In this case, both taxed and untaxed citizens demand positive levels of

[40]Note that as by definition $u(T) < -u(-T)$, this implies that the taxed citizen will start punishing before the untaxed citizen.

accountability: $G_t^* > G_0^* > 0$. Again, the specific equilibrium outcome depends on the relationship between the punishment thresholds and the costs citizens can impose on the government.

Case 3a: $G_t^* > G_0^* > q$

The costs citizens can impose on the government are too small to generate accountability. Equilibrium strategies with and without taxation are ($G_{Gov}^* = 0$, $\bar{s}^* = 1$ iff $G < G_t^*$) and ($G_{Gov}^* = 0$, $\bar{s}^* = 1$ iff $G < G_0^*$), respectively.

Case 3b: $G_t^* > q \geq G_0^*$

In this case, taxation actually decreases accountability: it raises demands to such a level that government would rather accept sanctions than buy citizen quiesence. Equilibrium strategies with and without taxation are ($G_{Gov}^* = 0$, $\bar{s}^* = 1$ iff $G < G_t^*$) and ($G_{Gov}^* = G_0^*$, $\bar{s}^* = 1$ iff $G < G_0^*$), respectively.

Case 3c: $q \geq G_t^* > G_0^*$

Taxation here increases accountability. Equilibrium strategies with and without taxation are ($G_{Gov}^* = G_t^*$, $\bar{s}^* = 1$ iff $G < G_t^*$) and ($G_{Gov}^* = G_0^*$, $\bar{s}^* = 1$ iff $G < G_0^*$). Taxation increases the level of public goods provision by $G_t^* - G_0^*$.

This describes the set of equilibria over the entire parameter space. Taxation increases the supply of accountability in cases 2b and 3c: these are the cases in which the costs of engaging in punitive action are sufficiently small, and in which citizens can enact sufficiently large costs on non-accountable government actors. These conditions are likely to be met when citizens can use elections to sanction poor performance; in areas where protests can enact significant costs on leaders (as is likely in urban areas); and when government repression is sufficiently low.

Cases in which taxation do not increase accountability are those in which there

are *multiple political market failures*: other facets of the accountability process are broken, and thus increasing citizens' demands will not have an impact on the level of accountability (in the form of public goods) provided in equilibrium. Note that while there is one case in which taxation actually decreases accountability, the scope conditions for the case are unlikely: A government that would sustain sanctions by increasing taxes is likely unwilling to impose a new tax in the first place.

C Additional Results

C.1 Balance Tests

	Tax Citizens	Grant Citizens	Difference	P Value
Male	0.748	0.696	0.053	0.315
Age	22.426	23.007	-0.581	0.429
Can Write	0.836	0.832	0.003	0.938
Can Read	0.831	0.847	-0.016	0.721
Speaks English	0.584	0.504	0.081	0.166
Years schooling	9.188	8.892	0.296	0.398
Post Secondary Ed	0.032	0.043	-0.011	0.625
Wage (past 4 wks)	120.705	111.507	9.198	0.752
Head of household	0.314	0.374	-0.060	0.279
Paid income tax	0.083	0.129	-0.046	0.198
Community Leader	0.058	0.059	-0.000	0.989
Speak at community meetings	0.218	0.214	0.004	0.939
Number groups belong to	0.782	0.750	0.032	0.770
Registered to vote	0.519	0.579	-0.059	0.307
Voted last election	0.481	0.507	-0.027	0.650

Table 6: *Balance Tests: Tax & Grant Games.* This table shows the mean covariate values for Citizens in the Tax and Grant treatments. "Difference" and P-value were calculated using a difference-of-means test.

C.2 Leader Responses

This section describes leader behavior from the Tax and Grant games. Note that as the role of Leader was played by ordinary Ugandan citizens, the external validity of these results is likely low. In particular, the formal model assumes that Leaders are strict revenue maximizers. If the citizens assigned to these roles are also motivated by other concerns, for example fairness or inequity aversion, the model's predictions may not hold. Additionally, there are only 75 data points for Leaders, compared to 296 Citizens; this was done to increase statistical power for the main analysis.

Figure 7 shows the distribution of the average transfer the Leader offered the Citizen in the Tax and Grant games. The vertical lines depict the means. The means are virtually identical; regression analysis (not shown) cannot reject the null that they are the same, and a Kolmogorov-Smirnov test cannot reject that the distributions are the same.

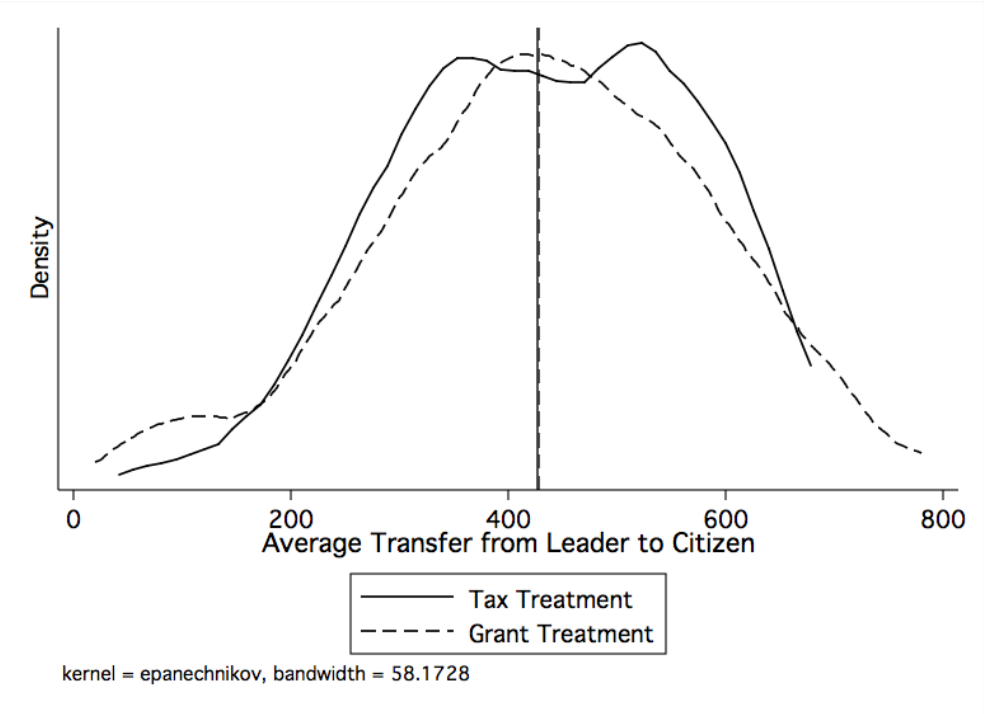

Figure 7: *Average transfers from Leaders to Citizens, Tax vs. Grant Treatments.* Density estimates of average leader offers in Tax and Grant Games. Outcome based on 5-round average of offers from Leaders to Citizens for each Leader. Vertical lines depict group means.

C.3 Robustness Checks

VARIABLES	(1)	(2)	(3)
Taxation	0.326**	0.334**	0.357**
	(0.16)	(0.15)	(0.15)
Controls	N	N	Y
FE	N	Y	Y
Obs	296	296	272

* p<0.10, ** p<0.05, *** p<0.01

Table 7: *Average Citizen Punishments in Tax and Grant Games - Ordered Probit.* This table replicates the OLS results using ordered probit. Column 1 depicts the bivariate relationship; Column 2 adds enumerator and site fixed effects; Column 3 includes controls. All standard errors are clustered at the session level.

VARIABLES	(1) Bivar	(2) FE	(3) Controls
Taxation	54.57***	55.12***	56.08***
	(19.16)	(18.62)	(18.74)
Constant	408.3***	414.0***	181.0
	(14.17)	(25.65)	(184.6)
Controls	N	N	Y
FE	N	Y	Y
Observations	1478	1478	1351
R^2	0.016	0.052	0.083

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8: *Pooled Citizen Punishment Thresholds in Tax and Grant Games - OLS.* This table shows analysis similar to that of Table 2, but with a different dependent variable. Instead of creating a five-round average of each Citizen's responses, the five rounds are pooled; each observation is the punishment threshold in a single Citizen-round. Standard errors are clustered at the respondent level. Specifications are otherwise as in Table 2.

VARIABLES	All	Round Dropped				
		Round 1	Round 2	Round 3	Round 4	Round 5
Taxation	54.252**	52.337**	47.211*	47.211*	51.761**	60.337**
	(22.441)	(23.639)	(23.009)	(23.009)	(23.340)	(21.698)
Constant	413.169***	426.789***	412.617***	412.617***	406.866***	405.333***
	(24.319)	(28.249)	(22.715)	(22.715)	(26.136)	(25.289)
Observations	296	296	296	296	296	296
R^2	0.089	0.092	0.075	0.075	0.079	0.095

*** p<0.01, ** p<0.05, * p<0.1
Robust standard errors in parentheses

Table 9: *Average Citizen Punishment Thresholds in Tax and Grant Games - Dropping Rounds (OLS).* Column 1 replicates the main analysis, including enumerator and site fixed effects and standard errors clustered by session. Columns 2-6 each drop one round from the average, so that "Round 1" refers to a four-round average that does not include Round 1.

D Experimental Protocols

This section provides the English-language protocols for the experiments desribed in the paper. Enumeration was conducted using a translation into Luganda, the dominant local language in central Uganda.

D.1 English-Language Protocols for Tax and Grant Games

Tax Game

Now I will explain the [first/second] activity. This activity is done by pairs of individuals. Each pair is made up of a Citizen and a Leader. These pairs, and whether you are a Citizen or Leader, are assigned by chance. Each of you will do this activity with someone from the group. However, none of you will know with whom you are playing. Only I know who plays with whom, and I will never tell anyone. You will complete this activity multiple times. But, you will be in a different group every time. [If second activity: These are different pairings and assignments than the last activity.]

I will now explain the rules of the activity, first with words and then showing some examples using pictures. We will also meet with you individually to go over the activity again – please wait until then to ask any questions you may have. Remember, there are no right or wrong answers; it is just what you prefer.

Rules of the Activity

At the start of the activity, the enumerator will give 1000 UGX to the citizen as his wages. Then, the enumerator will collect a tax of 500 UGX from the citizen and double it, so that it is now 1000 UGX. This money will be called the group fund. The group fund of 1000 UGX is then given to the leader of the group. The leader will then take this money and decide how to allocate it. He will choose how much to keep for himself as his salary, and how much to pass back to the

citizen.

If the citizen wishes, he can pay a small cost to punish the leader for how he has allocated the group fund. If the citizen decides to punish the leader, the citizen will pay 100 UGX and we will take 400 UGX away from the leader. The citizen will make this decision before he finds out how the leader split the money: he will be asked what he would do for each decision the leader could have made. No one receives the money taken away in the punishment.

In this activity there are no right or wrong decisions – it is completely up to you, and your decisions will be private. So that you can see how this works we will now go through some examples, using pictures.

Examples[41]

Note to enumerators: While going through these examples, demonstrate each decision using the pictures. Keep the examples general - do not use individuals.

1. Here we have drawings of two people. The red person is the citizen, and the blue person is the Leader. At first, the citizen has his wages, represented by these black circles. Each circle represents a 100-shilling coin, so he has 1000 shillings total.
2. The enumerator now taxes 500 shillings from the citizen. The taxed money is put into a blue envelope, and the money kept by the citizen goes into a red envelope.
3. The enumerator now doubles the amount in the blue envelope, so it is now 1000 shillings. This is the group fund.
4. The group fund of 1000 shillings is now given to the leader. The citizen keeps the other 500 shillings.

[41]This examples, and those in the rest of the protocols, were done using a set of stick figure diagrams representing each of the numbered stages below.

5. So, now the leader has 1000 shillings and the citizen 500 shillings.

   Next the leader will decide how to allocate the 1000 shillings between his own salary and the citizen. But before this happens, the citizen must choose which divisions of the money he would wish to punish. In this example, suppose that the citizen decides that he would punish the leader if he gets less than 700 shillings back from the leader. Remember, this is just an example – the Citizen could make any other decision. Also, remember that the Leader does not know this decision.

6. Now we will look at a couple of examples of decisions the Leader could make. First, in this example, suppose the leader allocates 1000 Sh. for himself, and gives 0 Sh. to the citizen. Now the Leader has 1000 Sh. and the citizen has 500 Sh.

7. Because the leader passed back less than 700 Sh, the punishment takes place. The citizen pays 100 Sh., and 400 Sh. is taken from the leader. The red lines through the coins show the punishment. Now, at the end of the round, the Leader has 600 Sh. and the citizen has 400 Sh.

8. Now consider another example. Suppose the leader allocates 500 Sh. for himself, and gives 500 Sh. to the citizen. Now the Leader has 500 Sh, and the citizen has 1000 Sh.

9. Because the leader passed back less than 700 Sh, the punishment takes place. The citizen pays 100 Sh., and 400 Sh. is taken from the leader. Now, at the end of the round, the Leader has 100 Sh. and the citizen has 900 Sh.

10. Now consider a third example. Suppose the leader allocates 300 Sh. for his own salary, and gives 700 Sh. to the citizen. Now the Leader has 300 Sh, and the citizen has 1200 Sh.

11. Because the leader passed at least 700 Sh, the punishment does not take place. Now, at the end of the round, the Leader has 300 Sh. and the citizen

has 1200 Sh. Remember, all of these are just examples. Any decision is ok – it is just what you prefer.

Instructions

We will now call each of you in turn. You will meet with one of the researchers in private. They will ask you to work through another example with them to be sure that you understand. You will also be able to ask any questions you have about the activity. You will then be told whether you will be a Citizen or a Leader. Remember that we have decided your roles, and which pair you are in, by chance.

Please remember the rules that we talked about at the beginning. These include being quiet while others are doing the activity; do not ask what other people decided to do; do not attempt to change your mind after you have completed the activity.

Protocols for one-on-one interactions: each round.

Let's look at one more example to be sure you understand the activity. *Note: enumerators demonstrated these with sets of 100 Sh. coins.*

1. At the start of the activity, the Citizen is given wages of 1000 shillings. What happens to that money? [Half is taken away as a tax, doubled, and given to the Leader.]
2. So, now the citizen has 500 Sh, and the leader has 1000 Sh. What decisions must the leader now make? [Split money between salary and citizen].
3. Now, suppose that the Citizen decides that he will punish if the Leader passes back less than 500 Shillings. Remember, the leader doesn't know this decision.
4. Suppose the Leader takes 400 Sh for his salary, and passes 600 Sh to the Citizen.
5. Will the punishment take place? [No]

6. So, what will be the final amount of money the Citizen has? The Leader? [Cit: 1100. Leader: 400]
7. If the punishment had taken place, how much would each person lose? [C: 100, L: 400]

Note to enumerators: Record whether answers were correct.

If the respondent is a Citizen:

You were randomly chosen to be a citizen. Here is your 1,000 USH. [Line up 10 100 Sh coins on the table.] I will now take 500 Sh as a tax on your money. I will double this amount and give it to the Leader of this group. He or she will decide how much to keep as his/her salary, and how much to give back to you.

Remember, you can choose to pay 100 Sh. to take 400 Sh. from the leader if you do not like his or her decision. I will now ask you to make this decision for each possible allocation of the money the leader could make.

- If the leader kept 1000 UGX and gave you 0 UGX, would you pay 100 UGX to take 400 UGX from the leader? (Mark Reply)
- What if the leader kept 900 UGX and gave you 100 UGX?
- What if the leader kept 800 UGX and gave you 200 UGX?
- etc.

Note: enumerators continued until respondent reached a level at which they did not punish, then stopped and recorded answer as the punishment threshold.

Thank you. Please go back and sit down quietly until we have met with everyone.

If the respondent is a Leader:

You were randomly chosen to be a Leader. You have been randomly paired with a citizen. We have taxed this citizen 500 Sh, and doubled it, so it is now 1000 Sh – the citizen has his 500 Sh. remaining. Here is your group fund of 1000 Sh (put 10 100 Sh coins on table). You must now decide how to allocate

the money between your salary and the citizen. Remember, if the citizen is not satisfied with your decision, they can pay 100 Sh. to take 400 Sh. away from you. Please put the amount of money you wish to keep as your salary here, and the amount you wish to pass to the citizen here.

[Record decision]

Thank you. Please go back and sit down quietly until we have met with everyone.

Grant Game

Now I will explain the [first/second] activity. This activity is done by pairs of individuals. Each pair is made up of a Citizen and a Leader. These pairs, and whether you are a Citizen or Leader, are assigned by chance. Each of you will do this activity with someone from the group. However, none of you will know with whom you are playing. Only I know who plays with whom, and I will never tell anyone. You will complete this activity multiple times. But, you will be in a different group every time. [If second activity: These are different pairings and assignments than the last activity.]

I will now explain the rules of the activity, first with words and then showing some examples using pictures. We will also meet with you individually to go over the activity again – please wait until then to ask any questions you may have. Remember, there are no right or wrong answers; it is just what you prefer.

Rules of the activity

At the start of the activity, the enumerator will give 500 Sh. to the citizen as his wages. He will then give a group fund of 1000 Sh to the Leader of the group. The leader will then take this money and decide how to allocate it. He will choose how much to keep for himself as his salary, and how much to pass back to the citizen.

If the citizen wishes, he can pay a small cost to punish the leader for how he has allocated the group fund. If the citizen decides to punish the leader, the citizen will pay 100 UGX and we will take 400 UGX away from the leader. The citizen will make this decision before he finds out how the leader split the money: he will be asked what he would do for each decision the leader could have made. No one receives the money taken away in the punishment.

In this activity there are no right or wrong decisions – it is completely up to you, and your decisions will be private. So that you can see how this works we will now go through some examples, using pictures.

Examples

Note to enumerators: While going through these examples, demonstrate each decision using the pictures. Keep the examples general and do not use individuals as examples.

1. Here we have drawings of two people. The red person is the citizen, and the blue person is the Leader. At first, the citizen has his wages, represented by these black circles. Each circle represents a 100-shilling coin, so he has 500 shillings total.
2. The enumerator now takes a group fund of 1000 shillings and gives it to the leader. The citizen keeps his 500 shillings.
3. So, now the leader has 1000 shillings and the citizen 500 shillings.

   Next the leader will decide how to allocate the 1000 shillings between his own salary and the citizen. But before this happens, the citizen must choose which divisions of the money he would wish to punish. In this example, suppose that the citizen decides that he would punish the leader if he gets less than 700 shillings from the leader. Remember, this is just an example – the Citizen could make any other decision. Also, remember that the Leader does not know this decision.

4. Now we will look at a couple of examples of decisions the Leader could make. First, in this example, suppose the leader allocates 1000 Sh. for himself, and gives 0 Sh. to the citizen. Now the Leader has 1000 Sh. and the citizen has 500 Sh.

   Because the leader passed back less than 700 Sh, the punishment takes place. The citizen pays 100 Sh., and 400 Sh. is taken from the leader. The red lines through the coins show the punishment. Now, at the end of the round, the Leader has 600 Sh. and the citizen has 400 Sh.

5. Now consider another example. Suppose the leader allocates 500 Sh. for himself, and gives 500 Sh. to the citizen. Now the Leader has 500 Sh, and the citizen has 1000 Sh.

   Because the leader passed back less than 700 Sh, the punishment takes place. The citizen pays 100 Sh., and 400 Sh. is taken from the leader. Now, at the end of the round, the Leader has 100 Sh. and the citizen has 900 Sh.

6. Now consider a third example. Suppose the leader allocates 300 Sh. for his own salary, and gives 700 Sh. to the citizen. Now the Leader has 300 Sh, and the citizen has 1200 Sh.

7. Because the leader passed at least 700 Sh, the punishment does not take place. Now, at the end of the round, the Leader has 300 Sh. and the citizen has 1200 Sh. Remember, all of these are just examples. Any decision is ok – it is just what you prefer.

Instructions

We will now call each of you in turn. You will meet with one of the researchers in private. They will ask you to work through another example with them to be sure that you understand. You will also be able to ask any questions you have about the activity. You will then be told whether you will be a Citizen or a Leader. Remember that we have decided your roles, and which pair you are in,

by chance.

Please remember the rules that we talked about at the beginning. These include being quiet while others are doing the activity; do not ask what other people decided to do; do not attempt to change your mind after you have completed the activity.

Protocols for one-on-one interactions: each round.

Let's look at one more example to be sure you understand the activity.

Note: enumerators demonstrated these with sets of 100 Sh. coins.

1. At the start of the activity, the Citizen is given wages of 500 shillings. Then the enumerator gives a group fund of 1000 Sh. to the Leader.
2. So, now the citizen has 500 Sh, and the leader has 1000 Sh. What decision must the leader now make? [Split money between salary & citizen].
3. Now, suppose that the Citizen decides that he will punish if the Leader passes back less than 500 Shillings. Remember, the leader doesn't know this decision.
4. Suppose the Leader takes 400 Sh for his salary, and passes 600 Sh to the Citizen.
5. Will the punishment take place? [No]
6. So, what will the final amount of money the Citizen has? The Leader? [Cit: 1100. Leader: 400]
7. If the punishment had taken place, how much would each person lose? [C: 100, L: 400]

Note to enumerators: Record whether answers were correct.

If the respondents is a Citizen:

You were randomly chosen to be a citizen. Here is your 500 USH. [Line up 10 100 Sh coins on the table] I will give a group fund of 1000 Sh. to the Leader of this group. He or she will decide how much to keep as his/her salary, and how

much to give back to you.

Remember, you can choose to pay 100 Sh. to take 400 Sh. from the leader if you do not like his or her decision. I will now ask you to make this decision for each possible allocation of the money the leader could make.

- If the leader kept 1000 UGX and gave you 0 UGX, would you pay 100 UGX to take 400 UGX from the leader? (Mark Reply)
- What if the leader kept 900 UGX and gave you 100 UGX? (Mark Reply)
- What if the leader kept 800 UGX and gave you 200 UGX? (Mark Reply)
- etc.

Note: enumerators continued until respondent reached a level at which they did not punish, then stopped and recorded that as the punishment threshold.

Thank you. Please go back and sit down quietly until we have met with everyone.

If the respondent is a Leader You were randomly chosen to be a Leader. You have been randomly paired with a citizen. The citizen has been given wages of 500 Sh. We will now give you a group fund of 1000 Sh. Here is the 1000 Sh. [Put 10 100 Sh coins on table]. You must now decide how to allocate the money between your salary and the citizen. Please put the amount of money you wish to keep as your salary here, and the amount you wish to pass to the citizen here.

[Record decision]

Thank you. Please go back and sit down quietly until we have met with everyone.

D.2 English-Language Protocols for Third-Party Punishment Games

Third-Party Punishment Tax Game:

Now I will explain the first activity. This activity will be completed of groups of three individuals: a Citizen, and Leader, and an Observer. These groups, and

whether you are a Citizen, a Leader, or an Observer, are assigned by chance. Each of you will do this activity with others from this room. However, none of you will know with whom you are playing. Only we know who plays with whom, and we will never tell anyone. You will complete this activity multiple times. But, you will be in a different group, with different people, every time.

I will now explain the rules of the activity, first with words and then showing some examples using pictures. We will also meet with you individually to go over the activity again – please wait until then to ask any questions you may have. Remember, there are no right or wrong answers; it is just what you prefer.

Rules of the Activity:

At the start of the activity, the enumerator will give 1000 UGX to the Citizen as his wages, and 1000 to the Observer as his wages. Then, the enumerator will collect a tax of 500 UGX from the Citizen and double it, so that it is now 1000 UGX. This money will be called the group fund. The group fund of 1000 Sh is then given to the Leader of the group. The Leader will then take this money and decide how to allocate it. He will choose how much to keep for himself as his salary, and how much to pass back to the Citizen.

The Observer will then see what the Leader decided to do. If the Observer wishes, he can pay a small cost to punish the Leader for how he has allocated the group fund. If the Observer decides to punish the Leader, the Observer will pay 100 UGX and we will take 400 UGX away from the Leader. The Observer will make this decision before he finds out how the Leader split the money: he will be asked what he would do for each decision the Leader could have made. No one receives the money taken away in the punishment. Also, remember that the Observer does not get any of the money from the group fund – that is only divided between the Citizen and the Leader.

In this activity there are no right or wrong decisions – it is completely up to

you, and your decisions will be private. So that you can see how this works we will now go through some examples, using pictures.

Examples:

Note to enumerators: While going through these examples, demonstrate each decision using the pictures. Keep the examples general - do not use individuals.

1. Here we have drawings of three people. The red person is the Citizen, the blue person is the Leader, and the green person is the Observer. At first, the Citizen has his wages, represented by these black circles. Each circle represents a 100-shilling coin, so he has 1000 shillings total. The Observer is given his wages of 1000 shillings. So, he has 10 100-shilling coins, as we can see here.
2. The enumerator now taxes 500 shillings from the Citizen. The taxed money is put into a blue envelope, and the money kept by the Citizen goes into a red envelope. Nothing happens to the Observer's money.
3. The enumerator now doubles the amount in the blue envelope, so it is now 1000 shillings. This is the group fund. The money kept by the Citizen is not increased, and again, nothing happens to the Observer's money.
4. The group fund of 1000 shillings is now given to the Leader. The Citizen keeps the other 500 shillings.
5. So, now the Leader has 1000 shillings and the Citizen 500 shillings. The Observer still has his 1000 shillings.

   Next the Leader will decide how to allocate the 1000 shillings group fund between his own salary and the Citizen. But before this happens, the Observer must choose which divisions of the money he would wish to punish. In this example, suppose that the Observer decides that he would punish the Leader if he passes less than 700 shillings back to the Citizen. Remember, this is just an example – the Observer could make any other decision. Also,

remember that the Leader and Citizen do not know this decision, and also that the Citizen and Observer cannot communicate.

6. Now we will look at a couple of examples of decisions the Leader could make. First, in this example, suppose the Leader allocates 1000 Sh. for himself, and gives 0 Sh. to the Citizen. Now the Leader has 1000 Sh., the Citizen has 500 Sh, and the Observer has his 1000 Sh.
7. Because the Leader passed back less than 700 Sh, the punishment takes place. The Observer pays 100 Sh., and 400 Sh. is taken from the Leader. The red lines through the coins show the punishment. Now, at the end of the round, the Leader has 600 Sh., the Citizen has 500 Sh, and the Observer has 900 Shillings.
8. Now consider another example. Suppose the Leader allocates 500 Sh. for himself, and gives 500 Sh. to the Citizen. Now the Leader has 500 Sh, the Citizen has 1000 Sh, and the Observer still has his 1000 Sh.
9. Because the Leader passed back less than 700 Sh, the punishment takes place. The Observer pays 100 Sh., and 400 Sh. is taken from the Leader. Now, at the end of the round, the Leader has 100 Sh. and the Citizen has 1000 Sh, while the Observer has 900 Sh.
10. Now consider a third example. Suppose the Leader allocates 300 Sh. for his own salary, and gives 700 Sh. to the Citizen. Now the Leader has 300 Sh, and the Citizen has 1200 Sh, while the Observer still has his 1000 Sh.
11. Because the Leader passed at least 700 Sh, the punishment does not take place. Now, at the end of the round, the Leader has 300 Sh., the Citizen has 1200 Sh, and the Observer has 1000 Sh. Remember, all of these are just examples. Any decision is ok – it is just what you prefer.

Instructions:

We will now call each of you in turn. You will meet with one of the researchers

in private. They will ask you to work through another example with them to be sure that you understand. You will also be able to ask any questions you have about the activity. You will then be told whether you will be a Citizen, a Leader, or an Observer. Remember that we have decided your roles, and who your partners are, by chance.

Please remember the rules that we talked about at the beginning. These include being quiet while others are doing the activity; do not ask what other people decided to do; do not attempt to change your mind after you have completed the activity.

Protocols for one-on-one enumeration: all roles

Let's look at one more example to be sure you understand the activity. *Note to enumerators: Demonstrate with coins.*

1. At the start of the activity, the Citizen is given wages of 1000 shillings. What happens to that money? [Half is taken away as a tax, doubled, & given to the Leader.]
2. Then, the Observer is given how much as his wage? [1000 UGX]
3. So, now the Citizen has 500 Sh, the Leader has 1000 Sh, and the Observer has 1,000 Sh. What decision must the Leader now make? [Split money between salary & Citizen].
4. Now, suppose that the Observer decides that he will punish if the Leader passes the Citizen less than 500 Shillings. Remember, the Leader and Citizen do not know about this decision.
5. Suppose the Leader takes 400 Sh for his salary, and passes 600 Sh to the Citizen.
6. Will the punishment take place? [No]
7. So, what will be the final amount of money the Citizen has? The Leader? The Observer? [Cit: 1100. Leader: 400. Observer: 1,000]

8. If the punishment had taken place, how much would each person lose? [C: 0, L: 400, O: 100]

[Record whether correct.]

When respondent is a Citizen:

You were randomly chosen to be a Citizen. Here is your 1,000 USH. [Line up 10 100 Sh coins on the table] The Observer has a wage of 1,000 USH. I will now take 500 Sh as a tax on your money. I will double this amount and give it to the Leader of this group. He or she will decide how much to keep as his/her salary, and how much to give back to you.

Remember, the Observer can choose to pay 100 Sh. to take 400 Sh. from the Leader if they do not like his or her decision.

Now, I want to know what you think is the most fair way the Leader could divide the group fund. Please use the coins to show me what you think is the most fair division of the group fund.

[Record Amount]

Thank you. Please go back and sit down quietly until we have met with everyone.

If respondent is a Leader: You were randomly chosen to be a Leader. You have been randomly paired with a Citizen and an Observer. We have given the Citizen 1,000 Sh and then taken a tax of 500 Sh and doubled it, so it is now 1000 Sh – the Citizen has his 500 Sh. remaining. The Observer has a wage of 1,000 USH. Here is your group fund of 1000 Sh (put 10 100 Sh coins on table). You must now decide how to allocate the money between your salary and the Citizen. Remember, if the Observer is not satisfied with your decision, he or she can pay 100 Sh. to take 400 Sh. away from you. Please put the amount of money you wish to keep as your salary here, and the amount you wish to pass to the Citizen here. [Record decision]

Thank you. Please go back and sit down quietly until we have met with everyone.

If respondent is an Observer: You were randomly chosen to be an Observer, and have been randomly paired with a Citizen and Leader. Here is your salary of 1,000 UGX. We gave the Citizen 1,000, then took a tax of 500 UGX, doubled it, and gave it to the Leader as the group fund. The Leader will choose how much of this group fund to keep for his own salary, and how much to pass back to the Citizen.

Remember, you can choose to pay 100 Sh. to take 400 Sh. from the Leader if you do not like his or her decision. I will now ask you to make this decision for each possible allocation of the money the Leader could make.

- If the Leader kept 1000 UGX and gave the Citizen 0 UGX, would you pay 100 UGX to take 400 UGX from the Leader? (Mark Reply)
- What if the Leader kept 900 UGX and gave the Citizen 100 UGX? (Mark Reply)
- What if the Leader kept 800 UGX and gave the Citizen 200 UGX? (Mark Reply)
- etc.

Note: enumerators continued until respondent reached a level at which they did not punish, then stopped and recorded that as the punishment threshold.

[Record punishment threshold.]

Thank you. Please go back and sit down quietly until we have met with everyone.

Third-Party Punishment Grant Game

Now I will explain the [first / second] activity. This activity will be completed of groups of three individuals: a Citizen, and Leader, and an Observer. These

groups, and whether you are a Citizen, a Leader, or an Observer, are assigned by chance. Each of you will do this activity with others from this room. However, none of you will know with whom you are playing. Only we know who plays with whom, and we will never tell anyone. You will complete this activity multiple times. But, you will be in a different group, with different people, every time. [If second activity: These are different pairings and assignments than the last activity.]

I will now explain the rules of the activity, first with words and then showing some examples using pictures. We will also meet with you individually to go over the activity again – please wait until then to ask any questions you may have. Remember, there are no right or wrong answers; it is just what you prefer.

Rules of the Activity:

At the start of the activity, the enumerator will give 500 UGX to the Citizen as his wages, and 1000 Sh to the Observer as his wages. Then, the enumerator will give a group fund of 1000 Sh the Leader of the group. The Leader will then take this money and decide how to allocate it. He will choose how much to keep for himself as his salary, and how much to pass back to the Citizen.

The Observer will then see what the Leader decided to do. If the Observer wishes, he can pay a small cost to punish the Leader for how he has allocated the group fund. If the Observer decides to punish the Leader, the Observer will pay 100 UGX and we will take 400 UGX away from the Leader. The Observer will make this decision before he finds out how the Leader split the money: he will be asked what he would do for each decision the Leader could have made. No one receives the money taken away in the punishment. Also, remember that the Observer does not get any of the money from the group fund – that is only divided between the Citizen and the Leader.

In this activity there are no right or wrong decisions – it is completely up to

you, and your decisions will be private. So that you can see how this works we will now go through some examples, using pictures.

Examples:

Note to enumerators: While going through these examples, demonstrate each decision using the pictures. Keep the examples general and do not use individuals as examples.

1. Here we have drawings of three people. The red person is the Citizen, the blue person is the Leader, and the green person is the Observer. At first, the Citizen has his wages, represented by these black circles. Each circle represents a 100-shilling coin, so he has 500 shillings total. The Observer is given his wages of 1000 shillings. So, he has 10 100-shilling coins, as we can see here.
2. The enumerator now takes a group fund of 1000 shillings and gives it to the Leader. The Citizen keeps his 500 shillings.
3. So, now the Leader has 1000 shillings and the Citizen 500 shillings. The Observer still has his 1000 shillings.

   Next the Leader will decide how to allocate the 1000 shillings group fund between his own salary and the Citizen. But before this happens, the Observer must choose which divisions of the money he would wish to punish. In this example, suppose that the Observer decides that he would punish the Leader if he passes less than 700 shillings back to the Citizen. Remember, this is just an example – the Observer could make any other decision. Also, remember that the Leader and Citizen do not know this decision, and also that the Citizen and Observer cannot communicate.
4. Now we will look at a couple of examples of decisions the Leader could make. First, in this example, suppose the Leader allocates 1000 Sh. for himself, and gives 0 Sh. to the Citizen. Now the Leader has 1000 Sh., the Citizen

has 500 Sh, and the Observer has his 1000 Sh.

5. Because the Leader passed back less than 700 Sh, the punishment takes place. The Observer pays 100 Sh., and 400 Sh. is taken from the Leader. The red lines through the coins show the punishment. Now, at the end of the round, the Leader has 600 Sh., the Citizen has 500 Sh, and the Observer has 900 Shillings.
6. Now consider another example. Suppose the Leader allocates 500 Sh. for himself, and gives 500 Sh. to the Citizen. Now the Leader has 500 Sh, the Citizen has 1000 Sh, and the Observer still has his 1000 Sh.
7. Because the Leader passed back less than 700 Sh, the punishment takes place. The Observer pays 100 Sh., and 400 Sh. is taken from the Leader. Now, at the end of the round, the Leader has 100 Sh. and the Citizen has 1000 Sh, while the Observer has 900 Sh.
8. Now consider a third example. Suppose the Leader allocates 300 Sh. for his own salary, and gives 700 Sh. to the Citizen. Now the Leader has 300 Sh, and the Citizen has 1200 Sh, while the Observer still has his 1000 Sh.
9. Because the Leader passed at least 700 Sh, the punishment does not take place. Now, at the end of the round, the Leader has 300 Sh., the Citizen has 1200 Sh, and the Observer has 1000 Sh. Remember, all of these are just examples. Any decision is ok – it is just what you prefer.

Instructions:

We will now call each of you in turn. You will meet with one of the researchers in private. They will ask you to work through another example with them to be sure that you understand. You will also be able to ask any questions you have about the activity. You will then be told whether you will be a Citizen, a Leader, or an Observer. Remember that we have decided your roles, and who your partners are, by chance.

Please remember the rules that we talked about at the beginning. These include being quiet while others are doing the activity; do not ask what other people decided to do; do not attempt to change your mind after you have completed the activity.

Protocols for one-on-one enumeration: all roles

Let's look at one more example to be sure you understand the activity. *Note to enumerators: Demonstrate with coins.*

1. At the start of the activity, the Citizen is given wages of 500 shillings. How much in wages does the Observer get? [1000 Sh.]
2. Then, how much is given to the Leader as the group fund? [1,000 Sh]
3. So, now the Citizen has 500 Sh, the Observer has 1,000 Sh, and the Leader has 1000 Sh. What decision must the Leader now make? [Split money between salary & Citizen].
4. Now, suppose that the Observer decides that he will punish if the Leader passes the Citizen less than 500 Shillings. Remember, the Leader and Citizen do not know about this decision.
5. Suppose the Leader takes 400 Sh for his salary, and passes 600 Sh to the Citizen.
6. Will the punishment take place? [No]
7. So, what will the final amount of money the Citizen has? The Leader? The Observer? [Cit: 1100. Leader: 400 Observer: 1,000]
8. If the punishment had taken place, how much would each person lose? [C: 0, L: 400, O:100]

[Record whether correct.]

If respondent is a citizen:

You were randomly chosen to be a Citizen. Here is your 500 USH. [Line up 5 100 Sh coins on the table] The Observer has a wage of 1,000 USH. I will give

a group fund of 1000 Sh. to the Leader of this group. He or she will decide how much to keep as his/her salary, and how much to give back to you.

Remember, the Observer can choose to pay 100 Sh. to take 400 Sh. from the Leader if they do not like his or her decision.

Now, I want to know what you think is the most fair way the Leader could divide the group fund. Please use the coins to show me what you think is the most fair division of the group fund.

[Record Amount]

Thank you. Please go back and sit down quietly until we have met with everyone.

If respondent is a Leader:

You were randomly chosen to be a Leader. You have been randomly paired with a Citizen and an Observer. The Citizen has been given wages of 500 Sh. The Observer has a wage of 1,000 USH. Here is your group fund of 1000 Sh (put 10 100 Sh coins on table). You must now decide how to allocate the money between your salary and the Citizen. Remember, if the Observer is not satisfied with your decision, he or she can pay 100 Sh. to take 400 Sh. away from you. Please put the amount of money you wish to keep as your salary here, and the amount you wish to pass to the Citizen here.

[Record decision]

Thank you. Please go back and sit down quietly until we have met with everyone.

If respondent is an Observer:

You were randomly chosen to be an Observer, and have been randomly paired with a Citizen and a Leader. Here is your salary of 1,000 UGX. We gave the Citizen 500 Sh, then gave the Leader a group fund of 1,000 Sh. The Leader will choose how much of this group fund to keep for his own salary, and how much

to pass to the Citizen.

Remember, you can choose to pay 100 Sh. to take 400 Sh. from the Leader if you do not like his or her decision. I will now ask you to make this decision for each possible allocation of the money the Leader could make.

- If the Leader kept 1000 UGX and gave the Citizen 0 UGX, would you pay 100 UGX to take 400 UGX from the Leader? (Mark Reply)
- What if the Leader kept 900 UGX and gave the Citizen 100 UGX? (Mark Reply)
- What if the Leader kept 800 UGX and gave the Citizen 200 UGX? (Mark Reply)
- etc.

Note: enumerators continued until respondent reached a level at which they did not punish, then stopped and recorded that as the punishment threshold.

Thank you. Please go back and sit down quietly until we have met with everyone.

D.3 English-Language Protocols for Conjoint Experiment

I am going to show you some scenarios that we have made up. You will see several pairs of officials who are suspected of corruption. These are not real people, but rather examples of the types of corruption that occur in some countries. Remember, we are not saying that any of your own officials have done this – it is an example of something that might happen in some places. Governments have limited resources to prosecute and punish corruption. For each pair of officials, you will be asked to choose which one you would rather see punished for his or her corrupt behavior. Even if you would like to see both punished, or neither, you must choose one. You will then be asked some other questions about your thoughts on these officials.

These columns represent two different officials. *(Note: Refer to clipboard.)* Each has a different role in government, and is accused of a different type of corruption.

Consider the first official. (NOTE: set out each attribute in turn. Fill in blanks using randomization from survey form.)

1. He is an BLANK official.
2. He works in the BLANK government.
3. He is accused of spending the money on BLANK .
4. The funds were supposed to be used to fund BLANK .
5. He is accused of misusing funds that came from BLANK .

Now, consider the second official. (NOTE: set out each attribute in turn)

1. He is an BLANK official.
2. He works in the BLANK government.
3. He is accused of spending the money on BLANK .
4. The funds were supposed to be used to fund BLANK .
5. He is accused of misusing funds that came from BLANK .

Q1: Which of these two officials would you personally rather see prosecuted and punished for what they have done?

Q2: Now, on a scale of 1 to 5, how serious was the corruption that Official 1 is accused of (point to correct profile)? Was it not at all serious, a bit serious, somewhat serious, very serious, or extremely serious? (1=not at all serious 2=a bit serious 3=somewhat serious 4=very serious 5=most serious)

Q3: Now, on a scale of 1 to 5, how serious was the corruption that Official 2 is accused of (point to correct profile)? Was it not at all

serious, a bit serious, somewhat serious, very serious, or extremely serious? (1=not at all serious 2=a bit serious 3=somewhat serious 4=very serious 5=most serious)

Attribute	Possible levels
The official was	Elected by the citizens; Appointed by the government
The official was a member of	Local Government; National Government
The official spent the money on:	Himself; His kin and village; Buying election support for his party
The money should have gone to:	Health; Education; Roads or other infrastructure; Water and sanitation; Government Salaries
The official stole money from:	Citizen's taxes; Foreign Donors; Transfers from Central to Local Government

Table 10: *Attributes and Possible Levels for Conjoint Experiment.*