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Inequality in Public Good Provision and Attitude Towards Taxation: Sub-national Evidence from Africa

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Inequality in Public Good Provision and Attitude Towards Taxation: Sub-national Evidence from Africa

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Abstract
This paper investigates the relationship between inequality in public good provision and attitude towards taxation in the context of sub-Saharan African countries. Individuals' attitude towards taxation is measured using the sixth round of the Afrobarometer geo-coded data, and inequality is measured with a Gini index computed using data on night light intensity around individuals. Our identification strategy relies on an IV estimation where the instrument is a Gini index computed on predicted pixels' light intensity based on the initial distance of each pixel from its closest enlightened pixel. Results suggest that inequality is positively associated with more pro-tax attitude. However, this association depends on the size of the area over which Gini indexes are computed: inequality in the immediate surrounding of individuals (in 20 up to 50km buffer areas) has a positive effect on their attitude towards taxation that we interpret as a higher demand for redistribution in more unequal context. In line with this interpretation, we also find that when facing high inequality, individuals in the bottom of wealth distribution or far away from economic centers have a more favorable attitude towards taxation.

Keywords
Inequality, attitude towards taxation, night light intensity, corruption.

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Résumé

Ce papier examine la relation entre l'inégalité dans la fourniture de biens publics et l'attitude envers la fiscalité dans le contexte des pays d'Afrique subsaharienne. L'attitude des individus vis-à-vis de la fiscalité est mesurée à l'aide du sixième cycle de données géocodées de l'Afrobaromètre, et l'inégalité est mesurée à l'aide d'un indice de Gini calculé à partir de données sur l'intensité de la lumière nocturne autour des individus. Notre stratégie d'identification repose sur une estimation IV où l'instrument est un indice de Gini calculé sur l'intensité lumineuse prévue des pixels en fonction de la distance initiale de chaque pixel par rapport à son pixel éclairé le plus proche. Les résultats suggèrent que l'inégalité est positivement associée à une attitude plus pro-fiscale. Toutefois, cette association dépend de la taille de la zone sur laquelle les indices de Gini sont calculés : l'inégalité dans l'environnement immédiat des individus (dans des zones tampons de 20 à 50 km) a un effet positif sur leur attitude à l'égard de la fiscalité que nous interprétons comme une demande plus forte de redistribution dans un contexte plus inégal. Conformément à cette interprétation, nous constatons également que lorsqu'ils sont confrontés à de fortes inégalités, les individus situés dans le bas de l'échelle de la répartition des richesses ou loin des centres économiques ont une attitude plus favorable à l'égard de la fiscalité.

Mots-clés

Inégalités, attitude à l'égard de la fiscalité, intensité de la lumière nocturne, corruption.

Introduction

Fiscal policies are an important way for developing countries to reach a fair income distribution and provide public services essential to the population. The Third International Conference on Financing for Development (2015) highlighted how important mobilizing domestic resources in developing countries will be to the financing of the sustainable development goals (SDGs). But widespread tax evasion makes the mobilization of domestic revenue challenging for most African countries. Although these countries have witnessed an increase of their tax-to-GDP ratio over the past decade, the average level of taxation remains very low at around 16 percent of gross domestic product in 2016.

Tax compliance is recognized as crucial in government's effort to collect taxes, and might be a significant lever for domestic resource mobilization in developing countries. Tax compliance is shaped by many factors relating to various economic, sociological and political features, which overall capture the attitude of individuals towards taxation. In this paper, we focus on the way inequality in local public good provision affects individuals' attitude towards taxation in 30 subsaharan African countries.

In the seminal work by Allingham and Sandmo (1972), tax evasion is modeled as an individual trade-off between the costs and benefits associated with evading taxes. More specifically, they represent the individual utility of the tax evader as a function negatively correlated with how easy it is to detect fraud and how costly it is for individuals to be caught (i.e. the magnitude of the penalty associated with tax fraud). The contribution of this pecuniary factor to tax compliance, often coined as the economic deterrence mechanism, has been recently investigated in the context of African countries by Fjeldstad et al. (2012) and Ali et al. (2014) which both find that easiness in avoiding taxes is indeed negatively correlated with tax compliance behavior.

The economic deterrence mechanism prevailed for a while as the main driver of tax compliance before the literature starts, in the early 2000s, investigating the role played by non pecuniary motivations (Lutmer and Singhal, 2014). Non pecuniary factors encompass a large set of intrinsic, reciprocity, and social motivations that shape individual attitude towards taxation and that are usually gathered under the concept of tax morale. The intrinsic motivations refers to the taxpayer's inner perception of how right it is to contribute to the national tax mobilization effort. Intrinsic motivation to comply with the tax system can be directly related to the individual perception of fairness of the tax system (Besley et al., 2019) which in turn depends on the taxpayer's reciprocity expectations. This is referred to as the fiscal exchange mechanism, which states that tax compliance should be higher when people perceive the benefits they can get out of paying taxes, notably regarding public good provision (Cowell and Gordon, 1988; Moore, 1998, 2004; D'Arcy, 2011). Intuitively, good infrastructure and public services such as health, education, or the police should be associated with more favorable attitudes towards taxation (i.e. higher tax morale), without reinforcing coercion (Bodea and LeBas, 2013). This fiscal exchange mechanism has also been evidenced by Fjeldstad et al. (2012) and Ali et al. (2014) in the context of some African states.

Building on the social influence theory, some studies have investigated the con-

tribution of norms, social and cultural influence on tax behaviour. Individuals' tax attitude has indeed been shown to be influenced by the average behaviour among the taxpayer's reference group (i.e. people comply when then perceive that their peers comply as well (Andreoni et al., 1998)). Simultaneously, tax evasion has also been found to be determined by long-run cultural factors which remain more difficult to inflect than taxpayers' risk aversion (Cummings et al., 2009). Still related with the influence of social factors, the literature has then highlighted taxpayer's perception of their treatment by fiscal authorities. Tax compliance seems to improve when individuals perceive that they - and/or the group they belong to - benefit from a fair treatment from the state, compared to other groups in the society (i.e. when their comparative treatment by fiscal authorities is rather fair (McKerchar and Evans, 2009)).

Lastly, and in a pretty straightforward manner, people are also expected to report more pronounced non-compliant behavior when they do not grant much confidence in their public institutions. The relationship between tax compliance and trust in the government, or in the fiscal department, is thus expected to be positive (Kirchler et al., 2008). Often labelled as the political legitimacy channel, Fjeldstad et al. (2012) and Ali et al. (2014) have emphasized, thanks to Afrobarometer data, that trust was indeed positively correlated with tax compliance in the context of some African countries.[1]

Our analysis seeks to understand the link between inequality and attitude towards taxation. A large strand of research in behavioral economics suggests that within country growing wealth disparity contributes to accentuate taxpayer stress and thereby increases the propensity to evade taxation. According to some studies, such negative effect between inequality and tax evasion should mostly occur at both ends of the income distribution given the reduced visibility of transactions as wage income declines as a share of total income i.e. among low and high income earners. While richest individuals should be more prone to enter tax-optimization strategies in a context of high inequality, poorer individuals might also consider avoiding taxation. This would be facilitated by a large prevalence of the informal sector to which they most often relate to (especially in the context of low-income countries and sub-Sahara African countries).

Despite the absence of study investigating such relationship in the context of African countries, there is evidence supporting the negative correlation between inequality and tax compliance in other regions. In line with the social actor model, Williams and Krasniqi (2017) examine the intrinsic motivation to pay taxes and investigate the individual and national heterogeneity in tax morale on a sample of 35 Eurasian countries. Using the 2010 Life in Transition Survey they show that age, marital status, and education do alter the intrinsic motivation to pay taxes and highlight a negative correlation with income inequality. They also provide evidence for the modernisation hypothesis, according to which tax morale is higher in more developed countries with stronger legal systems and less corruption. Gerstenblüth et al. (2008) find a similar result using the Latinobarometro (2005)

[1]Related to this last point is the role played by non-state actors which may decrease tax compliance when substituting for the state in the provision of public goods: taxpayers might believe that taxation is less needed to improve their standards of living thanks to the presence of alternative, and individually less costly, financing sources (Ali et al., 2014).

dataset on a cross-section of Latin American countries. Their results suggest that the level of inequality is negatively associated with tax compliance. Finally, Bloomquist (2003) uses data on the United States for the 1947 to 1999 period and also finds a negative relationship between inequality and tax compliance (proxied with salary under-reporting)

Yet, given that taxes aim at financing public goods and services, one might think of tax compliance as a proxy of demand for redistribution. The question of whether inequality affects votes for re-distributive policies appeared in the 1970s and suggests that inequality may be an important determinant of tax compliance. The median voter model indeed predicts a positive effect of inequality on pressure for redistribution (Romer, 1975; Meltzer and Richard, 1981). As put by Kenworthy and McCall (2008) : "The lower the median relative to the mean, the more the median income person or household is likely to benefit from government redistribution, in the sense that the transfers she receives will exceed her share of the tax burden." This mechanism relates to the fiscal exchange argument in which the prospects of benefit from public good provision increase tax compliance.

The literature seeking to test the link between inequality and the demand for redistribution has been abundant for more than twenty years and yet no consensus has emerged. Some papers have found support for the median voter model prediction that inequality is positively associated with a higher demand for redistribution[2] while others have not.[3] Gründler and Köllner (2017) provide evidence consistent with the median voter model, but they find that the effect of inequality on redistribution is stronger when using perceived inequality measures rather than objective measures. In addition, they show that the link is more tenuous in developing countries because of weaker political rights.

Yet, the median voter model fails to explain the differences observed between the United States and Europe, the latter being characterized by lower inequality and a higher redistribution than the United States (Benabou, 1996). This observation has given rise to new theoretical models introducing political structures in which elites have a greater political weight (Benabou, 2000) or considering the prospects for social mobility as more decisive in the demand for redistribution than position in income distribution (Piketty, 1995; Benabou and Ok, 2001). Heterogeneous preferences for redistribution according to social or identity groups may also explain the failure of the median voter model to explain cross-country differences. Alesina et al. (2001), for example, explain why the United States is both more unequal and less redistributive than Europe by introducing the concept of "reciprocal altruism" whereby voters are reluctant to redistribute money to the poor if the poor are considered responsible for their poverty situation or if they belong to a different ethnic or identity group.

[2]See for example Milanovic (2000) on a sample of 24 developed or transition countries; Kevins et al. (2018) for 22 European countries; Kerr (2014), Corcoran and Evans (2010), or Boustan et al. (2013) considering regional variations in the United States.

[3]Kenworthy and McCall (2007) adopt a long-run intra-country approach to analyze whether the rise in inequality during the 1980s and 1990s led to more redistribution. Based on the study of 8 OECD countries, they show that the median voter model does not hold. This result is similar to that of Georgiadis and Manning (2012) for the United Kingdom. Islam et al. (2018) reach the same conclusion on 21 OECD countries over a long period (1870-2011). An abundant literature showing the negative effect of ethnic inequality on the provision of public goods has also contributed to challenging the neoclassical model of the median voter (Alesina et al., 1999; Alesina and Ferrara, 2005).

This hypothesis of "reciprocal altruism" is justified by numerous studies, mainly conducted in the US context, showing that individuals are all the more favorable to redistribution when the poorest resembles them (Alesina et al., 1999; Luttmer, 2001).

In this paper, we build on this flourishing literature to investigate the effect of inequality, and more specifically inequality in public good provision on individual's attitude towards taxation. Our assessment of attitude towards taxation is provided by the sixth round of the Afrobarometer survey which includes a series of questions on the perception by individuals of how right it is to pay taxes. This survey is comparable across more than 30 African countries and provides latitude and longitude for each enumeration area (with 8 to 16 respondents in each enumeration area). This individual level data on attitude towards taxation is combined with inequality measures. In the tradition of Alesina et al. (2016), inequality is captured with Gini index computed using night light data at the pixel level for different zone area (20, 30, 40, 50, 60 and 70 kilometers from the centroid of each enumeration area). This measure captures inequality in public good provision - i.e. access to electricity - rather than the traditional income inequality used in the literature. This allows us to distinguish between the observed inequality in the immediate surrounding of an individual and inequality in a larger region, and investigate whether this spatial variation has an effect on individual's tax attitude. The focus on inequality at sub-national levels is motivated by the suspicion that such dis-aggregation may be more relevant than the national scale since individual's perception of inequality is more likely to be accurate in their surrounding environment based on day-to-day observations (Newman et al., 2015). Hence more local measures of inequality at the sub-national level probably better reflect the perceived inequality from an individual standpoint.

We find an average positive effect of inequality in 20-50km buffer areas on attitude towards taxation: within countries, respondents living in a surrounding more plagued by night light inequality report significantly more favorable attitude towards taxation. We interpret this result as indicative of more demand for redistribution in a context of larger local inequality in public good provision, albeit this may not necessarily translate into higher tax compliance. Our identification strategy relies on an IV estimation where the instrument is a Gini index computed on predicted pixels' light intensity based on the initial distance of each pixel from its closest enlightened pixel. We also challenge our results to a wide set of robustness checks which all suggest that our findings remain unaffected by potential sample selection issues nor by our definition of attitude towards taxation.

Finally, we exploit individual characteristics available in Afrobarometer surveys to investigate potential heterogeneity in the effect of inequality in public good provision on attitude towards taxation. Results indicate that such effect mainly stems from people ranking at the bottom of the national wealth distribution. We also find that individuals who live in unequal areas tend to be more favorable towards taxation when they are located further away from the enlightened pixels, in line with the idea that they may benefit more from redistribution. We also observe that the positive contribution of local inequality is sensitive to trust in institutions and perception of corruption that Afrobarometer's respondents grant to their fiscal and ruling institutions.

The rest of the paper is organized as follows. Section 2 discusses the data and the empirical strategy used to assess the contribution of local inequality to within-country variation in tax attitude. Section 3 presents the baseline results and challenges the robustness of our main findings. Section 4 investigates the potential transmission channels. Section 5 concludes.

1. Model and Data

1.1. Empirical Approach

The empirical specification we implement makes use of cross-section data and aims at estimating the impact of inequality on attitude towards taxation at the individual level, controlling as much as possible for the traditional determinants of attitude toward taxation highlighted in the literature: difficulty to avoid taxation (economic deterrence mechanism), access to public goods (fiscal exchange theory), behavior of the reference group towards taxes (social influences), relative treatment by tax administrations (comparative treatment mechanism), and trust that people have in the government (political legitimacy). The empirical specification hence takes the following form:

$$TAX\_ATTITUDE_{i,z,c} = \alpha_c + \beta INEQUALITY_{z,c} + \theta Y_{z,c} + \gamma CHANNELS_{i,z,c} + \delta X_{i,z,c} + \varepsilon_{i,z,c} \quad (1)$$

where *z* is a circular zone with a radius $\in \{20km, 30km, 40km, 50km, 60km, 70km\}$.

$TAX\_ATTITUDE_{i,z,c}$ denotes the attitude towards taxation of the individual i surveyed in the zone z of country c. $INEQUALITY_{z,c}$ represents inequality measured at the the zone z in a given country c. The circular zones around individuals could in theory go beyond country boundaries, but when computing the Gini index we restrict the night light observations to the pixels of the country in which individuals are located. Y_z is a vector of variable capturing characteristics of the zone z around individuals and includes the size of the population (in logarithm), and the average level of night light intensity per capita. $CHANNELS_{i,z,c}$ is a vector including variables at the individual-level controlling for the various determinants of attitude towards taxation highlighted in the literature (the perception by individuals of the difficulty to evade taxes, to access public goods, etc.). $X_{i,z,c}$ comprises individual characteristics that might explain why some people tend to display more pro-tax behaviors than others, such as age, education, wealth, employment status, as well as whether the individual lives in a rural or urban area. Lastly, α_c denotes a set of country fixed-effects, accounting for the contribution of time invariant country-level characteristics.

In this specification, attitude towards taxation is measured at the individual level whereas the main explanatory variable is measured at the zone level which is the same for all individuals in an enumeration area. In order to attenuate the potential bias as a result of this difference, we follow the literature by clustering the standard errors at the zone level (Moulton, 1990).

1.2. Individual Level Data

The main source of data for this study comes from the sixth round of Afrobarometer surveys conducted in 2014-15. The survey includes a series of questions about attitude towards taxation that are comparable across more than 30 African countries. We choose not

to focus on the restricted concept of tax compliance but rather to consider the more encompassing concept of attitude towards taxation. Although Afrobarometer is a non-state organisation, people surveyed might still perceive that their responses could be reported to public institutions. Hence, on sensitive questions such as the frequency of tax avoidance, people might under-report their non-compliance behavior by fear of retaliation hence giving rise to an attenuation bias.[4] In addition, they could also simply be ashamed of declaring that they do not pay their taxes (and do not contribute to the national effort in raising the country financing capacities) to someone they do not know. This suggests that the use of declarative measures regarding tax compliance might be debatable since these are likely to suffer from an over-reporting bias. As such we use dependent variables related to attitude towards taxation rather than tax compliance in order to alleviate the potential attenuation bias and increase the reliability of our dependent variable. Hence our dependent variable is a composite measure constructed from questions related to various dimensions of tax morale. These questions are reported in Table 1. Since the scale varies for each question, we first re-scale each variable on a scale from 0 to 1 and then take a simple average. The composite dependent variable is then labelled TAX_ATTITUDE, observed for each Afrobarometer respondents i. We will further use 3 other dependent variables as robustness checks. Descriptive statistics in Table A1 suggest that, among our sample (respondents pooled across 30 sub-Sahara African countries), 68 percent of individuals report an attitude that seems in favor of taxation.

Table 1: **Measuring Attitude Towards Taxation: Dependents' Composition**

Variable	Question	Scale	Rescaled to
NOT_PAYING_TAX$_{i,z,c}$	Wrong or right not to pay taxes	1-3	0-1
PEOPLE_MUST_PAY_TAX$_{i,z,c}$	Authorities always have the right to make people pay tax.	1-5	0-1
CITIZEN_MUST_PAY_TAX$_{i,z,c}$	Citizens must pay taxes vs. no need to tax the people	1-5	0-1
CITIZEN_PAY_TAX_IN_DEMOC$_{i,z,c}$	Good citizens pay tax in democracy	1-3	0-1
PAY_TAX_INCREASE_HEALTH$_{i,z,c}$	Pay more taxes to increase health spending	1-5	0-1

Regarding the controls intended to capture the determinants of attitude towards taxation highlighted in the literature, $CHANNELS_{i,z,c}$, we use various questions from the Afrobarometer survey, each of which relating to one of the mechanisms explained in the introduction. For the economic deterrence mechanism, we consider the difficulty to avoid taxes ($DIFF\_AVOID\_TAX_{i,z,c}$) as well as the perception of individuals about how often people committing fraud can go unpunished ($PEOPLE\_UNPUNISHED_{i,z,c}$) as measures of being caught when not complying. In order to capture the contribution of the fiscal exchange theory we use two questions reflecting the difficulty of getting public services such as medical

[4]Looking at other sensitive questions such as trust in institutions, Calvo et al. (2019) evidence that there is no systematic attenuation bias in responses of Afrobarometer respondents.

and police services ($DIFF\_OBTAIN\_MEDIC_{i,z,c}$ and $DIFF\_OBTAIN\_POLICE_{i,z,c}$).

To capture the comparative treatment channel, we consider a question assessing the individual perception of relative poverty which reflects how good the respondent grades his living conditions with respect to the others ($INEQ\_PERCEPTION_{i,z,c}$). We also include a variable capturing the perception by individuals of the fairness of the government towards their ethnic group ($ETHNIC\_UNFAIR_{i,z,c}$). Lastly, in order to control for the effect of political legitimacy on tax compliance we add two variables reporting the level of trust in the tax department as well as in the elected president ($TRUST\_TAX\_DEP._{i,z,c}$ and $TRUST\_PRESIDENT_{i,z,c}$).

The model controls for individual characteristics that may correlate with their willingness to pay taxes. We control for age, $AGE_{i,z,c}$, education, $EDUCATION_{i,z,c}$, employment status, $EMPLOYT_{i,z,c}$, and whether they live in urban areas, $URBAN_{i,z,c}$. Afrobarometer surveys also provide questions regarding the type of goods each respondent owns as well as indications regarding their accommodation. Using various individual characteristics we run a principal component analysis in order to get an individual wealth index ($WEALTH_{i,z,c}$) that is added to our specification as an individual control.[5] More details about these coding of explanatory variables are provided in Table S.A1 in the Supplementary Appendix. Table A1 in the Appendix provides summary statistics for variables used in the study.

1.3. Inequality Using Night Light Data

Turning to our variable of interest and in order to take into account spatial inequality across different sub-national levels we construct a Gini index based on night lights per capita which is a strong proxy of development at national and subnational level (Henderson et al., 2012; Michalopoulos and Papaioannou, 2013; Beyer et al., 2018). These studies used lights data from older generation of satellites which covered the period between 1992 to 2013. However, since the Afrobarometer surveys we use were conducted in 2014 and 2015, we make use of the new generation of light data (Visible Infrared Imaging Radiometer Suite (VIIRS)). The main advantage of this new set of light data is that they no longer suffer from a saturation problem.[6] The VIIRS data has not been used as much as the DMSP-OLS light data. Chen and Nordhaus (2015) shows that it predicts development better than the previous set. In our dataset, lights per capita at the country level has a correlation coefficient of 0.88 with GDP per capita at PPP constant dollar which is significant at 1 percent level. A recent study shows that, relative to VIIRS data, spatial inequality measured from DMSP-OLS is noisy and underestimated (Gibson et al., 2019).

[5] Similarly to the Demographic and Health Surveys, we compute a wealth index using a principal component analysis on different variables describing the habitat of individuals (kinds of wall, roof, etc.

[6] For a review of the older generation light data and its limits see Doll (2008).

Elvidge et al. (2012) was, to our knowledge, the first to use a Gini constructed from light per capita to examine the distribution of income and wealth. Authors however, conclude that this type of Gini is best described as "spatial extend of public good provision", rather than individual's income distribution.[7]

In order to compute the Gini that represents our measure of inequality ($INEQUALITY_{z,c}$), we first retrieve latitude and longitude of each enumeration area from Afrobarometer to geo-localize each respondent and further create a buffer zone around each individual for different radii (20,30, 40, 50, 60, 70 kilometers). We then impose a $1km \times 1km$ fishnet on light data and extract the value of light for each pixel within this buffer zone. We then divide it by population from Gridded Population of World (for International Earth Science Information Network , CIESIN) leading us to obtain the light per capita at the $1km \times 1km$ pixel-level. Since we now have the value of light and the population for each pixel we then are able to rank inhabitants of the buffer zone according to the value of light their are exposed to. Using the distribution of inhabitants with the distribution of light within the buffer zone we then compute the Gini coefficient for each buffer zone (z) in each country c using the classic Gini formula:

$$INEQUALITY_{z,c} = \frac{2\sum_{p=1}^{n} pLIGHTpc_{p,z,c}}{n\sum_{p=1}^{n} LIGHTpc_{p,z,c}} - \frac{n+1}{n}$$

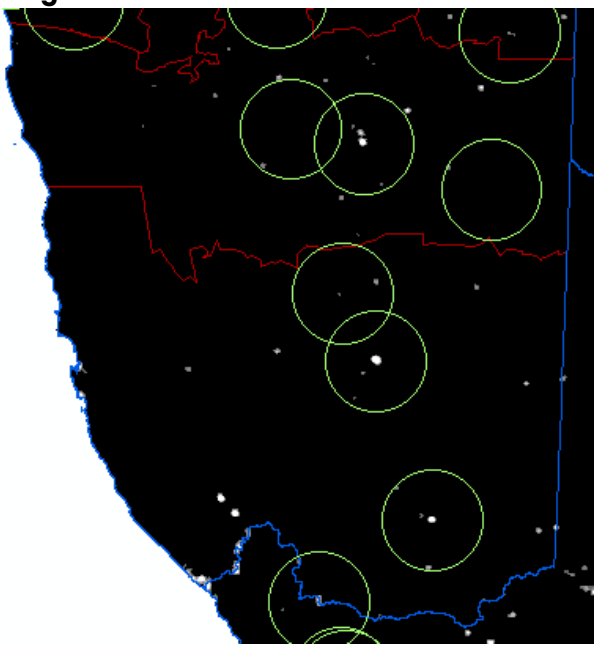
where $LIGHTpc_{p,z,c}$ is the value of light per capita for pixel p of the buffer zone z in the country c (with p pixels being sorted in ascending order – i.e. $LIGHTpc_{p,z,c} \leq LIGHTpc_{p+1,z,c}$). Lastly, we match each variable computed at the buffer zone level z ($INEQUALITY_{z,c}$, $POPULATION_{z,c}$, $LIGHTpc_{z,c}$[8]) with Afrobarometer's respondents considered in this study. Figure 1 shows the 50km buffer zone as an example. As a robustness check we further compute Gini indices at the first administrative division-level of each country using the same approach as for buffer zones. Figure S.A1 in Supplementary Appendix shows an example of spatial inequality for a few ADM1 regions in South Africa. Table A2 in the Appendix provides descriptive statistics for variables at the buffer zone-level.

Figure 2 presents the distribution of enumeration areas in Afrobarometer surveys and shows that our sample covers most of African regions, with the exception of Central Africa. Finally, Figure 3 displays the Gini index computed at the ADM1 level and shows the within country heterogeneity in the levels of inequality computed using the night lights.

[7] Nevertheless, the very recent literature dealing with spatial inequality measured from light density conceptualizes this Gini as income and/or wealth inequality (Alesina et al., 2016; Bluhm and Wong, 2017).

[8] The last two variable being the aggregation of pixel-level values of population and light per capita (average on the zone).

Figure 1: Buffer Zone with radius of 50KM



1.4. Identification Strategy

The country fixed effects in Equation 1 account for unobserved heterogeneity at the country-level - such as differences in tax systems or historical context - that may correlate with both the level of inequality and attitude towards taxation. Similarly, although higher population density is often associated with more pro-tax behaviors, structural differences in attitude towards taxation between urban and rural individuals is also accounted for with the inclusion of an urban dummy variable.

Yet, OLS estimation of Equation 1 faces other sources of endogeneity that need to be taken into account. Most notably, the model does not account for unobservable heterogeneity at the zone level. For example, if a zone is hit by a climatic shock that affects disproportionately the poorest segment of the population (hence increasing inequality) and reduces the ability to pay taxes of part of the population (hence impacting negatively the attitude of individuals towards taxation), the OLS estimate would be downward biased. Reverse causality is also likely to bias the identification of a proper causal effect of inequality on attitude towards taxation. Indeed, in order to reduce inequality, governments need to implement policies which usually need a strong fiscal capacity, which in itself needs higher taxation and ultimately more pro-tax attitude. In that case, the reverse causality bias would also induce an underestimation of the OLS coefficient of inequality.

In order to deal with endogeneity issue, we rely on an instrumental variable strategy. Our instrument is the level of inequality predicted by an agglomeration model based on light intensity in 2000. We first divide the sample of pixels in the year 2000 to lit and non-lit pixels. After identifying, within a country, the closest lit pixel, n, for every non-lit pixel p, we compute the distance between the two, $LNDISTANCE_{p,n,2000}$. Then we predict the value of night light

Figure 2: Spatial Distribution of Respondents

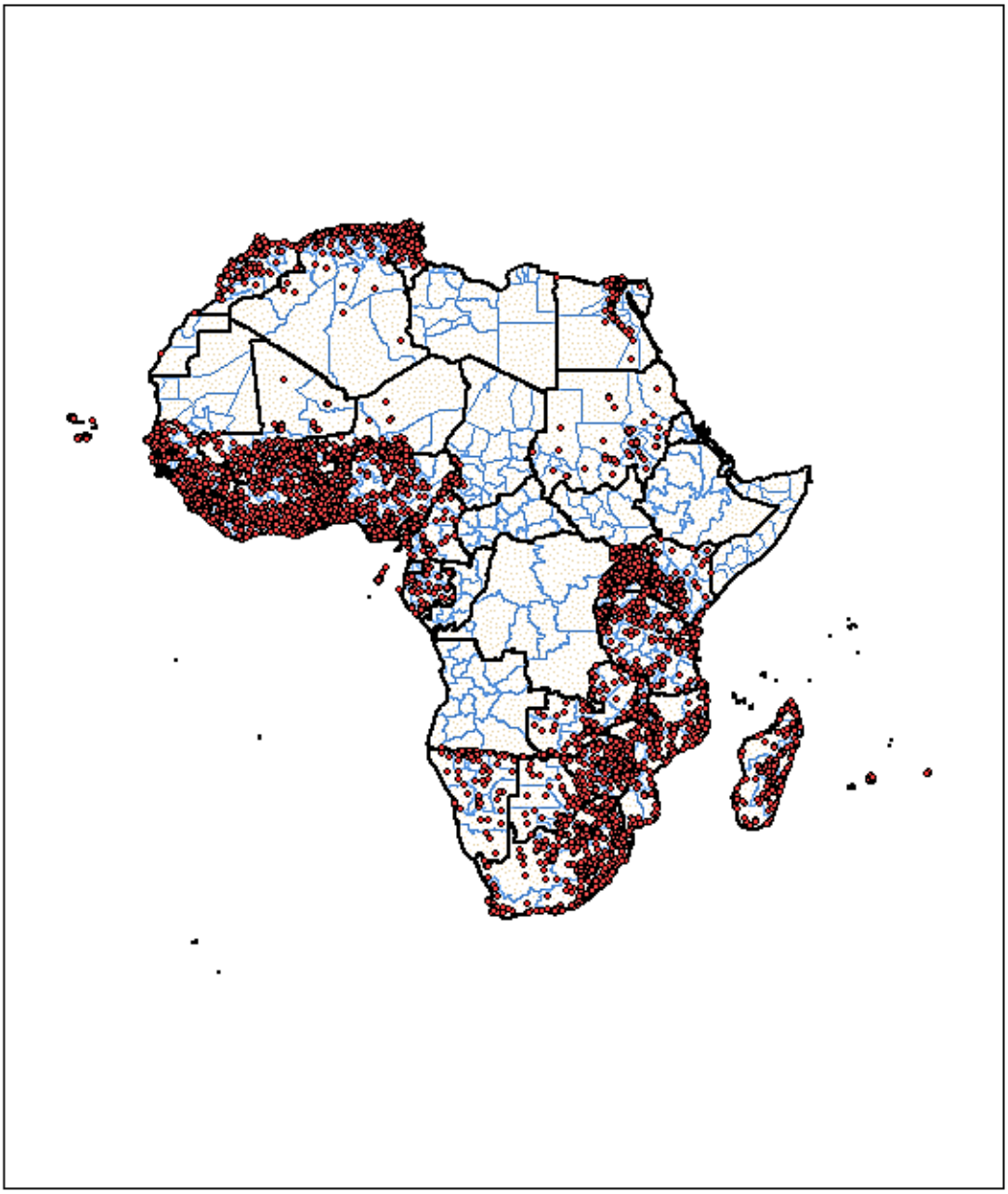
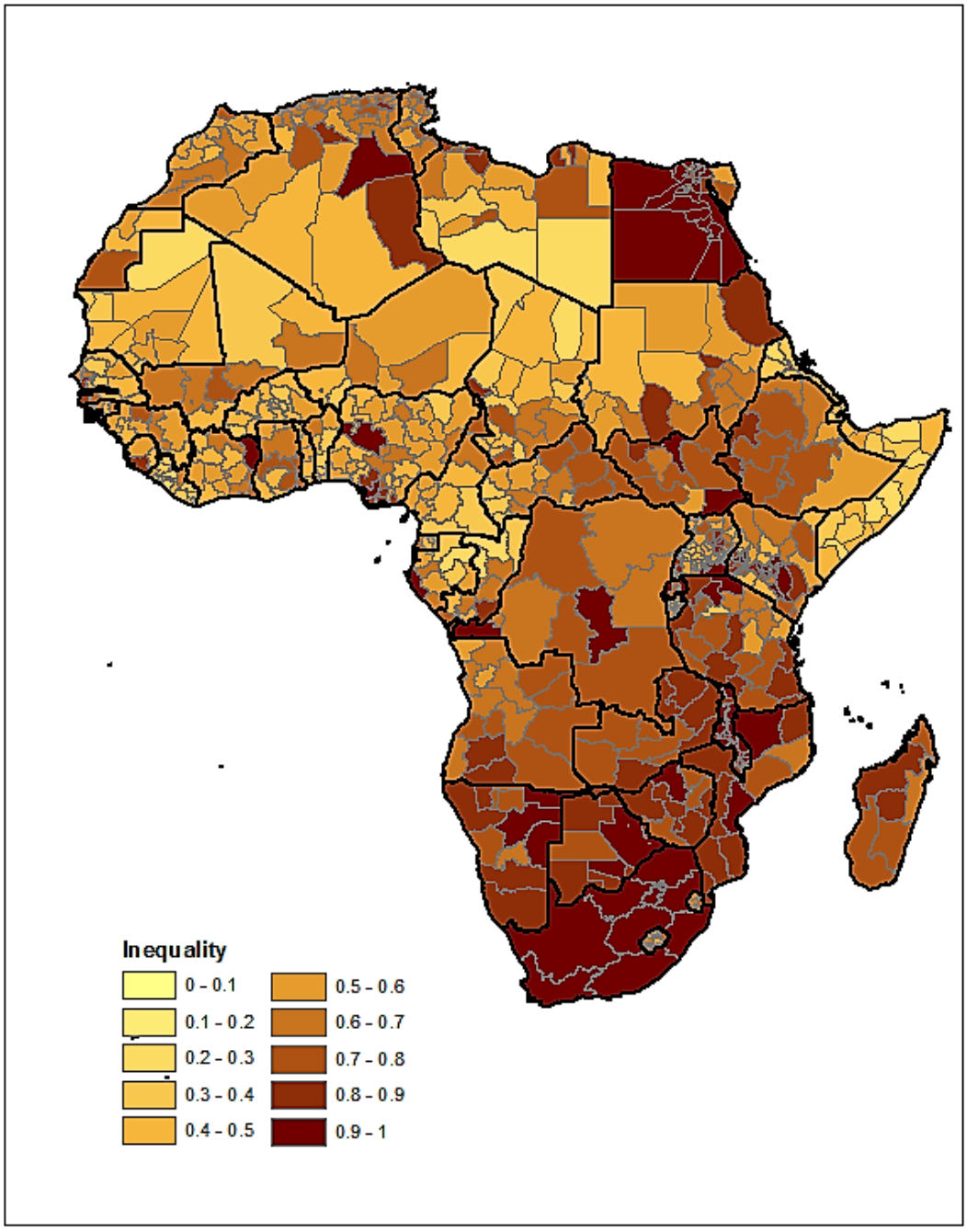


Figure 3: Inequality in Provision of Public Goods (ADM1-level)



for the year of survey.[9] We call this the zero-stage estimation which takes the following form:

$$LIGHT_p = \zeta LNDISTANCE_{p,n,2000} + \lambda LNDISTANCE^2_{p,n,2000} + \phi LNPOP_{p,2000} + ADM1_p + \varepsilon_p \quad (2)$$

where $LIGHT_p$ is the the observed value of light for pixel *p* at the year of the survey (2014 or 2015 depending on the country) using the VIIRS dataset. $LNDISTANCE_{p,n,2000}$ is the natural logarithm of the distance between pixel *p* and the closest lit pixel to it (*n*) in the year 2000, and $LNPOP_{p,2000}$ measures the population (in logarithm) of pixel *p* in year 2000. The model also includes square of distance, and first administrative subdivision fixed-effects. Results of the zero-stage estimation are reported in Table A3 in the appendix. The result displays a nonlinear relation between light intensity and the logarithm of distance: pixels that are far from lit-areas in 2000 have a lower probability of being lit in 2014/15, unless these are more isolated from any lit-areas. Population in 2000 is also positively correlated with light value in 2014/15.

Finally we compute a Gini index over these predicted lights ($PREDICTED\_LIGHT_p$) and use this "predicted gini" ($PREDICTED\_INEQ_{z,c}$) as the instrument for inequality at the year of survey $INEQUALITY_{z,c}$.[10] This instrument (which is computed for our various buffer zones as well as the first administrative subdivisions) can thus be defined as:

$$PREDICTED\_INEQ_{z,c} = \frac{2\sum_{p=1}^{n} pPREDICTED\_LIGHTpc_{p,z,c}}{n\sum_{p=1}^{n} PREDICTED\_LIGHTpc_{p,z,c}} - \frac{n+1}{n}$$

[9] Afrobarometer survey was conducted in 2014/2015 and in the baseline estimation we measure $INEQUALITY_{z,c}$ for these years using VIIRS night light data. However, VIIRS is only available after 2012. So in order to construct the instrument we used night light data in 2000 from DMSP-OLS, which is the older generation of light data.

[10] Note that the zero stage model reports an explanatory power of 30% which is high enough to be relevant and low enough for allowing a different variability in Gini instrument as compared to the one of the actual Gini indices in 2014-2015.

2. Baseline Results

Before discussing the results of the estimations for various zones around the individuals, we first examine the relationship between attitude towards taxation and inequality measured at ADM1 level (first administrative division). Column (1) of Table 2 below reports results of the OLS estimation of the relationship between inequality measured at first administrative division-level (ADM1-level) and tax attitude, as well as the contribution of all other mechanisms likely to affect attitude towards taxation. In column (1), standard errors are clustered at the ADM1 level. All of the channels follow the expected signs identified in the literature. When it is perceived that people could get away with tax evasion, and that there is not enough deterrence, their attitude is less likely to be in favor of taxation, albeit this relation is not statistically significant. When access to public goods such as medical services and police is difficult, it discourages individuals to support taxation; when government does not respect the fiscal exchange mechanism, neither do the citizens. Looking at the relationship from another angle, this could suggest that a significant increase in prospects for public goods and services might trigger people to improve their attitude towards tax compliance, though the causal relationship might also run in the opposite direction.

Further, the individual perception of her group unfair treatment by the government is negatively and significantly associated with lower tax morale. Additionally when individuals perceive their living conditions to be less favorable than that of others with whom they associate, they do not support taxation. This relates, to some extent, to the comparative treatment mechanism discussed above which states that perception of unfavorable treatment towards one's reference group adversely affects tax compliance. And finally trust in political institutions and confidence in the tax department are associated with more tax compliance, as suggested by political legitimacy channel. Overall, the results are in line with Ali et al. (2014) and seem to support the theoretical mechanisms determining tax compliance for our sample of African countries.

Not reported in the table but included are individual characteristics such as age, education, wealth, employment, and a urban dummy. In line with previous studies in the context of Africa (Fjeldstad et al., 2012; Ali et al., 2014), these characteristics suggest that older, more educated, richer, urban and employed people tend to be significantly more in favor of taxation.

While most of channels display the expected sign, estimation in column (1) of Table 2 shows that inequality measured at the ADM1 level does not have a direct association with individual attitude towards taxes. However, in some countries first administrative divisions (ADM1) are very vast. The average ADM1 surface area in our sample is around thirty thousands square kilometers (three times that of a zone with a radius of 60 kilometers). As such, inequality in public good provision observed at this level might not be perceived by the individual.

In order to explore this suspicion we have computed multiple Gini for smaller areas, from a radius of 20 to 70 kilometers surrounding each individual. Columns (2) to (7) of Table 2 presents the OLS estimation of Equation 1 on these various zones. Each column reports the OLS estimated coefficients of Equation 1 for which $INEQUALITY_{z,c}$ is computed over a circular zone with the radius of 20, 30, 40, 50, 60 or 70 kilometers. All estimations control for the various channels mentioned in the introduction, as well as individual characteristics, and

heteroskedasticity with robust standard errors clustered at same zone level as the variable of interest, $INEQUALITY_{z,c}$.

A review of columns (2) to (7) of Table 2 suggests that, contrary to ADM1-level, inequality measured at smaller areas does influence the attitude of tax payers. The estimated coefficients in Column (4) to (7) show positive and statistically significant association between inequality and attitude towards taxation. However, when estimated on OLS this association fades away for larger zones with radius of 60 and 70 kilometers, and ADM1 level.

The OLS estimation of inequality coefficient may be biased downward for example if the zone suffers a shock that could increase inequality and at the same time decrease the willingness of individuals to pay taxes. In order to deal with this problem we implement an instrumental variable approach as explained in section 2.4.

Panel B of of Table 3 presents the results of the IV estimations of Equation 1, while Panel A simply reproduces the OLS estimates. Panel C of Table 3 contains the first-stage estimation results which show that predicted inequality is associated with higher levels of contemporaneous inequality. The first-stage F-statistics confirms that the constructed instrument is not weak. Regarding second-step IV results in Panel B of Table 3, we find that the results are in line with the OLS estimations: higher inequality increases the willingness of individuals to pay taxes. Moreover, the IV results show that the OLS coefficients are underestimated and suggest larger bias for larger radius; for 20 kilometers buffer zone the IV estimated coefficient of inequality is one and a half times that of OLS whereas for 40 kilometers it is four times larger. This may be explained by the fact that the zero-stage estimation, which is an agglomeration model, performs better in predicting inequality on a small radius than on a large one, hence threatening the exclusion restrictions on larger zones.

Finally, Table 3 shows that the inequality measured at ADM1 level (Column (1)) is not statistically significant, either in OLS or in IV. We interpret these results as evidence for the hypothesis that inequality at the immediate surrounding of citizens have an impact on their attitude towards taxation, whereas when individual does not perceive inequality, even if larger, it does not affect their attitude.

In order to challenge the robustness of the results, we estimate Equation 1 using alternative dependent variables. As mentioned before declarative tax-related measures might suffer from over-reporting bias. Using the same questions in Table 1 we construct 3 alternative composite dependent variables. Table A4 in the Appendix reports the results of OLS and IV estimation using inequality measured over a radius of 30 kilometers. Both OLS and IV results support the baseline results.

We also re-run Equation 1 removing one country (and alternately one first administration subdivision - ADM1) in order to ensure that the effect we observe in Tables 3 is a genuine average effect and not only driven by observations from one given country or one particular ADM1. Results are not reported in the appendices but support our previous findings and are available upon request to the authors.

Table 2: Inequality and Attitude towards Tax Compliance: Zone Level

Dependent: **TAXATT**$_{i,z,c}$	(1) ADM1	(2) 70km	(3) 60km	(4) 50km	(5) 40km	(6) 30km	(7) 20km
INEQUALITY$_{z,c}$	-0.017	0.019	0.014	0.021*	0.027**	0.036***	0.036***
	(0.026)	(0.013)	(0.014)	(0.013)	(0.013)	(0.012)	(0.011)
DIFF_AVOID_TAX$_{i,z,c}$	0.003	0.003	0.003*	0.003	0.003*	0.003	0.003
	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
PEOPLE_UNPUNISHED$_{i,z,c}$	-0.005**	-0.005***	-0.006***	-0.006***	-0.006***	-0.006***	-0.006***
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
DIFF_OBTAIN_MEDIC$_{i,z,c}$	-0.009***	-0.009***	-0.009***	-0.009***	-0.009***	-0.009***	-0.009***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
DIFF_OBTAIN_POLICE$_{i,z,c}$	-0.005	-0.005*	-0.005*	-0.005*	-0.005*	-0.005*	-0.005*
	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
INEQ_PERCEPTION$_{i,z,c}$	-0.007***	-0.007***	-0.007***	-0.007***	-0.007***	-0.007***	-0.007***
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
ETHNIC_UNFAIR$_{i,z,c}$	-0.011***	-0.011***	-0.011***	-0.011***	-0.011***	-0.011***	-0.011***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
TRUST_TAX_DEP.$_{i,z,c}$	0.036***	0.036***	0.036***	0.036***	0.036***	0.036***	0.036***
	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
TRUST_PRESIDENT$_{i,z,c}$	0.005**	0.005***	0.005***	0.005***	0.005***	0.005***	0.005***
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
LIGHTpc$_{z,c}$	-0.009*	0.004	0.004	0.001	0.001	0.002	0.003
	(0.005)	(0.005)	(0.003)	(0.001)	(0.001)	(0.002)	(0.002)
R^2	0.150	0.150	0.150	0.150	0.150	0.151	0.151
Indiv. Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Zone-level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls (rest)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster Level	ADM1	ZoneID	ZoneID	ZoneID	ZoneID	ZoneID	ZoneID
N. Obs.	37294	37294	37294	37294	37289	37294	37294
N. Cluster	485	4341	4341	4341	4340	4341	4341
N. ADM1	485	485	485	485	485	485	485
N. Countries	30	30	30	30	30	30	30

Notes: Ordinary least squares (OLS) regressions of tax attitude for 2014/2015 cross-section of 30 Sub-Saharan African countries. In columns (2) through (7) $INEQUALITY_z$ is a Gini computed over different circular zones at the radius identified on the top of each column; from 70 to 20 Kilometers. In column(1) $INEQUALITY_z$ is measured at first administrative division (ADM1) level of the countries. All estimations control for individual characteristics (age, education, employment, wealth, urban/rural), zone level characteristics (level of development and population) and include country fixed effects with robust standard errors clustered at the level over which inequality is computed (reported in parentheses).* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Inequality and Attitude towards Taxation: Different Zones

Dependent: **TAXATT**$_{i,z,c}$	(1) ADM1	(2) 70km	(3) 60km	(4) 50km	(5) 40km	(6) 30km	(7) 20km
Panel A: OLS							
INEQUALITY$_{z,c}$	-0.017	0.019	0.014	0.021*	0.027**	0.036***	0.036***
	(0.026)	(0.013)	(0.014)	(0.013)	(0.013)	(0.012)	(0.011)
R^2	0.150	0.150	0.150	0.150	0.150	0.151	0.151
Panel B: IV - Second Stage							
INEQUALITY$_{z,c}$	-0.063	0.144	0.109	0.119*	0.109**	0.086**	0.055*
	(0.119)	(0.093)	(0.068)	(0.070)	(0.053)	(0.043)	(0.033)
R^2	0.073	0.069	0.070	0.070	0.071	0.073	0.073
Panel C: IV - First Stage							
PREDICTED_INEQ$_{z,c}$	0.147***	0.132***	0.180***	0.170***	0.206***	0.231***	0.271***
	(0.044)	(0.020)	(0.020)	(0.023)	(0.023)	(0.025)	(0.022)
Kleibergen-Paap LM stat (p-value)	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Kleibergen-Paap F-stat	11	45	80	56	81	87	152
Indiv. Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Zone-level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls (rest)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster Level	ADM1	ZoneID	ZoneID	ZoneID	ZoneID	ZoneID	ZoneID
N. Obs.	37294	37294	37294	37294	37289	37294	37294
N. Clusters	485	4341	4341	4341	4340	4341	4341
N. ADM1	485	485	485	485	485	485	485
N. Countries	30	30	30	30	30	30	30

Notes: Panel A presents the Ordinary least squares (OLS) regressions on tax attitude for 2014/2015 cross-section of 30 Sub-Saharan African countries (corresponding to the previous table). In column(1) $INEQUALITY_z$ is measured at first administrative division (ADM1) level of the countries. In columns (2) through (7) $INEQUALITY_z$ is a Gini computed over different circular zones at the radius identified on the top of each column; from 70 to 20 Kilometers. Panel B and C show, respectively, the second and first stage of the instrumental variable approach. $INEQUALITY_z$ is instrumented by a $PREDICTED\_INEQ_{z,c}$ based on an agglomeration model using the pixels with light in the year 2000. All estimations control for all the mechanisms explained in the previous section as well as the individual characteristics (age, education, employment and wealth), and include country and urban/rural fixed effects with robust standard errors clustered at the level over which inequality is computed (reported in parentheses). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

3. Heterogeneity of the Effect of Inequality

Previous results suggest a linear positive relationship between attitude towards taxation and inequality in night light measured around individuals up to 50 kilometers. In the following we examine whether the position of an individual in the wealth distribution changes the way inequality affects attitude towards taxation. We also examine whether the effect of inequality on attitude towards taxation depends on the distance of individuals from economic centers. Finally, we explore whether the quality of institutions influences how inequality affects citizens attitude towards taxes.

3.1. Does inequality affect wealth groups differently?

This section investigates non-linearity in the relationship between inequality and attitude towards taxation with regard to the position of the respondents in the wealth distribution.

Both inequality and taxes affect various wealth groups differently. Rich and poor individuals face different types and rates of tax ratios. Many poor individuals are not eligible for formal taxes, and yet they might benefit more from distributive policies and hence be more in favor of taxation, whereas the situation for the richer individuals could be different. As such we anticipate a heterogeneous effect of inequality on tax attitude.

In order to investigate this non-linearity we re-run the previous model extended with a dummy variable capturing the wealth quintiles of each respondent and its interaction with the Gini indicator. The empirical specification can thus be written as:

$$TAXATT_{i,z,c} = \alpha_c + \beta INEQUALITY_{z,c} + \sum_{j=1}^{4} \phi_j Qj_{i,z,c} + \sum_{j=1}^{4} \psi_j Qj_{i,z,c} \times INEQUALITY_{z,c} + \varepsilon_{i,z,c} \quad (3)$$

where $Qj_{i,z,c}$ is a dummy variable indicating the quintile to which the respondent i in the zone z of country c belongs. We use the wealth index constructed from information in Afrobarometer surveys to compute the different quintiles. We also chose to define the quintiles at the national level rather than the subdivision level in order to have enough individuals in each quintile. Although not reported in Equation 3, this new specification still controls for contribution of other channels discussed in section 1.1, $CHANNELS_{i,z,c}$, as well as individual controls, $X_{i,z,c}$, and country fixed effects. The standard errors are still clustered at the zone z level.

In the following analysis, we rely on IV estimations, since the OLS estimates of the coefficient of inequality seem to suffer from a downward bias. We use the interaction of the quintiles with the instrument of inequality as the instrument for the interaction terms. Table 4 reports the results of these IV estimations of 3 for different zones.

Table 4: Inequality and Attitude towards Taxation w/r to Wealth Groups

Dependent: **TAXATT**$_{i,z,c}$	(1) ADM1	(2) 70km	(3) 60km	(4) 50km	(5) 40km	(6) 30km	(7) 20km
INEQUALITY$_{z,c}$	-0.153	0.073	0.052	0.072	0.066	0.069	0.055
	(0.124)	(0.100)	(0.073)	(0.079)	(0.063)	(0.052)	(0.041)
q1=1 X INEQUALITY$_{z,c}$	0.195**	0.133***	0.122***	0.096**	0.076*	0.029	0.017
	(0.091)	(0.049)	(0.046)	(0.045)	(0.045)	(0.044)	(0.044)
q2=1 X INEQUALITY$_{z,c}$	0.175**	0.108**	0.090**	0.074*	0.063	0.038	0.015
	(0.075)	(0.044)	(0.041)	(0.041)	(0.040)	(0.039)	(0.038)
q3=1 X INEQUALITY$_{z,c}$	0.071	0.067	0.050	0.035	0.030	-0.010	-0.039
	(0.064)	(0.042)	(0.039)	(0.039)	(0.039)	(0.038)	(0.037)
q4=1 X INEQUALITY$_{z,c}$	0.116**	0.069*	0.053	0.033	0.039	0.015	0.007
	(0.055)	(0.039)	(0.036)	(0.036)	(0.037)	(0.037)	(0.037)
Joint Sig. P-value	0.076	0.049	0.082	0.118	0.126	0.231	0.233
R^2	0.074	0.067	0.069	0.069	0.071	0.073	0.074
First Stage							
PREDICTED_INEQ$_{z,c}$	0.171***	0.119***	0.175***	0.154***	0.184***	0.212***	0.269***
	(0.049)	(0.023)	(0.024)	(0.026)	(0.027)	(0.029)	(0.026)
q1=1 X PREDICTED_INEQ$_{z,c}$	-0.066**	0.000	-0.016	0.007	0.012	0.011	-0.017
	(0.031)	(0.017)	(0.019)	(0.019)	(0.019)	(0.022)	(0.022)
q2=1 X PREDICTED_INEQ$_{z,c}$	-0.033	0.026*	0.012	0.023	0.043**	0.037*	0.014
	(0.029)	(0.015)	(0.016)	(0.017)	(0.017)	(0.019)	(0.019)
q3=1 X PREDICTED_INEQ$_{z,c}$	-0.010	0.016	0.007	0.014	0.020	0.021	0.006
	(0.023)	(0.014)	(0.015)	(0.014)	(0.014)	(0.015)	(0.016)
q4=1 X PREDICTED_INEQ$_{z,c}$	-0.018	0.028**	0.022*	0.035***	0.030**	0.025*	0.007
	(0.017)	(0.011)	(0.012)	(0.012)	(0.012)	(0.014)	(0.014)
Kleibergen-Paap LM stat (p-value)	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Kleibergen-Paap F-stat	2	9	16	11	16	17	30
Indiv. Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Zone-level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls (rest)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster Level	ADM1	ZoneID	ZoneID	ZoneID	ZoneID	ZoneID	ZoneID
N. Obs.	37294	37294	37294	37294	37289	37294	37294
N. Clusters	485	4341	4341	4341	4340	4341	4341
N. ADM1	485	485	485	485	485	485	485
N. Countries	30	30	30	30	30	30	30

Notes: Top panel of the table shows the second stage of instrumental variable approach estimation of Equation 3 in which we examine whether inequality (computed over different zones) affects wealth groups differently. The bottom panel shows the respective first stage. The p-value of the joint significance test for $INEQUALITY_{z,c}$ and its interaction term is reported at the bottom of first panel. All estimations control for the mechanisms explained in the previous section as well as individual and zone level characteristics, and include country fixed effects with robust standard errors clustered at the level over which inequality is computed (reported in parentheses). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The results suggest that the positive effect of inequality measured on small zones (20 and 30 km) does not seem to depend on the wealth group of individuals. On the contrary, we now observe that for larger zones (40 km to ADM1), the absence of average effect of inequality displayed in Table 3 may be explained by the heterogeneity of individuals within these zones. Columns (1) to (4) suggest that the positive effect of inequality on tax attitude is mostly driven by Afrobarometer's respondents at the bottom of the wealth distribution i.e. those belonging to the first two quintiles. Indeed the coefficient associated with interaction terms are significantly positive for buffer zones of 40 up to 70 km. They are also jointly significant. These results suggest that inequality has a stronger positive association on the tax attitude of individuals belonging to the bottom of the wealth distribution than on the tax attitude of the respondents from the fifth quintile. This lets us think, that in line with the predictions of the median voter theorem, the 40% bottom of the wealth distribution is prone to support higher redistribution (through attitudes more favourable towards taxation) when inequality in terms of public good provision is higher.

For median voter theorem to be at play here, one factor is democratic condition in these countries; we expect in countries that enjoy a higher level of quality of democracy to observe a stronger effect. Table S.A3 in Supplementary Appendix shows the results of interaction of inequality with respondent's satisfaction with the democracy in the country as well as with the respondent's perception of the extend of the democracy. These interactions are computed for inequality measured on the 30 km zone. For both measures of quality of democracy the interaction term is positive and statistically significant suggesting that the effect of inequality on tax attitude increases with the quality of democracy.

3.2. Sensitivity to the distance from economic centers

We also investigate whether inequality has a different effect on attitude towards taxation depending on the distance of Afrobarometers' respondents to the economic centers. To do so, we first identify the highest light intensity in their own buffer zone. We expect respondents far away from the strongest enlightenment to be more likely to report attitude in favor of taxation when being exposed to higher inequality since they would represent those left behind in terms of public goods provision. These individuals may anticipate that they are more likely to benefit from the next public investment in public good provision.

Results of Table 5 suggest first that distance from highest light intensity is negatively associated with attitude towards taxation since respondents that are far away from economic centers are more likely to display less rosy attitude towards taxation than those closer to the highest light in their zone. Table 5 also suggests that the positive association between inequality and attitude towards taxation is higher when individuals live further away from the economic centers (proxied by the distance to the highest light in the zone). Individuals that are located further away from light may display higher needs of public good provision, hence higher demand for redistribution. This result is in line with the interpretation of the positive association between inequality and attitude towards taxation as being driven by higher demand for redistribution. This heterogeneity in the effect of inequality on attitude towards taxation is displayed for all sizes of buffer zones (the p-value of the coefficient of

inequality is close to 0.1 in column (3)).

We also test interactions of inequality with a variable indicating whether the individual lives in a urban area. Table 6 displays results that are in line with those of Table 5. Individuals that live in cities have a more favorable attitude towards taxation than those living in rural areas, but inequality negatively affects their attitude towards taxation maybe because they expect that the burden of that taxation should be higher than their benefits.

Table 5: Inequality and Attitude towards Taxation: Interaction with Distance to Highest Light in the Zone

Dependent: **TAXATT**$_{i,z,c}$	(1) 70km	(2) 60km	(3) 50km	(4) 40km	(5) 30km	(6) 20km
INEQUALITY$_{z,c}$	0.023	0.025	0.078	0.012	-0.016	-0.048
	(0.094)	(0.085)	(0.084)	(0.072)	(0.066)	(0.048)
INEQUALITY$_{z,c}$ X LNDIST_TO_LIGHT$_{z,c}$	0.046**	0.050***	0.033	0.053***	0.044**	0.045**
	(0.018)	(0.018)	(0.020)	(0.020)	(0.020)	(0.019)
LNDIST_TO_LIGHT$_{z,c}$	-0.032**	-0.035***	-0.023*	-0.033***	-0.025**	-0.025**
	(0.013)	(0.012)	(0.013)	(0.012)	(0.012)	(0.011)
Joint Sig. P-value	0.014	0.004	0.015	0.001	0.007	0.032
R^2	0.063	0.064	0.064	0.065	0.069	0.072
First Stage						
PREDICTED_INEQ$_{z,c}$	0.201***	0.225***	0.210***	0.247***	0.260***	0.363***
	(0.052)	(0.047)	(0.050)	(0.043)	(0.048)	(0.042)
PREDICTED_INEQ$_{z,c}$ X LNDIST_TO_LIGHT$_{z,c}$	-0.011	-0.012	-0.006	-0.008	-0.004	-0.037**
	(0.014)	(0.013)	(0.016)	(0.014)	(0.015)	(0.015)
LNDIST_TO_LIGHT$_{z,c}$	0.006	0.007	0.006	0.005	0.007	0.016**
	(0.009)	(0.007)	(0.008)	(0.007)	(0.007)	(0.007)
Kleibergen-Paap LM stat (p-value)	0.00	0.00	0.00	0.00	0.00	0.00
Kleibergen-Paap F-stat	23	35	24	45	45	74
Indiv. Controls	Yes	Yes	Yes	Yes	Yes	Yes
Zone-level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Controls (rest)	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster Level	ZoneID	ZoneID	ZoneID	ZoneID	ZoneID	ZoneID
N. Obs.	28507	30287	30884	31909	32862	34364
N. Clusters	3394	3573	3651	3713	3841	3995
N. ADM1	458	463	466	466	468	474
N. Countries	30	30	30	30	30	30

Notes: Table 5 presents the result of instrumental variable approach estimation of Equation 3 while $INEQUALITY_{z,c}$ is interacted with $LNDIST\_TO\_LIGHT_{z,c}$. Distance shows distance (logarithm) from the centroid of the corresponding zone to the highest light in the zone. The p-value of joint significance of $INEQUALITY_{z,c}$ and the interaction term is reported at the bottom of the top panel. All estimations control for all of the mechanisms explained in the previous section as well as individual and zone level characteristics, and include country fixed effects with robust standard errors clustered at the level over which inequality is computed (reported in parentheses). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Inequality and Attitude towards Taxation: Interaction with Urban Dummy

Dependent: **TAXATT**$_{i,z,c}$	(1) ADM1	(2) 70km	(3) 60km	(4) 50km	(5) 40km	(6) 30km	(7) 20km
INEQUALITY$_{z,c}$	0.048	0.205**	0.173**	0.170**	0.153***	0.114**	0.077**
	(0.142)	(0.097)	(0.073)	(0.074)	(0.057)	(0.047)	(0.038)
INEQUALITY$_{z,c}$ X URBAN$_{i,z,c}$=1	-0.164***	-0.177***	-0.163***	-0.148***	-0.114***	-0.082**	-0.055
	(0.059)	(0.038)	(0.035)	(0.034)	(0.033)	(0.033)	(0.034)
URBAN$_{i,z,c}$=1	0.118***	0.128***	0.117***	0.106***	0.081***	0.059***	0.040*
	(0.042)	(0.026)	(0.024)	(0.023)	(0.022)	(0.021)	(0.021)
Joint Sig. P-value	0.007	0.000	0.000	0.000	0.001	0.011	0.107
R^2	0.070	0.064	0.066	0.067	0.069	0.072	0.073
First Stage							
PREDICTED_INEQ$_{z,c}$	0.116***	0.131***	0.174***	0.162***	0.201***	0.224***	0.249***
	(0.044)	(0.020)	(0.020)	(0.023)	(0.023)	(0.026)	(0.023)
PREDICTED_INEQ$_{z,c}$ X URBAN$_{i,z,c}$=1	0.065*	0.004	0.016	0.021	0.014	0.020	0.066***
	(0.035)	(0.019)	(0.020)	(0.021)	(0.022)	(0.024)	(0.024)
URBAN$_{i,z,c}$=1	-0.044**	-0.013	-0.018	-0.022*	-0.014	-0.007	-0.023*
	(0.018)	(0.012)	(0.012)	(0.011)	(0.011)	(0.012)	(0.013)
Kleibergen-Paap LM stat (p-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kleibergen-Paap F-stat	5	22	40	28	41	43	72
Indiv. Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Zone-level Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls (rest)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster Level	ADM1	ZoneID	ZoneID	ZoneID	ZoneID	ZoneID	ZoneID
N. Obs.	37294	37294	37294	37294	37289	37294	37294
N. Clusters	485	4341	4341	4341	4340	4341	4341
N. ADM1	485	485	485	485	485	485	485
N. Countries	30	30	30	30	30	30	30

Notes: Table 6 presents the result of instrumental variable approach estimation of 3 while $INEQUALITY_{z,c}$ is interacted with a dummy identifying whether the respondents lives in an urban or rural area. The p-value of joint significance of $INEQUALITY_{z,c}$ and the interaction term is reported at the bottom of the top panel. All estimations control for all of the mechanisms explained in the previous section as well as individual and zone level characteristics, and include country fixed effects with robust standard errors clustered at the level over which inequality is computed (reported in parentheses). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

3.3. Sensitivity to trust in institutions

We further examine whether the institutional environment influences the positive impact of inequality on individual's attitude towards taxation. In line with the other channels that have been highlighted in the existing literature, the inclusion of an interaction term between inequality and trust in institutions seeks to capture the differential effect of inequality with respect to the political legitimacy channel. Building on our prior findings we expect Afrobarometers' respondents to display attitude in favor of taxation when inequality in their surrounding is important, and even more so when they trust their public institutions and economic policy-makers. Indeed, in the context of trustworthy public and political environments people would be more inclined to ask for redistribution while in a context of corrupt and less reliable politics or public administration people will know that deploying pro-tax attitude in order to help government finance public good provision would be useless. Table 7 shows the result of interaction terms between inequality and various variables of trust in institutions (columns (1) to (5)). Once again, it is applied to the 30 km zone.

As in previous Tables, all models control for a set of country fixed-effects and for variables at the individual and zone level. Trust in tax department and in the president are present in all models since they were part of the baseline estimation model in Tables 2 and 3. Note that all trust variables are coded in order for the higher values to show more confidence.

Surprisingly in almost all IV models the coefficients of inequality are not statistically significant whereas the interaction terms are positive and statistically significant (besides trust in elected local officials in column (4)). However, the joint significance test shows that in all estimations these variables are jointly significant (again except in column (4)). These results suggest that inequality would result in more support for taxation only if citizens trust their government. One point of concern is the negative sign of the trust variables in level which are significant in four of the estimations. Although the coefficients are jointly significant, this suggests that for certain levels of inequality, the marginal effect of trust is zero (including at mean). This issue would need further assessment of each individual trust variable to identify the critical thresholds under/above which marginal effects are significant.

In the same vein, we run the same estimates as these reported in Table 7 but using corruption perception variables instead of trust. As expected, results of table 8 report a negative coefficient for the interaction term between inequality and the various corruption variables. Almost all types of corruption perception but the one that people display regarding their tax department (which has a negative effect on tax attitude independently of the level of inequality) are dampening the positive effect of inequality on attitude towards taxation. When corruption is perceived as highly prevalent in the society, individuals tend to display less favorable attitude towards taxation.

Table 7: Interaction with Institutional Environment: Trust (OLS & IV) 30km

Dependent: **TAXATT**$_{i,z,c}$ **Trust in:**	(1) Tax Department	(2) President	(3) Parliament	(4) Elected Official	(5) Ruling Party
INEQUALITY$_{z,c}$	-0.003	-0.050	-0.014	0.039	-0.094*
	(0.047)	(0.051)	(0.047)	(0.044)	(0.050)
INEQUALITY$_{z,c}$ X VAR$_{i,z,c}$	0.026**	0.039***	0.029***	0.008	0.052***
	(0.010)	(0.012)	(0.011)	(0.011)	(0.011)
VAR$_{i,z,c}$	0.020***	-0.019**	-0.020***	-0.008	-0.034***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Joint Sig. P-value	0.006	0.000	0.007	0.218	0.000
R^2	0.073	0.072	0.073	0.074	0.073
First Stage					
PREDICTED_INEQ$_{z,c}$ X VAR$_{i,z,c}$	0.012***	0.013***	0.005	-0.002	0.011**
	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)
PREDICTED_INEQ$_{z,c}$	0.235***	0.226***	0.251***	0.267***	0.227***
	(0.024)	(0.025)	(0.024)	(0.024)	(0.025)
Kleibergen-Paap LM stat (p-value)	0.00	0.00	0.00	0.00	0.00
Kleibergen-Paap F-stat	74	75	75	75	67
Indiv. Controls	Yes	Yes	Yes	Yes	Yes
Zone-level Controls	Yes	Yes	Yes	Yes	Yes
Controls (rest)	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Cluster Level	ZoneID	ZoneID	ZoneID	ZoneID	ZoneID
N. Obs.	37294	37294	37291	37291	35123
N. Clusters	4341	4341	4341	4341	4154
N. Subdivisions	485	485	485	485	468
N. Countries	30	30	30	30	28

Notes: Instrumental variable approach estimations of 1 with where $INEQUALITY_{z,c}$ is interacted with trust variables. Top and bottom panel provide, respectively, the second stage and first stage estimation. The p-value of joint significance of $INEQUALITY_{z,c}$ and its interaction term is reported at the bottom of the top panel. $INEQUALITY_{z,c}$ is measured at the 30-kilometer radius. All estimations control for the the mechanisms explained in the previous sections as well as individual and zone level characteristics, and include country fixed effects. Robust standard errors clustered at the 30-kilometer radius are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Interaction with Institutional Environment: Corruption (OLS & IV) 30km

Dependent: **TAXATT**$_{i,z,c}$ **Corruption in:**	(1) Tax Department	(2) President	(3) Government Officials	(4) Police	(5) Courts	(6) Handling Corruption
INEQUALITY$_{z,c}$	0.060	0.162***	0.156***	0.169***	0.120**	0.025
	(0.049)	(0.046)	(0.051)	(0.055)	(0.049)	(0.046)
INEQUALITY$_{z,c}$ X VAR$_{i,z,c}$	0.000	-0.047***	-0.040***	-0.043***	-0.026*	0.019
	(0.013)	(0.013)	(0.014)	(0.014)	(0.013)	(0.012)
VAR$_{i,z,c}$	-0.017**	0.020**	0.017**	0.020**	0.006	-0.003
	(0.008)	(0.008)	(0.009)	(0.009)	(0.008)	(0.008)
Joint Sig. P-value	0.253	0.000	0.005	0.005	0.046	0.047
R^2	0.078	0.073	0.073	0.073	0.074	0.075
First Stage						
PREDICTED_INEQ$_{z,c}$ X VAR$_{i,z,c}$	0.008	-0.001	0.007	0.007	0.005	0.008*
	(0.006)	(0.005)	(0.005)	(0.005)	(0.006)	(0.004)
PREDICTED_INEQ$_{z,c}$	0.247***	0.264***	0.247***	0.247***	0.251***	0.247***
	(0.028)	(0.027)	(0.028)	(0.027)	(0.029)	(0.022)
Kleibergen-Paap LM stat (p-value)	0.00	0.00	0.00	0.00	0.00	0.00
Kleibergen-Paap F-stat	71	74	73	74	71	76
Indiv. Controls	Yes	Yes	Yes	Yes	Yes	Yes
Zone-level Controls	Yes	Yes	Yes	Yes	Yes	Yes
Controls (rest)	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster Level	ZoneID	ZoneID	ZoneID	ZoneID	ZoneID	ZoneID
N. Obs.	37276	37284	37279	37283	37275	37288
N. Clusters	4341	4341	4341	4341	4341	4341
N. Subdivisions	485	485	485	485	485	485
N. Countries	30	30	30	30	30	30

Notes: Instrumental variable approach estimations of 1 with where $INEQUALITY_{z,c}$ is interacted with corruption variables. Top and bottom panel provide, respectively, the second stage and first stage estimation. The p-value of joint significance of $INEQUALITY_{z,c}$ and its interaction term is reported at the bottom of the top panel. $INEQUALITY_{z,c}$ is measured at the 30-kilometer radius. All estimations control for the the mechanisms explained in the previous sections as well as individual and zone level characteristics, and include country fixed effects. Robust standard errors clustered at the 30-kilometer radius are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4. Conclusion

This paper examines the relationship between inequality and attitude towards taxation in 30 African countries. Using geo-coded data from round six of Afrobarometer survey, we construct a composite measure of attitude towards taxation at the individual level. Further, using night light intensity data from VIIRS we compute a Gini index over alternative zones surrounding each individual. The results show that when facing high levels of inequality, citizens are more supportive of taxation. However, this average effect is more precisely estimated when inequality is measured at circular areas with radius of 20 to 50 kilometers and the impact fades away at larger areas such as 60 or 70 km or ADM1 level. Although we compute an objective measure of inequality, these results provide indirect evidence that inequality, notably inequality in public good provision, tends to be more accurately perceived at the local level.

We further examine the heterogeneity of the effect of inequality with regard wealth groups to which each respondents belongs. We find that individuals in poorer groups (i.e. the bottom 40% f the wealth distribution) are more supportive of taxation when inequality is high which grants support for the median voter theorem. Results also suggest that taxpayers display more favorable attitude towards taxation in reaction to high level of local inequality when they are located further away from economic centers, which we interpret as evidence that their demand for redistribution is higher when they live away from economic centers. In the same vein, we finally examine the effect of institutional environment on the relationship between inequality and attitude towards taxation. Consistently with our previous results, we find that inequality raises support for taxes only if citizens trust the government and when corruption is perceived as less prevalent.

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Appendix

Table A1: Summary Statistics

	Mean	Std.Dev.	Min	Max	Obs.
Dependent					
TAX_ATTITUDE$_{i,z,c}$ $(scale)$	0.68	0.20	0	1	37294
TAXATT_A$_{i,z,c}$ $(0-1\,score)$ $(3\,Criteria)$	0.69	0.23	0	1	37294
TAXATT_B$_{i,z,c}$ $(0-3\,scale)$ $(3\,Criteria)$	1.98	0.95	0	3	37294
TAXATT_C$_{i,z,c}$ $(0-5\,scale)$ $(5\,Criteria)$	3.17	1.34	0	5	37294
Composition of Dependent					
NOT_PAYING_TAX_(WRONG/RIGHT)$_{z,c}$	2.50	0.63	1	3	37294
PEOPLE_MUST_PAY_TAX$_{z,c}$	3.82	1.18	1	5	37294
CITIZEN_MUST_PAY_TAX$_{z,c}$	2.17	1.17	1	5	37294
PAY_TAX_INCREASE_HEALTH$_{z,c}$	2.89	1.62	1	5	37294
CITIZEN_PAY_TAX_IN_DEMOC$_{z,c}$	2.68	0.61	1	3	37294
Channels					
DIFF_AVOID_TAX$_{i,z,c}$	2.75	1.35	0	4	37294
PEOPLE_UNPUNISHED$_{i,z,c}$	1.79	1.01	0	4	37294
DIFF_OBTAIN_POLICE$_{i,z,c}$	0.61	1.17	0	4	37294
DIFF_OBTAIN_MEDIC$_{i,z,c}$	1.52	1.36	0	4	37294
TRUST_PRESIDENT$_{i,z,c}$	2.69	1.18	0	4	37294
TRUST_TAX_DEP.$_{i,z,c}$	2.37	1.18	0	4	37294
INEQ_PERCEPTION$_{i,z,c}$	2.10	1.02	0	4	37294
ETHNIC_UNFAIR$_{i,z,c}$	1.54	1.00	0	4	37294
Individual Characteristics					
AGE$_{i,z,c}$	37.07	14.29	18	105	37294
EDUCATION$_{i,z,c}$	3.49	2.17	0	9	37294
EMPLOYT$_{i,z,c}$	0.40	0.49	0	1	37294
WEALTH$_{i,z,c}$	0.03	0.98	-3	6	37294
Institutional					
TRUST_PARLIAMENT$_{i,z,c}$	2.48	1.13	0	4	37291
TRUST_ELECTED_LOC$_{i,z,c}$	2.43	1.12	0	4	37291
TRUST_RULING_PARTY$_{i,z,c}$	2.43	1.16	0	4	35123
CORRUPTION_TAX$_{i,z,c}$	2.23	1.08	0	4	37276
CORRUPT_COURTS$_{i,z,c}$	2.19	1.05	0	4	37275
CORRUPT_POLICE$_{i,z,c}$	2.51	1.03	0	4	37283
CORRUPT_GOV_OFF$_{i,z,c}$	2.32	0.99	0	4	37279
N. SUBDIVISIONS	485	0.00	485	485	37294
N. COUNTRIES	30	0.00	30	30	37294

Table A2: Summary Statistics: night light Variables

	Mean	Std.Dev.	Min	Max	Obs.
Inequality					
INEQUALITY$_{20}$	0.61	0.19	0.2	1.0	37294
INEQUALITY$_{30}$	0.64	0.18	0.2	1.0	37294
INEQUALITY$_{40}$	0.65	0.18	0.2	1.0	37289
INEQUALITY$_{50}$	0.67	0.18	0.2	1.0	37294
INEQUALITY$_{60}$	0.68	0.18	0.2	1.0	37294
INEQUALITY$_{70}$	0.70	0.18	0.2	1.0	37294
INEQUALITY$_{ADM1}$	0.69	0.17	0.3	1.0	37294
Lightpc					
LIGHTpc$_{20}$	0.03	0.31	-0.0	8.5	37294
LIGHTpc$_{50}$	0.05	0.64	-0.0	12.2	37294
LIGHTpc$_{30}$	0.04	0.45	-0.0	8.8	37294
LIGHTpc$_{40}$	0.05	0.62	-0.0	11.9	37294
LIGHTpc$_{60}$	0.03	0.27	-0.0	10.2	37294
LIGHTpc$_{70}$	0.02	0.15	-0.0	7.5	37294
LIGHTpc$_{ADM1}$	0.02	0.12	-0.0	9.3	37294
Instrument					
Inequality Predicted					
PREDICTED_INEQ$_{20}$	0.47	0.24	0.1	1.0	37294
PREDICTED_INEQ$_{50}$	0.51	0.23	0.1	1.0	37294
PREDICTED_INEQ$_{30}$	0.49	0.24	0.1	1.0	37294
PREDICTED_INEQ$_{40}$	0.50	0.23	0.1	1.0	37294
PREDICTED_INEQ$_{60}$	0.52	0.22	0.1	1.0	37294
PREDICTED_INEQ$_{70}$	0.53	0.22	0.1	1.0	37294
PREDICTED_INEQ$_{ADM1}$	0.50	0.24	0.1	1.0	37294

Table A3: Stage Zero

Dependent: **Pixel Light at the time of the survey (2014 or 2015)**	(1)
$LNDISTANCE_{p,n,2000}$	-0.573***
	(0.001)
$LNDISTANCE_{p,n,2000} \times LNDISTANCE_{p,n,2000}$	0.105***
	(0.000)
$LNPOP_{p,2000}$	0.298***
	(0.001)
R^2	0.29
ADM1 FE	Yes
N. Obs.	18,334,032
N. ADM1	604
N. Country	36

Notes: Table A3 presents the result of the ordinary least squares (OLS) estimation of Equation 2. It includes fixed effects for the first administrative division and robust standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A4: Different Compositions of Dependent Variable: OLS & IV 30km

Dependent:	(1) $\text{TAXATT}_{i,z,c}$	(2) $\text{TAXATT\_A}_{i,z,c}$	(3) $\text{TAXATT\_B}_{i,z,c}$	(4) $\text{TAXATT\_C}_{i,z,c}$
	Baseline	3 Criteria (Score 0-1)	3 Criteria (Score 0-3)	5 Criteria (Score 0-5)
Panel A: OLS				
$\text{INEQUALITY}_{z,c}$	0.036***	0.038***	0.170***	0.259***
	(0.012)	(0.014)	(0.055)	(0.080)
R^2	0.151	0.148	0.134	0.145
Panel B: IV - Second Stage				
$\text{INEQUALITY}_{z,c}$	0.086**	0.106**	0.404*	0.592**
	(0.043)	(0.051)	(0.207)	(0.301)
R^2	0.073	0.065	0.058	0.068
Panel C: IV - First Stage				
$\text{PREDICTED\_INEQ}_{z,c}$	0.231***	0.231***	0.231***	0.231***
	(0.025)	(0.025)	(0.025)	(0.025)
Kleibergen-Paap LM stat (p-value)	0.00	0.00	0.00	0.00
Kleibergen-Paap F-stat	87	87	87	87
Indiv. Controls	Yes	Yes	Yes	Yes
Zone-level Controls	Yes	Yes	Yes	Yes
Controls (rest)	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Cluster Level	ZoneID	ZoneID	ZoneID	ZoneID
N. Obs.	37294	37294	37294	37294
N. Clusters	4341	4341	4341	4341
N. Subdivisions	485	485	485	485
N. Countries	30	30	30	30

Notes: Panel A, B and C, respectively, show the OLS, second stage (IV) and first stage (IV) estimation of Equation 1 using alternative dependent variables. $INEQUALITY_{z,c}$ in all columns is measured in a radius of 30 kilometers. Column (1) provides the baseline corresponding to Column (6) of Table 3. Column (2) through column(3) use different compositions of the same variables as dependent variable. Table 1 explains the composition of each dependent variable. All estimations control for the mechanisms explained in the previous sections as well as individual and zone level characteristics, and include country fixed effects with robust standard errors clustered at 30-kilometer radius (reported in parentheses). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Supplementary Appendix

Spatial Inequality and Attitude Towards Taxation: The Case of Sub-Saharan Africa

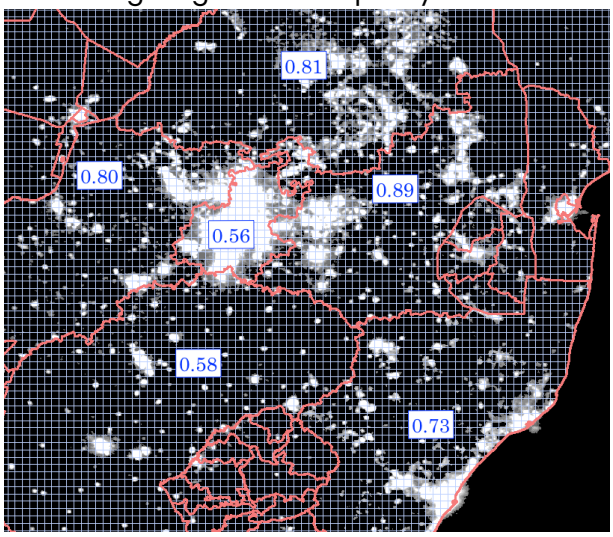
Table S.A1: Afrobarometer data - Recoding

Variable$_{i,z,c}$	**Description**	**Initial Coding**	**Final Coding**
CORRUPT_VAR		-1: Missing	. : Missing
VAR:	Corruption: tax officials	0: None	1: Not at all
	Corruption: judges	1: Some of them	2: Just a little
	Corruption: gov. officials	2: Most of them	3: Somewhat
	Corruption: police	3: All of them	4: A lot
		9: Don't know	DK dummy (0/1)
TRUST_VAR		-1: Missing	. : Missing
VAR:	Trust tax department	0: Not at all	1: Not at all
	Trust key leader	1: Just a little	2: Just a little
	Trust parliament	2: Somewhat	3: Somewhat
	Trust elec. local. gov.	3: A lot	4: A lot
	Trust ruling party	9: Don't know	0: Don't know
	Trust courts of law		DK dummy (0/1)
DIFF._KNOW_TAX	Difficulty to find out what taxes or fees to pay	1: Very easy	1: Very easy
		2: Easy	2: Easy
		3: Difficult	3: Difficult
		4: Very difficult	4: Very difficult
		9: Don't know	0: Don't know
			DK dummy (0/1)
DIFF._AVOID_TAX	Difficulty to avoid paying taxes	1: Very easy	1: Very easy
		2: Easy	2: Easy
		3: Difficult	3: Difficult
		4: Very difficult	4: Very difficult
		7: Don't have to pay taxes	0: Don't pay taxes
		9: Don't know	0: Don't know
			TAX_PAYER (0/1)
			DK dummy (0/1)
DIFF._OBTAIN_MEDIC	Difficulty to obtain medical treatment	0: No Contact	0: No Contact
		1: Very Difficult	4: Very Difficult
		2: Difficult	3: Diffficult
		3: Easy	2: Easy
		4: Very Easy	1: Very Easy
			ND_MEDIC (0/1)

Table S.A2: Afrobarometer data - Recoding (continued)

Variable$_{i,s,c,t}$	**Description**	**Initial Coding**	**Final Coding**
DIFF._OBTAIN_POLICE	Difficulty to obtain help from the police	0: No Contact 1: Very Difficult 2: Difficult 3: Easy 4: Very Easy	0: No Contact 4: Very Difficult 3: Diffficult 2: Easy 1: Very Easy ND_COP (0/1)
PEOPLE_UNPUNISHED	How often ordinary people unpunished	0: Never 1: Rarely 2: Often 3: Always 9: Don't know	1: Never 2: Rarely 3: Often 4: Always 0: Don't know DK dummy (0/1)
INEQ_PERCEPTION	Your living conditions vs. Others	1: Much Worse 2: Worse 3: Same 4: Better 5: Much Better . : Missing	4: Much Worse 3: Worse 2: Same 1: Better 0: Much Better . : Missing
ETHNIC_UNFAIR	Ethnic unfair	0: Not Applicable 1: Never 2: Sometimes 3: Often 4: Always . : Missing	0: Not Applicable 1: Never 2: Sometimes 3: Often 4: Always . : Missing ETHNIC_APPLIC (0/1)

Figure S.A1: night light and inequality at the ADM1 level



This Figure is only for illustration purposes. The source of data for this picture is DMSP-OLS light data and not VIIRS which we use in order to compute the inequality measures. DMSP-OLS data is only available until 2013, as a result we use VIIRS data which are available for since 2012. The figure shows part of South Africa, and displays how we compute inequality at ADM1 level. The numbers displayed inside each [red] boundary is the corresponding Gini.

Table S.A3: Interaction with Democratic Condition (OLS & IV) 30km

Dependent: **TAXATT**$_{i,z,c}$	(1) Extend Democ.	(2) Satisf. Democ.
INEQUALITY$_{z,c}$	-0.008	-0.016
	(0.046)	(0.047)
INEQUALITY$_{z,c}$ X VAR$_{i,z,c}$	0.029***	0.025***
	(0.010)	(0.009)
VAR$_{i,z,c}$	-0.009	-0.006
	(0.007)	(0.006)
Joint Sig. P-value	0.004	0.004
R^2	0.075	0.074
First Stage		
PREDICTED_INEQ$_{z,c}$ X VAR$_{i,z,c}$	0.007*	0.005
	(0.004)	(0.004)
PREDICTED_INEQ$_{z,c}$	0.245***	0.247***
	(0.026)	(0.026)
Kleibergen-Paap LM stat (p-value)	0.00	0.00
Kleibergen-Paap F-stat	74	74
Indiv. Controls	Yes	Yes
Zone-level Controls	Yes	Yes
Controls (rest)	Yes	Yes
Country FE	Yes	Yes
Cluster Level	ZoneID	ZoneID
N. Obs.	37291	37289
N. Clusters	4341	4341
N. Subdivisions	485	485
N. Countries	30	30

Notes: Instrumental variable approach estimations of Equation 1 where $INEQUALITY_{z,c}$ is interacted with quality of democracy variables. Top and bottom panel provide, respectively, the second stage and first stage estimation. The p-value of joint significance for $INEQUALITY_{z,c}$ and its interaction term is reported at the bottom of the top panel. $INEQUALITY_{z,c}$ is measured at the 30-kilometer radius. All estimations control for the the mechanisms explained in the previous sections as well as individual and zone level characteristics, and include country fixed effects. Robust standard errors clustered at the 30-kilometer radius are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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