The Impact of Chinese Aid on Political Trust *

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December 13, 2021

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Abstract

This paper examines whether Chinese aid fuels citizens' trust in government by matching geocoded data on Chinese aid projects located in Ghana from 2000 and 2014 to 8,157 respondents from rounds 2 to 6 of Afrobarometer survey. The results indicate that Chinese aid fuels trust in the ruling party. The findings do not suggest that Chinese aid projects are intentionally sited in locations where the ruling government has support. The effect on trust appears to be partly due to the improvement in living conditions of individuals living close to active Chinese aid project sites.

Keywords: Chinese aid, Ghana, Political trust, Afrobarometer, Geocoded data,

JEL classification: C31; D72; F35, I31

*To be revised based on reviewers' comments and re-submitted to the Journal of International Development

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1 Introduction

The multi-faceted impacts associated with international aid flows have received tremendous attention in research; nevertheless, researchers draw contrasting conclusions on its effectiveness, especially to recipient economies; thus, making aid research a quite controversial field (Qian, 2015). Advocates for aid contend that it is essential for poverty eradication (Sachs, 2006), however, critics argue contrarily that foreign aid may not be associated with any considerable positives and could rather degrade institutions and hinder progress in recipient economies (Deaton, 2013; Easterly, 2008; Knack, 2001). Despite the unsettled contention, foreign aid flows have increased unperturbedly, new major donors have arisen and altered the nature and flow of aid; and thus, kindled the need for continuous research on foreign aid flows. China is undoubtedly the most important major donor to have arisen in recent years, issuing development assistance that rivals that of the traditional Western donors (Dreher et al., 2011, 2018, 2021b). The rise in Chinese development assistance[1] has drawn expected inquiry into the motive for these flows and their impacts. China's approach as a donor has been hailed as effective in meeting the needs of recipient countries and is associated with less bureaucratic requirements (Brautigam, 2011; Fuchs et al., 2015). Critics, however, assert that Chinese aid is self-seeking, directed to developing economies with the purpose of gaining commercial advantages for its domestic firms and stimulate institutional inefficiencies in order to access natural resource deposits (Kaplinsky et al., 2007; Marantidou and Glosserman, 2015; Tan-Mullins et al., 2010; Tull, 2006) and therefore makes it detrimental to the economic performance of recipient countries (Crouigneau and Hiault, 2006; Onjala, 2018). Considering these mixed findings, much evidence is, therefore, desirable to obtain a clear understanding of Chinese development assistance but efforts had been significantly hindered by China's reluctance in disclosing in-depth information on their development assistance, leading to some level of speculative conclusions by researchers. The release of a new dataset by AidData (Bluhm et al., 2018) on China's official financing has consequently engendered a rising number of empirical studies on Chinese aid.

In this study, I examine whether Chinese aid impacts political trust[2]. Specifically, I assess whether Chinese aid projects cause citizens to develop greater levels of trust in the ruling

[1] Subsequently, Chinese development assistance is interchangeably used with Chinese aid
[2] Subsequently, political trust is interchangeable used with trust

party. Focusing on Ghana in this study is consequential. Ghana is one of the top 10 recipients of Chinese aid, having received aid worth about $2.5 billion[3] which has led to the implementation of 95 Chinese aid projects in Ghana; some of these projects are, however, yet to be implemented. The high volume of Chinese aid flows to Ghana makes it a good candidate for analyzing this yet to be explored impact of Chinese aid. Accordingly, I match geocoded data on Chinese aid projects located in Ghana between 2000 to 2014 to 8,025 respondents from rounds 2 to 6 of Afrobarometer survey and assess the differences in respondents' level of trust in the ruling party based on their proximity to Chinese aid project sites. I conduct a difference-in-difference type of analysis by comparing the responses of individuals living close to sites where a Chinese aid project is under implementation during the time of the survey (active sites) to those living close to a site where a Chinese aid project is scheduled to be located but implementation had not commenced at the time of the survey (inactive sites). The findings robustly affirm that Chinese aid induces greater levels of trust in the ruling party. Particularly, compared to individuals living close to inactive sites, those living close to active sites are more likely to indicate trust in the ruling party. Further, the findings do not indicate that Chinese aid projects are intentionally sited in locations where the ruling government has support. The observed influence is apparently due to the improvement in the living conditions of individuals living close to project sites.

This paper falls within the recently emerging studies using geocoded data on Chinese aid project locations around the world (Brazys and Vadlamannati, 2021; Cruzatti C et al., 2020; Dolan and McDade, 2020; Dreher et al., 2021b; Guo and Jiang, 2020; Knutsen and Kotsadam, 2020; Sanfilippo et al., 2020). This paper, therefore, contributes to this field of literature.

More importantly, to the best of my knowledge, this paper is the first to use geocoded data on Chinese development finance to examine how exposure to Chinese aid influences citizenry political trust. Consequently, the findings provide novel insight into the impacts Chinese aid is having in Ghana and also adds to the limited studies on the relationship between Chinese aid and citizenry perceptions and attitudes (Huang and Cao, 2019; Isaksson, 2020; Knutsen and Kotsadam, 2020; Xu and Zhang, 2020).

[3] AidData: https://www.aiddata.org/china-official-finance

2 Literature Review

2.1 Political Trust

Political trust, as Hetherington explains, is a "a basic evaluative orientation toward the government founded on how well the government is operating according to people's normative expectations" (Hetherington, 1998, pg. 791). This explanation suggests that citizens are more likely to trust the government if their expectations of the government are met. Accordingly, a considerable number of studies show that citizens' trust in the government is determined by their perception of governments' performance in meeting perceived expectations (Espinal et al., 2006; Hetherington, 2005; Mishler and Rose, 2001; Wolak and Palus, 2010, see). It, therefore, seems plausible to argue that citizens' trust in government is significantly influenced by the economic and political situation in the country. For instance, when individuals support the party in power, they are more likely to trust the national government (Critin, 1974; Hetherington and Rudolph, 2015; Keele, 2005). Individuals also exhibit stronger trust when the economic conditions are better (Chanley et al., 2000; Keele, 2007; Weatherford, 1984). Uslaner (2001) finds that personal finance and the extent of the rich-poor income gap are also determinants of trust in the national government. Thus, there is considerable evidence that supports the assertion that economic and political conditions are significant determinants of trust in national governments.

At the state/provincial level of governance, the evidence, however, is mixed. Though evidence for trust in national government shows that individuals are more likely to exhibit trust when their political party is in power, it has not been found to always hold for the state-level government (Banda and Kirkland, 2018; Flavin, 2013; Banda and Kirkland, 2018). A consensus is also yet to be established on the role of economic conditions. More recently, (Wolak, 2020) finds that individuals are more likely to trust the state government if they witness improvement in their economic situation and observe improvement in the employment rate in the state. The significant role of economic conditions is also found true in Latin American neighborhoods (Córdova and Layton, 2016). Banda and Kirkland (2018), however, observe a negative correlation between perception of the national economy and trust in state government. The findings are mixed in other related studies (Farnsworth, 1999; Flavin, 2013; Kelleher and Wolak, 2007; Weinschenk and Helpap, 2015; Wolak and Palus, 2010, see).

2.2 Chinese Aid and Political Trust

Considering the evidence on the determinants of citizenry trust in government, a cogent argument can be made for the existence of a causal relationship between aid and trust. If citizens' trust in the national government is to a large extent determined by government meeting their expectations, then channeling foreign aid into projects expected by citizens is likely to influence their trust in the national government. If a citizen expects the government to provide good roads and other social infrastructure, such an individual is likely to trust more in a government that provides such amenities. This relationship is what this paper seeks to evaluate.

Between 2000 and 2014, a total of 95 projects located in Ghana have been funded by aid from China (Dreher et al., 2021b). These Chinese aid projects have the potential of impacting the livelihood and welfare of citizens. Thus, as they witness the implementation of these projects, their public attitude towards the national government is likely to be influenced. Chinese aid has been found to stimulate short-term economic growth (Dreher et al., 2021b) and development in beneficiary economies (Dreher et al., 2021a). However, using geocoded data on Chinese aid project sites, Isaksson and Kotsadam (2018a) find that Chinese aid doesn't exert any significant impact on local economic activity at the subnational level. Brazys and Vadlamannati (2021) also add that Chinese development outflows hinder economic reforms in recipient countries, unlike development flows from the West.

Nevertheless, studies that analyze the localized effects of Chinese aid projects provide convincing evidence that suggests that Chinese aid projects have significant effects on the welfare of locals living close to project sites, though characterized by some nuances. These findings outline that Chinese aid improves infant mortality [4] and education (Sanfilippo et al., 2020) and local employment (Guo and Jiang, 2020). These findings, therefore, suggest that Chinese aid projects impact citizenry livelihood, particularly, those living close to project sites. If this holds, then the public attitude of individuals living close to these project sites is likely to be influenced. This hypothesis is buttressed by studies that find significant peculiarities in the attitude of people living close to Chinese aid project sites. For instance, people living close to Chinese aid project sites have a positive perception of China Xu and Zhang (2020);

[4] Cruzatti C et al. (2020), however, argue that Chinese aid rather decreases infant mortality at the country level but increases it at the subnational level

prefer economic experts to run the economy (Huang and Cao, 2019); refrain from involvement in trade unions (Isaksson and Kotsadam, 2018b); more likely to identify in ethnic terms (Isaksson, 2020) and are exposed to widespread corruption (Isaksson and Kotsadam, 2018a). Against this background, it is therefore interesting to analyze the nexus between Chinese aid and the citizenry's trust in the national government. As people get exposed to Chinese aid projects, are they more or less likely to trust the government?

3 Data and Estimation Strategy

3.1 Data

To estimate the impact of Chinese aid on trust, I geographically match Chinese aid projects in Ghana between the years 2000 and 2014 to 8,127 respondents from rounds 2-6 of Afrobarometer surveys in Ghana conducted over the period 2002 to 2014. The data on Chinese aid projects in Ghana is sourced from AidData's Geocoded Global Chinese Official Finance Dataset (Version 1.0.1) (Bluhm et al., 2018). The dataset covers Chinese foreign aid projects located across various regions of the world. In the absence of sufficiently reliable information on Chinese foreign aid outflows largely due to China's reluctance in disclosing this information, Bluhm et al. Bluhm et al. (2018) employ a media-based Tracking Underreported Financial Flows (TUFF) methodology to collect data on Chinese financial outflows to other nations[5]. Each project in the dataset is assigned latitude and longitude coordinates, thus the location of each project site is identifiable. These locations are, however, at varying levels of precision. The precision levels range from 1 to 8 in a decreasing level of granularity or precision. Following Dreher et al. (2019), I only consider precisions levels 1 to 4; where 1 is representative of coordinates corresponding to an exact location; 2 means that the specified location is near, in the "area" of, or up to 25 km away from the exact location; locations assigned precision level of 3 is indicative that the location is, or is analogous to, a second-order administrative division (ADM2), such as a district or municipality; while precision level 4 relates to a first-order administrative division (ADM1), such as a province or state.

AidData classifies Chinese projects as either Official Development Assistance (ODA), Other Official Flows (OOF) or Vague Flows (VF). ODA is aid flows from official agencies to devel-

[5]see Strange et al. (2017) for a detailed discussion on the TUFF methodology

oping economies that are listed in DAC's ODA recipients. These flows should be aimed at improving welfare and economic development and must be concessional with a grant element of 25% or more[6]. Flows that do not meet the requirements of ODA are labeled as OOF; VF is a third category added by AidData to classify flows that do not qualify to be categorized as ODA or OOF. Since this study focuses on the impacts of Chinese aid, only aid projects classified as ODA are considered.

Identifying the local impact the implementation of aid projects has on citizens' trust in the ruling party requires the identification of the start and end dates of each project. Thus, projects whose start and end dates are not available, even after a manual search for these dates, are dropped from the sample. This limits the sample to a total of 16 projects in 36 locations in Ghana. Table 1 presents the sectoral decomposition of the projects.

Table 1: Sectoral Distribution of Chinese Aid Projects

Sector	Frequency	Percentage
Communications	9	25
Education	3	8.33
Energy Generation and Supply	4	11.11
Government and Civil Society	3	8.33
Health	4	11.11
Non-food commodity assistance	1	2.78
Other Social infrastructure and services	3	8.33
Transport and Storage	9	25
Total	36	100

The point coordinates of the Chinese aid projects are matched to the point coordinates of respondents of the Afrobarometer survey. The Afrobarometer surveys are nationally representative surveys conducted to gather public perceptions on democracy, governance, the economy and society in African countries[7] and is a widely accepted data for empirical analyses of public attitude (Depetris-Chauvin et al., 2020; Huang and Cao, 2019; Isaksson and Kotsadam, 2018a,b) The point coordinates in the Afrobarometer data refer to enumeration areas (EA) of the survey, which are villages, towns or neighborhoods. I follow Knutsen et al. (2017) to conduct this matching process. I measure the distance between the location of Chinese projects and the center points of the enumeration areas and analyze the perception of respondents in enumeration areas that fall within a specified cut-off distance from at least

[6]OECD-DAC Glossary of Key Terms and Concepts: https://www.oecd.org/dac/dac-glossary.htm#ODA
[7]https://afrobarometer.org/about

one Chinese aid project location. Figure 1 depicts the location of Chinese aid projects and Afrobarometer survey EA.

In gathering the data, respondents were asked how much they trust the ruling party, guided by the following response categories; 0 "Not at all", 1 "Just a little", 2 "Somewhat", 3 "A lot". To measure political trust, I code the responses into a dummy variable which equals 1 for any extent of trust in the ruling party (response categories 1-3) and 0 for no level of trust. In the estimations, I also include the ordinal response variable ranging from 0-4. The independent variables of interest concentrate on respondents living within 50 km, which is the specified cut-off distance, of a Chinese aid project location. I compare the extent of trust of respondents living close to a project site where the implementation of the project was ongoing when the Afrobarometer survey was conducted (active sites) to respondents living close to sites where projects will be sited in the future but implementation had not commenced at the time of the survey (inactive sites). From Appendix 1, 6.2% of respondents live within 50 km of an active project site while 19.2% live within inactive project sites.

3.2 Estimation Strategy

It is unconvincing to assume that the distribution of Chinese aid projects in Ghana is random. The non-random distribution of these aid projects suggests that some locations and their inhabitants characterized by certain features will relatively be more likely to receive aid than other locations. The implementation of aid projects takes place with the cooperation of ruling governments, hence, ruling governments could influence location choice. This suggests that the location of aid projects is likely to be influenced by pre-existing levels of trust in the ruling party. For instance, aid projects could be sited, as a reward, in locations that have shown massive support for the ruling government. In such areas, the level of trust in the ruling party is likely to be high. On the other hand, projects could also be cited in other areas where the ruling party is unpopular in order to win the trust of the locals. Thus, a cogent argument can be made for the existence of a relationship between the location of aid projects and the pre-existing level of trust in the ruling party. The existence of this relationship means that in the quest to estimate the causal effect of Chinese aid on trust, comparing the trust levels of respondents living close to Chinese aid project sites to those living far away from would produce inaccurate results. To circumvent this identification issue, I follow Knutsen

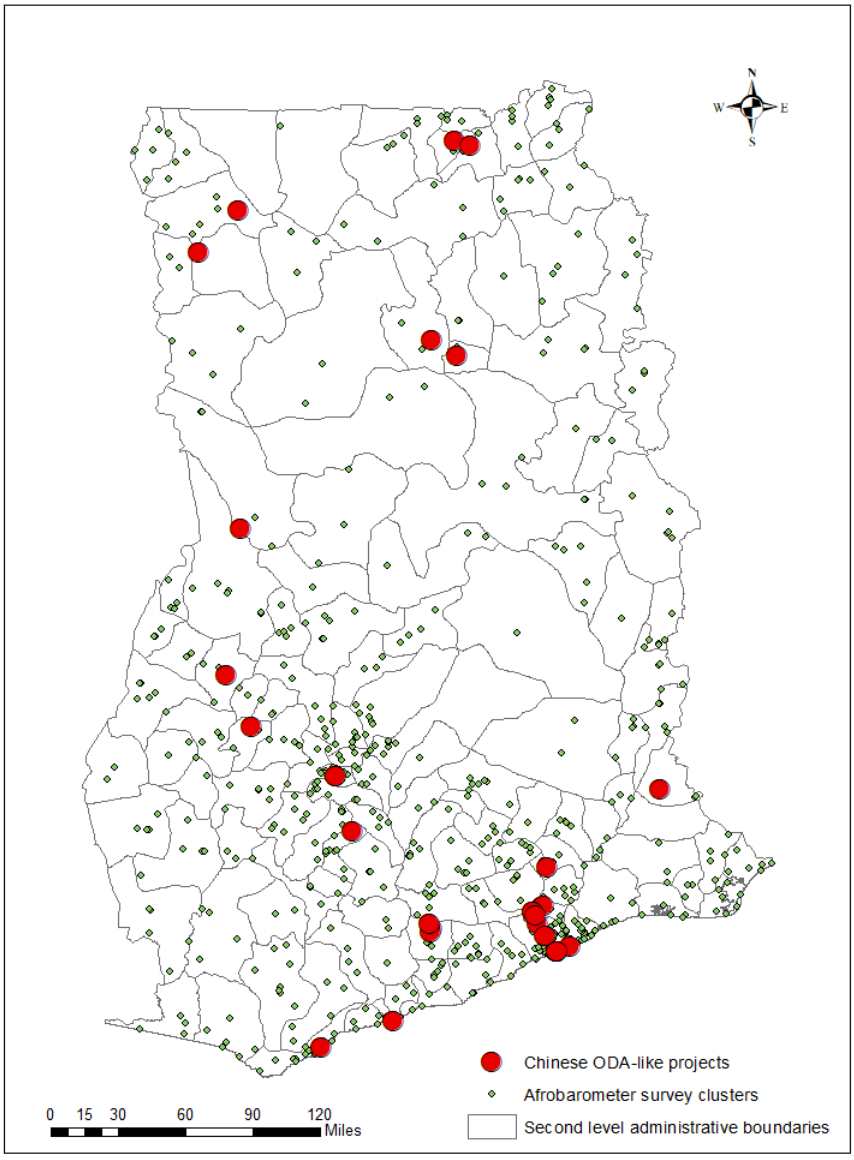

Figure 1: Location of Chinese Aid Projects and Afrobarometer Survey Clusters

et al. (2017)'s estimation approach. Specifically, the approach compares the trust levels of individuals living close to sites where the implementation of a Chinese aid project was ongoing during the time of the Afrobarometer survey to those living near project sites where a Chinese aid project is to be sited in the future but implementation had not begun during the time of the survey. This approach is reflected in the baseline regression as follows;

$$Y_{ict} = \beta_1 Active_{ict} + \beta_2 Inactive_{ict} + \gamma X_{it} + \varphi_c + \delta_c + \rho_t + \epsilon_{ict} \quad (1)$$

where Y is either the dummy or ordinal measure of the political trust of individual i in cluster

c in year t. active is a dummy variable capturing whether the respondent lives within 50 km of an ongoing Chinese aid project; the dummy inactive denotes respondents living within 50 km of a site where a Chinese aid project is to be located but implementation had not begun at the time of the survey. X_{it} is a vector of individual controls; urban/rural residence, gender, age, age squared, educational level and employment status. φ_c represents the spatial characteristics of EA which includes subnational area population count, subnational area population density[8], land area, water area, distance to the capital city, distance to national border, distance to airport and distance to port;[9] δ_c and ρ_t are region and year fixed effects to control for variations across regions and years, respectively. Standard errors are clustered at EA to cater for correlated errors. Having earlier discussed the correlation between the location of aid projects and the pre-existing levels of trust,β_1 can't be solely interpreted as the causal impact of Chinese aid projects on the trust. Such an interpretation would mean assuming there is no correlation between the location of aid projects and the pre-existing levels of trust, which would be an unconvincing assumption. Simultaneously capturing active and inactive in the model allows the comparison of active project sites to inactive ones. Thus, implementing a difference-in-difference (DiD) framework between active and inactive, β_2, controls for unobservable time-invariant characteristics that may impact the selection of Chinese aid project sites. Accordingly, $\beta_1 - \beta_2$ gives the treatment effect of Chinese aid projects on the local people's trust in the ruling party.

4 Results

4.1 Baseline Results: Chinese Aid and Political Trust

The estimation results show that Chinese aid projects fuels trust in the ruling party. Table 2 presents the baseline estimation results; trust is measured as dummy and ordinal in columns 1 and 2 respectively. In all columns, individual and location characteristics are controlled for, including region and year fixed effects. As can be observed, the DiD estimate ($\beta_1 - \beta_2$), is positive and significant in both columns, as evidenced by the p-value of the F-test. Thus, the estimates provide evidence that Chinese aid projects induce trust in the ruling party in localities where the implementation of aid projects is ongoing compared to localities where

[8] I interpolate the missing years for the population data.

[9] The distance measures are the shortest distance to the closest facility or destination.

the projects are yet to be implemented.

Table 2: Chinese Aid and Political Trust: Baseline Results

VARIABLES	(1) Dummy	(2) Ordinal
Active (50 km)	0.124***	0.329***
	(0.029)	(0.088)
Inactive (50 km)	0.030	0.034
	(0.021)	(0.062)
Observations	7,932	7,932
R-squared	0.140	0.158
Baseline controls	YES	YES
Region FE	YES	YES
Year FE	YES	YES
Difference	0.094	0.295
F-test: active-inactive=0	11.51	12.83
F-test: p-value	0.001	0.000

The baseline controls include urban residence, age, age^2, gender, educational level, employment status, distance to capital city, population count of subnational area, population density of subnational area, water area, land area, distance to closest airport, national border and port. Difference is the "difference in difference" result between active and inactive project sites accompanied by the F-test and its p-value. Robust standard errors clustered at enumeration areas are in parentheses; *** p< .01, ** p<.05, * p<.1.

4.2 Sensitivity Analyses

The result that Chinese aid projects stimulate trust among the local citizenry is robust across an extensive set of varying estimations. To examine how the results would respond to altering the cut-off distance, I consider three other cut-off distances; 10 km, 25 and 75 km. As can be seen from Table 3, across all the columns, the results, at varying significance levels, confirm significantly that Chinese aid projects induce trust in the ruling party.

Figure 1 portrays the coef plots of the four cut-off distances, revealing a positive effect for all the distances. Determining the ideal cut-off distance is a barter between the size of the treatment group and noise (Knutsen et al., 2017). Smaller cut-off distances will capture few individuals in the treatment group while larger distances are likely to capture untreated individuals and lead to an attenuation bias.

Table 3: Sensitivity to Different Cut-off Distances

VARIABLES	(1) Dummy	(2) Ordinal	(3) Dummy	(4) Ordinal	(5) Dummy	(6) Ordinal
Active (10 km)	0.120***	0.231**				
	(0.036)	(0.111)				
Inactive (10 km)	0.023	-0.018				
	(0.026)	(0.076)				
Active (25 km)			0.116***	0.282***		
			(0.031)	(0.091)		
Inactive (25 km)			0.012	-0.008		
			(0.020)	(0.060)		
Active (75 km)					0.133***	0.410***
					(0.025)	(0.079)
Inactive (75 km)					0.003	0.032
					(0.022)	(0.065)
Observations	7,932	7,932	7,932	7,932	7,932	7,932
R-squared	0.138	0.156	0.138	0.157	0.141	0.161
Baseline controls	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Difference	0.097	0.250	0.105	0.290	0.130	0.379
F-test: active-inactive=0	5.738	4.072	10.40	8.841	27.20	25.10
F-test: p-value	0.017	0.044	0.001	0.003	0.000	0.000

The baseline controls include urban residence, age, age^2, gender, educational level, employment status, distance to capital city, population count of subnational area, population density of subnational area, water area, land area, distance to closest airport, national border and port. Difference is the "difference in difference" result between active and inactive project sites accompanied by the F-test and its p-value. Robust standard errors clustered at enumeration areas are in parentheses; *** p< .01, ** p<.05, * p<.1.

4.3 Heterogenous Timing Effects

It is worthy to note that though all the estimations involve year fixed-effects to control for variations across time, Chinese aid projects may be associated with endogenous timing effects. Since I consider projects implemented in Ghana between 2002 to 2014, it may be the case that the level of trust in locations where projects were implemented later may exhibit some endogenous variation from locations where projects were implemented earlier. To account for this possible concern, I consider the timing of projects in the analysis presented in Table 4. Time until start is the difference between the Afrobarometer survey interview date and the start date of a project[10] and therefore accounts for possible heterogeneous timing in the choice of location for Chinese aid projects. The coefficient of Time until start is insignificant

[10]In order to maintain the full sample for the estimations I assign zeros to those living either close to active project sites or beyond 25 km of any project sites.

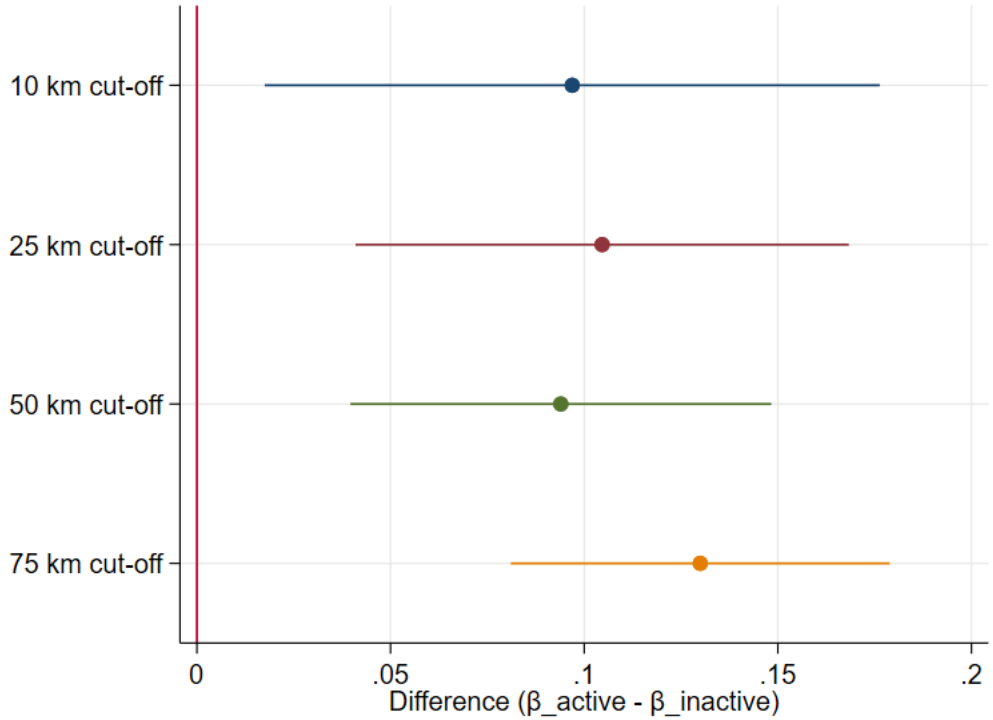

Figure 2: Impact across different cut-off distances

in both columns, while the DiD estimates remain significant, thus, confirming that the results are not influenced by the heterogeneous timing in the choice of project sites.

4.4 Chinese Aid, Party Support and Ethnicity

Ghana is a democratic country that holds an election every four years, thus, it is very likely that citizens are affiliated or support certain political parties. Consequently, trust is likely to be influenced by individuals' political affiliations; a respondent who supports the ruling party is more likely to exhibit trust. As part of the survey questions, respondents were asked if they feel close to any political party; those that felt close to a particular political were then asked to name the party. The dummy variable, party support, assumes 1 if the respondent feels close to the ruling party and 0 otherwise. Table 5 presents the regression results[11], as expected, party support is positively correlated with trust in the ruling party, exhibiting significance in both columns and suggests that those who feel close to the ruling party are more likely to exhibit trust. The interaction effect in column 2 between active and party support allows

[11]Respondents that do not identify with any political party are dropped from the sample. For ease of interpreting the results, estimations are carried out for only the dummy dependent variable

Table 4: Chinese Aid and Political Trust: Project Timing

VARIABLES	(1) Dummy	(2) Dummy
Active (50 km)	0.124***	0.329***
	(0.029)	(0.088)
Inactive (50 km)	0.033	0.027
	(0.022)	(0.065)
Time until start	0.000	-0.000
	(0.000)	(0.000)
Observations	7,932	7,932
R-squared	0.140	0.158
Baseline controls	YES	YES
Region FE	YES	YES
Year FE	YES	YES
Difference	0.091	0.301
F-test: active-inactive=0	10.15	12.72
F-test: p-value	0.001	0.000

The baseline controls include urban residence, age, age^2, gender, educational level, employment status, distance to capital city, population count of subnational area, population density of subnational area, water area, land area, distance to closest airport, national border and port. Difference is the "difference in difference" result between active and inactive project sites accompanied by the F-test and its p-value. Robust standard errors clustered at enumeration areas are in parentheses; *** p< .01, ** p<.05, * p<.1.

us to analyze how the effect of living close to aid projects varies conditional on the political affiliation of the respondent. The result shows that for individuals who support the ruling party, living close to active as compared to inactive sites is associated with a higher likelihood of trust in the ruling party.

In columns 3 and 4, the focus is on how ethnicity influences trust. Some studies have shown that ethnicity is influential to citizens' national identity (Green, 2020; Isaksson, 2020; Koter, 2019, see), hence it remains interesting to see whether ethnicity influences trust in the ruling party. Are people likely to trust the ruling party if they share the same ethnicity with the president? To assess this I introduce ethnicity, a dummy variable that assumes 1 if an individual belongs to the same ethnic group as the president and 0 otherwise. The results do not provide evidence that sharing the same ethnicity with the president induces trust in the ruling party.

Table 5: Chinese Aid, Party Support and Ethnicity

	Political Trust (Dummy)					
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
Active (50 km)	0.090***	0.021	0.125***	0.102***	0.091***	0.044
	(0.028)	(0.043)	(0.029)	(0.037)	(0.028)	(0.048)
Inactive (50 km)	0.029	0.033	0.030	0.030	0.030	0.034
	(0.021)	(0.021)	(0.021)	(0.021)	(0.022)	(0.021)
Party support	0.224***	0.217***			0.225***	0.217***
	(0.011)	(0.011)			(0.011)	(0.011)
Active (50 km)*Party support		0.127***				0.132***
		(0.044)				(0.045)
Ethnicity			-0.007	-0.010	-0.013	-0.012
			(0.017)	(0.018)	(0.016)	(0.017)
Active (50 km)*Ethnicity				0.031		-0.033
				(0.042)		(0.048)
Observations	7,093	7,093	7,932	7,932	7,093	7,093
R-squared	0.207	0.208	0.140	0.140	0.207	0.208
Baseline controls	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Difference	0.060	-0.012	0.094	0.071	0.061	0.011
F-test: active-inactive=0	4.818	0.0697	11.57	3.969	4.923	0.045
F-test: p-value	0.0284	0.792	0.001	0.047	0.027	0.832
Difference (active + active*party support)-inactive		0.115		0.102		0.142
F-test: (active + active*party support)-inactive=0		20.76		10.08		0.216
F-test: (active + active*party support)-inactive=0: p-value		0.000		0.002		0.642

The baseline controls include urban residence, age, age^2, gender, educational level, employment status, distance to capital city, population count of subnational area, population density of subnational area, water area, land area, distance to closest airport, national border and port. Difference is the "difference in difference" result between active and inactive project sites accompanied by the F-test and its p-value. Robust standard errors clustered at enumeration areas are in parentheses; *** p< .01, ** p<.05, * p<.1.

4.5 Heterogeneous Analysis

To analyse the heterogeneous effect of Chinese aid projects on trust, I disaggregate the population into subgroups according to their background. The population is grouped into rural and urban residence; male and female; employed and unemployed; non-tertiary and tertiary. Employed refers to individuals who are part or full-time employed while unemployed refers to individuals without any form of employment. Tertiary comprises individuals who have completed university education and non-tertiary captures those who haven't. This analysis presents an opportunity to assess the variation in trust across different population characteristics. Table 6 presents the estimation results. As can be observed, of all the subgroups, the DiD estimate is insignificant only in the tertiary subgroup; thus, those in rural and urban areas, males and females, employed and unemployed who live within 50 km of active project sites are all more likely to trust in the ruling party compared to their counterparts living close to inactive project sites. However, as observed in columns 7 and 8, among individuals living close to active project sites, those who haven't completed university education are more likely to exhibit trust in comparison to those who have completed university education. The small sample size of the tertiary subgroup may possibly account for its insignificance.

Table 6: Chinese Aid and Political Trust: Population Heterogeneity

VARIABLES	(1) Rural	(2) Urban	(3) Male	(4) Unemployed	(5) Employed	(6) Non_Tertiary	(7) Tertiary
Active (50 km)	0.084**	0.168***	0.138***	0.098**	0.140***	0.124***	-0.002
	(0.040)	(0.038)	(0.035)	(0.044)	(0.033)	(0.029)	(0.286)
Inactive (50 km)	0.037	0.004	0.004	-0.010	0.053**	0.037*	-0.244
	(0.029)	(0.028)	(0.027)	(0.030)	(0.027)	(0.022)	(0.211)
Observations	4,010	3,922	3,995	3,307	4,625	7,696	236
R-squared	0.148	0.188	0.161	0.153	0.183	0.141	0.738
Baseline controls	YES	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES
Difference	0.0474	0.165	0.134	0.108	0.0871	0.0874	0.242
F-test: active-inactive=0	1.326	18.74	13.10	6.058	7.371	9.685	0.560
F-test: p-value	0.250	1.82e-05	0.000310	0.0140	0.00675	0.00191	0.455

The baseline controls include urban residence, age, age^2, gender, educational level, employment status, distance to capital city, population count of subnational area, population density of subnational area, water area, land area, distance to closest airport, national border and port. Difference is the"difference in differenc" result between active and inactive project sites accompanied by the F-test and its p-value. Robust standard errors clustered at enumeration areas are in parentheses; *** p< .01, ** p<.05, * p<.1.

4.6 Using Probit, Logit, Ordered Logit and Ordered Probit Models

For further robustness checks, I perform extended estimations using logit and probit models. Specifically, I re-run the baseline regression for the dummy dependent variable using both logit and probit models. For the ordinal dependent variable, I employ ordered logit and probit models. The results of these estimations, presented in Table 7, are similar to the baseline findings. For all the estimations, the DiD estimate is strongly significant and confirms the initial finding that people living close to active project sites are more likely to trust in the ruling party.

Table 7: Chinese Aid and trust: Logit and Probit Estimations

VARIABLES	(1) Logit	(2) Probit	(3) Ordered Logit	(4) Ordered Probit
Active (25 km)	0.603***	0.359***	0.518***	0.301***
	(0.212)	(0.117)	(0.165)	(0.098)
Inactive (25 km)	0.057	0.030	-0.012	-0.006
	(0.156)	(0.085)	(0.100)	(0.060)
Observations	7,882	7,882	7,932	7,932
Baseline controls	YES	YES	YES	YES
Region FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Difference	0.547	0.330	0.530	0.307
Wald-test: active-inactive=0	5.727	6.827	9.287	8.732
Wald-test: p-value	0.017	0.009	0.002	0.003

The baseline controls include urban residence, age, age^2, gender, educational level, employment status, distance to capital city, population count of subnational area, population density of subnational area, water area, land area, distance to closest airport, national border and port. Difference is the"difference in difference" result between active and inactive project sites accompanied by the Wald-test and its p-value. Robust standard errors clustered at enumeration areas are in parentheses; *** p< .01, ** p<.05, * p<.1.

4.7 Chinese Aid and Voting Preference

So far, the results consistently indicate that Chinese aid projects fuel trust in the ruling party. Among the various reasons for which individuals decide to vote for a particular political party, trust is likely to be a key consideration. Voters are more prone to voting for a president they trust (Knutsen and Kotsadam, 2020). Also, as trust in the incumbent party declines, citizens are more likely to vote for opposition party candidates (Bélanger and Nadeau, 2005; Hetherington, 1999). Following this thought, since the obtained findings so far show that trust

in the ruling party is prevalent in areas close to active project sites, a higher likelihood of votes can be expected for the ruling party in these areas. To empirically test this, I introduce respondents' vote preference, Party vote, which is a dummy variable indicating whether an individual would vote for the ruling party (1), an opposition party or would not vote (0) should an election be held tomorrow. In column 2, the dummy value of 0 is also assigned to individuals who don't answer the question or don't know who to vote for. This captures voting on the extensive margin, thus the number of vote accrued by a party constitute the percentage obtained from survey respondents who answered the question. Voting on the intensive margin, presented in column 3, omits individuals who don't answer the question or don't know who to vote for. Thus, votes accrued constitute the percentage from those who would have voted. As can be seen from Table 8, the DiD estimate is positive and significant in all three columns confirming the initial expectations. The results mean that individuals living close to active project sites, compared to those living close to inactive sites, are more likely to vote for the ruling party if an election were to be held the next day.

Table 8: Chinese Aid and Voting Preference

	(1)	(2)	(3)
VARIABLES	Party vote	Party vote (Extensive)	Party vote (Intensive)
Active (50 km)	0.215***	0.177***	0.215***
	(0.054)	(0.048)	(0.055)
Inactive (50 km)	0.048	0.035	0.052
	(0.044)	(0.039)	(0.046)
Observations	5,322	6,786	4,993
R-squared	0.184	0.177	0.177
Baseline controls	YES	YES	YES
Region FE	YES	YES	YES
Year FE	YES	YES	YES
Difference	0.167	0.142	0.163
F-test: active-inactive=0	10.90	9.250	10.11
F-test: p-value	0.001	0.002	0.002

The baseline controls include urban residence, age, age^2, gender, educational level, employment status, distance to capital city, population count of subnational area, population density of subnational area, water area, land area, distance to closest airport, national border and port. Difference is the "difference in difference" result between active and inactive project sites accompanied by the F-test and its p-value. Robust standard errors clustered at enumeration areas are in parentheses; *** p< .01, ** p<.05, * p<.1.

4.8 Exploring Theoretical Mechanisms

The findings thus far confirm that Chinese aid projects fuels trust in the ruling party. In this section, I explore the mechanisms through which aid projects may affect trust among citizens. I suggest two principal mechanisms. First, the implementation of aid projects is associated with both direct and indirect employment opportunities, increased economic activities and other positive spillovers. Consequently, we can expect improvement in the living conditions or welfare of people living close to active project sites. As people experience improvement in their welfare, they are more likely to be pleased with the ruling party and therefore trust the ruling party. I, therefore, estimate the impact of the aid projects on respondents' living conditions. As expected, the results in column 1 of Table 9 confirm that individuals living near active project sites are more likely to indicate improvement in their living conditions compared to those living near sites where the aid projects are yet to be implemented.

The estimations in columns 2 to 5 are based on the fairness heuristic theory (FHT) (Van den Bos et al., 2001, 1998). The FHT hypothesizes that in determining how much trust to have in authorities, individuals consider the state of distributive fairness within their social context. When individuals observe widening inequality in their societies, they perceive that the distributive fairness is poor and thus, their trust in the local government is reduced (Córdova and Layton, 2016). The theory, therefore, suggests that the perception of inequality is a major mediator of the effect of economic and political conditions on political trust. To test this theory, two additional variables are introduced. First, perceived inequality captures respondents self-reported living conditions compared to other Ghanaians. The second variable, handling inequality, is respondents' perception of how well the government is handling narrowing the income gap between the rich and poor in the country.

The results in columns 2 and 4 suggest that individuals living close to active sites are more likely to indicate relative improvement in their living conditions and also give better ratings of the government's efforts in reducing the rich-poor gap. Columns 3 and 5 also confirm that the impact of Chinese aid on trust is to some extent mediated by the perceived inequality and governments' effort in addressing the issue.

Across all the columns, the DiD estimates are positive and significant at varying levels and thereby confirm the robustness of our main findings that individuals living close to active sites are more likely to trust in the ruling party, compared to those living close to inactive sites.

The results also support the prediction of the FHT that trust is to some extent mediated by perceptions of inequality.

Table 9: Chinese Aid and Political Trust: Exploring Theoretical Mechanisms

VARIABLES	(1) Living condition	(2) Perceived Inequality	(3) Trust	(4) Handling Inequality	(5) Trust
Active (50 km)	0.070**	0.214***	0.272***	0.303***	0.216***
	(0.029)	(0.066)	(0.086)	(0.076)	(0.074)
Inactive (50 km)	-0.005	-0.037	0.038	0.062	0.014
	(0.019)	(0.052)	(0.063)	(0.050)	(0.056)
Perceived inequality			0.133***		
			(0.013)		
Handling inequality					0.383***
					(0.015)
Observations	8,157	7,752	7,507	7,823	7,615
R-squared	0.091	0.083	0.174	0.098	0.252
Baseline controls	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Difference	0.075	0.250	0.235	0.241	0.202
F-test: active-inactive=0	6.271	13.81	8.114	10.20	8.113
F-test: p-value	0.012	0.000	0.004	0.001	0.004

The baseline controls include urban residence, age, age^2, gender, educational level, employment status, distance to capital city, population count of subnational area, population density of subnational area, water area, land area, distance to closest airport, national border and port. Difference is the "difference in difference" result between active and inactive project sites accompanied by the F-test and its p-value. Robust standard errors clustered at enumeration areas are in parentheses; *** p< .01, ** p<.05, * p<.1.

5 Conclusion

China's increasing aid flows to African economies have attracted expected attention to the impact these aid allocations are having. Beyond the popular economic and social impact, aid flows are likely to influence public attitudes or perceptions; inducing either positively or negatively.

In this study, I assess whether Chinese aid causes citizens to trust the ruling party. For this purpose, I match geocoded data on Chinese aid projects in Ghana between 2000 and 2014 to respondents from 5 waves of Afrobarometer survey conducted between 2002 and 2014. Implementing a difference-in-difference framework, I am able to compare the difference in trust between areas where the implementation of a Chinese aid project is ongoing to areas where Chinese aid projects are scheduled to be located but implementation was yet to commence at the time of the Afrobarometer survey. I find that Chinese aid projects induce trust in the ruling party. Specifically, individuals living close to sites where the implementation of a Chinese aid project is ongoing are more likely to trust in the ruling party, compared to those living close to yet to be implemented project sites. This finding is resistant to a battery of robustness checks.

In addition, I explore the theoretical mechanisms through which Chinese aid can influence citizens to trust the ruling party. The findings support the assertion that the implementation of aid projects is associated with stimulating conditions and positive spillovers that improve the living conditions of people living close to project sites. Compared to those living close to sites with yet to be implemented projects, I find that individuals living close to active project sites are more likely to indicate improvement in their living conditions.

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Appendix

A.1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Trust (dummy)	7,932	.748	.434	0	1
Trust (ordinal)	7,932	1.534	1.133	0	3
Active 10	8,157	.019	.137	0	1
Inactive 10	8,157	.06	.238	0	1
Active 25	8,157	.037	.188	0	1
Inactive 25	8,157	.122	.327	0	1
Active 50	8,157	.062	.24	0	1
Inactive 50	8,157	.192	.394	0	1
Active 75	8,157	.075	.264	0	1
Inactive 75	8,157	.242	.429	0	1
Urban/rural residence	8,157	1.508	.5	1	2
Age	8,157	38.683	15.699	18	110
Age^2 (divided by 100)	8157	17.428	14.678	324	121
Gender	8,157	1.5	.5	1	2
Education	8,157	3.027	2.043	0	9
Employment	8,157	.581	.493	0	1
Population count	8,157	419,811.17	657,668.27	47,652.398	2,469,995
Population density	8,157	1,832.77	3,621.597	8.312	12,723.972
Distance to capital city (km)	8,157	209.187	163.707	1.308	645.635
Distance to airport (km)	8,157	66.426	53.102	1.57	250.01
Distance to border (km)	8,157	146.679	56.966	.723	293.629
Distance to port (km)	8,157	192.813	167.854	1.937	655.651
water area (km^2)	8,157	24.826	113.734	0	1,078.932
land area (km^2)	8,157	1,103.9	1,285.819	38.343	8,554.945
Time until start	7,932	-138.438	467.12	-3885	0
Party support	7093	.357	.479	0	1
Ethnicity	7,932	.309	.462	0	1
Living condition	8,157	2.364	1.326	1	5
Perceived inequality	7,752	2.879	1.099	1	5
Handling inequality	7,823	1.947	.94	1	4
Party vote	5,322	.458	.498	0	1
Party vote (Extensive)	6,786	.359	.48	0	1
Party vote (Intensive)	4,993	.488	.5	0	1

A.2: Variable Definition and Source

Variable	Description	Source
Trust (dummy)	Dummy variable that equals 1 if respondent indicates any level of trust in the ruling party and 0 otherwise.	Afrobarometer
Trust (ordinal)	Captures individuals' responses on their trust in the ruling party. The Responses range from 1-4 indicating not at all, just a little, somewhat and a lot, respectively.	Afrobarometer
Active	Dummy variable that equals 1 if respondent lives close to the specified distance (10, 25 or 50 km) of a site where implementation of a Chinese project was ongoing at the time of the Afrobarometer survey, 0 otherwise.	AidData
Inactive	Dummy variable that equals 1 if respondent lives within a specified distance (10, 25 or 50 km) of a site where a Chinese project was scheduled to be located but implementation had not begun at the time of the survey, 0 otherwise.	AidData
Urban residence	Dummy variable that equals 1 if respondent lives in an urban area and 0 otherwise.	Afrobarometer
Age	Respondents' age in years, and its squared from divided by 100.	Afrobarometer
Gender	Dummy variable that equals 1 if respondent is a male and 0 if female.	Afrobarometer
Education	Highest level of education respondent has completed.	Afrobarometer
Employment	Employment status of respondent.	Afrobarometer

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Variable	Description	Source
Population count	The UN WPP-adjusted population count of human population in subnational area.	Center for International Earth Science Information Network (CIESIN) at Columbia University 2018
Population density	Population density of subnational area.	CIESIN
Water area (km^2)	Total water surface area in kilometers square, including permanent ice and water, per pixel.	CIESIN
Land area (km^2)	Total land surface area in kilometers square, excluding permanent ice and water, per pixel.	CIESIN
Distance to capital city (km)	The shortest geodesic distance (in kilometers) to Accra, the capital city of Ghana.	Author's own calculation
Distance to airport (km)	The shortest geodesic distance (in kilometers) to the closest active airport.	Logistics Capacity Assessments (LCAs)
Distance to border (km)	The shortest geodesic distance (in kilometers) to the closest national border.	LCAs
Distance to port (km)	The shortest geodesic distance (in kilometers) to the closest port.	LCAs
Time until start	The difference between the Afrobarometer survey interview date and the planned start date of Chinese aid project for inactive project sites.	Author's calculation based on Afrobarometer data
Party support	Dummy variable that equals 1 if the respondent feels close to the political party in government and 0 otherwise.	Afrobarometer

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Variable	Description	Source
Ethnicity	Dummy variable that equals 1 if respondent shares same ethnicity with the president and 0 otherwise.	Afrobarometer
Party vote	Dummy variable that equals 1 if respondent would vote for the ruling party should an election be held tomorrow and 0 if respondent would vote for an opposition party or would not vote.	Afrobarometer
Party vote (extensive margin)	This is a variation of Party vote. Respondents that don't answer the question or do not know are assigned the value 0.	Afrobarometer
Party vote (intensive margin)	This is another variation of Party vote. Respondents that don't answer the question or do not know are dropped from the sample.	Afrobarometer
Perceived inequality	How respondents rate their living conditions compared to those of other Ghanaians? The response categories range from 1 "much worse" to 5 "much better".	Afrobarometer
Handling inequality	Respondents perception of how well or badly the current government is handling narrowing gaps between the rich and poor.	Afrobarometer
Living condition	Dummy variable that equals 1 if respondent answers that their present living condition is fairly or very good and 0 otherwise.	Afrobarometer