THE DRAGON'S GIFT OR POISON?
THE LOCALIZED IMPACT OF CHINESE AID ON AFRICAN CONFLICTS

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ABSTRACT

This paper examines the impact of Chinese aid on African conflicts at local level. Chinese aid is often described as "rogue aid" because of its distinct features of "no-strings-attached" and its ignorance of democracy and governance. However, little is known about through which channels this form of foreign aid constitutes an important driver behind a potential aid-conflict nexus. Given the competing mechanisms that aid can both incentivize rebellions and strengthen state military power, I hypothesize that Chinese aid does not exert an amplification effect on conflicts in African countries. To address the potential endogeneity, I use the interaction of the amount of China's steel production and the probability of receiving Chinese aid to instrument for Chinese aid. Relying on fine-grained grid cell data, overall, I do not detect any effect of Chinese aid on conflicts in African countries. However, when disaggregating conflict events by political agents involved, I find a positive effect of Chinese aid on the occurrence of riots and protests in Africa. I estimate that on average the cells with Chinese aid have 0.351 higher probability of having riots and protests. Chinese aid in two specific categories, i.e. social infrastructure and economic infrastructure, is likely to contribute most to this effect. Qualitative evidence shows that the poor labor practices, neglect of environmental impact, and little local content might be the reasons. China should carefully review its way of giving aid.

This thesis is dedicated to all the great people
without whom this study would not be possible.

To my parents, Dexiang and Min,
thank you for supporting me, financially and emotionally, in all my ambitions.

To my thesis advisor and mentor, Prof. Kern,
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Many thanks,
Jie Song

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I. Introduction

The impact of foreign aid is a question of vital importance in the study of international political economy. Foreign aid is argued to be able to alleviate poverty (e.g. Alvi and Senbeta, 2011; Collier and Dollar, 2002), consolidate democracy (e.g. Daniel and Tirone, 2011), and improve education and health outcomes (e.g. Chowdhury et al., 2013; Dreher, Nunnenkamp and Thiele, 2008). Since many aid recipients are the countries most prone to conflicts, it has long been researched whether foreign aid affects the conflicts in recipient countries.

There are competing mechanisms that aid can influence conflicts, but no consensus has been established on the causal paths. On the one hand, more aid inflow may increase the reward of capturing the state power for the potential rebels and therefore fuel conflicts (Grossman, 1992). On the other hand, foreign aid is by nature fungible, as it can be diverted to the use other than the purposes earmarked by the donor. During a civil war, aid is most efficiently used as military expenditure, and the strengthened state military power should reduce the duration of conflicts (Ree and Nillesen, 2008). It is also argued that foreign aid, together with good economic policies, can promote economic development and reduce the risk of conflicts by eliminating a country's dependence on primary commodity exports and thus reducing this important income source for rebels (Collier and Dollar, 2002; Collier and Hoeffler, 2002). However, it is not clear which of the competing mechanisms may be more relevant in certain contexts.

This paper focuses on the impact of aid on African conflicts from a non-traditional donor: China. China has become an emerging donor and Chinese aid primarily focuses

on infrastructure, such as energy generation and supply, transport and storage, and industry, mining, and construction (AidData, 2017). The presence of China in international donor community is controversial. Chinese aid distinguishes itself from the aid from traditional donors because of its "no-strings-attached" feature and its ignorance of governance. Criticized as "rogue aid", Chinese aid is considered a tool to advance Chinese political and economic interests but not intended to help the development of recipient countries (Naím, 2007). Nevertheless, Chinese aid also presents positive economic impact because of its focus on infrastructure, which is underfunded by the traditional donors (Berthelemy, 2011; Dreher et al., 2016). The impact of Chinese aid on African conflicts is of primary interests in this paper.

With the improved availability of data about Chinese aid, there is a growing literature on the determinants, characteristics, and economic impact of Chinese aid, but to the best of my knowledge, there is little rigorous quantitative evidence on the effect of Chinese aid on African conflicts. This paper focuses on filling this gap.

Instead of the common approach of studying the aid-conflict nexus at country level, I examine the relationship at local level. If the determinants of conflicts are localized, studies that aggregate the aid and conflict data at country level can lead to a spurious relationship. It is also found that disaggregating aid and conflict data and investigating geographical information help identify mechanisms that aid triggers conflicts (Findley et al., 2011). Therefore, I adopt a localized approach to study the impact of Chinese aid on African conflicts.

Using two geo-referenced datasets from AidData and the Armed Conflict Location

& Event Data Project (ACLED), I construct a cell-year panel comprised of grid cells with a size of 100km*100km. I do not use a level of subnational administrative division as the observational unit, because the boundaries of administrative entities can be changed because of conflict, which may introduce bias. In the contrast, the size and boundary of grid cells are arbitrarily determined according to the purpose of the research, so it is completely exogenous to the conflict dynamics.

In identifying the causal effects of Chinese aid on African conflicts, reverse causality is one of the main sources of endogeneity. Since Chinese aid has a focus on infrastructure projects, conflicts and the associated instability may discourage Chinese from giving aid to the region. Other omitted variables, such as potential political and economic shocks correlated with both aid and conflicts, may bias the OLS estimates (Nunn and Qian, 2013). Measurement error in the aid data can also result in attenuation bias.

Identifying an exogenous source of variation is crucial to tackle the endogeneity problems. I instrument for Chinese aid by the interaction of the amount of China's steel production and the probability of receiving Chinese aid in a given year for a given cell as a variant of the instrument suggested by Dreher et al. (2016). As a foundational industry, China's steel industry provides material support for the development of all other industries. Dreher et al. (2016) argue that because of the strategically important role of steel, Chinese government maintains an excessive capacity of steel production and uses part of the surplus in foreign aid projects. The value of Chinese aid to Africa changes in the same direction as China's steel production. China's steel production is

plausibly relevant to Chinese aid and exogenous to African conflicts.

Enlightened by Nunn and Qian (2014) and Dreher et al. (2016), I exploit the differences in the probability of receiving Chinese aid in each cell as the source of cross-sectional variations. I estimate the probability of receiving Chinese aid by calculating the proportion of years that a cell received Chinese aid and interact the probability with the annual amount of China's steel production as the instrument. It is expected that the cells that regularly receive Chinese aid are more likely to be affected by the change in the amount of China's annual steel production than the cells that rarely receive Chinese aid (Dreher et al., 2016).

This identification strategy is similar to a difference-in-differences approach, where I examine the differential effects of Chinese aid on the cells with higher and lower probability of receiving Chinese aid (Nunn and Qian, 2014; Dreher et al., 2016). My identifying assumption is that conflicts in Africa will not be affected by China's steel production through channels other than receiving Chinese aid, when time-invariant features for each cell and changes across time that are similar to all cells are controlled for. Therefore, the key to estimating causal effect is to ensure the exogeneity condition of the instrument. China's production of steel is unlikely to be affected by omitted variables that affect conflicts in Africa. However, the probability of receiving Chinese aid is endogenously determined and may be directly affected by the conflicts in the cell. For this reason, I include cell fixed effects in both stages of regressions, controlling the time-invariant probability of receiving Chinese aid. With an endogenous variable controlled, its interaction with an exogenous variable should be exogenous

(Bun and Harrison 2014; Dreher et al., 2016; Nizalova and Murtazashvili 2016; Nunn and Qian, 2014).

My results show that overall Chinese aid does not have a significant impact on African conflicts. When I disaggregate African conflicts into different categories according to the political agents involved, I find Chinese aid still has no effects on most categories of conflicts, i.e. government-related conflicts, rebel force-related conflicts, militia-related conflicts, and violence against civilians. The only category that Chinese aid has a significant impact on is riots and protests, the most localized one among all categories. On average, after controlling for year and cell fixed effects, one more Chinese aid in the previous year is associated with 5.112 more riots or protests. The cells with Chinese aid in the previous year have 0.351 higher probability of having riots or protests. 1% higher value of Chinese aid in the previous year is correlated with 0.024% higher fatalities in riots or protests. Disaggregating Chinese aid in different sectors show that Chinese aid in social and economic infrastructure is likely to contribute to this amplification effect. These results are robust across different measurements of the dependent variable and the key independent variable.

This paper contributes to several literatures. First, it provides empirical evidence for the aid-conflict nexus at local level. Most studies of aid-conflict nexus choose country as the level of aggregation, but this may either lead to a spurious relationship or obscure relationships that truly exist (Findley et al., 2011). My finding that Chinese aid only increases riots and protests, the most localized category among all conflicts, well justifies the method of studying the aid-conflict nexus at local level. Second, my

findings shed lights on the socio-economic impact of Chinese aid. Overall, Chinese aid has no impact on African conflicts, but Chinese aid in social and economic infrastructure is likely the cause of more riots and protests in Africa. The mechanism may be quite different from the mechanism described by Gross (1999) and Collier and Hoeffler (2002), but it is closely relevant to the way China is giving aid. Lastly, my findings add to the broader literature of the impact of foreign aid.

The remaining paper is organized as follows: Section II reviews the relevant literature. Section III describes the data. Section IV illustrates the empirical strategy. Section V presents the empirical results. Section VI discusses the findings.

II. Literature Review

1. Aid and Conflict

Foreign aid, as a voluntary transfer from governments or inter-governmental organizations to another governments, aims at promoting the recipient country's economic, social, and political development (Nielsen et al., 2011). The reasons of giving aid, however, also depend on the donor countries' strategic concerns, including foreign policy concerns, and promotion of trade (McKinlay and Little 1977).

There has been an extensive literature analyzing the relationship between aid and conflict, primarily focused on theoretical mechanisms. Normatively, foreign aid planners propose that foreign aid should be used to reduce poverty as well as inequality to prevent conflict, and donors should use aid as a sanction to encourage the recipients establishing the institutions for "non-violent conflict expression and resolution", which is, in other words, imposing conditions on the recipient countries (Addison, 2000, p. 315). However, Empirical studies show a mixed picture. There are competing mechanisms through which aid may fuel or reduce conflicts. There are mainly two main perspectives. On one hand, generous foreign aid, which can be considered as a form of rent, can attract potential rebels as a reward for victory (Grossman, 1992). On the other hand, it is argued that the recipient government may use the aid to strengthen their military power and thus reduce the risk of conflicts (Collier and Hoeffler, 2002). Below, I briefly outline these two streams in the literature.

Aid as a Reward for Rebels

Grossman (1992) models the time allocation of rulers and peasants under the

presence of foreign aid and predicts that inflow of foreign aid is likely to increase conflicts. In his model, foreign aid increases the expected payoff of potential peasant insurgents, so the peasants tend to reallocate time from production to "*an intensified struggle over distributive shares (of foreign aid)*" (Grossman, 1992, p. 287). More generous aid, as a larger reward of capturing the state, can lead to a larger incentive for insurrection. Though the ruler will also allocate more resources to deter potential rebellion to benefit his/her own clientele, such as the people from his/her own ethnic group, unless the ruler's optimal policy combination can completely deter all insurrections, foreign aid increases political instability (Grossman, 1992). Empirically, it is shown that rebels can use the embezzled aid to recruit more soldiers and finance the warfare (Anderson, 1999, p. 38; Blouin and Pallage, 2008; Maren, 1997, p. 103–104, 260). Humanitarian aid and development aid also provide the rebels with necessary resources to continue existing conflict. Food aid, unlike other types of aid, requires long-distance transportation and is easy to be confiscated from the recipients, so it becomes a target of rebels. Nunn and Qian (2014) use the interaction of lagged U.S. wheat production and the probability of receiving U.S. food aid for a country as an instrument for U.S. food aid and show US food aid increases the incidence of armed civil conflicts and prolongs existing conflicts.

Qualitative studies also find other mechanisms of aid fueling conflicts. In Somalia, aid largely strengthens business elites, who have an interest in the continued cycle of violence in the country (Webersik, 2006). A similar result is also found in Kyrgyzstan, where the elite class captured aid inflows, and used these funds to enhance their

privileged position, which, in turn, lead to an increase in popular grievance and conflicts (Vaux and Goodhand, 2001).

Aid, Growth and Military Power

Collier and Hoeffler (2002) propose another model of rebellion and argue that though there is no direct effect of aid and policy on risk of conflict, aid and policy together can increase the country's growth rate, decrease its dependence on primary commodity exports, which is a potential funding for rebels. Aid can also improve the state military capacity, so it can reduce the duration of civil war and even potentially prevent it from happening by either a strong army or solid economic growth (Nielsen et al., 2011). Similarly, Ree and Nillesen (2008) fail to find if aid reduces the probability of civil conflict onset but reveal that inflow of foreign aid can reduce the duration of ongoing civil conflicts because aid flow is most effectively spent in military purpose during conflict time.

Aid Type and Fungibility

There are various types of aid, different donors, and recipient countries. The impact of aid can vary in different contexts. It has been pointed out that different findings in aid-conflict literature may be attributed to different empirical strategies or different types of aid that were examined (Nunn and Qian, 2014).

Most foreign aid is fungible, meaning that the aid earmarked for a particular purpose specified by the donors can be diverted to other uses according to the recipient government's own preferences (Feyzioglu, Swaroop, and Zhu, 1998). Among different types of aid, though eliminating transaction cost, budget support is considered more

fungible than project-based aid (Leiderer, 2012). Feyzioglu, Swaroop and Zhu (1998) find that the recipient countries reduce their own funding to agriculture, education, and energy sectors if they receive aid earmarked to these sectors, while only the loans to transport and communication sector are fully spent on the original purposes.

It is argued that fungible foreign aid, similar to natural resources, creates substantial rents, and when it is captured by the governments or rebels, it can be used to finance rebellions and civil war (Blattman and Miguel, 2010). Findley et al. (2011) summarize that aid fungibility can influence conflict when it boosts military expenditures of the government or creates opportunities for rent-seeking throughout the country. Fungible aid, through influencing military expenditures, can increase the risk of conflict (Addison and Murshed, 2001). More spending on military forces may trigger regional arms races and raise the risk of civil war (Collier, 2009; Collier and Hoeffler, 2007).

2. Chinese Aid and Conflicts

With the promotion of the "Belt and Road" Initiative, China's development finance is attracting greater attention worldwide. African countries are main recipients of Chinese official aid (AidData, 2017). As an emerging donor, from 2000 to 2014, China has given out a total of $354.3 billion official finance, compared to $394.6 billion from the United States during the same period (AidData, 2017).

The determinants of Chinese aid are a mix of political and economic factors. Before its massive "Reform and Opening-Up" in 1978, China's Official Development Finance (ODF) to Africa was mainly driven by ideology and political strategy (Brautigam,

2009). In the post-reform period, Chinese ODF still serves political objectives, but also development goals (Brautigam, 2009). The acknowledgement of "One-China Policy" is crucial in the diplomatic and economic relationship between China and any other country, but besides it, there is generally no conditionality in China's development finance.

Featured by "no-strings-attached", Chinese aid is considered to have a dominant focus on natural resources and is perceived as a tool to advance China's own political and economic interests (Naím, 2007; Song, 2018). Criticized as "rogue aid", in many undemocratic countries, Chinese aid outcompetes the aid from the World Bank and other donors that requires the recipient countries to improve governance or implement economic reform; as a result, the power of dictators is strengthened by the unconditional aid (Naím, 2007). For the donor community, China's no-strings-attached aid, as research shows, reduces the average number of conditions in foreign aid globally: faced with an unconditioned alternative from China, the recipient countries gain more bargaining power in the negotiation over aid conditionality with traditional donors (Song, 2018; Swedlund, 2017). Even in countries with notorious human rights abuses, such as Sudan and Democratic Republic of the Congo, the Chinese pragmatism prevails—China gives aid to them in exchange for copper, cobalt, and oil (Brautigam, 2009; Song, 2018). China does have strong ties, maybe enhanced through giving aid, with countries that have good political relations or countries that are resource-rich (Berthelemy, 2011).

However, "rogue aid" may be an unjustified claim. In studying Chinese aid from

1956 to 2006, Dreher and Fuchs (2015) find that political concerns indeed drive Chinese aid allocation, but it is no more politically oriented than traditional donors. Moreover, Chinese aid is independent of democracy and governance, as expected, but surprisingly, natural resource endowment does not determine the allocation of Chinese aid (Dreher and Fuchs, 2015). Brautigam (2009) also argues that the focus on natural resources is not the whole picture of Chinese aid policies, and the intention of mutual benefits, drawn from China's own experience as an aid recipient of Japanese aid also plays an important role.

There is also a growing literature on the economic impact of Chinese aid in the recipient countries. In many infrastructure contracts, China requires the aid recipients to repay the loan by commodity exports to China, which can be a good way to counter the negative impact of natural resource curse (Brautigam, 2009; Ross, 2008). However, the nontransparent tendering process of Chinese aid projects often results in the winning of a Chinese SOE (Brautigam, 2009; Song, 2018). Generally, Chinese aid, trade and investment focus on some sectors that are underfunded by traditional donors, especially infrastructure, and provides substantial cooperation as well as technical assistance in sectors like health and agriculture (Berthelemy, 2011; Song, 2018). The study does not find any significant impact of China engagement on African economy (Berthelemy, 2011). Specifically, for Chinese aid, Dreher et al. (2017) find that Chinese aid exerts positive effects on economic growth in the recipient countries and meanwhile it does not weaken the effectiveness of aid from traditional donors.

The impact of Chinese aid on conflicts in recipient countries is not yet thoroughly

studied. With the newly available dataset of Chinese aid, Strange et al. (2017) replicate the study of the impact of "aid shock", i.e. a sudden decrease in aid receipt on recipient states, which significantly increases the probability of conflict onset (Nielsen et al., 2011). Strange et al. (2017) show that excluding Chinese aid results in an inaccurate estimate of the impact of "aid shock" on conflict, as Chinese aid, to some extent, has become a substitute for the aid from traditional donors. They argue that when traditional donors retreat and almost generate an aid shock, sufficient funding from China can stabilize the aid flow, prevent an aid shock from happening and eventually reduce conflicts.

Nevertheless, some qualitative evidence shows the dark side of Chinese aid that increases conflicts. Chinese aid and investment in infrastructure is usually associated with huge ambition to grab land. In 2006, Mozambique was offered a loan of $2 billion to build a dam over the Zambezi River, which was expected to greatly improve the agricultural productivity for the fertile land in the valley, and 3,000 Chinese were allowed to farm there, triggering protests (Condon, 2012). Condon argues that compared to traditional donors, China is now offering African countries a development of "grow-at-any-cost" (2012). This is arguably true. Between 2003 and 2009, the Merowe Dam in Sudan, funded by both China and a few Arab financiers, doubled the electricity generation for Sudan, at the cost of forced resettlement of 50,000 people and protests of the affected communities, resulted in blooding repression from the Sudanese government (Brautigam, 2009; International Rivers, 2018). In 2005, an explosion at a Chinese-owned explosives plant in Zambia, as a Chinese investment (not qualified for

aid), killed 51 factory workers; as a result, the Chinese investment was widely accused of working conditions and safety standards (Brautigam, 2009; Condon, 2012). In 2006 and 2011, in two protests over wage and poor working conditions respectively, some workers were shot and wounded by security guards and Chinese managers (Brautigam, 2009; Condon, 2012). The same happened in Zambia (Rice, 2012). Low transparency in Chinese aid is also harshly criticized. An Australian federal minister accused China of funding useless aid projects in Pacific countries, such as roads to nowhere, as an indirect way of funneling money to local leaders (Graue and Dziedzic, 2018). Kishi and Raleigh (2015) argue unconditional Chinese aid provides the state with unrestricted fund to repress the citizens and improves the state's ability to engage in conflicts.

The effect of Chinese aid on conflict is still being debated, and there are a few problems to be addressed. The first is that there is no study of the average causal effects of Chinese aid on African conflicts yet because of the difficulties in identification. Reverse causality is one of the main sources of endogeneity. Since Chinese aid has a focus on infrastructure projects, conflicts and the associated instability may discourage Chinese from giving aid to the region. Other omitted variables, such as potential political and economic shocks correlated with both aid and conflicts, may bias the OLS estimates (Nunn and Qian, 2013). Measurement error in the aid data can also result in attenuation bias. Strange et al. (2017) adopt lagged aid data strategy to mitigate the concerns about endogeneity, but it is insufficient to entirely eliminate the bias. To search for causality in the case of Chinese aid, it might be most practical to find a relatively valid instrumental variable for Chinese aid, such as an interaction term of China's steel

production and the probability of receiving Chinese aid, as suggested by Dreher et al. (2017).

The second problem is that whether Chinese aid has differential effects on different types of conflicts as a result of the distinct features of Chinese aid. As discussed before, there are many empirical evidence about Chinese aid increasing protests (Brautigam, 2009; Condon, 2012; International Rivers, 2018; Rice, 2012), which is a more direct way of the aid-conflict nexus. However, other categories of conflicts, such as government- and rebel force-related conflicts, can be affected by aid in a more indirect way. A closer examination of the heterogenous effects is needed.

Last but not least, conflicts often happened at subnational level and are related to region-specific conditions. For instance, population, ethnicity, and access to natural resources, especially the existence of diamond or natural resource mining, can be important in triggering subnational conflicts (Rød and Buhaug, 2005). Many existing aid datasets, e.g., OECD's CRS data and Aid Data, are project-based, so aggregating aid information at country level eliminates the project-specific information, especially the geographical information. Researchers have shown that disaggregating aid and conflict data can help identify competing causal mechanisms in aid-conflict nexus (Findley et al., 2011). A localized study of the nexus between Chinese aid and African conflicts is vital to disentangle competing mechanisms. Therefore, my approach is to examine Chinese aid at local level, carefully considering the geographical relationship between aid and conflict events.

III. Data Description

I mainly use two datasets in this study. One is AidData's Chinese Official Finance to Africa Dataset, 2000-2012, Version 1.1.1, which is a georeferenced dataset of Chinese official finance activities in Africa from 2000 to 2012 (Strange et al., 2017). The dataset includes a unique project and location identifier, project name, location, value of the projects, recipient country, time of commitment, etc. It records 3,545 physical locations of 1,952 Chinese development finance projects. In this study, I do not limit Chinese aid to OECD's definition of Official Development Assistance (ODA)[1]. AidData codes Chinese aid based on the definition of Official Development Finance (ODF), including ODA, grants, concessional and non-concessional development lending, and Other Official Flows (OOF) for development purposes[2]. Therefore, in this study, I define "Chinese aid" as all ODF in AidData dataset. In terms of sectoral distribution, Chinese ODF to Africa is earmarked to a diverse range of sectors, such as agriculture, education, communication, mining, and health.

The other dataset is the ACLED Version 8 (1997 – 2017) standard file from the Armed Conflict Location & Event Data Project (ACLED), which includes locations, dates, and types of all reported violent and non-violent conflict events across entire

[1] The OECD Definition of Official Development Assistance (ODA) (OECD, 2018):
"the flows to countries and territories on the DAC List of ODA Recipients and to multilateral institutions which are:
i. provided by official agencies, including state and local governments, or by their executive agencies; and
ii. each transaction of which: a) is administered with the promotion of the economic development and welfare of developing countries as its main objective; and b) is concessional in character and conveys a grant element of at least 25 percent (calculated at a rate of discount of 10 percent)."

[2] The OECD Definition of Official Development Finance (ODF) (OECD, 2018):
"used in measuring the inflow of resources to recipient countries: includes
(a) bilateral official development assistance (ODA),
(b) grants and concessional and non-concessional development lending by multilateral financial institutions, and
(c) Other Official Flows for development purposes (including refinancing Loans) which have too low a Grant Element to qualify as ODA."

African continent (ACLED, 2018). The conflicts recorded in ACLED is political violence, defined as "the use of force by a group with a political purpose or motivation" (ACLED, 2017, p. 7). ACLED data "focuses on tracking a range of violent and non-violent actions by political agents, including governments, rebels, militias, communal groups, political parties, rioters, protesters and civilians" (ACLED, 2017, p. 7). Table 1 shows the definition of various political agents, where I combine political militia and communal militia together, and combine protesters and rioters into one category based on their similarity.

Table 1 Types of Political Agents in ACLED Data

Political Agent	Definition
Government	Internationally recognized regimes in assumed control of a state
Reble Force	Political organizations whose goal is to counter an established national governing regime by violent acts
Political Militia	Armed agents supported by political elites of various types, seeking to influence political processes but not change the government
Communal Militia	Groups engaged in local political competition, often traditionally based contests between ethnic, community or local religious groups
Protesters	Individuals who participate in non-violent demonstrations
Rioters	Individuals who participate in either violent demonstrations or spontaneous acts of disorganised violence
Civilians	In whatever number or association, victims of violent acts within ACLED

Because of the availability of Chinese aid data, I limit the time series of Chinese aid to 2000-2012. Since aid data is lagged for one year in my empirical models, the conflict data I use in this study is from 2001 to 2013. To make two major datasets comparable, I limit the conflicts events to the 51 countries where China gives aid, so I exclude The Gambia and Swaziland from the conflict dataset. There is no Chinese aid in either country because they did not establish an official diplomatic relation with China; instead, they recognized Taiwan during the period of this study. This partly shows the political nature of Chinese aid.

Thus, the conflict dataset used in this study has 71,137 records in this period. The types of events include battles, riots and protests, violence against civilians, remote violence and non-violent actions such as headquarters or base established, strategic development, and recruitment drives. I calculate both average effects and heterogenous effects based on the political agents involved. According to Table 1, the five types of conflicts are government-related conflicts, rebel force-related conflicts, militia-related conflicts, riots and protests, and violence against civilians.

In the instrumental variable approach to tackle endogeneity, I use the amount of steel production in China to construct the instrument. The data is scraped and aggregated from Monthly Crude Steel Production Data: 1990 – 2016 from the website of World Steel Association (World Steel Association, 2017). Because the logged lagged amount of China's steel production is used in the first-stage regression, I use the steel production data from 1998 to 2011.

To construct a cell-year panel from two referenced datasets, I first downloaded maps of all African countries that received Chinese aid from the Database of Global Administrative Areas (GADM). Then, according to the longitude and latitude in both datasets, I mapped all aid projects and conflict events. The spatial points contain information of each aid project and conflict event. Later, I created square grid cells of equal size to cover entire African continent. Only the cells on land are of interests, so I dropped all cells in the ocean. The final step is to spatially join all points of aid and conflict to the grid cells, and aggregate data by year within each cell. My study focuses on 100km*100km cells, so the main sample contains 3,175 cells and there will be

41,275 cell-year observations. There are a few aid projects in the middle of the ocean of “Gulf of Suez” and “Gulf of Guinea”, so they are not included in the main sample. In the ACLED datasets, many conflicts happened at the Sinai Peninsula of Egypt, which geographically does not belong to Africa, so based on the boundary of GADM maps, they are also excluded. Finally, my main sample of 3,175 cells contains 3,531 out of 3,545 locations of Chinese aid projects and 71,064 out of 71,137 conflict events. Figure 1 presents the African continent with and without 100km*100km cells. Figure 2 is a close view of East African community. There is no clear pattern of aid-conflict nexus. A closer look at the map of East Africa shows some evidence of reverse causality that Chinese may choose to locate the aid projects in “safer” places, but the reach of Chinese aid is still relatively limited. Given the conflicts in Uganda, Rwanda, and Burundi, spatial autocorrelation of conflicts may be a concern. Apparently, there are certain regions that are more prone to conflicts. With this cell-year panel, I dive deeper into the localized effects of Chinese aid on conflict.

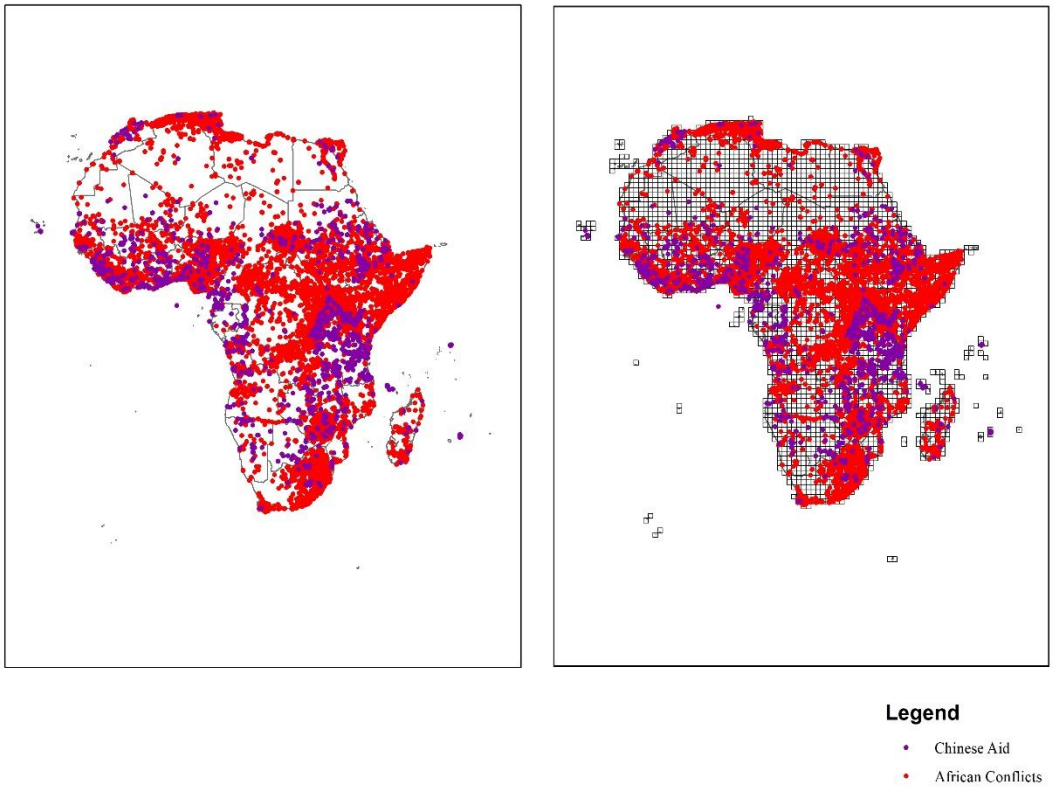

Figure 1 Chinese Aid and African Conflicts

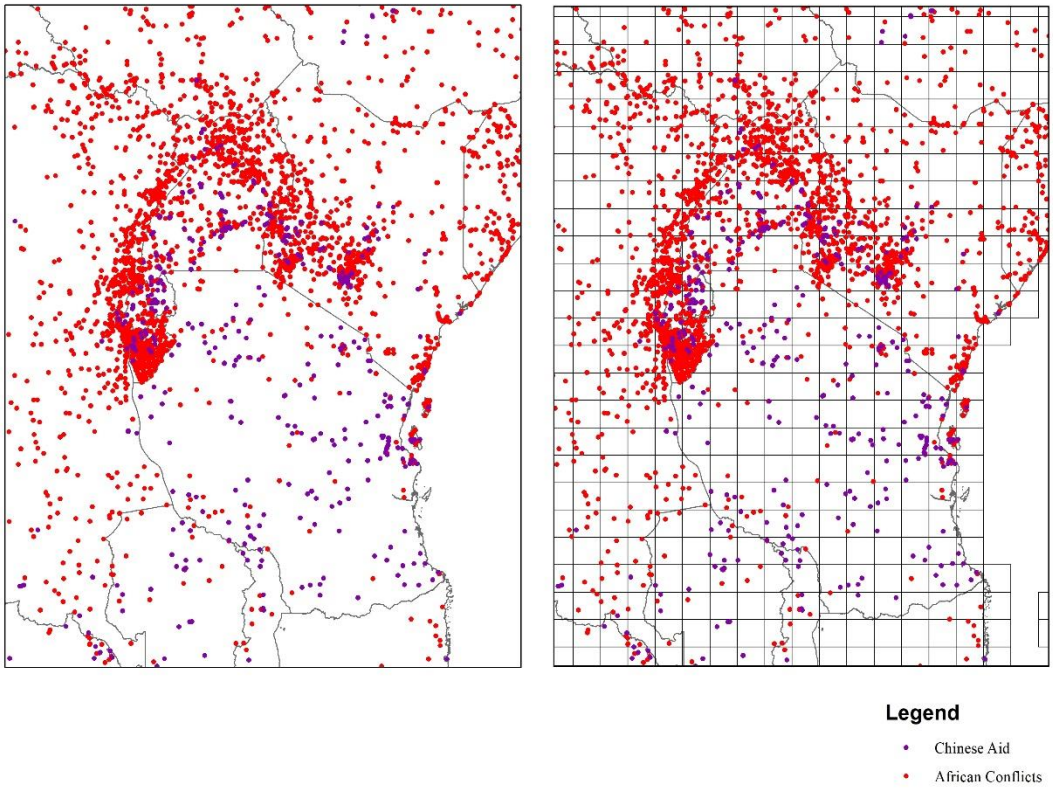

Figure 2 Chinese Aid and African Conflicts (East Africa)

IV. Empirical Strategy

1. Baseline Model

I examine the relationship of Chinese aid and African conflicts with a cell-year panel. My baseline model is a linear model with variations in dependent and independent variables. The model is specified as follows:

$$Conflict_{i,t} = \beta_0 + \beta_1 Aid_{i,t-1} + \beta_2 \tau_{i,t} + \beta_3 \varphi_t + \beta_4 \omega_i + \varepsilon_{i,t} \quad (1)$$

$Conflict_{i,t}$ is the outcome of conflict events in cell i during year t. There are three variations in the dependent variables: the number of conflicts that happened; a binary variable coded 1 if any conflicts happened; total fatalities due to conflicts. $Aid_{i,t-1}$ is a measurement of Chinese aid in cell i during the previous year $t-1$. There are also three variations in the independent variable: the number of aid projects; a binary variable coded 1 if there were any Chinese aid projects; the total value of Chinese aid. I run regressions with variations in both dependent and independent variables, so the robustness is built into the study. For the projects across multiple locations, the original AidData dataset does not record the amount of aid flow in every single location, so I divide the total amount of aid flow of a project by the number of locations. It is worth to notice that around one third of aid projects (1,128 out of 3,545) do not have any information regarding the value. Therefore, the value of these projects is coded "N/A", and the projects will be automatically dropped when aggregating the project value at cell level, but the projects are counted when aggregating the number of aid projects or calculating the binary variable of aid.

$\tau_{i,t}$ captures cell fixed effects, which are the characteristics different across cells but fixed over time, including geography, distribution of natural resources, and some relatively invariant ethnical features. φ_t is the year fixed effects, controlling for the change in a given year which are the same across cells, such as improved military technology. ω_i is the third-order polynomial of longitude and latitude of the cell centroids interacted with year fixed effects, which allows to control for the unobserved variables correlated across space and time.

2. Instrumental Variable Approach

Estimation of equation (1) cannot imply any causal relationship between Chinese aid and conflicts in Africa. The causality can go either from Chinese aid to conflict or from conflict to Chinese aid, while other omitted variables may also affect both Chinese aid and African conflicts, so I adopt an instrumental variable approach to mitigate concerns about endogeneity. Inspired by the study of U.S. food aid on conflicts by Nunn and Qian (2014), Dreher et al. (2016) suggest instrumenting for Chinese aid by exploiting the variation in the amount of China's steel production and differences in the probability of receiving Chinese aid.

For China's steel production, both the relevance and exogeneity conditions seem to hold. On the one hand, China's steel production is relevant to Chinese aid. Dreher et al. (2016) argue that because of the strategically important role of steel, Chinese government maintains an excessive capacity of steel production and uses part of the surplus in foreign aid projects. In China's Steel Industry Adjustment and Upgrade Plan

(2016-2020), China's steel industry is explicitly encouraged to participate in the Belt and Road Initiative and focus on the markets in developing countries (Ministry of Industry and Information Technology, 2016). On the other hand, the variation of China's steel production is plausibly exogeneous to African conflicts. The production of steel in China is determined by domestic demand of steel, monetary and credit policies, and regional development strategy. One may suspect that the political economic situation in Africa still affects China's ability to secure stable supply of raw materials for steel production. However, in 2016, China's imports of iron ore from Africa only constitute 6.0% of China's total imports of this commodity, specifically from South Africa (4.9%), Mauritania (0.83%), Sierra Leone (0.3%), and Liberia (0.026%) (MIT Media Lab, 2018). Compared to China's two largest suppliers of iron ore, namely, Australia (61%) and Brazil (22%), the conflict-prone regions in African countries appear to have only negligible affects, if any at all, on China's steel production (MIT Media Lab, 2018).

China's steel production alone is invariant across different entities, so Dreher et al. (2016) interact the amount of China's steel production with the probability of receiving Chinese aid for the province, defined as the proportion of years that the province received Chinese aid. I adopt a variant of this instrument in estimating the Two-Stage Least Squares (2SLS) Model. The first stage equation is the following:

$$Aid_{i,\,t-1} = \gamma_0 + \gamma_1 Steel_{i,\,t-2} * p_{i,\,t} + \gamma_2 \tau_t + \gamma_3 \varphi_i + \vartheta_{i,\,t} \quad (2)$$

My second-stage equation is similar to Equation (1) but the third-order polynomial terms controlling for spatial autocorrelation across time is excluded, because the

dependent variable in the first stage, i.e. a measurement of Chinese aid, is not likely to be spatially correlated with each other and even if there is some spatial pattern of Chinese aid, it can be controlled by the cell fixed effects. Another practical reason for changing model specification comes from the fact that including the spatial terms dramatically weakens the relevance of the instrument.

In the first-stage equation, $Steel_{i,\,t-2}$ is the logged amount of China's steel production in thousand tons in the period prior to Chinese aid. Based on previous discussion of the IV, it is reasonable to think that Chinese aid is relevant to China's steel production in the previous period. Multiplying the logged lagged amount of China's steel production with the probability of receiving Chinese aid for a given cell makes the IV variant across time and entities. $p_{i,\,t}$ is measured by the number of years of receiving Chinese aid divided by total number of years in the sample, i.e. 13. $p_{i,\,t}$ is thus the average probability of receiving aid from China for a given cell between 2000 and 2012, a constant number for each cell, ranging from 0 to 1.

In the IV approach, it is expected that the cells that regularly receive Chinese aid are more likely to be affected by the change in the amount of China's annual steel production than the cells that rarely receive Chinese aid (Dreher et al., 2016). This identification strategy is similar to a difference-in-differences approach, where it examines the differential effects of Chinese aid on the cells with higher and lower probability of receiving Chinese aid (Dreher et al., 2016; Nunn and Qian, 2014)

My identifying assumption is that conflicts in Africa is not affected by China's steel production through channels other than receiving Chinese aid, when time-invariant

features for each cell and changes across time that are similar to all cells are controlled for. Therefore, the key to estimating causal effect is to ensure the exogeneity condition of the instrument. As discussed before, China's steel production is unlikely to be affected by omitted variables that affect conflicts in Africa. However, the probability of receiving Chinese aid is endogenously determined and may be directly affected by the conflicts in the cell. For this reason, I include cell fixed effects in both stages of regressions, controlling the time-invariant probability of receiving Chinese aid. With an endogenous variable controlled, its interaction with an exogenous variable should be exogenous (Bun and Harrison 2014; Dreher et al., 2016; Nizalova and Murtazashvili 2016; Nunn and Qian, 2014).

At baseline and the study of average effects, I run regressions for the abovementioned models using the entire sample to calculate the correlation and average effects of Chinese aid on all types of conflict events. Then I have a series of sub-group 2SLS regressions to study the heterogeneous effects of Chinese aid on different types of conflicts. This can be helpful to examine the causal mechanisms that aid influences conflicts. According to Table 1, there are 5 types of political agents in ACLED data. Based on the similarity of political agents, I run 5 sub-group regressions for the conflicts involving government, rebel force, political militia and communal militia, rioters and protestors, and civilians.

For the average effects of Chinese aid on conflict events, I hypothesize that there is no robust significant relationship because of the competing theoretical mechanism. The subgroup regressions may help tease out the effects of different mechanisms. For

the conflicts involving government, if cells with more Chinese aid have fewer conflicts, then probably Chinese aid strengthens a country's military power and prevent conflicts from happening, but it can also be that economic development reduces conflict, where the mechanism is more obscure. If more Chinese aid is associated with more government-related conflicts, then it may be because that the leaders become more violent or that there are more rebels, militias, and riots and protests against government. Regressions limited to conflicts involving rebel force can identify whether aid incentivizes rebels to take over the state power. If more aid is associated with more conflicts involving rebel forces, then Chinese aid may fuel conflicts through providing more generous rewards of capturing the state. The role of political and communal militias is not thoroughly studied in literature, but it is likely that these militias, though not targeting at taking over state power, may seek rents from aid projects at local level. The literature review identifies that local elites strengthened by aid money may have an interest in continued conflicts. Since political militias are controlled by local political elites and similarly communal militias are usually controlled by ethnical elites, a positive impact of Chinese aid on conflicts involving both actors may provide evidence for this mechanism. Study of conflicts involving rioters and protestors, which are unorganized as opposed to abovementioned all organized political violence, helps find if there is any resentment among local people that is associated with Chinese aid, which can also be a source of conflicts. Finally, regressions of all conflicts involving civilians can measure on average whether Chinese aid is associated with more or fewer violence

against civilians, as civilians are always coded as victims in conflicts (ACLED, 2018).

Table 2 is the summary statistics of key variables.

Table 2 Summary Statistics, 2001-2013

Variables	Obs.	Mean	Std. Dev.	Min	Max
		Chinese Aid			
No. of Projects	41,275	0.0855	0.606	0	34
Aid Dummy	41,275	0.0381	0.192	0	1
Value of Aid	41,275	2.691m	48.01m	0	3,038m
		All Types of Conflicts			
No. of Conflicts	41,275	1.722	14.72	0	1,153
Conflict Dummy	41,275	0.186	0.389	0	1
Fatalities	41,275	5.712	69.56	0	5,432
		Government-related Conflicts			
No. of Conflicts	41,275	0.691	7.429	0	784
Conflict Dummy	41,275	0.117	0.322	0	1
Fatalities	41,275	2.923	48.99	0	5,426
		Rebel force-related Conflicts			
No. of Conflicts	41,275	0.412	5.258	0	325
Conflict Dummy	41,275	0.0477	0.213	0	1
Fatalities	41,275	2.59	49.21	0	5,432
		Militia-related Conflicts			
No. of Conflicts	41,275	0.58	7.576	0	799
Conflict Dummy	41,275	0.071	0.257	0	1
Fatalities	41,275	1.875	30.54	0	2,998
		Riots and Protests			
No. of Conflicts	41,275	0.346	5.524	0	782
Conflict Dummy	41,275	0.0497	0.217	0	1
Fatalities	41,275	0.194	9.924	0	1,631
		Violence against Civilians			
No. of Conflicts	41,275	0.499	4.806	0	319
Conflict Dummy	41,275	0.0711	0.257	0	1
Fatalities	41,275	1.877	33.1	0	3,011

V. Empirical Results

1. Average Effects

Baseline Results

The main results of the baseline regressions are presented in Table 3. Regression (1) to Regression (9) show the fixed effects regression results of different variations in dependent variable and key independent variable. Table 3 shows inconsistent results. Model (1) in Table 3 shows that after controlling for all time-invariant characteristics for each cell, all changes that are similar to all cells, and the unobserved variables correlated across space and time, one more Chinese aid project in the previous year is associated with 0.475 fewer conflict in a given cell. This result is statistically significant at 5% significance level. However, this result is not robust across different measurements of conflict and aid. When I change the dependent variable to its binary form, measure its intensity by the logged value of fatalities, or change the independent variable to its binary form and logged value, the results are no longer statistically significant. It is possible that the relationship between Chinese aid and conflicts is sensitive to measurement.

The baseline results do not tell much about the causal effects of Chinese aid—the results are inconsistent and not robust. Moreover, though including cell and year fixed effects, the baseline model dose not rule out the possibilities of endogeneity. There can be severe reverse causality: the Chinese may strategically choose the "safer" cities where there are fewer conflicts to locate their aid projects. In the next subsection, I use an instrumental variable approach to tackle this issue.

Table 3 Chinese Aid and African Conflicts, Fixed Effects, 2001-2013

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	No. of Conflicts	No. of Conflicts	No. of Conflicts	Binary Conflict	Binary Conflict	Binary Conflict	Fatalities (logged)	Fatalities (logged)	Fatalities (logged)
No. of Aid Projects	-0.475**			0.002			-0.009		
	(0.232)			(0.004)			(0.011)		
Binary Aid		-1.003			0.013			-0.047	
		(0.620)			(0.011)			(0.032)	
Aid Value (logged)			-0.019			0.001			-0.002
			(0.058)			(0.001)			(0.002)
Cell FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Adj. R-sq	0.027	0.027	0.027	0.058	0.058	0.058	0.033	0.033	0.033
Observations	41,275	41,275	41,275	41,275	41,275	41,275	41,275	41,275	41,275

Notes: Standard errors (in parentheses) are clustered at cell level. A third-order polynomial of longitude and latitude interacted with year fixed effects is included to control for the unobserved spatial autocorrelation of conflicts across time.
* p<0.1 ** p<0.05 *** p<0.01.

Instrumental Variable Approach

Table 4 presents the results of the Two-Stage Least Squares regressions (2SLS). I use the interaction of the amount of China's steel production and the probability of receiving Chinese aid in a given cell as the instrument for Chinese aid. Starting from the first stage, as expected, the point estimate of the instrument is positive and significant at any conventional level. In Table 4, the first-stage F statistics are consistently over 20, which safely rules out the possibility of being a weak instrument.

Table 4 shows the second-stage results, the average effects of Chinese aid on African conflicts. The coefficient estimates of Chinese aid is insignificant across different specifications. This is consistent with my hypothesis—overall, Chinese aid may have no impact on African conflicts. This may be a result of the competing mechanisms in aid-conflict nexus. In the next subsection, I dive deeper into the heterogenous effects of Chinese aid on different categories of African conflicts.

Table 4 Chinese Aid and African Conflicts, 2SLS, 2001-2013

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	No. of Conflicts	No. of Conflicts	No. of Conflicts	Binary Conflict	Binary Conflict	Binary Conflict	Fatalities (logged)	Fatalities (logged)	Fatalities (logged)
No. of Aid Projects	4.038			0.016			-0.052		
	(3.083)			(0.019)			(0.070)		
Binary Aid		19.086			0.074			-0.246	
		(14.057)			(0.089)			(0.333)	
Aid Value (logged)			1.222			0.005			-0.016
			(0.905)			(0.006)			(0.021)
Cell FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
First-Stage F-Stat	21.96	24.46	20.33	21.96	24.46	20.33	21.96	24.46	20.33
Observations	41,275	41,275	41,275	41,275	41,275	41,275	41,275	41,275	41,275

Notes: Standard errors (in parentheses) are clustered at cell level. * p<0.1 ** p<0.05 *** p<0.01.

2. Disaggregating Conflict Events

I disaggregate the conflict events by the political agents involved and obtain 5 major categories, i.e. government-related conflicts, rebel force-related conflicts, militia-related conflicts, riots and protests, and violence against civilians. Since civilians are defined as civilian victims in the original ACLED dataset, it can never be the political agent that provokes a conflict. Also note that these categories are not mutually exclusive—a conflict between government and rebel forces appears in both government-related conflicts and rebel force-related conflicts. This method is expected to target at a specific political agent and study the effects of Chinese aid on its likelihood of being involved in conflicts.

Table 5 to Table 9 present the results of subgroup regressions using an instrumental variable approach. Table 5 shows the effects of Chinese aid on the government involvement in conflict events. Scholars who suspect Chinese aid of being more fungible than aid from traditional donors may expect to see a significant relationship between government-related conflicts and Chinese aid, while both signs are possible for the coefficient estimate. The government can either be more violent to their citizens (Kishi and Raleigh, 2015), or be strengthened militarily such that no political agents dares to challenge it (Nielsen et al., 2011). Table 5 does not show any consistent and robust results, so I cannot derive any causal interpretation of Chinese aid on government-related conflicts.

For the conflicts involving rebel forces (Table 6), militias (Table 7), and civilians (Table 9), the coefficient estimates of Chinese aid are very sensitive to measurements

of aid and conflicts and I do not find any robust results. Therefore, it can be hard to find robust evidence of the competing mechanisms of aid-conflict nexus, such as the fueling effects of aid on conflicts through providing the rebel forces with more generous reward of capturing the state power.

However, as presented in Table 8, the impact of Chinese aid on riots and protests is statistically significant at 5% level and robust across different measurements. The magnitude of the effects is economically large. Regression (1) indicates that controlling for year and cell fixed effects, one more Chinese aid is associated with 5.112 more riots and protests. Regression (5) shows that after controlling for year and cell fixed effects, the cells where there are Chinese aid projects in the previous year have 0.351 higher probability of having riots and protests. Regression (9) shows that 1% higher value of Chinese aid is correlated with 0.024% higher fatalities in riots and protests. Though the results are significant and consistent, the mechanism that Chinese aid leads to more riots and protests is unknown.

When disaggregating conflict events and using an instrumental variable, I eliminate the third-order polynomial spatial term, because it weakens the instrument and the first-stage dependent variable, a measurement of Chinese aid, is not likely to be spatially correlated.

Table 5 Chinese Aid and Government-Related Conflicts, 2SLS, 2001-2013

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	No. of Conflicts	No. of Conflicts	No. of Conflicts	Binary Conflict	Binary Conflict	Binary Conflict	Fatalities (logged)	Fatalities (logged)	Fatalities (logged)
No. of Aid Projects	1.743			0.067***			-0.009		
	(1.154)			(0.025)			(0.065)		
Binary Aid		8.237			0.315***			-0.040	
		(5.228)			(0.112)			(0.310)	
Aid Value (logged)			0.527			0.020***			-0.003
			(0.337)			(0.007)			(0.020)
Cell FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
First-Stage F-Stat	21.96	24.46	20.33	21.96	24.46	20.33	21.96	24.46	20.33
Observations	41,275	41,275	41,275	41,275	41,275	41,275	41,275	41,275	41,275

Notes: Standard errors (in parentheses) are clustered at cell level. * p<0.1 ** p<0.05 *** p<0.01.

Table 6 Chinese Aid and Rebel Force-Related Conflicts, 2SLS, 2001-2013

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	No. of Conflicts	No. of Conflicts	No. of Conflicts	Binary Conflict	Binary Conflict	Binary Conflict	Fatalities (logged)	Fatalities (logged)	Fatalities (logged)
No. of Aid Projects	-2.058**			-0.024			-0.148**		
	(0.909)			(0.020)			(0.074)		
Binary Aid		-9.726**			-0.113			-0.701**	
		(4.217)			(0.091)			(0.331)	
Aid Value (logged)			-0.623**			-0.007			-0.045**
			(0.272)			(0.006)			(0.022)
Cell FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
First-Stage F-Stat	21.96	24.46	20.33	21.96	24.46	20.33	21.96	24.46	20.33
Observations	41,275	41,275	41,275	41,275	41,275	41,275	41,275	41,275	41,275

Notes: Standard errors (in parentheses) are clustered at cell level. * p<0.1 ** p<0.05 *** p<0.01.

Table 7 Chinese Aid and Militia-Related Conflicts, 2SLS, 2001-2013

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	No. of Conflicts	No. of Conflicts	No. of Conflicts	Binary Conflict	Binary Conflict	Binary Conflict	Fatalities (logged)	Fatalities (logged)	Fatalities (logged)
No. of Aid Projects	0.095			0.060***			0.037		
	(0.704)			(0.022)			(0.047)		
Binary Aid		0.450			0.284***			0.173	
		(3.302)			(0.093)			(0.218)	
Aid Value (logged)			0.029			0.018***			0.011
			(0.212)			(0.006)			(0.014)
Cell FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
First-Stage F-Stat	21.96	24.46	20.33	21.96	24.46	20.33	21.96	24.46	20.33
Observations	41,275	41,275	41,275	41,275	41,275	41,275	41,275	41,275	41,275

Notes: Standard errors (in parentheses) are clustered at cell level. * p<0.1 ** p<0.05 *** p<0.01.

Table 8 Chinese Aid and Riots and Protests, 2SLS, 2001-2013

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	No. of Conflicts	No. of Conflicts	No. of Conflicts	Binary Conflict	Binary Conflict	Binary Conflict	Fatalities (logged)	Fatalities (logged)	Fatalities (logged)
No. of Aid Projects	5.112**			0.074***			0.079**		
	(2.334)			(0.023)			(0.037)		
Binary Aid		24.165**			0.351***			0.376**	
		(10.681)			(0.095)			(0.167)	
Aid Value (logged)			1.547**			0.023***			0.024**
			(0.688)			(0.006)			(0.011)
Cell FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
First-Stage F-Stat	21.96	24.46	20.33	21.96	24.46	20.33	21.96	24.46	20.33
Observations	41,275	41,275	41,275	41,275	41,275	41,275	41,275	41,275	41,275

Notes: Standard errors (in parentheses) are clustered at cell level. * p<0.1 ** p<0.05 *** p<0.01.

Table 9 Chinese Aid and Violence Against Civilians, 2SLS, 2001-2013

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	No. of Conflicts	No. of Conflicts	No. of Conflicts	Binary Conflict	Binary Conflict	Binary Conflict	Fatalities (logged)	Fatalities (logged)	Fatalities (logged)
No. of Aid Projects	-0.563			0.051**			-0.052		
	(1.072)			(0.023)			(0.054)		
Binary Aid		-2.661			0.239**			-0.246	
		(5.176)			(0.101)			(0.257)	
Aid Value (logged)			-0.170			0.015**			-0.016
			(0.331)			(0.007)			(0.016)
Cell FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
First-Stage F-Stat	21.96	24.46	20.33	21.96	24.46	20.33	21.96	24.46	20.33
Observations	41,275	41,275	41,275	41,275	41,275	41,275	41,275	41,275	41,275

Notes: Standard errors (in parentheses) are clustered at cell level. * p<0.1 ** p<0.05 *** p<0.01.

3. Disaggregating Chinese Aid

According to the OECD definition of sectors of development finance, I disaggregate Chinese aid into 4 categories: 1) Social infrastructure and services, including education, health, water and sanitation, government and civil society, and other social infrastructure and services; 2) Economic infrastructure and services, including energy generation and supply, business and other services, transport and storage, banking and financial services, and communications; 3) Production sectors, including agriculture, forestry and fishing, industry, mining, and construction, and trade and tourism; 4) All other aid projects, including general budget support, action relating to debt, emergency response, unallocated or unspecified, and other multisector. I use the interaction of the amount of China's steel production and the probability of receiving Chinese aid to instrument for a specific category of Chinese aid with three variations. In this model, it is possible that the exogeneity condition of Chinese aid does not hold. When the variable instrumented for is Chinese aid in social infrastructure and services, it is likely that Chinese aid may affect African conflicts through other categories of Chinese aid, such as Chinese aid in economic infrastructure and services. This concerns me especially if Chinese give aid according to a specific portfolio. I use this section as a robustness check of the results in the previous section.

Among 4 categories of Chinese aid, the aid projects on social infrastructure and economic infrastructure have consistently significant effects on riots and protests with a reasonably safe first-stage F-statistic. The other two category do not have consistent results or have a low first-stage F-statistic. Table 10 presents the regression results of

Chinese social infrastructure aid on African riots and protests. From the first-stage F-statistics, the relevance condition of the instrument holds for most models, but it is weakened when it instruments for logged value of Chinese social infrastructure aid. All coefficient estimates are statistically significant at 5% level. Regression (1) shows that controlling for cell and year fixed effects, one more Chinese aid in social infrastructure, like health and education programs, leads to 12.477 more riots or protests. Regression (5) indicates that controlling for cell and year fixed effects, the cells with Chinese aid in social infrastructure have 0.453 higher probability of having riots or protests, compared to the cells without Chinese aid in social infrastructure. Regression (9) means that one percent increase in the value of Chinese aid in social infrastructure increases the fatalities due to riots and protests by 0.052%.

Table 11 presents the regression results of Chinese economic infrastructure aid on African riots and protests. The first-stage F-statistic is above 10, meaning it is relevant. All coefficient estimates are statistically significant at 5% level. Regression (1) means that one more Chinese aid project on economic infrastructure leads to 16.778 more riots and protests. Regression (5) indicates that the cells with Chinese economic infrastructure aid projects have 0.462 higher probability of having riots and protests, compared to the cells without Chinese economic infrastructure aid. Regression (9) shows that one percent higher value of Chinese aid in economic infrastructure causes 0.037% higher fatalities due to riots and protests.

Table 10 Chinese Aid in Social Infrastructure and Riots and Protests, 2SLS, 2001-2013

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	No. of Conflicts	No. of Conflicts	No. of Conflicts	Binary Conflict	Binary Conflict	Binary Conflict	Fatalities (logged)	Fatalities (logged)	Fatalities (logged)
No. of Aid Projects	12.477**			0.181***			0.194**		
	(5.998)			(0.057)			(0.093)		
Binary Aid		31.132**			0.453***			0.484**	
		(14.701)			(0.135)			(0.225)	
Aid Value (logged)			3.334**			0.048***			0.052**
			(1.639)			(0.016)			(0.025)
Cell FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
First-Stage F-Stat	10.36	12.7	5.41	10.36	12.7	5.41	10.36	12.7	5.41
Observations	41,275	41,275	41,275	41,275	41,275	41,275	41,275	41,275	41,275

Notes: Standard errors (in parentheses) are clustered at cell level. * p<0.1 ** p<0.05 *** p<0.01.

Table 11 Chinese Aid in Economic Infrastructure and Riots and Protests, 2SLS, 2001-2013

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	No. of Conflicts	No. of Conflicts	No. of Conflicts	Binary Conflict	Binary Conflict	Binary Conflict	Fatalities (logged)	Fatalities (logged)	Fatalities (logged)
No. of Aid Projects	16.778**			0.244***			0.261**		
	(7.727)			(0.085)			(0.127)		
Binary Aid		31.736**			0.462***			0.493**	
		(14.201)			(0.139)			(0.226)	
Aid Value (logged)			2.354**			0.034***			0.037**
			(1.071)			(0.010)			(0.017)
Cell FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
First-Stage F-Stat	13.86	18.41	19.33	13.86	18.41	19.33	13.86	18.41	19.33
Observations	41,275	41,275	41,275	41,275	41,275	41,275	41,275	41,275	41,275

Notes: Standard errors (in parentheses) are clustered at cell level. * p<0.1 ** p<0.05 *** p<0.01.

VI. Discussion

This paper studies the localized impact of Chinese aid on African conflicts, instrumenting for Chinese aid to a cell by the interaction of the amount of China's steel production and the probability of receiving Chinese aid. The results are that overall, Chinese aid has no significant impact on African conflicts, but heterogenous effects do exist. Chinese aid has an amplification effect on the riots and protests in Africa, the most localized category among all conflicts. The results are consistent and robust across different measurements of the dependent variable and independent variable. The results well justify the methods of examining the relationship at local level. Surprisingly, Chinese aid has no impact on government- and rebel force-related conflicts, contrary to the theories of aid-conflict nexus that aid reduces conflicts by strengthening military power or aid increases conflicts by incentivizing rebel groups (Grossman, 1992; Nielsen et al., 2011; Ree and Nillesen, 2008).

My findings imply that China should have a complete and comprehensive review of its aid projects and a more rigorous monitoring and evaluation system. I think there can also be huge heterogeneity across Chinese companies in Africa. Some may comply with local laws and regulations very well, but some do not. A lot of riots and protests, as discussed in the Section of Literature Review, is caused by the poor working conditions and lax safety standards in Chinese companies (Brautigam, 2009; Condon, 2012; Rice, 2012). Many infrastructure projects, such as the Merowe Dam in Sudan, were carried out without an environmental assessment and resulted in huge protests in the affected communities (International Rivers, 2018). In addition, a qualitative analysis

of the ACLED conflict event dataset shows that there were many riots and protests against Chinese companies for unpaid wage, wage increase, and better working conditions (ACLED, 2018). A lack of environmental protection in many Chinese infrastructure construction projects, such as building mega-dams, highways, and water and sanitation facilities, raises huge local awareness regarding the adverse environmental impact (ACLED, 2018). Also, China's arms dealing and support for Zimbabwe's Mugabe government also triggered protests (ACLED, 2018). However, the number of riots and protests directly related to Chinese and Chinese aid is relatively small, compared to the magnitude of the coefficient estimate I obtain from quantitative analysis. Chinese aid may lead to more riots and protests in a more indirect way.

The mechanism may be rooted in the way that China gives aid. Usually Chinese infrastructure aid projects are contracted to a Chinese state-owned enterprise. The contractor brings in a large number of Chinese labor, imports part of the construction materials from home (Brautigam, 2009; Dollar, 2016). A potential influx of Chinese traders and cheap Chinese goods accompanying the Chinese aid projects, may outcompete local businesses, crowd out the market for local goods and make local people's life harder (ACLED, 2018; Brautigam, 2009). Chinese aid agencies, in my opinion, should consider further improving local ownership in their aid projects. And, comprehensive monitoring and evaluation of Chinese aid projects is necessary to deliver better development outcomes.

One of the limitations of this study is that the mechanisms that Chinese aid leads to riots and protests in Africa remain understudied. The theories of aid-conflict nexus

are focused primarily on the effects of aid on government- and rebel force-related conflicts and do not discuss enough about riots and protests. Though empirical evidence, as discussed above, sheds some light on this relationship, a formal theoretical framework of aid leading to riots and protests, based on the behavioral responses of multiple parties, is needed to improve our understanding of the mechanism.

The second limitation is that it is hard to rigorously test the potentially heterogenous effects of different categories of aid projects. Though Chinese aid in social and economic infrastructure is most likely to contribute to the impact of Chinese aid on African conflicts, the excludability condition of the instrument might be violated when I use the main instrumental variable to instrument for just one category of Chinese aid. More rigorous identification strategy for a specific category of aid might be helpful.

A third limitation is that the aid-conflict nexus may not be limited to one single observational unit. An aid project in one country may cause protests or other conflicts in another country. Though not military aid, China's arms sales to Zimbabwe sparked protests of the Zimbabwean exile communities in South Africa (ACLED, 2018). Information spread cross boundaries of countries or cells can fuel conflicts. This problem cannot be easily solved, regardless of the level of aggregation I use.

This study presents interesting results when disaggregating conflict events and Chinese aid. It is a localized study at cell level, and among different conflict events, riots and protests, the only category with significant and robust results, is the most localized one. I believe the localized approach is the way to obtain more robust and convincing evidence on aid-conflict nexus. Further examination of the mechanisms of

aid and riots and protests, effects of different categories of aid projects, and the feature of aid from different donors and the implications on local conflicts are of special interests in future studies.

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