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ORIGINAL ARTICLE

Chinese Aid Projects and Local Tax Attitudes: Evidence from Africa

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Abstract

The provision of Chinese aid to Africa is characterized by a policy of minimal conditions, whereby aid is extended to African leaders in response to their requests. This approach may afford African leaders greater discretion in expediting the implementation of Chinese aid projects. However, it also renders Chinese aid vulnerable to corruption, as leaders may exploit it to secure political favor for a specific region without the need to adjust government tax and spending policies. Such a characteristic of Chinese aid projects may ultimately shape local attitudes towards taxation and, thereby, influence state–society relations. This paper puts this claim to an empirical test using data from the Afrobarometer surveys and the AidData. The results indicate that exposure to Chinese aid projects creates negative perceptions among citizens regarding the state's tax enforcement behavior. Interestingly, the study also reveals a positive association between Chinese aid and tax morale or compliance among citizens residing around Chinese aid projects. Noteworthily, these results are confined only to less democratic settings. A similar analysis for World Bank aid projects does not exhibit such a relationship. The findings suggest a tradeoff associated with Chinese aid. On the one hand, it promotes compliance among beneficiaries. On the other hand, it engenders weak tax enforcement perceptions. The implication is that if the negative consequences outweigh the positive ones, Chinese aid has the potential to undermine the government's reputation for fiscal responsibility, which in turn poses challenges to the development of state capacity through robust fiscal contracts.

Keywords Africa · Chinese aid projects · Political bias · Tax enforcement · Tax morale

Résumé

La fourniture de l'aide publique au développement chinoise aux nations africaines se caractérise par une politique de conditions minimales, selon laquelle l'aide est accor-

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dée aux dirigeants africains en réponse à leurs demandes. Cette approche donne aux dirigeants africains plus de discrétion et permet une mise en œuvre plus rapide des projets financés par l'aide publique chinoise, ce qui reflète la voie du développement de la Chine. Néanmoins, ces caractéristiques rendent également l'aide publique chinoise plus vulnérable à la corruption, car les dirigeants peuvent l'exploiter pour obtenir des faveurs politiques pour une région spécifique sans avoir à ajuster les politiques fiscales et de dépenses du gouvernement. Cet article soutient que cette caractéristique de l'aide publique chinoise crée des perceptions négatives en matière d'application de la loi fiscale. Pour tester cette proposition, l'étude combine les données géocodées de l'aide chinoise d'AidData avec les enquêtes d'Afrobaromètre. Nous trouvons des preuves que l'aide au développement chinoise est négativement associée aux perceptions de l'application de l'impôt, mais positivement associée à la morale ou à la conformité fiscale. Une analyse similaire pour les projets d'aide financés par la Banque mondiale ne montre pas une telle corrélation. Les résultats suggèrent un compromis permettant à l'aide publique chinoise d'aider les gouvernements bénéficiaires à obtenir la conformité des bénéficiaires, tout en engendrant également la perception d'une application fiscale plus faible. Le document implique que si la partialité politique de l'aide publique chinoise peut améliorer la morale fiscale ou la conformité fiscale, elle peut également avoir des conséquences négatives imprévues sur l'application des lois fiscales, érodant finalement la réputation du gouvernement en matière de responsabilité budgétaire.

Introduction

The relationship between foreign aid and tax enforcement behavior has been the subject of considerable scholarly interest in the field of political economy. A compelling claim regarding this linkage stems from political economy models, notably the selectorate model. The selectorate model posits that in the context of large democracies, political leaders, propelled by their pursuit of power and the imperative to preserve their positions in office, often utilize tax revenues for the provision of public goods (see De Mesquita et al. 2002). However, taxes can be politically unpopular and carry significant political costs. In political environments characterized by lower levels of democracy and clientelism, leaders may employ alternative strategies, such as relying on local patronage networks. As part of these strategies, leaders may strategically allocate foreign aid to specific regions as a means of patronage or to finance development initiatives that would otherwise be financially burdensome or difficult to fund through taxes alone. For instance, political leaders may grant tax exemptions to industries or groups they believe will offer political support. Consequently, the presence of politically biased foreign aid is likely to result in a negative relationship between foreign aid and tax enforcement, as it diminishes the government's incentive to generate revenue.

Despite the appealing theoretical claim, existing econometric studies suggest a minimal or non-existent effect of foreign aid on government tax efforts (e.g., see Prichard 2016; Morrissey 2015). That being the case, however, recent scholarship has shifted its attention towards examining the potential impact of foreign aid on

state–society relations (e.g., see Isaksson and Durevall 2022; Bai et al. 2022; Blair and Winters 2020). This evolving perspective argues for a path-dependence framework, wherein state behavior and citizens' perceptions mutually influence each other. The underlying rationale is that foreign aid may erode the government's incentive to engage in negotiations with society to increase tax revenue, thereby weakening the fiscal contracts between the state and its citizens. Consequently, there is a possibility that the responsibility for providing public goods may shift from the local government to external donors, resulting in reduced government efforts to develop its own governance capacity and generate fiscal income from its citizens. This, in turn, may create a perception among citizens that their government is ineffective in tax enforcement (Blair and Winters 2020). Drawing from this line of argument, this study seeks to make a valuable contribution to the existing literature by examining and analyzing the relationship between politically biased foreign aid and citizens' tax-related attitudes.

Given China's non-interference aid policy, Chinese aid may have unique characteristics that make it particularly susceptible to local patronage networks and, therefore, may affect perceptions of tax enforcement in the recipient countries. Specifically, Chinese aid programs in Africa do not require explicit policy reform on the part of the recipients (Brautigam 2011). Instead, Chinese aid follows a demand-driven approach, whereby African leaders receive aid in response to their requests. Perhaps due to these features, Chinese aid projects are more likely to be located in the birthplaces of African leaders (Dreher et al. 2019). This tendency towards political expediency enables recipient country leaders to utilize Chinese aid projects for domestic political gain. By strategically directing Chinese aid towards their regions of political support, African politicians may seek to purchase political support by maximizing the private benefits of supporters, as suggested by the selectorate model. Such governments may even tolerate corruption, as also suggested by the selectorate model, which may explain why Chinese aid is positively associated with paying and receiving bribes at the local level (Isaksson and Kotsadam 2018). The political bias in Chinese aid allocation (Dreher et al. 2019) and the resulting corruption (Isaksson and Kotsadam 2018) may lead citizens to believe that tax officials are engaged in corrupt practices, such as accepting bribes, and thus, have less incentive and ability to enforce taxes. This may eventually erode citizens' trust in the government's ability to enforce tax and, thus, implants negative tax enforcement perceptions. This present study puts this claim to an empirical test. It empirically examines whether political biases in Chinese aid potentially diminish citizens' perceptions of the government's tax enforcement behavior.

To test the theoretical claim, I matched geo-referenced data on official development projects in Africa from 2000 to 2014 with data on respondents from the Afrobarometer survey. I utilized a spatial differences in differences (DID) method that enables me to recover the effects of foreign aid by comparing respondents' residing around ongoing and anticipated aid projects. The analysis produces interesting results. First, I find evidence that Chinese aid is associated with negative perceptions of tax enforcement. Second, Chinese aid is positively associated with tax morale or compliance. Third, these results are confined only to less democratic settings. Finally, no similar pattern was found when the main analysis was replicated on aid

from the World Bank. The political bias in Chinese aid allocation helps explain this duality, where it is negatively associated with tax enforcement perceptions yet positively associated with tax morale. Put simply, the political favoritism in Chinese aid allocation may help secure the tax compliance of aid beneficiaries while simultaneously eroding the government's reputation for tax enforcement. The findings support the claim that political bias in Chinese aid allocation may assist in achieving compliance among aid beneficiaries while simultaneously damaging the government's image of tax enforcement.

The paper contributes to different strands of the literature. The study adds to the research on foreign aid and tax enforcement behavior by taking a micro-perspective. While macro-level studies can help understand the overall impact of aid on tax revenue (e.g., Prichard 2016; Morrissey 2015), they may not capture the nuances of local attitudes towards taxation and how aid interventions affect them. Evidence of tax-related behavior at the local level can be informative in understanding broader attitudes towards taxation and its implications for compliance and revenue collection. The study also adds to the growing but conflicting recent research on the impact of Chinese aid in Africa. Recent research documents that local Chinese aid projects are more likely to engender authoritarian norms (Gehring et al. 2022; Bai et al. 2022), regional favoritism (Dreher et al. 2019), corruption (Isaksson and Kotsadam 2018), political distrust (Atitianti 2023), ethnic division (Isaksson 2020), social disengagement (Adera 2023), and crime incidences (Appiah-Kubi and Jarrett 2022). Nonetheless, there is also evidence that Chinese aid to Africa continues to be effective in boosting economic development (Dreher et al. 2021a, b; Hou et al. 2021). Economic reforms have political costs to leaders in the short run, and this absence of institutional conditionality makes Chinese aid attractive to leaders who fear that institutional reform might undermine their domestic bases of support (Brazys and Vadlamannati 2021; Mohan and Tan-Mullins 2009). Along this line, the paper adds to the research by documenting a negative association between Chinese aid and tax-related behavior. Finally, the paper also adds to and builds upon research that examines the determinants of tax-related attitudes (Ciziceno and Pizzuto 2022; McCulloch et al. 2021). It adds to this line of research by showing that foreign aid is one factor that affects tax-related attitudes.

The rest of the paper is organized as follows. "Relationship to the Literature" section presents the literature to which this paper is related. "Data" section describes the data. "Identification Strategy" section presents the empirical method. "Results" section presents and discusses the results. "Conclusion" section concludes the paper.

Relationship to the Literature

This paper contributes to and builds upon different strands of literature. First, it is related to and builds upon research that examines the determinants of tax-related attitudes. With a focus on Nigeria, McCulloch et al. (2021) investigate the factors related to tax morale. The authors find results that individuals with a perception of increased penalties and greater difficulty avoiding taxes tend to have higher tax morale. Furthermore, tax morale is higher when individuals believe that their fellow

citizens pay taxes, experience less frequent bribery, and have higher trust in tax officials. Ciziceno and Pizzuto (2022) argue that life satisfaction is one factor affecting tax morale. Using longitudinal data from the World Value Survey, they demonstrate that individuals who report higher life satisfaction also exhibit higher tax morale. According to the authors, the positive relationship between life satisfaction and tax morale tends to be more evident when individuals' vertical trust (confidence in the government) is higher. It contributes to this line of research by providing evidence that foreign aid is another factor that affects tax-related attitudes.

Second, the study contributes to the ongoing debate on the impact of Chinese aid.[1] China has explicitly stated that it does not seek to promote government reform with its development packages, which suggests that Chinese aid is unlikely to contribute to institutional reform (Hernandez 2017). Several studies have explored the relationship between Chinese aid and various outcomes in recipient countries. The most recent of these studies use geocoded Chinese aid data this paper used. For instance, Isaksson and Kotsadam (2018) found that Chinese aid is associated with higher experiences of paying bribes compared to aid from the World Bank. Similarly, Dreher et al. (2019) documented that Chinese aid exhibits political bias, often favoring the birthplaces of African leaders. Moreover, Isaksson (2020) found that Chinese aid increases the salience of ethnic identity in Africa, which could have implications for social cohesion and political stability. Giovannetti and Sanfilippo (2009) show that the presence of China displaces African firms. Furthermore, Gehring et al. (2022) show that Chinese aid cultivates an increase in the acceptance of authoritarian norms. Nonetheless, Dreher et al. (2021a) argue that the local receipt of Chinese aid does not necessarily lead to worse economic outcomes, despite being more vulnerable to political capture. They suggest that this may be due to the fact that Chinese aid often comes in the form of infrastructure projects, which have the potential to boost economic growth and development. Nonetheless, Dreher et al. (2021b) indicate that in countries where China's aid support is minimal, aid from the United States tends to be more effective. Finally, research suggests that Chinese aid serves as a means for China to gain soft power. As argued by Morgan (2019), Chinese aid programs contribute to positive perceptions of China among African citizens. However, McCauley et al. (2022) finds that the proximity of African countries to Chinese foreign direct investment decreases their perception of China's development model as the most suitable for their country. This study contributes to this debate by investigating the link between Chinese aid and local tax enforcement perceptions (TEPs).

Third, it adds to the research on the link between foreign aid and taxation, which is mostly based on macro-level analysis. The literature presents a debatable relationship between foreign aid and domestic tax revenue. While some studies argue that foreign aid has a negative impact on domestic tax efforts (Benedek et al. 2014; Thornton 2014; Pivovarsky et al. 2003), others argue that this relationship is not robust (Morrissey 2015; Morrissey et al. 2014; Clist and Morrissey 2011), or that foreign aid may have a modest but positive effect on domestic tax revenue (Clist

[1] See Ajakaiye and Kaplinsky (2009) for the trade effects of China in Africa.

2016). The disagreement in the literature seems to stem from issues related to data quality (Prichard 2016) and endogeneity, as well as differences in empirical methods used (Carter 2013). While previous studies have focused on cross-country analysis, this study takes a micro-perspective and examines the impact of aid on TEPs at a sub-national level. Foreign aid is typically given to governments instead of individuals, and thus, citizens' behavior may act as an indirect reflection of state behavior (Blair and Winters 2020). With such a premise, the result could be taken as evidence that Chinese aid projects may lead to a lower probability of tax enforcement. Within this framework, the present paper contributes to a more comprehensive and nuanced understanding of the intricate relationship between foreign aid and tax enforcement.

Data

The analysis uses established geocoded data. The location of Chinese aid projects comes from the AidData. Geocoded data on self-reported tax related attitudes are from the Afrobarometer surveys.

The Chinese Aid Data

The geocoded Chinese aid data are obtained from the AidData's Geocoded Global Chinese Official Finance Version 1.1.1 dataset (e.g., see Dreher et al. 2021b; Bluhm et al. 2018). This dataset includes a total of 3485 geolocated Chinese development projects, including both Chinese aid and non-concessional official financing, implemented between 2000 and 2014 in 6190 locations across approximately 130 developing countries. The dataset was established using a methodology known as Tracking Underreported Financial Flows (TUFF), which relies on open-source media and aims to reduce misreporting and underreporting of projects. The dataset is organized at the project location level and includes variables such as project location, commitment year, implementation start year, status, sector, and amount of aid pledged.

According to the OECD-DAC, an aid flow qualifies as official development assistance (ODA) if it is provided by official agencies to developing countries on the DAC list of ODA recipients. It should also be concessional in nature, with a grant element of at least 25%, and its primary objective should be to promote economic development in developing countries. However, Chinese aid does not adhere to DAC definitions, and AidData cannot verify the financing terms. Nonetheless, the AidData pre-filtered Chinese development projects according to their flow class (namely, 'ODA-like,' 'OOF-like,' or 'Vague OF'), as well as their primary intent. AidData classifies aid with a non-developmental intent as OOF-like aid, while developmental aid includes both ODA-like aid and developmental loans in OOF that are not concessional enough to qualify as ODA. Among OOF-like aid, a considerable number of projects represent a mixture of official aid and export credits, which are aid-like and flow to developing regions. However, their terms and conditions appear commercial and non-concessional, leading to a finding that part of China's

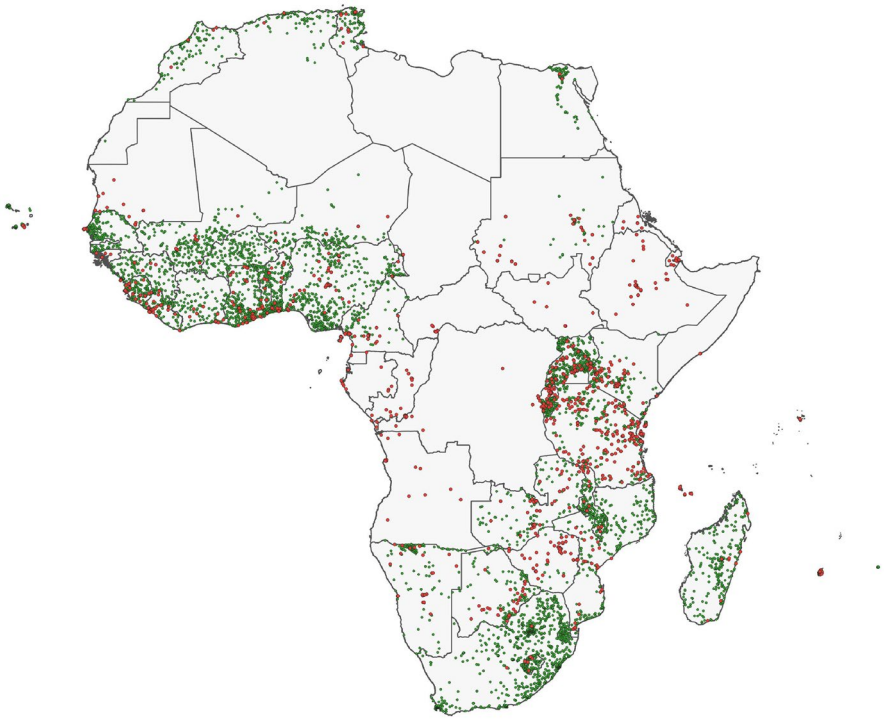

Fig. 1 Locations of ODA-like Chinese projects and Afrobarometer clusters

official finance recorded in AidData is not subsidized and not aid based on the Chinese government's definition.

This paper uses the category of records in the dataset that AidData designates as ODA-like projects. This follows from the existing literature and is a definition of foreign aid consistent with the Chinese government, which excludes non-subsidized and commercial loans disbursed and funded by policy banks, such as the China Development Bank. In particular, the focus is on aid cases with a clear developmental purpose, notably including infrastructure building such as roads, trains, hospitals, schools, power plants, irrigation systems, and other social facilities. The AidData dataset contains the location coordinates (latitude and longitude) of these aid projects. Figure 1 plots the locations of ODA-like Chinese projects. These are shown by red dots.

The Afrobarometer Surveys

The Afrobarometer surveys are extensive attitudinal surveys that aim to explore public opinions on a wide range of issues, including perceptions of tax enforcement. For the empirical analysis presented in this paper, I primarily rely on rounds 3, 5,

and 6 of the Afrobarometer surveys, as these are the only rounds that contain the key-dependent variable for the empirical analysis. The 3rd, 5th, and 6th rounds of the Afrobarometer surveys cover 18, 34, and 36 countries, respectively, and were administered during the periods of 2005–2006, 2011–2013, and 2014–2015.

As in the AidData, the Afrobarometer surveys provide the latitude and longitude coordinates for survey respondents.[2] I grouped together individuals with similar point coordinates to create clusters. These clusters are represented by small green dots in Fig. 1.

Tax enforcement perceptions The key-dependent variable is an indicator of tax enforcement perception (TEP). The Afrobarometer includes data on the respondent's subjective evaluation of tax enforcement. However, the data on TEP are available only in rounds 3, 5, and 6. Therefore, the empirical analysis primarily relies on these three rounds of the Afrobarometer surveys. In round 3, respondents were asked, "How likely do you think it would be that the authorities could enforce the law if a person like yourself did not pay a tax on some of the income they earned?" Answers were provided on a four-point scale, 1 for 'not at all likely,' 2 for 'Not very likely,' 3 for 'Likely,' and 4 for 'very likely.' Round 4 did not include a similar question. In rounds 5 and 6, a similar question was asked: "Based on your experience, how easy or difficult is it to avoid paying the income or property taxes that you owe to the government?" Respondents provided answers as 1 for 'very easy,' 2 for 'easy,' 3 for 'difficult,' and 4 for 'very difficult.'

Based on this variable, I create a dummy of TEPs that takes a value of 1 if the responses are 3 and 4, or 0 if the responses are 1 and 2.[3] There are at least three advantages of using this dummy over the original measure. First, the empirical analysis in this study depends on the mean difference between the treatment and control groups. Using the mean difference of categorical variables across groups as a valid measure is incorrect from a statistical standpoint, and it can lead to misleading conclusions. However, the dummy variable can be regarded as a quantitative variable, and therefore, it can be used to compare means across various groups. Second, the explanatory variable used in this study is a dummy variable. Consequently, using a dummy outcome variable can simplify the interpretation of coefficients derived from Ordinary Least Squares (OLS) analysis. Moreover, there is a slight difference in the wording of the questions used to capture the perceptions of tax enforcement. In round 3, the question refers to the likelihood that tax authorities could enforce the law on payment of income tax, whereas in rounds 5 and 6, it refers to the ease of avoiding paying income or property taxes. By grouping similar items together, the use of a dummy variable can help to account for differences in the wording of questions and their corresponding answers. Notwithstanding this, I will later demonstrate that the results remain robust even when utilizing the original measure.

Controls The analysis controls for several variables. Table 7 in the "Appendix" reports the variables used in this study. These include age, age^2, gender (a male dummy), place of residence (an urban dummy), respondents' education level,

[2] The geocoded Afrobarometer data are obtained from the Afrobarometer team through a formal request.

[3] Table 12 reports Afrobarometer samples by Country and Survey Waves.

employment status, relative living standards, the perceived performance of the president, and access to public goods. The source and description of most of these variables are provided in the "Appendix."

Identification Strategy

AidData contains the location coordinates (latitude and longitude) of project sites. Similarly, the Afrobarometer surveys provide the location coordinates for survey respondents. I used the point coordinates in the aid data to identify the aid projects near each surveyed Afrobarometer respondent. I created clusters of respondents by grouping individuals with similar coordinates. All respondents with the same coordinates had the same projects identified nearby. Finally, using this information, I created a *D*-kilometer buffer zone around each Chinese project site. If a respondent in cluster *j* falls within a *D*-kilometer buffer zone of ongoing Chinese aid (absent any project), s/he falls into a treatment group consisting of clusters of respondents. Conversely, a respondent from cluster *j* falls into a control group if he/she resides outside the *D*-kilometer buffer zone around an ongoing Chinese project site.

In the matched sample, about 18.3%, 27.4%, 42.6%, and 63.2% of respondents respectively reside within 25, 50, 75, 100, and 200 km of an ongoing Chinese aid project (OCP). Using this information, the baseline estimating specification takes the following form:

$$Y_{ijt} = \alpha_0 + \theta_{12}\mathrm{OCP}_{Dit} + X_{ijt}{}'\beta + \mu_{\mathrm{c}} + S_t + \epsilon_{ijt}, \tag{1}$$

where Y_{ijt} is the outcome of interest for the *i*th individual; OCP_{Di} is a dummy equal to 1 if the respondent lives within *D* kilometers of an ongoing Chinese project site or zero otherwise; $X_{ijt}{}'$ is the vector of controls; μ_{c} are country-fixed effects; S_t are survey year-fixed effects, and ϵ_{ijt} is the idiosyncratic error term.

In specification 1, the coefficient of interest is θ_{12}. Let K_{g} denote the observable factors for each group. These factors may include project-specific and respondent-specific characteristics. The difference between the groups that live within and outside *D* kilometers of an ongoing Chinese project (OCP) is $[\theta_{12} + K_1 - K_2]$. Thus, the causal identification of θ_{12} requires two assumptions. First, individuals living near ongoing projects are basically similar to those living far from those Chinese projects. Second, the location of Chinese projects is randomly decided, or there is no localization in Chinese projects. However, both of these assumptions are less likely to hold. For instance, Dreher et al. (2019) show that Chinese aid projects are more likely to be in the home regions of African political leaders. In the presence of such non-randomness, it is not possible to recover the causal effect of Chinese aid on tax enforcement from a comparison of people living close to and far away from aid project sites.

To address the challenge of identifying the effects of Chinese aid projects, I adopt a temporal–spatial DID identification strategy from a recent literature. This approach involves comparing ongoing and anticipated Chinese aid projects (e.g., see Isaksson 2020; Isaksson and Kotsadam 2018). The Afrobarometer typically visits

different areas in different years and this hinders me from following specific localities over time, before and after a project was initiated. Yet, the Afrobarometer does cover different areas at different times. I exploited this time variation in the data to set up the DID. Similar to Isaksson and Kotsadam (2018), I classify a project as either 'Ongoing' (OCP) or 'Planned' (PCP) based on the time at which an Afrobarometer survey visits a specific Chinese aid project location. For instance, suppose China launches two projects, one in 2006 and another in 2010. If the 2005 Afrobarometer survey covers the area where the 2006 project will be completed, then the project from 2006 is designated as planned for a survey respondent covered in the 2005 Afrobarometer survey. Similarly, the 2010 project is marked as Ongoing if the Afrobarometer survey covers the locality of that project in 2011. This provides the basis for a spatial DID identification strategy that leverages temporal and spatial variation in the data. This is made possible due the fact that different project areas are surveyed by the Afrobarometer at different points in time. Such a spatial DID identification strategy enables us to overcome the challenge of identifying the effects of Chinese aid.

In particular, the method relies on the comparison of one treatment group with three control groups. The treatment group is composed of respondents living within D kilometers of an Ongoing project site (group 1). Meanwhile, the three control groups consist of respondents living outside the D kilometers of an Ongoing project site (group 2), living within D kilometers of a planned Chinese project (group 3), and living outside the D kilometers from a planned Chinese project (group 4). Using this information, I re-specify the empirical model as follows:

$$Y_{ijt} = \alpha_0 + \theta_{12}\mathrm{OCP}_{Dit} + \theta_{34}\mathrm{PCP}_{Dit} + X_{ijt}{}'\beta + \mu_{\mathrm{c}} + S_t + \epsilon_{ijt}. \tag{2}$$

In specification 2, PCP is a variable that represents a planned Chinese project. Specifically, it is a binary variable that takes a value of 1 for an individual residing within D kilometers of a planned project that is yet to start, provided that there are no completed projects in the same area. In our matched sample, about 2.6%, 4.6%, 6.7%, and 8.7% of respondents respectively reside within 25, 50, 75, 100, and 200 kilometers of a planned Chinese aid project (PCP).

To better understand the estimation process, let us define K_3 and K_4 as observable project-specific and respondent-specific characteristics for groups 3 and 4, respectively. The difference between group 1 and group 2 is given by $[\theta_{12} + K_1 - K_2]$, while the difference between group 3 and group 4 is given by $[\theta_{34} + K_3 - K_4]$. When there are no Ongoing projects, θ_{34} captures a selection effect. The differences between the treatment group and control groups can be expressed as $[\theta_{12} + K_1 - K_2] - [\theta_{34} + K_3 - K_4]$. By assuming that $[K_1 - K_2] - [K_3 - K_4] = 0$, I can obtain the spatial DID estimator, which is $\theta_{\mathrm{DID}} = \theta_{12} - \theta_{34}$. This estimator reflects the impact of a Chinese project after controlling for the endogenous selection in the Chinese project locations. The idea behind this approach is that by taking the difference between these two parameters, I can isolate the causal effect of aid on tax effort behavior from the combined selection and causal effect (Isaksson and Kotsadam 2018).

Table 1 Chinese aid and tax enforcement perceptions: main estimates

Cut-off	(1) 25 km	(2) 25 km	(3) 25 km	(4) 25 km	(5) 25 km
Ongoing (OCP_{25i})	−0.019***	−0.027***	−0.013**	−0.026***	−0.017***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Planned (PCP_{25i})	0.070***	0.063***	0.117*	0.064***	0.021*
	(0.012)	(0.012)	(0.062)	(0.013)	(0.013)
$OCP_{25i} - PCP_{25i}$	−0.0892***	−0.0896***	−0.130**	−0.0896***	−0.0387**
Observations	92,970	92,260	71,531	76,694	76,694
R^2	0.001	0.029	0.026	0.033	0.039
Baseline controls	No	Yes	Yes	Yes	Yes
Endogenous controls	No	No	No	Yes	Yes
Country FE	No	Yes	Yes	Yes	Yes
Region FE	No	No	No	No	No
Survey year FE	No	No	No	No	Yes
Included Survey Waves	3, 5, 6	3, 5, 6	5, 6	3, 5, 6	3, 5, 6

The dependent variable is a dummy of an individual's subjective assessment of income tax enforcement. Baseline controls include age, age^2, gender (a male dummy), and place of residence (an urban dummy). Endogenous controls include respondents' education level, employment status, living standards, the perceived performance of the president, interaction with local authorities, and access to public goods. Standard errors are clustered at the Afrobarometer cluster level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Results

The main results are presented in Table 1. The unit of observation is an individual respondent in the Afrobarometer cluster j. To account for the correlation of errors among respondents from the same cluster, standard errors are clustered at the Afrobarometer cluster level. The dependent variable is a dummy of an individual's subjective assessment of tax enforcement. The results are for 25 km cut-off.

Baseline Estimates

The first row of Table 1 presents the estimates for the baseline specification in Eq. 1. The estimates presented in the Table are based on the Linear Probability Model (LPM), which uses OLS to estimate the binary dependent variable.[4] In column 1, the point estimate for θ_{12} is −0.019, which is statistically significant at the 1% level. This estimate suggests that the TEP of a respondent residing within 25 km of Chinese

[4] Given that the dependent variable is binary, logit or probit may provide better estimates. In my case, the marginal effects estimated from the logit estimator are similar to those obtained using OLS. For example, the marginal effect estimate for OCP in column 1 of 1 is −0.018698 with a standard error of 0.00595, which is statistically significant and close to the estimate obtained using OLS. However, the DID estimates require taking mean differences between treatment and control groups, making OLS a better option. Using a logit estimator produces log odds ratios, which makes it difficult to generate the DID estimates.

project sites is lower by about 1.9 percentage points compared to individuals who live outside the 25 km cut-off. Column 2 introduces country-fixed effects and baseline controls, such as age, age^2, a gender (male) dummy, and place of residence (an urban dummy). Accounting for these factors, the point estimate for θ_{12} in column 2 is −0.027, which is statistically significant at the 1% level.

As noted above, there is a difference in the wording of the dependent variable between round 3 and the other two rounds. While both may capture tax enforcement behavior they are not identical—one could believe that authorities could enforce the law (even if they choose not to) and that it is easy to avoid paying tax (especially property tax). To account for this difference, column 3 reports results after excluding the data from round 3. As can be seen, results are not very sensitive to the wording of the dependent variable.

Column 4 adds respondents' education level, employment status, relative economic standing, the perceived performance of the president, interaction with local authorities, and access to public goods. I refer to this set of controls as 'endogenous controls,' as they could potentially be an outcome of Chinese aid. However, I include them to demonstrate that our results remain robust despite their inclusion. Among these controls, the male dummy, education level, relative economic standing, and access to public goods are statistically significant and show a positive correlation with tax enforcement perceptions.

As can be seen from column 4 of Table 1, the results are robust to the inclusion of the 'baseline' as well as the 'endogenous' controls. With these controls and the country-fixed effects, the point estimate for θ_{12} in column 2 is −0.026, which is statistically significant at the 1% level. In column 5, survey year-fixed effects are further added.

Overall, the results remain consistent. The most conservative estimate for θ_{12} is −0.017. It indicates that the enforcement perception of a respondent residing within 25 km of Chinese project sites is lower by about 1.7 percentage points compared to a respondent who lives outside the 25 km cut-off.

Estimates from Comparing Ongoing and Planned Projects

The estimates from comparing Ongoing and Planned Chinese projects are also presented in Table 1. These are shown by the estimates on $\mathrm{OCP}_{25i} - \mathrm{PCP}_{25i}$. As previously argued, there is non-randomness in the selection of Chinese project sites. Notably, the statistically significant estimates of θ_{34} demonstrate the importance of accounting for non-randomness in the selection of Chinese project sites. Specifically, Chinese aid projects are often located in areas with higher pre-existing TEPs. Neglecting to consider the estimate of PCP_{Di} when interpreting the estimate on OCP_{Di} could lead to an overestimation of the effect of Chinese aid. Therefore, I rely on the $\mathrm{OCP}_{25i} - \mathrm{PCP}_{25i}$ estimates reported in Table 1.

The null hypothesis that the difference $[\mathrm{OCP}_{25i} - \mathrm{PCP}_{25i}]$ is zero is rejected at the 5% level. This is represented by the stars on the estimates of $[\mathrm{OCP}_{25i} - \mathrm{PCP}_{25i}]$, which indicate the p values from the F-test that tests whether the difference $[\mathrm{OCP}_{25i} - \mathrm{PCP}_{25i}]$ is zero. The estimates on $[\mathrm{OCP}_{25i} - \mathrm{PCP}_{25i}]$ suggest that

Table 2 Chinese aid, tax compliance, and tax morale

Cut-off	(1)	(2)	(3)
	25 km	25 km	25 km
Dependent variable	Not refused taxes	Punish non-payers	Tax morale
DID ($OCP_{25i} - PCP_{25i}$)	0.198***	0.217**	0.052***
Observations	73,044	68,812	98,794
R^2	0.036	0.059	0.048
Baseline controls	Yes	Yes	Yes
Endogenous controls	Yes	Yes	Yes
Country FE	Yes	Yes	Yes
Survey year FE	Yes	Yes	Yes
Included Survey Waves	5, 6	5, 6	3, 4, 5, 6

Baseline controls include age, age^2, gender (a male dummy), and place of residence (an urban dummy). Endogenous controls include respondents' education level, employment status, living standards, the perceived performance of the president, interaction with local authorities, and access to public goods. Standard errors are clustered at the Afrobarometer cluster level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

individuals living near a Chinese project are more likely to hold lower TEPs. The preferred estimate is presented in column 5 of Table 1, where I have accounted for all relevant controls. According to this estimate, individuals living close to Chinese project sites are 3.9 percentage points more likely to hold lower TEPs as compared to those residing near planned Chinese project sites. This differs from the baseline estimates reported in the first row of Table 1. These results provide evidence supporting the argument that Chinese aid projects may have an adverse effect on TEPs due to their tendency to foster incidences and norms of corruption.

Chinese Aid, Tax Morale, or Tax Compliance

The findings, thus, far suggest a negative correlation between Chinese aid and TEPs. Previous research has established a positive correlation between tax morale (TM) and enforcement perceptions (e.g., McCulloch et al. 2021; Filippin et al. 2013). In the sample, there is also a positive and statistically significant correlation between tax enforcement and TM. Therefore, it is plausible that the results obtained so far may reflect TM—i.e., perceptions of tax compliance or the probability of being detected and penalized for non-compliance, in addition to enforcement perceptions.

To test whether this is the case in our context, I estimate the main specification using Afrobarometer data on tax compliance and tax morale. The results are reported in Table 2. The findings on tax compliance are presented in columns 1–2, while column 3 reports the result on TM. In all columns, the estimates are from the LPM where the outcome variables are dummies. As can be seen from Table 2, Chinese aid is positively correlated with tax compliance and TM. For instance, the estimate in column 1 of Table 2 shows that a respondent living near an Chinese project is 19.8 percentage points less likely to refuse to pay taxes. One concern may be that the differences in the samples used in Tables 2 and 1 could affect the

comparability of the two sets of results. To address this concern, I re-estimated the results in Table 2 using the same samples as in Table 1.[5] The results are similar, suggesting that the differences observed are not solely due to differences in the samples. In aggregate, Chinese aid exhibits a negative association with perceptions of tax enforcement, while concurrently displaying a positive association with TM or compliance.

Why does Chinese aid seem to be associated with high levels of tax compliance or morale, while at the same time being linked to lower perceptions of tax enforcement? As mentioned earlier, Chinese aid is characterized by a policy of minimal conditions and a demand-driven approach, which affords political leaders in recipient nations more discretion. This allows politicians to reward Chinese projects as political support for a locality without needing to adjust government tax and spending policies, potentially boosting the morale of people in the area and leading to higher tax compliance or morale. However, this discretionary approach also has its downsides. Chinese aid projects may have characteristics associated with corrupt behavior, as highlighted by Isaksson and Kotsadam (2018). This can lead to perceptions among citizens that tax collectors are being paid off, or that state institutions including the tax officials corrupt. Thus, the negative TEPs associated with Chinese aid may reflect citizens' generic perception of the corruption in state institutions, rather than their own tax morale or need for tax compliance.

A similar explanation, which follows from the selectorate model, is that politicians may be incentivized to associate themselves with Chinese aid projects as a means of rewarding local support. While this political strategy may help garner the support of aid beneficiaries, it may also lead to a decline in the government's reputation for tax enforcement. High tax compliance or morale, in the absence of strong tax enforcement, may indicate the presence of patronage networks between the government and citizens. In other words, citizens may comply with tax obligations out of loyalty to political leaders, rather than a genuine belief in the importance of paying taxes for public goods and services. Thus, a respondent may have high tax compliance or morale, even when he or she believes that there is a lower tax enforcement mechanism.

Tax Compliance: Tax compliance refers to the extent to which citizens decide to comply with tax laws. Afrobarometer has two questions that are related to respondents' attitudes towards tax compliance. These questions ask respondents to indicate their perception of the ethical and legal implications of not paying taxes owed on income. I use these variables to categorize respondents as more or less compliant with tax regulations. The first question reads as: "Here is a list of actions that people sometimes take as citizens. For each of these, please tell me whether you, personally, have [Refused to pay a tax or fee to the government]?" The original answers are coded as 4 for "Often," 3 for "Several times," 2 for "Once or twice," 1 for "Would if had the chance" and 0 for "Would never do this." Based on this variable, I create a

[5] The results of this exercise have been omitted to save space but can be made available upon request to the author(s).

dummy of 'Non-Tax Refusal (NRPT)' that takes a value of 1 if the ordinal variable has a value of 0 or 0 if the original variable has a value of 1–4.

Another measure of tax compliance comes from the question that reads as: "I am now going to ask you about a range of different actions that some people take. For each of the following [Not paying the taxes they owe on their income], please tell me whether you think the action is not wrong at all (1), wrong but understandable (2), or wrong and punishable (3)." Based on this question and its answers, I create a dummy of 'Punish Not Paying Taxes (PNPT)' that takes a value of 1 if the original variable has a value of 3 or 0 if the original variable has a value of 1–2.

Tax Morale (TM): TM is the extent of belief a citizen has about paying taxes voluntarily. Afrobarometer asks respondents to indicate their level of agreement or disagreement with the statement, which reflects their moral stance on the legitimacy and power of tax authorities. The question reads as "The tax authorities always have the right to make people pay taxes." This question is answered as 1 for 'Strongly Disagree,' 2 for 'Disagree' 3 for 'Neither Agree Nor Disagree,' 4 for 'Agree,' and 5 for 'Strongly Agree.' Based on this question and its answers, I create a dummy of TM that takes a value of 1 if the answers to the original question are coded as 4–5 or 0 if the original answers are 1–2.

Heterogeneity: Does Regime Type Matter?

The main argument of the paper is that the observed effects are driven by the political bias in Chinese aid allocation and the specific type of political system in which the aid is received. In particular, in the absence of strong institutions such as tax capacity, Chinese aid is more likely to undermine tax enforcement. The idea is derived from the theory of the selectorate, which suggests that political favoritism is less likely to prevail in democratic regimes. This is due to the presence of a larger coalition, which imposes constraints on the utilization of patronage networks. When applied to the present case, the model suggests that the impact of foreign aid on taxes is more pronounced in small coalition systems or in political systems that can be characterized as autocracies. This is because providing private goods, such as patronage, to crucial supporters becomes an optimal political survival strategy in such systems. Conversely, leaders in large coalition systems may maintain political power by offering benefits to all members of society. Thus, as the coalition size increases, the negative effects of foreign aid arising from its political bias will diminish. This implies that the effects are expected to be more noticeable in political systems characterized by low levels of democracy or small political coalitions, commonly referred to as autocracy (De Mesquita et al. 2002).

Therefore, the aforementioned results should exhibit weaker tendencies in democracies. If this is indeed the case, it can be considered as evidence that the effect of Chinese aid stems from its role in facilitating political patronage in autocracies.

Table 3 Chinese aid and tax attitudes by regime type

	Democratic			Non-Democratic		
	(1)	(2)	(3)	(4)	(5)	(6)
Differences in differences (DID)	−0.013	0.015	−0.009	−0.045***	−0.041***	0.0801***
Observations	27,090	27,089	32,784	49,604	49,604	66,009
R^2	0.044	0.093	0.101	0.038	0.064	0.074
Baseline controls	Yes	Yes	Yes	Yes	Yes	Yes
Endogenous controls	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	No	No	Yes	No	No
Region FE	No	Yes	Yes	No	Yes	Yes
Survey year FE	Yes	Yes	Yes	Yes	Yes	Yes
R^2	3, 5, 6	3, 5, 6	3, 5, 4, 6	3, 5, 6	3, 5, 6	3, 4, 5, 6

Baseline controls include age, age^2, gender (a male dummy), and place of residence (an urban dummy). Endogenous controls include respondents' education level, employment status, living standards, the perceived performance of the president, interaction with local authorities, and access to public goods. Standard errors are clustered at the Afrobarometer cluster level. ***$p < 0.01$

To empirically address this inquiry, I use data on democracy versus autocracy from Geddes et al. (2014) and split the sample by regime type to check whether heterogeneity exists along this dimension.[6] In particular, I replicate the main analysis for democratic and non-democratic sub-samples. The results are presented in Table 3. In columns 1, 2, 4, and 5, the dependent variable is the measure of perceived tax enforcement, while in columns 3 and 6, it is the measure of TM. The results indicate that the observed effects hold for non-democratic samples, where the estimates are statistically significant. However, in the case of democratic sub-samples, the estimates are not statistically significant. This suggests that the impact of Chinese foreign aid in augmenting resources available for patronage is more pronounced in non-democratic regimes. Consequently, foreign aid weakens governments' incentives to raise taxes by increasing the resources available for patronage, and this effect is particularly noticeable in small coalition systems. Thus, the effects under investigation have heterogeneity across different regime types and are not independent of regime types.

Robustness Checks

This section reports additional sets of robustness checks. First, I use 50, 75, 100, and 200 km cut-offs as alternative specifications. Second, I undertook a falsification test. I estimate the main specification for non-Chinese-type aid. The same analysis is replicated for World Bank aid and no similar pattern is observed. This exercise helps to sort out the nature of foreign aid that is bad for tax efforts. Finally, I re-estimated the main results for Chinese aid using the original measures of tax attitudes.

[6] The regime types data from Geddes et al. (2014) are accessed at https://sites.psu.edu/dictators/.

Table 4 Chinese aid and tax enforcement (TEP): robustness to other cut-offs

Variables	(1) 50 km	(2) 75 km	(3) 100 km	(4) 200 km
Differences in differences ($OCP_{Di} - PCP_{Di}$)	−0.0340***	−0.0323***	−0.0227***	−0.0136*
Ongoing (OCP_{50i})	−0.008*			
	(0.005)			
Planned (PCP_{50i})	0.026***			
	(0.009)			
Ongoing (OCP_{75i})		−0.009*		
		(0.005)		
Planned (PCP_{75i})		0.023***		
		(0.008)		
Ongoing (OCP_{100i})			−0.009**	
			(0.005)	
Planned (PCP_{100i})			0.014*	
			(0.008)	
Ongoing (OCP_{200i})				0.009*
				(0.005)
Planned (PCP_{200i})				0.022***
				(0.008)
Observations	73,412	71,756	71,374	71,888
R^2	0.040	0.040	0.041	0.040
Baseline controls	Yes	Yes	Yes	Yes
Endogenous controls	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Survey year FE	Yes	Yes	Yes	Yes
Included Survey Waves	3, 5, 6	3, 5, 6	3, 5, 6	3, 5, 6

The dependent variable is a dummy of an individual's subjective assessment of income tax enforcement. Baseline controls include age, age^2, gender (a male dummy), and place of residence (an urban dummy). Endogenous controls include respondents' education level, employment status, living standards, the perceived performance of the president, interaction with local authorities, and access to public goods. Standard errors are clustered at the Afrobarometer cluster level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Estimates for 50, 75, 100, 200 km Cut-offs

The earlier estimates were based on a 25 km cut-off. To assess the robustness of our findings, I re-estimated the results in column 5 of 1 using a 50 km cut-off and presented them in column 1 of Table 4. Remarkably, the results reveal a consistent pattern in the estimates. Specifically, the estimate for $\theta_{12} - \theta_{34}$ at 50 km is −0.0340, which is only slightly lower than the estimate of −0.0387 obtained with a 25 km cut-off. This suggests that the earlier estimates are robust and not sensitive to a slight change in the choice of the cut-off distance.

The identification strategy in this paper relies on two assumptions. First, the selection process for anticipated project locations is not systematic. This assumption is likely to hold for two reasons. First, the political actors in the office are responsible for the planning and execution of aid projects, thereby enhancing confidence in the robustness of our findings. Second, the comparative analysis of four distinct groups of individuals overcomes the potential identification bias stemming from non-random selection in the location of projects. I believe that this enhances the validity of our conclusions and increases the credibility of our analysis.

Nonetheless, it is important to show that differences in project-specific and respondent-specific characteristics do not pose a significant challenge. Specifically, the difference between $K_1 - K_2$ and $K_3 - K_4$ should be negligible: $[K_1 - K_2] - [K_3 - K_4] = 0$. Thus, the first type of information required is showing that groups that receive and do not receive Chinese projects are similar on pre-treatment observables. Table 8 in the "Appendix" presents results from a balance test. Except for the two variables, treated and control groups are similar. Chinese aid is associated with urban and educated respondents. This poses less challenge as the analysis has already controlled for these variables.

The empirical method also requires showing that locations that receive and do not receive Chinese projects are similar on pre-treatment observables. Directly testing this assumption is challenging as it requires knowledge of all relevant (un) observable project-specific and respondent-specific characteristics. To address this, I perform an implicit test by widening the cut-off distance. With a large cut-off distance, the difference between untreated individuals and the treatment group should approach zero. Therefore, we expect $\theta_{12} - \theta_{34}$ to diminish as one moves further away from OCP locations. To check for this, I estimate specification (7) for cut-offs of 50, 75, 100, and 200 km and report the results in columns 1–4 of Table 4. The findings indicate a decline in the size of the estimates as the distance from the project sites increases. This decline supports our identification assumption and suggests that there is no systematic difference between PCP and OCP as one moves further away from OCP locations. Thus, these findings could be regarded as supportive of the validity of the identifying assumption employed for spatial DID.

Estimates with Region Fixed Effects

So far, the analysis has controlled for variations in average tax attitudes over time by including Survey Wave-fixed effects. However, there may also be variations in tax attitudes across different locations. As mentioned earlier, this could pose a challenge if there are differences between areas that receive Chinese projects and those that do not. This section attempts to take these issues into account by including region-fixed effects in the analysis. By doing so, only tax attitudes among individuals within the same region are compared. This helps control for both observable and unobservable differences specific to each region, leaving residual differences in tax attitudes that are more likely attributable to variations in Chinese aid across space.

Table 5 replicates the DID estimates presented in Table 4. The only modification is that Table 5 incorporates region-fixed effects instead of country-fixed effects. The

Table 5 Chinese aid and tax enforcement (TEP) with region FE

Cut-off	(1) 50 km	(2) 75 km	(3) 100 km	(4) 200 km
$OCP_{Di} - PCP_{Di}$	−0.0342**	−0.0373***	−0.0325***	−0.0278 ***
Observations	77,518	75,888	75,658	76,361
R^2	0.070	0.071	0.072	0.071
Baseline controls	Yes	Yes	Yes	Yes
Endogenous controls	Yes	Yes	Yes	Yes
Country FE	No	No	No	No
Region FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Included Survey Waves	3, 5, 6	3, 5, 6	3, 5, 6	3, 5, 6

The dependent variable is a dummy of an individual's subjective assessment of tax enforcement. Baseline controls include age, age^2, gender (a male dummy), and place of residence (an urban dummy). Endogenous controls include respondents' education level, employment status, living standards, the perceived performance of the president, interaction with local authorities, and access to public goods. Standard errors are clustered at the Afrobarometer cluster level. ***$p < 0.01$, **$p < 0.05$

results demonstrate that the findings remain robust even after considering both temporal and spatial variations in tax attitudes.

Estimates for World Bank Aid: As a Falsification Test

Whether the observed effect on tax enforcement is unique to Chinese-type aid or a general pattern is important in understanding the broader implications of our findings. The initial argument was that the features of Chinese aid, such as non-interference in domestic affairs and the lack of conditionality, may contribute to the negative effect on tax enforcement efforts. In contrast, other donors, such as the World Bank, often attach conditions to their aid, which may affect tax enforcement differently.

As observed in past studies such as Dreher et al. (2019), Chinese aid is likely to be located in the birth regions of African leaders. Similarly, it is associated with higher experiences of corruption (Isaksson and Kotsadam 2018). Yet, there has not been evidence that such regional favoritism in Chinese aid has made it ineffective for development (e.g., see Dreher et al. 2021a; Xu et al. 2020). Nonetheless, there is evidence that foreign aid from the US is less effective in the presence of Chinese aid (Dreher et al. 2021b). Since Chinese aid, unlike World Bank aid, has regional favoritism (Dreher et al. 2019), it is likely to be instrumentalized for local patronage networks. Following this, I conducted a falsification exercise to test this hypothesis by replicating our main regression analysis for World Bank aid projects. This exercise helps identify the nature of foreign aid that undermines tax efforts.

Data on World Bank projects come from "World Bank Geocoded Research Release, Version 1.4.2." This geocoded dataset includes all World Bank projects in the IBRD and IDA lending lines approved from 1995 to 2014. It tracks 5684 projects across 61,243 locations in the world. Figure 2 presents the locations of World Bank Projects and Afrobarometer clusters. In the figure, the red dots are the locations of

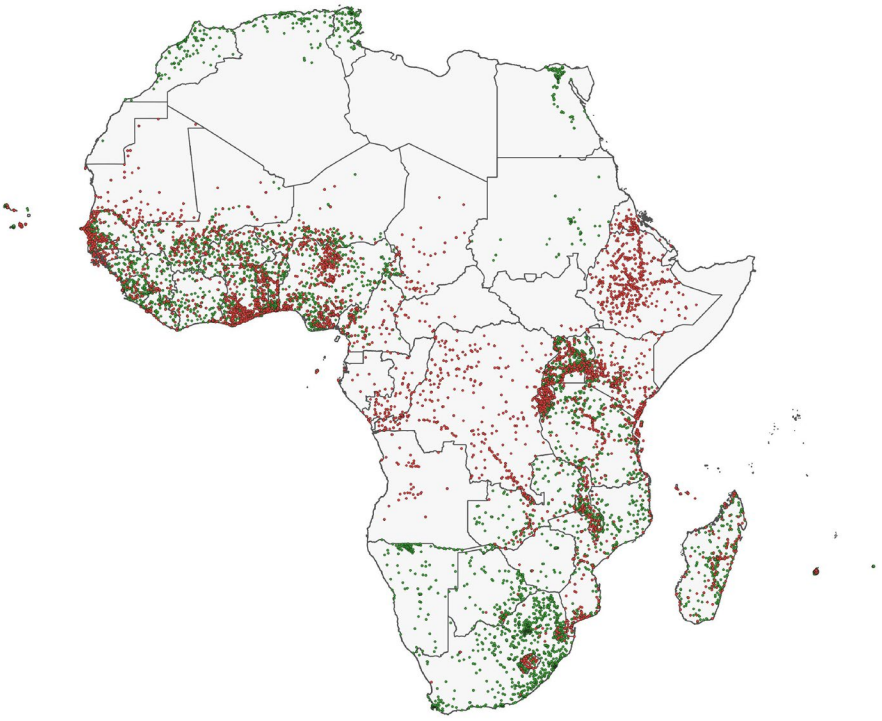

Fig. 2 Locations of World Bank projects and Afrobarometer clusters

World Bank projects, whereas the green dots are the locations of Afrobarometer clusters.

The results from replicating our main regression analysis for World Bank aid projects are reported in Table 6. The DID ($\text{OWBP}_{Di} - \text{PWBP}_{Di}$) estimates for the difference between (OWBP_{Di} and planned PWBP_{Di}) World Bank project are reported in the first row of the table along with p values for the F-test ($\text{OWBP}_{Di} - \text{PWBP}_{Di}$) = 0. In all cases, the null hypothesis that $\text{OWBP}_{Di} - \text{PWBP}_{Di} = 0$ is not rejected. Overall, the results indicate that the estimates for World Bank aid do not suggest a similar pattern in terms of crowding out tax enforcement efforts. This finding supports our initial hypothesis that the effect is peculiar to Chinese-type aid. In sum, our results highlight that foreign aid's tax effort-reducing effect depends on whether it has the potential of ending up in clientelistic local networks.

I also replicate Table 2 for World Bank projects. The results are reported in Table 11 in the "Appendix." There is no significant relationship between WB projects and tax compliance or morale.

Using the Original Measures for Tax Attitudes

Finally, the main analysis uses dummy variables to represent tax attitudes, although the original tax attitude measures are not in the form of dummies. To

Table 6 World Bank aid and tax enforcement (TEP): a falsification test

Variables	(1) 25 km	(2) 50 km	(3) 75 km	(4) 100 km
Differences in differences ($OWBP_{Di} - PWBP_{Di}$)	0.0107	0.0194	0.0129	0.0201
p value for F-test on $OWBP_{Di} - PWBP_{Di} = 0$	[0.255]	[0.0913]	[0.330]	[0.240]
Ongoing ($OWBP_{25i}$)	−0.003			
	(0.005)			
Planned ($PWBP_{25i}$)	−0.014			
	(0.010)			
Ongoing ($OWBP_{50i}$		0.006		
		(0.007)		
Planned ($PWBP_{50i}$)		−0.013		
		(0.012)		
Ongoing ($OWBP_{75i}$)			−0.016**	
			(0.008)	
Planned ($PWBP_{75i}$)			−0.029**	
			(0.014)	
Ongoing ($OWBP_{100i}$)				−0.017*
				(0.009)
Planned ($PWBP_{100i}$)				−0.037**
				(0.018)
Observations	73,341	74,269	76,020	77,133
R^2	0.040	0.040	0.040	0.039
Baseline controls	Yes	Yes	Yes	Yes
Endogenous controls	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Survey year FE	Yes	Yes	Yes	Yes
Survey Waves	3, 5, 6	3, 5, 6	3, 5, 6	3, 5, 6
Difference in difference				

The dependent variable is a dummy of an individual's subjective assessment of income tax enforcement. Baseline controls include age, age^2, gender (a male dummy), and place of residence (an urban dummy). Endogenous controls include respondents' education level, employment status, living standards, the perceived performance of the president, interaction with local authorities, and access to public goods. Standard errors are clustered at the Afrobarometer cluster level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

check whether this affects the results, I re-estimated the main results presented in Tables 1 and 2 using the original measures of tax attitudes. In Table 10, in the "Appendix," I report results using the original measures instead of the dummies. The results are robust to using the original measures.

Conclusion

The increasing Chinese presence in Africa has brought about alternative sources of finance, political alliance, trade, and foreign aid. However, the Sino-Africa relationship is not without controversy. One of these debates lies in whether the net effect of Chinese aid is positive or negative. Unlike Western aid, Chinese aid is aid with no conditionalities as China follows a policy of non-interfering inside aid-receiving nations' domestic affairs (Wang and Elliot 2014). This unconditionality has been found to make Chinese aid rampantly corrupted at a sub-national level in Africa, whereas World Bank's aid has no such an effect (Isaksson and Kotsadam 2018). Even worse is that the conditionality of the World Bank gets less stringent in the presence of China (Hernandez 2017). In particular, a World Bank aid project co-located with a Chinese project is more likely to be corrupted (Brazys et al. 2017). Likewise, Chinese aid is found to inhibit economic reforms (Brazys and Vadlamannati 2021). Moreover, Chinese aid is found to make aid from countries such as the United States less effective (Dreher et al. 2021b). Furthermore, Chinese aid follows a demand-driven approach, where African leaders receive aid in response to their requests. This is perhaps one reason why Chinese aid project is more likely to be placed in the birthplaces of African regions (Dreher et al. 2019). All of these raise important questions regarding the potential externalities of Chinese aid projects in Africa.

This paper examines the impact of Chinese aid projects on tax related attitudes in Africa. Chinese aid provided to African countries is characterized by a policy of minimal conditions and a demand-driven approach. This approach affords political leaders in recipient nations more discretion, potentially reflecting China's own development trajectory, and allows for the implementation of development projects at a faster pace. However, these attributes also render Chinese aid vulnerable to corruption by government officials, as it may be used to serve domestic political objectives. This paper contends that such conditions may give rise to negative perceptions among citizens towards the government's ability to enforce taxes, as corrupt behavior among state officials erodes public trust in the performance of tax enforcement authorities. Drawing from the selectorate theory of political survival, I hypothesize that Chinese aid projects undermine tax enforcement perceptions, as the provision of aid may decrease the political incentives to tax core supporters. To test this claim, I match geocoded foreign aid data with the Afrobarometer surveys and apply a spatial–temporal DID identification strategy that exploits the timing of Afrobarometer surveys. Using such a method that compares ongoing and planned aid projects, I find intriguing results. I have found evidence suggesting that Africans living close to Chinese aid projects hold negative perceptions of tax enforcement, but display higher tax morale or compliance. However, when I replicated the same analysis using World Bank projects, I did not observe a similar pattern. One possible explanation for these results pertains to the political bias in Chinese aid, which traps it within patronage networks between the government and citizens. Political leaders may reward a locality with Chinese aid in exchange for citizens' support which manifests itself in the form of

tax compliance. Therefore, citizens comply with tax authority not out of a civic duty to contribute to public goods and services, but as a means of demonstrating loyalty and gaining access to benefits. Such networks can lead to high tax compliance or morale, even when enforcement is weak or perceptions of enforcement are low. Overall, the results suggest that Chinese aid projects in Africa can harm the government's image on tax enforcement but have a minimal effect on tax morale or compliance. The findings suggest a tradeoff associated with Chinese aid. On one the hand, it promotes compliance among beneficiaries. On the other hand, it engenders weak tax enforcement perceptions. The implication is that if the negative consequences outweigh the positive ones, Chinese aid has the potential to undermine the government's reputation for fiscal responsibility, which in turn poses challenges to the development of state capacity through robust fiscal contracts.

This study contributes to the literature on the impact of Chinese aid and highlights the need for greater attention to the potential negative externalities of aid in recipient countries. The findings have important policy implications for both Chinese aid donors and African governments. Chinese aid should be designed in a way that promotes transparency, accountability, and good governance. Such an approach mitigates the risk of Chinese aid being ensnared in perpetuating patronage politics, thus enhancing the potential for Chinese aid to effectively attain its development objectives. African governments should also take steps to improve their tax enforcement efforts and reduce their reliance on aid as a source of revenue. This could include improving tax administration, enhancing tax compliance, and promoting economic diversification. Moreover, the results contribute to the growing literature on the varying effects of aid on state–society relations, highlighting the need to consider the nature of the donor in understanding the implications of aid. Specifically, the results suggest that the negative effects of aid on tax enforcement are more behavioral, rather than simply a result of financial competition. Policy reforms associated with the conditionality of aid may help neutralize these negative effects. Overall, the findings underscore the importance of carefully examining the nature of aid and its potential impact on domestic institutions and governance.

The paper provides interesting issues for further study. First and foremost, the paper relies on the subjective evaluation of tax enforcement. Thus, they do not necessarily imply lower tax payments and may not affect government tax behavior more generally. Conversely, the results should be interpreted within the framework that foreign aid has the potential to influence government behavior, which in turn can affect citizen behavior and ultimately be reflected in state behavior. This means that the findings may not necessarily imply a direct causal link between Chinese aid and reduced tax revenue. Rather, they suggest a complex interplay between foreign aid, government behavior, and citizen behavior that requires further investigation. Second, while the study provides important insights into the impact of Chinese aid on tax enforcement behavior, further research is needed to better understand the mechanisms behind the findings. Third, future studies could explore the role of political connections, local institutions, and other factors that may affect the relationship between Chinese aid and tax enforcement behavior. This study underscores the importance of considering potential negative externalities when designing aid programs, particularly in the context of developing

Table 7 Summary statistics by project status

	Ongoing				Planned			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		Ongoing = 0		Ongoing = 1		Planned = 0	Planned = 1	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
For 25 km								
Tax Enforcement	0.158	0.365	0.168	0.374	0.162	0.369	0.0903	0.287
Tax Morale	0.795	0.404	0.806	0.395	0.799	0.401	0.743	0.437
Not Refused Paying Taxes	0.727	0.445	0.735	0.441	0.729	0.444	0.436	0.502
Punish Not Paying Taxes	0.530	0.499	0.561	0.496	0.537	0.499	0.289	0.460
Bribed Police	0.195	0.397	0.251	0.434	0.209	0.407	0.116	0.320
Bribed for Documents	0.202	0.402	0.241	0.428	0.212	0.409	0.141	0.348
Economic Standing	2.833	1.010	2.943	1.015	2.854	1.012	2.841	1.016
Urban	0.332	0.471	0.710	0.454	0.397	0.489	0.574	0.494
Male Dummy	0.499	0.500	0.499	0.500	0.499	0.500	0.499	0.500
Education	3.103	2.104	4.032	2.067	3.270	2.131	3.514	2.000
Employment Status	1.313	1.385	1.509	1.348	1.338	1.367	1.789	1.752
Public Goods Index	3.114	1.719	3.691	1.683	3.215	1.728	3.453	1.683
Government Performance	2.773	0.983	2.660	0.974	2.748	0.982	2.872	0.980
Age	37.09	14.63	36.02	13.95	36.94	14.52	35.02	14.09
Age	15.89	13.08	14.92	12.16	15.75	12.93	14.25	12.21

countries where aid plays a crucial role in development. One issue is that self-reported responses do not measure tax performance or actual behavior, but rather TM—perceptions of tax compliance or the likelihood of being caught and punished for non-compliance. While this issue should not be ignored, self-reported responses can provide valuable insights into government behavior. It is important to note that foreign aid is typically given to governments rather than individuals, and can potentially affect citizens' perceptions of their government's behavior. According to a recent review by Blair and Winters (2020), foreign aid may weaken citizen confidence in the state, mainly due to its impact on state behavior. Therefore, within such a framework, citizens' subjective tax assessments may indeed reflect the government's efforts towards taxation. However, a more robust approach would be to obtain actual data on tax and directly examine the effect of Chinese aid on tax enforcement behavior.

Appendix

Table 7 reports variables used in this study. The discussion of how each of these variables is constructed is given in this section.

Urban dummy This is a variable that takes a value of 1 if a respondent lives in an urban area or 0 if the respondent lives in a rural area.

Local Public goods index This variable is constructed as a summative index of dummies showing the availability of electricity, school, health center, market, sewage, and pipe water in the Enumeration Area of the Afrobarometer surveys.

Education In the Afrobarometer, education is coded on a scale from 0 (no schooling) up to 9 (postgraduate education). Thus, higher values on this indicator show a higher education level.

Employment status Employment status is based on the question, "Do you have a job that pays cash income? Is it full-time or part-time? And are you presently looking for a job (even if you are presently working)?" The answers are 0 for "No (not looking)," 1 for "No (looking)," 2 for "Yes, part-time (not looking)," 3 for "Yes, part-time (looking)," 4 for "Yes, full time (not looking)" and, 5 for "Yes, full time (looking)."

Perceived Economic Standing The measure of perceived equality comes from the question that asks "In general, how do you rate your living conditions compared to those of other (Batswanians/kenyanias...?" The answers have a code 1 for "Much worse, 2 for "Worse," 3 for "Same," 4 for Better," and 5 for "Much better." From this variable, I create a dummy measure of perceived equality that equals 1 if the individual feels her or his living condition is the same as other countrymen, and 0 if she or he feels "Much worse, Worse, Better, Much better."

Corruption experience Afrobarometer asks questions on experiences of bribing. In particular, the survey asks respondents if they, in the preceding year, have "had to pay a bribe in order to get a document or a permit or avoid a problem with the police (avoid a fine or arrest or pass a checkpoint)." The responses to these questions range between 0 and 3, which consecutively captures the response categories 'Never,' 'Once or twice,' 'A few times,' and 'Often.' I use these Afrobarometer questions on experiences with bribes to generate two binary variables that show if the respondent has encountered the described situations at least once in the past year. I refer to these variables as bribing the police or bribing for a document.

Government Performance "Do you approve or disapprove of the way that the following people [The President] have performed their jobs over the past twelve months, or haven't you heard enough about them to say?" Relevant answers are coded as 1 for "Strongly Disapprove," 2 for "Disapprove," 3 for "Approve," and 4 for "Strongly Approve." See Tables 8, 9, 10, 11 and 12.

Table 8 Balance table

	(1) Mean/(SE)	(2) Mean/(SE)	(3) Mean difference
Panel A: Ongoing ODA-like Chinese projects			
	$OCP_{25i} = 0$	$OCP_{25i} = 1$	(2) − (1)
Age	37.018	36.097	−0.921***
Age2	15.770	14.900	−0.870***
Male	0.513	0.511	−0.002***
Urban	0.329	0.758	0.429***
Education	3.152	4.207	1.055***
Employed	0.568	0.645	0.077***
Economic standing	0.324	0.340	0.016
Public Goods Index	0.943	0.977	0.034***
Performance	0.176	0.239	0.063***
Bribed Police	0.212	0.259	0.047***
Bribed for ID	0.209	0.246	0.036***
F-test of joint significance (*F*-stat)			33.307***
Panel B: Planned ODA-like Chinese projects			
	$PCP_{25i} = 0$	$PCP_{25i} = 1$	(2) − (1)
Age	36.931	34.400	−2.532***
Age2	15.676	13.737	−1.939***
Male	0.513	0.505	−0.008
Urban	0.393	0.628	0.235***
Education	3.317	3.622	0.305***
Employed	0.582	0.601	0.019
Economic standing	0.326	0.366	0.040
Public Goods Index	0.948	0.947	−0.002
Performance	0.185	0.220	0.035
Bribed Police	0.222	0.135	−0.088
Bribed for ID	0.217	0.163	−0.054
F-test of joint significance (*F*-stat)			1.712*

Panel A presents the observed mean difference for groups residing within ($OCP_{25i} = 1$) and outside ($OCP_{25i} = 0$) a 25 km radius of Ongoing ODA-like Chinese projects. The *F*-test of joint significance (*F*-stat) indicates a significant difference between the two sets of groups. Panel B presents the observed mean difference for groups residing within ($PCP_{25i} = 1$) and outside ($PCP_{25i} = 0$) a 25 km radius of Planned ODA-like Chinese projects. The *F*-test of joint significance (*F*-stat) suggests only a weak difference between the two sets of groups. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Table 9 Chinese aid and tax enforcement: main estimates with controls

Cut-off	(1) 25 km	(2) 25 km	(3) 25 km	(4) 25 km	(5) 25 km
Ongoing (OCP_{25i})	−0.019***	−0.027***	−0.013**	−0.026***	−0.017***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Planned (PCP_{25i})	0.070***	0.063***	0.117*	0.064***	0.021*
	(0.012)	(0.012)	(0.062)	(0.013)	(0.013)
$OCP_{25i} - PCP_{25i}$	−0.0892***	−0.0896***	−0.130**	−0.0896***	−0.0387**
Age		−0.000	−0.000	−0.000	−0.001
		(0.000)	(0.001)	(0.000)	(0.000)
Age^2		0.000	−0.000	0.000	0.001
		(0.000)	(0.001)	(0.001)	(0.001)
Male dummy		0.012***	0.016***	0.005**	0.005**
		(0.002)	(0.003)	(0.002)	(0.002)
Urban dummy		0.017***	0.026***	0.004	0.004
		(0.004)	(0.004)	(0.005)	(0.004)
Education				0.005***	0.004***
				(0.001)	(0.001)
Employment status				−0.002*	0.000
				(0.001)	(0.001)
Economic standing				0.009***	0.009***
				(0.002)	(0.002)
Public goods				0.004***	0.004***
				(0.001)	(0.001)
Govt performance				0.000	0.003
				(0.002)	(0.002)
Contacted local councilor				0.006***	0.007***
				(0.002)	(0.002)
Observations	92,970	92,260	71,531	76,694	76,694
R^2	0.001	0.029	0.026	0.033	0.039
Baseline controls	No	Yes	Yes	Yes	Yes
Endogenous controls	No	No	No	Yes	Yes
Country FE	No	Yes	Yes	Yes	Yes
Survey year FE	No	No	No	No	Yes
Included Survey Waves	3, 5, 6	3, 5, 6	5, 6	3, 5, 6	3, 5, 6

The dependent variable is a dummy of an individual's subjective assessment of income tax enforcement. Baseline controls include age, age^2, gender (a male dummy), and place of residence (an urban dummy). Endogenous controls include respondents' education level, employment status, living standards, the perceived performance of the president, interaction with local authorities, and access to public goods. Standard errors are clustered at the Afrobarometer cluster level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Table 10 Chinese aid and tax attitudes: robustness using the original measures

Variables	25 km	25 km	25 km	25 km
DID ($OCP_{25i} - PCP_{25i}$)	−0.135***	0.178***	0.347***	0.132***
Observations	76,694	73,044	68,812	108,520
R^2	0.049	0.034	0.063	0.056
Baseline controls	Yes	Yes	Yes	Yes
Endogenous controls	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Waves	3, 5, 6	5, 6	5, 6	3, 4, 5, 6

The dependent variable is tax enforcement perceptions in column 1, Not Refused to pay taxes in column 2, Punish Non-tax complaint in column 3, and tax morale in column 4. Baseline controls include age, age^2, gender (a male dummy), and place of residence (an urban dummy). Endogenous controls include respondents' education level, employment status, living standards, the perceived performance of the president, interaction with local authorities, and access to public goods. Standard errors are clustered at the Afrobarometer cluster level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Table 11 World Bank aid, tax compliance, and tax morale

Cut-off	(1)	(2)	(3)
	25 km	25 km	25 km
Dependent variable	Not refused taxes	Punish non-payer	Tax morale
$OWBP_{25i} - PWBP_{25i}$	0.0314	−0.0315	−0.0196
Observations	68,843	64,528	103,577
R^2	0.037	0.060	0.053
Baseline controls	Yes	Yes	Yes
Endogenous controls	Yes	Yes	Yes
Country FE	Yes	Yes	Yes
Survey year FE	Yes	Yes	Yes
Included Survey Waves	5, 6	5, 6	3, 4, 5, 6

Baseline controls include age, age^2, gender (a male dummy), and place of residence (an urban dummy). Endogenous controls include respondents' education level, employment status, living standards, the perceived performance of the president, interaction with local authorities, and access to public goods. Standard errors are clustered at the Afrobarometer cluster level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Table 12 Afrobarometer samples by country and Survey Waves

	(Round 3)				(Round 5)				(Round 6)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	TEP	NRPT	PNPT	TM	TEP	NRPT	PNPT	TM	TEP	NRPT	PNPT	TM
Benin	1134	0	0	944	976	1132	1189	967	1076	1185	1197	1105
Botswana	1109	0	0	932	742	1080	1026	1012	714	907	881	851
Cape Verde	613	0	0	506	545	588	594	537	383	437	418	393
Ghana	1104	0	0	1045	1992	2350	2337	2267	1895	2315	2271	2209
Kenya	857	0	0	667	1202	1303	1306	1221	1504	1717	1677	1537
Lesotho	717	0	0	561	496	748	703	691	573	762	744	648
Madagascar	1279	0	0	910	862	1062	1008	821	1099	1186	1188	1107
Malawi	1146	0	0	1031	2109	2347	2331	2248	2127	2336	2296	2252
Mali	1113	0	0	1037	1099	1189	1193	1126	1154	1192	1190	1105
Mozambique	1060	0	0	879	1838	2165	1800	1856	1897	2181	2027	1781
Namibia	1145	0	0	831	697	1087	1094	946	805	1053	1048	962
Nigeria	2219	0	0	1834	2045	2274	2267	2038	2062	2328	2242	1934
South Africa	2117	0	0	1657	1746	2334	2258	1914	1866	2310	2275	2101
Senegal	1113	0	0	979	977	1131	1155	1081	846	1156	1162	1108
Tanzania	1188	0	0	981	2085	2279	2239	2160	2157	2220	2195	2007
Uganda	2364	0	0	2101	2100	2228	2292	2160	2023	2311	2278	2206
Zambia	1021	0	0	869	912	1071	1033	1010	687	1028	954	991

Table 12 (continued)

	(Round 3)				(Round 5)				(Round 6)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	TEP	NRPT	PNPT	TM	TEP	NRPT	PNPT	TM	TEP	NRPT	PNPT	TM
Zimbabwe	1013	0	0	878	1912	2298	2212	2022	1741	2267	2189	2029
Algeria					0	1012	0	828	494	659	648	533
Burkina Faso					994	1116	1126	997	1049	1169	1181	1077
Burundi					990	1089	1099	1006	1041	1168	1148	1055
Cameroon					908	1102	1127	1051	1012	1162	1128	1114
Cote D'Ivoire					979	1164	1121	1082	975	1165	1169	1098
Egypt					0	947	0	829	371	669	645	520
Guinea					1060	1147	1115	1064	1065	1172	1176	1125
Liberia					945	1115	1043	1081	959	1135	1124	1112
Mauritius					888	1041	1029	904	774	1006	994	915
Morocco					0	1142	0	934	768	1113	1082	930
Niger					994	1162	1125	1090	1004	1158	1151	1072
Sierra Leone					1121	1174	1154	1100	820	1155	1111	1101
Sudan					0	906	0	866	660	770	735	677
Swaziland					875	1085	1079	998	841	1133	1109	1059
Togo					971	1044	1058	1000	996	1107	1117	1092
Tunisia					0	1052	0	1002	1042	1097	1099	1077
Gabon									1034	1143	1144	1126
São Tomé and Príncipe									949	1057	1063	1030

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Declarations

Conflict of interest The author is not aware of any potential conflicts of interest.

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