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## Article

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## DEVELOPMENT ECONOMICS | RESEARCH ARTICLE

# Chinese aid and social ties in Africa: Evidence from sub-national aid projects

Abreham Adera<sup>1\*</sup>

**Abstract:** Is there any possibility that foreign aid may negatively affect African social ties? To answer such a question, this paper examines the impact of local Chinese aid projects on social capital in Africa. China or Chinese contractors directly control or operate Chinese projects in Africa. This feature may disengage Africans from participating in their own local development activities. Likewise, China gives unconditional aid, which may nurture corruption. By creating losers and winners, corruption may make people unhappy. Because of these features, Chinese aid projects may hinder the formation of social capital. This paper puts this claim to an empirical test using data from the Afrobarometer surveys and AidData. Conditional on a set of controls, I find several interesting results. First, Chinese aid is negatively associated with generalized trust. Second, Chinese aid projects are related to disengagement from associational life. Third, no similar pattern is found when the main analysis is replicated on aid from the World Bank. Finally, neither the Chinese nor the World Bank's aid is related to subjective wellbeing. The results suggest that Chinese aid may wither local social ties through social disengagement. Overall, the findings imply that it is vital to engage local citizens in the design and implementation of Chinese aid projects.

**Subjects:** Culture & Development; Economics and Development; Politics & Development; International Political Economy; International Relations

**Keywords:** Chinese aid; social capital; social engagement; Africa

## 1. Introduction

Chinese aid has two distinguishing features that may make it to have negative externalities on social ties in Africa. One feature of the Chinese projects to Africa is that China directly controlled them. There are cases where Chinese contractors run up to 70 percent of Chinese aid projects in Africa (A.S. Isaksson et al., 2020; Sun, 2014; Tan-Mullins et al., 2010; Tull, 2006). This feature may insulate local Africans from participating in their own development activities. The unconditionality of Chinese aid projects is another key feature of Chinese aid projects. China follows a policy of non-interfering in the domestic affairs of aid-receiving nations (Wang & Elliot, 2014). This feature of Chinese aid makes it easily corrupted. By creating losers and winners, the corruptive nature of the Chinese aid may erode social ties through its effect on subjective wellbeing. Through these channels, Chinese aid could be antithetical to Africa's social ties.

Although the above claim is theoretically appealing, there is a dearth of systematic evidence showing the effect of Chinese aid on social ties, subjective well-being or associational life. This paper attempts to fill in this gap by applying an empirical method to data from two sources: the Afrobarometer surveys and AidData. The empirical method exploits a spatial differences in differences (DID) strategy that accounts for the endogenous location of Chinese aid projects. The method estimates the impact of Chinese aid as the difference between estimates for individuals living closer to an ongoing Chinese project and estimates for individuals living closer to a Chinese project that is about to appear in the future. Using this method, this article documents several interesting results. First, Chinese aid is negatively related to social ties. In particular, the result is that Chinese aid is inversely related to generalized trust while there is no such effect for particularized trust.<sup>1</sup> The negative effects, however, are conditional on the incidences of corruption and institutional trust around Chinese aid project locations. The negative estimate does not hold when excluding corruption and institutional trust from the regression. This implies that the effect of Chinese aid works through institutional variables. Second, Chinese aid is also negatively associated with participation in associational life. Third, no similar pattern is found when the main analysis is replicated on aid from the World Bank. Finally, neither Chinese nor World Bank aid is related to subjective wellbeing. The results suggest that Chinese aid may wither local social ties through its social disengagement effect. The policy implication is that it is vital to engage local citizens in the design and implementation of Chinese aid projects.

This paper contributes to the growing corpus of empirical literature that documents that Chinese assistance to Africa is likely to nurture corruption (A. -S. Isaksson & Kotsadam, 2018; Brazys et al., 2017), negative views toward China (McCauley et al., 2022), protests and institutional distrust (Iacoella et al., 2021). This article adds to this line of research by quantitatively evaluating the micro-level effects of Chinese aid on social capital in a large sample of respondents across African countries. The results are consistent with the literature on malleability of beliefs, which claims and shows that beliefs respond to outside intervention (Andrabi & Das, 2017; Clingingsmith et al., 2009; Mullainathan & Shleifer, 2005).

The rest of this paper is organized as follows: Section 2 presents the conceptual framework and a review of related literature. Section 3 describes the specification for empirical analysis. The description of the data is in Section 4. The findings are presented in Section 5. Section 6 concludes the work.

## 2. Conceptual framework and related literature

### 2.1. Foreign aid and social ties

Social capital, particularly that of generalized trust, plays a vital role in economic exchange and investment, financial development (Guiso et al., 2009; Roy et al., 2014; Yu et al., 2015), for economic growth (Algan et al., 2010; Beugelsdijk & van Schaik, 2005) for economic growth (Algan et al., 2010; Beugelsdijk & van Schaik, 2005) or for innovation (Fountain, 1997). As a result, the World Bank has been advocating community driven development (CDD) projects for social capital reconstruction (Mansuri et al., 2004; World Bank, WB, 2011). CDD projects are designed to empower grass-roots engagement for prioritizing, identifying, and implementing local projects (Dongier et al., 2003).

Through what channel (s) would foreign aid impact social ties? The question of how foreign aid influences social capital is not self-evident. In this section, we conceptualize why Chinese aid might influence social capital. I argue that there are two intertwined channels through which Chinese aid impacts social capital.

The first mechanism may be referred to as a social engagement channel. Participation in the community is the lifeblood of social capital (Boix et al., 1996; Shah, 1998; Uslaner & Conley, 2003; Uslaner, 1998; Völker & Flap, 2001). In the “Bowling Alone,” Putnam (2000) explicates that the

individualization of leisure activities (as reflected by the substitution of membership in associations and club by watching television) decreases social capital. He provides empirical evidence from the US. Olken (2009) documents similar results for Indonesia. From this standpoint, social capital could be conceived as “an individual’s sacrifices made in an effort to promote cooperation with others” (Dayton-Johnson, 2003). Thus, one mechanism through which aid promotes social capital or interpersonal trust is through its effect on participation in the community. There is empirical evidence that supports this claim, and community participation is the principal reason why CDD project interventions resulted in social cohesion in some contexts (King et al., 2010). (Fearon et al., 2009) run a randomized field experiment in Northern Liberia in 2008 to identify the impact of a post-conflict “community driven reconstruction (CDR)” program. Their results show that participation in the CDR improved social cohesion. For a cross-section of individuals in Uganda shows that foreign aid decreased perceptions of inequality and thus raised generalized trust in Uganda. Andrabi and Das (2017) (2017) assessed the impact of aid on trust towards foreign relief and aid providers in Pakistan. By exploiting exposure to a large earthquake that struck Northern Pakistan in 2005, they find that a face-to-face contact with foreign aid workers resulted in a positive change in trust towards Western (USA and Europe) aid workers. These findings suggest that project-level foreign support could be pro-social capital.

Nonetheless, at least two issues need addressing. First, the positive relationship between social capital and foreign aid in some contexts cannot be generalized. The evidence is such that even the CDD intervention did not initiate a broader social change in the Philippines (Labonne & Chase, 2011); had few impacts on collective action in an experimental program in Afghanistan (Beath et al., 2012); a zero impact on public goods and trust games in the lab experiment in Sudan (Avdeenko et al., 2014); does not result in lasting positive changes in local institutions or social norms (Casey et al., 2012; Casey, 2018) or did not result in better corruption control (Olken, 2007). The fact that we do not yet know if aid is contributing to social capital erosion at the local level clearly shows the need to directly link aid to social capital and pin down the mechanisms thereof.

Second, the focus hitherto has mostly been on traditional donors. One question to ask is what happens if one focuses on a non-traditional donor such as China? It is thus not clear if a positive or a zero impact of aid on social capital is the only case. Chinese aid may dampen community participation due to a substitution effect that may arise for two major reasons. First, China directly controls its aid projects in recipient countries. This insulates the locals from participating in developmental or cooperative social activities. This argument parallels with the view that extrinsic financial incentives may crowd out intrinsic motivations for cooperation (Bénabou & Tirole, 2006; Mellström & Johannesson, 2008). Second, a substitution effect may also arise due to China’s demand-driven aid practices. Beijing follows a demand-driven approach in that it gives aid in response to a request from partner countries. There has been evidence, for instance, that birth-places of African political leaders receive larger Chinese aid. This unconditional resource rent may break state-society linkages (McGuirk, 2013) since they harm institutions in a way that leads people to disengage from associational life or refuse to comply with government. This mechanism can be summarized as:

*Channel 1: Chinese projects in Africa are directly controlled by China. This decreases the need to mobilize community for development, and thus withers social capital formation.*

The second mechanism operates through subjective well-being. The SWB channel can be thought of as an indirect channel that operates through institutional trust. Happiness or subjective wellbeing (SWB) is a strong positive correlate of social capital (see Bjørnskov, 2003; Ram, 2010, for instance). Thus, SWB is another through which foreign aid affects social capital. The explanation for SWB channel is rooted in the institutional theory of social capital (see Nannestad, 2008; Rothstein et al., 2008, for instance). This theory posits that social capital is the result of quality institutions. According to research, the positive effects of aid on institutions are pronounced when donors hold receiving government accountable (Resnick et al., 2013) or on when aid is not fungible

(Findley et al., 2011). It can thus be argued that quality institutions mediate the link between foreign aid and social capital. In other words, citizens infer that most people are corrupt and thus become less trusting when political institutions are corrupt (Banerjee, 2016; Chang & Chu, 2006; Rothstein & Eek, 2009). A. -S. Isaksson and Kotsadam (2018) documents that Chinese aid is associated with local corruption. Corruption erodes institutional trust (Anderson & Tverdova, 2003), and thus Iacoella et al. (2021) find evidence that Chinese aid breeds institutional distrust. On the basis of this evidence, we can then claim that the corrupted Chinese projects are posing a real threat to cooperative social norms in Africa. The discussion on the second mechanism can be summarized as:

*Channel 2: Local Chinese aid projects in Africa are corrupt and thus breed institutional distrust. This will eventually make people distrustful by making them unhappy.*

Nonetheless, it is not self-evident that the social capital of an average citizen becomes low just because a public servant accepts bribes (Richey, 2010). The predictions of institutional theory of social capital presuppose the presence of institutions. This prediction is less likely to hold in Africa, where formal institutions are either severely ineffective or non-existent. In the absence of effective institutional mechanism, corruption (in the form of bribes) may serve as the means to speed up or grease government operations and hence may play positive roles (see Méon & Weill, 2010, for review). Thus, an empirical exercise is needed to test the assumption that corruption corrodes social capital through its effect on institutional distrust.

There also is a normative explanation as to why corruption may make people unhappy. Corruption makes people unhappy either due to the guilt of offering (receiving) bribes or because of the victimization threat resulting from paying for what one is legally entitled to (Wu & Zhu, 2016). However, the effect of corruption depends on the how corrupt the environment is. In a highly corrupt environment, people are more tolerant and adaptive towards corruption (Graham, 2011; Johnston, 2002; Moreno, 2002; Morris & Klesner, 2010). In a corrupt environment, corruption may become a socially acceptable norm violation (Robert & Arnab, 2013). If this is the case, then its negative effect on social capital is negligible (Banerjee, 2016) or may even be positive due to citizens' heavy reliance on their trust-based networks in dishonest environment (Uslaner & Conley, 2003; Völker & Flap, 2001; Woolcock et al., 2001). In the context of our study, A. -S. Isaksson and Kotsadam (2018) provide suggestive evidence that people around Chinese projects have developed tolerant norms towards corruption. Hence, corruption may have little effect on happiness in such situations. Nevertheless, there is some evidence, at a macro level, that an increase in aid is bad for happiness when corruption is high (Arvin & Lew, 2011; Arvin et al., 2012). Therefore, the micro foundation of the relationship between aid and recipient happiness in a corrupt environment is yet to be known.<sup>2</sup>

## 2.2. Related literature

The research on foreign aid in Africa has primarily focused on traditional aid. The rise in China's influence is attracting more and more research in the area. Within this framework, this paper builds on and adds to the burgeoning empirical literature that contrasts the impacts of Chinese aid with those of other donors. This section reviews the related literature on the impacts of Chinese aid. This review is by no means exhaustive, yet covers the most recent studies in the area.

Chinese aid is found to have negative effects or externalities. By combining data from the Afrobarometer to AidData, A. -S. Isaksson and Kotsadam (2018) find that Chinese aid enhances local corruption in Africa. The authors did not find a similar effect for aid from the World Bank. Utilizing time-series cross-sectional data that covers the period from 2000 to 2014 and about 130 developing countries, Ping et al. (2022) finds that China's resource-related programs erode political accountability in recipient countries. These results are borne by the unconditionality of the Chinese aid policy. Worse, there is also evidence 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). According to the study by Dreher, Fuchs, Parks, et al. (2021), aid from the United States tends to be more effective in countries that receive no substantial support from China. Moreover, there is also evidence that Chinese assistance to Africa is likely to nurture political favoritism. Dreher et al. (2019) investigate whether foreign aid is prone to political capture in aid-receiving countries. They collected data on 117 African leaders' birthplaces and geocoded development projects across 2969 physical locations in Africa from 2000 to 2012. Using these data, the authors find that political leaders' birth regions receive substantially larger financial flows from China in the years when they hold power compared to what the same region receives at other times. According to the authors, there is no similar pattern of favoritism in the spatial distribution of World Bank development projects.

Our paper is mainly related to studies that link Chinese aid to attitudes. Combining a geo-referenced data set on Chinese aid projects obtained from AidData with the political attitudes of residents from four World Values Survey waves across 526 sub-national regions in 47 developing countries, (Bai et al., 2022) finds that Chinese aid motivates a positive attitude toward domestic governmental organs. A.S. Isaksson et al. (2020) examines effect of Chinese development projects on ethnic grievances. Their analysis relies on a georeferenced data set on development projects and survey data for 50,520 respondents from eleven African countries. The authors find that a Chinese project makes ethnic identities more salient, whereas there is no similar pattern for development projects from other donors. Likewise, (Appiah-Kubi & Jarrett, 2022) finds that Chinese aid is positively associated with reported crime. This paper adds to this line of research by quantitatively evaluating the micro-level effects of Chinese aid on social capital.

The research presented above shall not lead one to characterize Chinese aid only as pernicious. There is evidence that China's assistance has a positive impact on economic development outcomes like growth (Dreher et al., 2022) and inequality (Bluhm et al., 2018), and social development outcomes such as education and health (Martorano et al., 2020). Dreher, Fuchs, Hodler, et al. (2021) estimate estimates the effect of Chinese aid on sub-national economic development—as measured by per capita nighttime light emissions. They use data that covers 709 provinces and 5,835 districts within 47 African countries between 2001 and 2012. Their result demonstrates that Chinese aid improves local development. Dreher, Fuchs, Parks, et al. (2021) introduces a new data set of official financing from China to 138 developing countries between 2000 and 2014. Using this data, the authors investigate whether Chinese development finance affects economic growth in recipient countries. Their results demonstrate that Chinese development finance boosts short-term economic growth. Martorano et al. (2020) study the impact of Chinese aid on household welfare in Sub-Saharan Africa by combining data on Chinese development projects with data from Demographic and Health Surveys. They find that Chinese aid projects improve education and child mortality. Combining 92 demographic and health surveys (DHS) for a maximum of 53 countries and almost 55,000 sub-national locations over the 2002–2014 period, Dreher et al. (2023) show that Chinese aid increases infant mortality at sub-national scales, but decreases mortality at the country-level. Overall, a meta-regression analysis of 473 estimates from 15 studies Mandon et al. (2022) shows that Chinese aid has had a favorable influence on economic and social outcomes but a negative, if small, impact on governance.

Finally, it is worthwhile to mention studies that explore whether Chinese aid could generate support for China in recipient countries. These lines of studies on how Chinese official assistance influences Chinese soft power in recipient economies have not reached a consensus either. Using descriptive analysis, Morgan (2019) finds that Chinese aid contributes to the positive perceptions of China among African citizens. (McCauley et al., 2022) finds that proximity to Chinese FDI in Africa decreases respondents' perceptions of China's model of development as the best model for their country. Iacoella et al. (2021) find that areas which receive a larger number of Chinese projects are more likely to experience protests. Eichenauer et al. (2021) show that Chinese aid leads to more polarized opinions on China in Latin America.

### 3. Empirical method

The analysis relies on data from the Afrobarometer and the AidData databases.<sup>3</sup> AidData contains aid project location coordinates (latitude and longitude). Using QGIS, the location of the Chinese Development project is plotted, and this is shown by the red triangles in Figure A1. Similarly, the Afrobarometer surveys provide the location point coordinates (i.e., the latitude and longitude) for the Afrobarometer survey respondents. Using this information, clusters are created by grouping observations for individuals with similar point coordinates. These are shown by the small green dots in Figure A1. Then distance (in kilometers) is measured from the cluster center points to the nearby aid project sites. Using this information, the baseline empirical model is given in specification (1) as:

$$Y_{ijct} = \alpha_0 + \lambda ACP_{Dit} + Z_{ijct}'\phi + \theta_c + S_t + \epsilon_{ijct} \quad (1)$$

Where  $Y_{ijct}$  is variable of interest for the  $i^{th}$  individual in the  $j^{th}$  cluster at time  $t$  in country  $c$ ;  $ACP_{Dit}$  takes a value of 1 for individual  $i$  that lives  $D$  kilometers close to an Active Chinese Project (ACP) site or zero otherwise;  $Z_{ijct}'$  is the vector of controls;  $\theta_c$  are country fixed effects;  $S_t$  are survey rounds fixed effects; and  $\epsilon_{ijct}$  is the idiosyncratic error term.

The aim is to identify  $\lambda$ . There are two primary challenges to the causal identification of  $\lambda$ . First, the conclusion of the paper is misleading, without controlling for development projects from other major donors at the same site. Thus, the analysis has to rule out the potential impact of past, ongoing and future projects from China or other countries. To overcome this challenge, the main specification is estimated conditional on the absence of previous projects in an area. Second, the causal identification of  $\lambda$  requires that there is no project localization or that Chinese projects are randomly located. Chinese project locations are endogenous and that assumption does not hold. (Dreher et al., 2019) show that there is regional favoritism in Chinese aid allocation. If Chinese projects are endogenously located due to pre-existing factors that make people more trusting (such as lower inequality, quality institutions, better infrastructure, democracy), the estimate on the dummy  $ACP_{Dit}$  does not represent the causal effect of Chinese aid on social capital. To overcome this challenge, we resort to a strategy that draws from the insights of identification strategies employed to identify the impact of local projects (see Blair et al., 2021a, 2021b; A. -S. Isaksson, 2020; A. -S. Isaksson & Kotsadam, 2018; Knutsen et al., 2017, for instance). The strategy is to rely on a spatial temporal DID estimator that extracts the impact of a Chinese project after controlling for the endogenous selection in project locations.

For convenience, let CCP denote a forthcoming Chinese project. A forthcoming Chinese project (CCP) is a project that is planned to appear in an area conditional on the absence of previous projects in that area. Using this technique, the spatial differences in differences (DID) specification is given as:

$$Y_{ijct} = \alpha_0 + \gamma_1 ACP_{Dit} + \gamma_2 CCP_{Dit} + Z_{ijct}'\phi + \theta_c + S_t + \epsilon_{ijct} \quad (2)$$

Where  $CCP_{Dit}$  takes a value of 1 for an individual that lives within  $D$  kilometers of a forthcoming Chinese project, or zero otherwise.

In specification (2), the coefficient on ACP (i.e.,  $\gamma_1$ ) captures any causal effect of aid plus potential selection effects. The coefficient on CCP (i.e.,  $\gamma_2$ ), on the other hand, captures only a selection effect. Our interest now is to get an estimate that equals  $\gamma_1 - \gamma_2$ . This is a spatial DID estimator that reflects the impact of a Chinese project after controlling for the endogenous selection in project locations. The idea is that by taking the difference between these two parameters; we subtract the selection effect from the combined selection and causal effect, leaving behind the causal effect of aid on the outcome variable of interest. In particular,  $ACP_{50i} - CCP_{50i}$  ( $\gamma_1 - \gamma_2$ ) gives



a difference-in-difference (DID) type of measure that controls for unobservable time-invariant characteristics that may influence selection into being a Chinese project site. The key assumption behind this approach is that the selection process relevant for ongoing and coming projects sites is the same.

One additional concern with the identification is that there is a possibility of endogeneity stemming from the timing of projects. There shall be three categories of projects: past, ongoing at the time of the survey, and to be implemented in the future. Projects may start earlier in some places with certain attitudes and this imposes a challenge to identification strategy if projects that start at earlier dates are systematically different from projects that start at later dates. Our coding of a project as ACP or CCP does not have a direct correspondence with the time when a project starts. The Afrobarometer covers different areas at different times. A project is coded either as ACP or CCP, depending on the time when a certain project area is covered by the Afrobarometer survey. For instance, suppose that two projects are implemented, one in the 2007 and another in 2011. This does not necessarily mean that we will code the project from 2007 as ACP and that the project from 2010 is coded as CCP. Suppose the Afrobarometer survey covers the locality of the 2007 project in 2006. Based on this, the project from 2007 is coded as CCP project. Similarly, if the Afrobarometer survey covers the locality of the 2011 project in 2012, then the project from 2011 is coded as ACP project. It is this time variation in data that we are exploiting for identification.

### 3.1. Accounting for confounding factors

There remains other challenges posed by other confounding factors. The slave trade corroded culture of trust within Africa (Nunn et al., 2011). Ethnic diversity, inequality; and religiosity are important determinants of social capital (Berggren & Bjørnskov, 2011; Bjørnskov, 2007). Thus, the estimated effects could merely be the result of ethnic diversity, inequality, or history. The analysis attempts to account for these factors, albeit indirectly. First, democracy mediates the negative effects of ethnicity on economic outcomes (Bluedorn, 2001). Second, perceived quality of domestic institutions plays a significant role as the mechanism through which historical slave trade affects contemporary mistrust within Africa (Nunn et al., 2011). Furthermore, (Blair & Winters, 2020) argues that there is no direct effect of foreign aid on an individual's trust and its effect instead is indirectly through its effect on institutions. In fact, Chinese projects are characterized with local institutional distrust (Iacoella et al., 2021), widespread local corruption (A. -S. Isaksson & Kotsadam, 2018) and lower democratization (Xiaojun, 2017). These confounding factors are taken into account by controlling for measures of democracy, institutional trust, corruption and membership in a religious institution. Education improves people's knowledge, their ability to comprehend information, and their awareness of the effects of their own and other people's actions (Bjørnskov, 2007). Education may have a significant socializing impact that may help young people develop a more accepting mindset toward strangers. We thus control for education. Resource rents have a modernization or development effect (Ross, 2001); and hence there are concerns that foreign aid may mold social capital only through its effects on modernization or urbanization (Zhang et al., 2015). For that reason, we also control for a measure of public goods as well as for a dummy indicating respondent's place of residence.<sup>4</sup>

Time-invariant observable and unobservable cross-country variations in the prevailing macroeconomic conditions, the quality of political institutions or colonial history, may affect our results. Such factors are generally time invariant for individuals from within the same country. Besides, there could be some time variant factors. We thus include country ( $\theta_c$ ) and survey round ( $S_t$ ) fixed effects.

## 4. Data

The geocoded Chinese aid data and the geocoded Afrobarometer surveys are the main sources of data for the analysis. Covering large sample individuals from African countries, the Afrobarometer surveys have been to assess respondent's attitudes towards issues that include civil society, institutional trust, corruption perception and experiences, government performance, ethnic identity, subjective living conditions and crime. The number of countries and individuals covered in the

survey has increased over time. The countries in the survey are 12,16,18,20,34 and 36 in Rounds 1 (1999–2001), 2 (2002–2004), 3 (2005–2006), (2008), 5 (2011–2013), 6 (2014–2015) and 7 (2016–2018), respectively. In this work, we rely on the 3–6 rounds of these surveys.<sup>5</sup> In these rounds, the countries covered by the survey includes Benin, Burkina Faso, Cape Verde, Ghana, Kenya, Lesotho, Madagascar, Malawi, Mali, Mozambique, Namibia, Nigeria, Senegal, South Africa, Tanzania, Uganda, Zambia, Zimbabwe.

The geo-coded Chinese aid data is from the AidData (Bluhm et al., 2018).<sup>6</sup> In total, this data set has 3,485 geocoded aid projects worth 273.6 billion dollars implemented between 2000–2014. Of this data, we rely on the geo-coded Chinese aid data. This is obtained from the Finance Version 1.1.1 data set.

The two data sets have geographic information. In the Afrobarometer data, there are observations with similar longitudes and latitudes. First, clusters are created by clustering observations with similar longitudes and latitudes. These clusters may be referred to as Afrobarometer clusters. The clustered data is then merged with data on the geocoded Chinese aid projects. The result of this exercise is presented in Figure A1. As can be seen, Afrobarometer cluster points contain Chinese projects around them. Thus, the two data sets are geographically related.

#### 4.1. Variable construction

##### 4.1.1. Dependent variables

One of the main dependent variables is social capital. Social capital is commonly understood as social networks, norms, and trust (Portes, 1998; Putnam, 2000). It encompasses heuristics facilitating collective action and reciprocal cooperation under uncertainty (Tversky & Kahneman, 1974); and is mostly characterized by trust (Durlauf, 2002). Robert Putnam identifies the “bridging” and the “bonding” components of trust (Sobel, 2002). The former refers to bonds of connectedness cementing diverse social groups and takes the forms of generalized trust towards strangers. The latter is the form of social capital that bonds similar individuals such as families, relatives or co-ethnics and is sometimes referred to as particularized trust.

In this work, particularized trust is measured with Afrobarometer survey question that asks the respondents the level of trust they have for their relatives or neighbours. After deleting the irrelevant answers, we coded a response to take the values 0 for “not at all”, 1 for “just a little”, 2 for “I trust them somewhat” and 3 for “I trust them a lot”. Based on this, we use trust in relatives or trust in neighbours as the measures of the particularized trust (the bonding social capital).

Bridging social capital (generalized trust) is based on the Afrobarometer question that asks “Generally speaking, would you say that most people can be trusted or that you must be very careful in dealing with people?”. The relevant answers take the value of 1 for “Most people can be trusted (1)” and 0 for “Must be very careful”.

Another dependent variable is a measure of community participation or associational life. We consider two questions in the Afrobarometer that ask about community engagements. The first asks about the number of times a person attends community meetings in the preceding year. The answer to this question ranges from 0 for “Would never do this” to 4 for “Often”. The second question asks about a respondent’s voluntary membership status in the community development association. The answers to this question take the values 3 for “Official Leader”, 2 for “Active Member”, 1 for “Inactive Member” and 0 for “Not a Member”.

The last dependent variable we consider is happiness or subjective wellbeing (SWB). To construct a measure of subjective wellbeing, we rely on self-reported economic condition assessment (egotropic evaluation) question in the Afro Barometer survey. In the survey, respondents are asked as “In general, how would you describe your own present living conditions?”. The answers

take values 5 for “Very good”, 4 for “Fairly Good”, 3 for “Neither good nor bad”, 2 for “Fairly Bad”, 1 for “Very Bad”. An increasing value on this variable implies higher life satisfaction or subjective wellbeing. We note that other works have also been using this measure for subjective wellbeing in Africa (e.g., see Blanchflower, 2021).

#### 4.2. Control variables

The analysis controls for several control variables. These include an individual’s age, age squared, gender (a male dummy), place of residence (an urban dummy), levels of education, employment status, perceived inequality, index of active religious membership, an index of public goods, an indicator of political repression, an index of institutional trust, and index of corruption incidence and an index of democratic quality. The summary statistics of the variables are given in 1 in the [Appendix](#). This section describes the construction of most of these variables.

##### 4.2.1. Institutional Trust Index (ITI)

Institutional Trust Index is constructed from the Afrobarometer question that asks the level of trust of respondents in “The Parliament/The Police/Courts of Law/Your elected local council”. The answer categories are 0 for “Not at all”, 1 for “Just a little”, 2 for “Somewhat”, and 3 for “A lot”. It is from this variable that we construct our measure of institutional trust after deleting the missing values and the answer “Do not know”. By using these four variables, the intention is to capture a commonality in the different powers of the state.

##### 4.2.2. Quality of democracy

As in (Quaranta, 2018), quality of democracy measure at an individual level is constructed from the Afrobarometer question “How satisfied are you with the way democracy works in [your country]?”. (Logan & Mattes, 2012) note that this measure is correlated with the Freedom House scores and the Bertelsmann score on democratic quality.

##### 4.2.3. Corruption index

Corruption Index is constructed as a summative index from two questions of the Afrobarometer survey that show the paying of bribes. The first item comes from a question that asks the number of times a respondent gave a bribe to the police and the other comes from a question that asks the number of times a respondent gave a bribe to a public servant in order to receive a document.

##### 4.2.4. Perceived inequality

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, we 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 zero if she or he feels “Much worse, Worse, Better, Much better”.

##### 4.2.5. Education

In the Afrobarometer, education is coded on a scale from 0 (no schooling) up to 9 (postgraduate education).

##### 4.2.6. 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) “.

#### 4.2.7. Public goods index

Public goods index is a summative index from binary dummies indicating the presence of school, clinic, electricity and market in the district an individual lives in. The highest value on this index is 4, which shows that four public goods are available in the district.

#### 4.2.8. Active religious membership

Active Religious Membership variable is derived from the Afrobarometer question asking if respondents are not members, inactive members, or active members of a religious organization. This variable takes the values 3 for “Official Leader”, 2 for “Active Member”, 1 for “Inactive Member” and 0 for “Not a Member”. Active members of religious organizations may be taken as a proxy for community activism.

### 5. Results

For convenience, all the tables are reported in the [Appendix](#). The main DID estimates on Chinese aid projects are presented in Table [B2](#). The unit of observation is an individual respondent. In all columns, a set of controls, country as well as year fixed effects are included. In all regressions, standard errors clustered at the Afrobarometer cluster levels. The estimates for the coefficient on ongoing project ( $ACP_{50i}$ ) and on to be implemented project ( $CCP_{50i}$ ) are given respectively in the third and fourth rows of the Table [B2](#). As indicated by the statistically significant coefficients on  $CCP_{50i}$  in columns 2 and 3 of Table [B2](#), Chinese projects are located in areas with lower pre-existing trust levels. Thus, interpreting only the coefficient of  $ACP_{50i}$ , without taking into account that of  $CCP_{50i}$ , overestimates the effect of the Chinese presence. Hence, DID (i.e.,  $ACP_{50i} - CCP_{50i}$ ) estimates are reported in 1<sup>st</sup> row of Table [B2](#).

We first focus on the results on the bridging social capital, which we measured by generalized trust. These results are reported in row 1, column 1 of Table [B2](#). The dependent variable is a dummy of generalized trust. The result indicates that the probability of trusting other people for an individual residing 50 kilometers (kms) nearer to an active or ongoing Chinese project (ACP) is 0.04 times lower than an individual living 50 kilometers afar.

We reiterate that these results are obtained after accounting for modernization and institutional variables. When variables such as corruption and institutional trust are dropped, the impact gets weaker. This suggests that the effect of Chinese aid are borne by not only its features but also by the quality of institutions in the recipient countries. In other words, the negative effects of Chinese aid on social capital are conditional on the incidences of corruption and institutional trust around Chinese aid project locations.

The estimates for trust in neighbours and trust in relatives are given in column 2 and 3 of Table [B2](#). No similar trend exists for the bonding social capital. As can be seen, the estimates on  $ACP_{50i} - CCP_{50i}$  are not statistically distinguishable from zero. Thus, Chinese aid does not have an effect on the bonding (particularized) form of social capital.

#### 5.1. Sensitivity to alternative cut-offs

As a robustness check, we estimate the empirical specification for wider geographic cut-offs. We report estimation results of specification (2) respectively for 75,100 and 200 kilometer cut-offs in Table [B3](#). We observe a similar pattern to the result in column 1 of Table [B3](#). At 100 km cut off, the result becomes half of the estimate for the 50 km cut off. At 200 km cut off; the effect disappears. This exercise may serve as a falsification test. The consistent decline in the estimates implies that the effect is indeed due to the Chinese aid. In other words, there is no systematic difference between CCP and ACP as one moves further away from ACP locations. This could thus be taken as evidence that the common trend assumption of a DID set up is not violated.

#### 5.2. Mechanisms

Table [B4](#) reports results on the mechanisms proposed in section [2.1](#). The dependent variable is an indicator of the frequency of community meetings in column 1, is an indicator of

membership in voluntary association or community group in column 2 and an indicator of subjective wellbeing (SWB) in column 3.

The estimates from using measures of community engagement are given in columns 1 and 2 of Table B4. As can be seen from columns 1 and 2 of Table B4, there are generally lower participation in community meetings and voluntary membership in community development associations in Africa. This is shown by the coefficient on  $CCP_{50i}$ . This is in the absence of Chinese aid projects. In the presence of Chinese aid projects, there is more community disengagement and this can be seen by the size of the coefficient on  $ACP_{50i}$  in columns 1 and 2 of Table B4. As shown by the coefficient on the difference between  $ACP_{50i}$  and  $CCP_{50i}$ , Chinese aid projects have resulted in a significant fall in participation in community meetings and voluntary membership in community development associations. Thus, one way through which Chinese aid projects corrode social capital is through their negative effect on associational life.

When turning to the SWB channel, we see that the coefficient on  $ACP_{50i}$  in column 3 is negative and statistically significant. This indicates that respondents living near active Chinese aid projects have lower SWB. Nonetheless, there are no strong results to claim that Chinese aid projects are negatively related to SWB. This is shown by the coefficient on the difference between  $ACP_{50i}$  and  $CCP_{50i}$ .

The signs of other controls (not reported) are inline with the existing literature. Age squared, education, being employed are positively related to happiness as in (Alesina et al., 2004; Di Tella et al., 2001; Dolan et al., 2008). Consistent with the evidence that higher relative earnings of a neighbor are bad for one's happiness (Bjørnskov, 2007; Luttmer, 2005), perceived equality and happiness are positively related. Similar to the evidence on the positive link between religion and wellbeing (Campante & Yanagizawa-Drott, 2015; Dehejia et al., 2007; Fidrmuc et al., 2015), the coefficient of membership in religious organization variable is positive. Consistent with the literature that development positively matters for subjective well being (see Kenny, 2005, for instance), individuals in urban areas and with developed infrastructure manifest higher happiness. Similarly, institutions are significant determinants of happiness, as in other works (see Bjørnskov et al., 2010, for instance).

### 5.3. Estimates on World Bank aid

One would argue that the results presented so far may not only indicate the effects of Chinese aid. The findings could indirectly be the effects of development projects from other major donors in Africa, e.g., the United States or Europe. This is less of a concern since the main specification is estimated conditional on the absence of any previous projects in an area. Nonetheless, it is still important to show whether development projects from other countries have similar impacts. For comparison, thus, we have replicated the analysis for aid from the World Bank.

Table B5 reports estimates of specification (2) for the World Bank aid projects. Results indicate that Chinese aid stands in sharp contrast with the World Bank aid. As shown in column 1, the World Bank aid has no effect on generalized trust. The coefficients on  $AWP_{50i}$  in columns 2 and 3 of Table B5 suggest that active World Bank aid projects (AWP) are not related to social disengagement. One similarity between Chinese aid (see column 3 of Table B4) and world bank aid (see column 4 of Table B5) is that neither affects subjective well-being (SWB).

## 6. Concluding remarks

Recent literature documents positive contributions of Chinese aid flows, at least at the national level. It aids social education and child health (Martorano et al., 2020) and greases short-run economic growth (Dreher, Fuchs, Parks, et al., 2021). However, there are also negative externalities from aid. This paper proposes and tests the hypothesis that imposes negative externalises on social capital.

Chinese aid has two distinguishing features that may make it impose negative externalises on social capital. First, Chinese projects in Africa are directly controlled or operated by Chinese contractors. This feature may insulate local Africans from participating in their own development activities; and thus be

disengaging to associational life. Second, China gives unconditional aid as a result of which Chinese aid projects breed norms of corruption. This may have bad consequences on subjective well-being. Through these channels, Chinese aid could be antithetical to Africa's social ties.

To test the hypothesis, I use data from the Afrobarometer surveys and the AidData. With an empirical strategy that exploits a temporal spatial DID, I find some that Chinese aid projects are doing a bad job to cultural norms in Africa. This effect is present only for the bridging, as opposed to bonding, forms of social capital. In particular, I find that individuals living closer to ongoing, compared to individuals living near planned, Chinese development projects manifest lower scopes of generalized trust. For comparison, the main analysis is replicated on aid from the World Bank. Yet, I do not find similar effects for the World Bank aid.

Turning to the mechanisms, I test for two theoretical mechanisms through which Chinese aid may affect social capital. These are social engagement and subjective well-being channels. I get evidence that Chinese aid projects hamper associational life or participation in community. I do not find support for the subjective well being channel. That is, I do not find evidence that Chinese aid is bad for subjective well-being. I thus argue that it is through the social disengagement channel that Chinese aid affects social capital.

This study provides an interesting explanation on social capital consequences of China's engagement in Africa. Nevertheless, the analysis is not without limitations. Though attempts are made to address the biases arising from a non-random location of Chinese aid projects, some degree of scepticism must remain as to how these results are to be interpreted. If anything, this study relies on observational data that gives rise to endogeneity concerns. Biases may arise from the difficulty of not fully considering the role of all exogenous factors. Second, the results are silent on the duration of effects. The analysis is not capable of showing how long lasting this impact of the Chinese project is. Thus, the findings should only be interpreted as short-run effects. Third, constrained by the data at hand, the paper offers limited insights into the intriguing but unresolved subject of how Chinese aid might influence social capital, which offers an intriguing topic for further study. It is thus crucial to interpret the findings within the particular framework of the quantitative analysis that the paper employs. For comparison, the paper replicates the main analysis on aid from the World Bank. Nonetheless, it is still important to show whether development projects from other major donors such as the United States have similar impacts. Finally, this paper is limited only to the analysis of foreign aid. Investigating the effects of other Chinese flows, such trade and FDI on social ties, would be a significant extension given the high level of interest in China's imprint in developing nations. These are gaps that a further analysis shall consider.

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#### Availability of data and materials

All data used for this study are included in this article

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#### Notes

1. This paper measures particularized trust as trust in relatives or trust in neighbors.
2. For the donor, happiness could be promoted by pro social spending at the individual level (Aknin et al., 2020); and aid promotes donor happiness in cross country settings as well (Arvin & Lew, 2010).
3. See data section for data description.
4. The construction of each of these variables is presented in the Data section.
5. We obtained geo-coded Afrobarometer data from the Afrobarometer team via an email request.
6. The data is available at <https://www.aiddata.org/data/geocoded-chinese-global-official-finance-dataset>.



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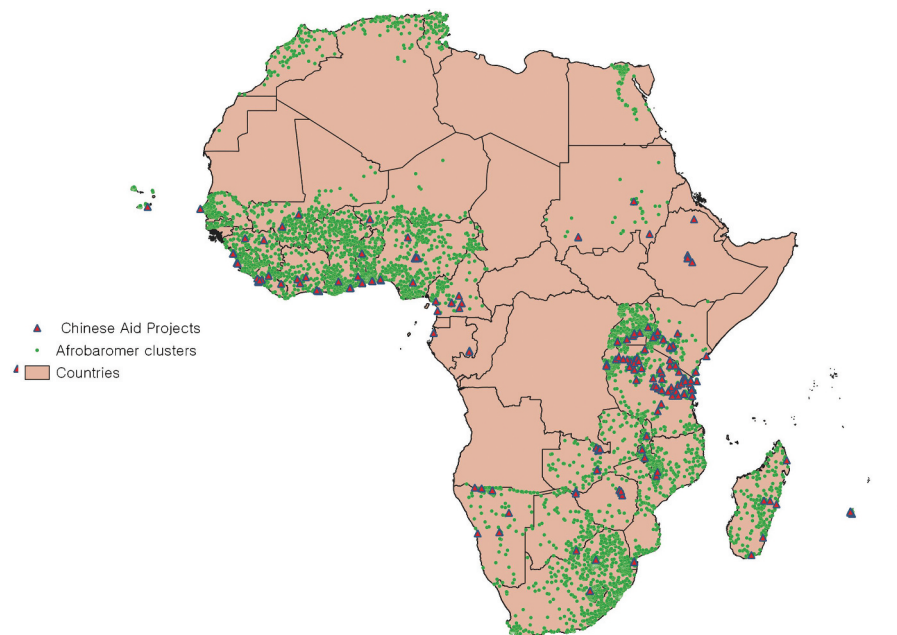
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## Appendix A

**Figure A1.** In this figure, the red triangles represent the location of Chinese aid projects. The green dots are location of afrobarometer respondents. Overall, the figure provides the distribution of Chinese projects around Afrobarometer clusters.



## Appendix B

**Table B1. Summary statistics**

VARIABLES	Mean	SD	Min	Max
<b>Dependent variables</b>				
Trust relatives	2.366	0.900	0	3
Trust neighbours	1.767	1.007	0	3
Generalized trust	0.186	0.389	0	1
Community Meeting Attendance	2.100	1.332	0	4
Membership in Community in DA	0.618	0.931	0	3
Subjective Well being (SWB)	2.677	1.188	1	5
<b>Control variables</b>				
Institutional Trust Index	8.016	4.106	0	15
Corruption Index	0.701	1.368	0	6
Democratic quality index	2.467	1.047	0	4
Public Goods index	3.221	1.727	0	6
Political repression index	1.835	1.094	0	3
Perceptions of inequality	0.332	0.471	0	1
Religious Membership Index	0.974	0.984	0	3
Age	36.89	14.51	18	130
Age Squared	15.71	12.92	3.240	169
Urban Dummy	0.402	0.490	0	1
Male Dummy	0.499	0.500	0	1
Education Levels	3.276	2.128	0	9
Employment status	1.350	1.380	0	5
<b>Chinese aid projects within different Kilometers</b>				
$ACP_{50i}$	0.274	0.446	0	1
$CCP_{50i}$	0.0458	0.209	0	1
$ACP_{75i}$	0.367	0.482	0	1
$CCP_{75i}$	0.0592	0.236	0	1
$ACP_{100i}$	0.426	0.495	0	1
$CCP_{100i}$	0.0674	0.251	0	1
$ACP_{200i}$	0.632	0.482	0	1
$CCP_{200i}$	0.0874	0.282	0	1



**Table B2. Chinese aid and trust : DID estimates**

Variables	(1) Generalized Trust	(2) Trust Neighbours	(3) Trust relatives
$ACP_{50i} - CCP_{50i} (Y_1 - Y_2)$	-0.0402***	-0.0151	0.00316
$ACP_{50i}$	-0.031***	-0.107***	-0.069***
	(0.008)	(0.020)	(0.017)
$CCP_{50i}$	0.009	-0.092***	-0.072***
	(0.015)	(0.033)	(0.025)
Observations	27,425	27,787	37,324
R-squared	0.093	0.198	0.152
controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes

Notes: The controls include respondent's individual's age, age squared, gender (a male dummy), place of residence (an urban dummy), levels of education, employment status, perceived inequality, index of active religious membership, an index of public goods, an indicator of political repression, an index of institutional trust, and index of corruption incidence and an index of democratic quality. ACP/CCP denotes active/planned Chinese project. Standard errors are clustered at the Afrobarometer survey cluster level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

**Table B3. Chinese aid and trust : Robustness**

Variables	(1) Generalized Trust	(2) Generalized Trust	(3) Generalized Trust
$ACP_{Di} - CCP_{Di} (Y_1 - Y_2)$	-0.0381***	-0.0258**	0.00415
$ACP_{75i}$	-0.031***		
	(0.007)		
$CCP_{75i}$	0.007		
	(0.013)		
$ACP_{100i}$		-0.043***	
		(0.007)	
$CCP_{100i}$		-0.018	
		(0.013)	
$ACP_{200i}$			-0.045***
			(0.008)
$CCP_{200i}$			-0.049***
			(0.013)
Observations	30,902	30,666	30,681
R-squared	0.092	0.095	0.097
controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes

Notes: The controls include respondent's individual's age, age squared, gender (a male dummy), place of residence (an urban dummy), levels of education, employment status, perceived inequality, index of active religious membership, an index of public goods, an indicator of political repression, an index of institutional trust, and index of corruption incidence and an index of democratic quality. ACP/CCP denotes active/planned Chinese project. Standard errors are clustered at the Afrobarometer survey cluster level \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .



**Table B4. The mechanisms**

VARIABLES	(1) Community Meeting	(2) Volunteerism	(3) Subjective Wellbeing (SWB)
$ACP_{50i} - CCP_{50i}$	-0.0653**	-0.0471**	-0.0393
$ACP_{50i}$	-0.176***	-0.113***	-0.030**
	(0.016)	(0.011)	(0.015)
$CCP_{50i}$	-0.111***	-0.066***	0.009
	(0.030)	(0.020)	(0.032)
Observations	91,795	91,696	91,798
R-squared	0.222	0.185	0.137
controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes

Notes: The controls include respondent's individual's age, age squared, gender (a male dummy), place of residence (an urban dummy), levels of education, employment status, perceived inequality, index of active religious membership, an index of public goods, an indicator of political repression, an index of institutional trust, and an index of corruption incidence and an index of democratic quality. ACP/CCP denotes active/planned Chinese project. Standard errors are clustered at the Afrobarometer survey cluster level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ .

**Table B5. Estimates for World Bank aid**

VARIABLES	(1) Trust	(2) Community Meet.	(3) Volunteerism	(4) SWB
$AWP_{50i}$	-0.015	-0.026	-0.009	-0.016
	(0.011)	(0.020)	(0.014)	(0.018)
$CWP_{50i}$	-0.018	0.088***	0.045*	-0.058*
	(0.014)	(0.033)	(0.024)	(0.035)
$AWP_{50i} - CWP_{50i}$	0.00245	-0.114***	-0.0538***	0.0420
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes

Notes: The controls include respondent's individual's age, age squared, gender (a male dummy), place of residence (an urban dummy), levels of education, employment status, perceived inequality, index of active religious membership, an index of public goods, an indicator of political repression, an index of institutional trust, and index of corruption incidence and an index of democratic quality. AWP/CWP denotes active/planned World Bank project. Standard errors are clustered at the Afrobarometer survey cluster level. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .