

International  
Institute of  
Social Studies

The Erasmus logo is a stylized, handwritten-style script of the word "Erasmus" in a dark grey color.

**CONFLICT IN SUB-SAHARAN AFRICA:  
THE IMPACT OF CHINESE AID  
AS EXTERNAL INTERVENTION**

FINAL VERSION

by:

***KHUYEN VUONG***

MASTER OF ARTS IN DEVELOPMENT STUDIES

Major:

**ECD**

Supervisor:

Assoc. Pf. Dr. Elissaios Papyrakys

Second Supervisor:

Dr. Quang Nguyen

The Hague, The Netherlands  
2025

# **Conflicts in Sub-Saharan Africa: The Impact of Chinese Aid as External Intervention**

## **ABSTRACT**

This study examines the impact of Chinese aid on conflict in Sub-Saharan Africa during the period 2001-2021. Chinese aid is different from traditional aid, as its largely aims at financial assistance for infrastructure projects. These large-scale financial flows are argued to create economic and social imbalances in recipient countries, which in turn can fuel conflict. Drawing from the literature on external intervention and conflict, the study finds that Chinese aid is associated with higher level of conflict in Sub-Saharan Africa at district level, particularly the repression of civilians. By introduce a spatial analysis model, research finds the decentralise effect in the areas inhabited by powerless ethnic groups. It then discusses the potential causal channels, suggesting for future research.

---

### *Keywords*

Conflict, Chinese Aid, Sub-Saharan Africa, Civil Conflict, Foreign aid

Word counts: 14,787

# Contents

1. Introduction	6
2. Literature reviews	10
2.1 – Foreign aid & civil conflict: the role of external intervention	10
2.2 - The impact of Chinese aids in conflicts	13
2.3 – Scope of the research and research questions	15
3. Data and Methods	19
4. Empirical strategy	23
4.1 - The impact of Chinese aid on conflict	23
4.2 - The IV – Spatial Autoregression model (IV – SAR)	26
4.3 - The effect of Chinese aid on conflict in excluded groups' areas	27
5. Estimation results	28
5.1. Descriptive statistics and sample size	28
5.2. The impact of Chinese aid on conflict in Sub-Saharan Africa	29
5.3. <i>Chinese aid and the dynamics of intergroup conflicts</i>	31
5.3. Controlling for the spatial biased	35
5.4, The effect of “politically biased” aid	38
6. Limitations and Discussions	40
6.1 – Conclusions	40
6.2 – Limitation and Discussion	40
APPENDIX	42

## LIST OF TABLES

Table 1. Conflict classification .....	21
Table 2. Descriptive Summary .....	28
Table 3. The effect of Chinese aid on conflict in Sub-Saharan Africa at district level (ACLED and UCDP data) .....	30
Table 4. The effect of Chinese aid on conflict in Sub-Saharan Africa (ACLED data) – Robustness check of control variables.....	32
Table 5. Types of aid - Heterogeneous treatment effect (ACLED data).....	33
Table 6. The effect of Chinese aid on conflict by types of conflict.....	34
Table 7. The spatial-effect adjustments on the effect of Chinese aid on the number of state-based conflict events .....	36
Table 8. Comparison of the impact of Chinese aid on conflict at regions controlled by powerless groups versus the rest .....	39

## LIST OF ABBREBRATIONS

Two-Stage Least Squares	2SLS
The Armed Conflict Location and Event Data	ACLED
Global Administrative Areas – administrative level 1	ADM1
Global Administrative Areas – administrative level 2	ADM2
GeoEPR - Geo-referencing Ethnic Power Relations	EPR
Global Administrative Areas	GADM
Geocoded Official Development Assistance Dataset	GODAD
Instrument Variable	IV
The Instrument Variable - Spatial Autoregression	IV-SAR
Mineral Resources Data System	MRDS
The National Bureau of Statistics of China	NBSL
Ordinary Least Squares	OLS
Spatial Autoregression	SAR
Sub-Saharan Africa	SSA
The Uppsala Conflict Data Program	UCDP

*“Power and violence are opposites; where the one rules absolutely, the other is absent.”*

Hannah Arendt

## 1. Introduction

Prolonged conflicts in Africa are rooted in a complex combination of historical legacies, socio-political fragmentation, and the geographical distribution of natural resources. Over the past thirty years, many Sub-Saharan African countries have faced ethnic cleavages, severe civil violence, undermining the development in the region (Abdel-Latif and El-Gamal, 2024). Persistent civil wars and armed conflicts have been, mainly or to some extent, associated with the control and exploitation of valuable and lootable resources (Berman et al., 2017; Ross, 2004). Furthermore, instability in the region possibly draws the interventions of third parties, driven either by humanitarian concerns or strategic interests (Findley and Marineau, 2015). States and international organizations can engage in strategically significant or conflict-affected areas through direct military involvement, arms transfers, or financial assistants. From the perspective of interests, third parties with strong interests in resource-rich areas, or close economic and political ties to the host country/ethnic groups may have more incentive to intervene (Battiston et al., 2025). A third party can escalate conflicts, either directly through military operations in the region, or indirectly by supporting their ally. Regardless of their political or humanitarian purposes, inconsiderate intervention can also trigger conflicts by increasing local grievances, especially when the third party biased toward one side (Findley and Marineau, 2015; Gent and Shannon, 2011). However, a third party may have incentives to ease the conflict. Beyond humanitarian considerations, this motivation may stem from economic interests, such as maintaining its trade flow and prevent infrastructure destruction in the region (Battiston et al., 2025). Another channel of external intervention is foreign aid. As Blattman and Miguel (2010) suggested, in post-war period, foreign aid flows may play a significant role to consolidating peace.

In Sub-Saharan Africa (SSA), countries have been experienced the spiral of civil conflict among small groups rather than interstate war (Elbadawi and Sambanis, 2000). The dynamic, therefore, mostly happens at the ethnic or local levels. Despite its significant economic influence in SSA, China adopts the policy of non-interference in internal affairs. However, China has a clear incentive to engage in conflicts in resource-rich areas to maintain its regional supply chain. China has developed large-scale production capabilities, leading to a significant demand for critical minerals and prompting efforts to diversify its supply sources. Over the past decades, China has heavily invested in Africa, particularly in the SSA. China—alongside the U.S.—has been one of the two largest investors in Africa for the last twenty years. While U.S. investment has remained relatively stagnant over the past decade, China has rapidly emerged as the dominant investor in the region. In terms of aid, China plays a key role as a major source of financing for infrastructural projects involving critical minerals—such as copper, cobalt, nickel, lithium, and rare earth elements (REEs), which are essential for clean energy transition (Escobar et al., 2025). Since 2015, through expansive foreign aid and loans delivered via bilateral agreements under the Belt and Road

Initiative (BRI), Chinese has become increasingly involved in politics and security in the region (Cabestan, 2023). Nevertheless, there are critics that China uses concessional loans and debt arrangements (as a form of *economic power*<sup>1</sup>) to build alliances with leaders of developing countries (Isaksson and Kotsadam, 2020). Some assessments suggest that political favouritism in Chinese aid may disproportionately benefit the dominant ethnic group or the incumbent government. These forms of participation are believed to aim to preserve long-term access to the natural resources of the continent, often in exchange for investments in public infrastructure. While these engagements have spurred economic growth, they have raised concerns about the impact of aid on violence in recipient countries, including corruption, political capture, and conflict (Dreher et al., 2021). This implies the probable increment of conflict in the short term.

Identifying the causal effect of aid and conflict in large scale is challenging, as there are multiple ways through which aid may affect conflict, while contextual conditions differ substantially across regions (Blattman and Miguel, 2010). Therefore, the result should be interpreted within the context of specific region and the characteristics of aid. In this study, the impact of Chinese aid on conflicts in SSA is examined through two possible mechanisms. *First*, the presumed politically biased Chinese aid may fuel conflicts by amplifying local grievances, while SSA has been known for its resource abundance and easily appropriated. This is derived from the extensive literature on the “*greed and grievance*” hypothesis<sup>2</sup> (Collier, 2004; Collier and Hoeffler, 2002). The unconditional Chinese aid is often perceived as it disproportionately benefits the dominant ethnic groups or the incumbent governments, as it is often “based on request” from these groups (Isaksson and Kotsadam, 2020; Dreher et al., 2021, 2017). This can also empower (politically or militarily) the already powerful groups, and thereby exacerbate grievances in local areas, particularly given that Chinese aid is often favour the stronger side<sup>3</sup>. This dynamic can also be explained further as aid can shift the relative power between two groups, as proposed by Herrera et al. (2022) in their theory of power war<sup>4</sup>. *Second*, China may make use of their concessional flows to impose their economic and diplomatic power in the region to ease the conflict. Battiston et al. (2025) have introduced a game-theory-based model of conflicts and resource value, accounting for strong interest of a powerful third party. They suggest that China, as the world second-largest economy, may form economic and perhaps political ties with the dominant side (who already controls resource after a war<sup>5</sup>). When resource value rises, China, as a powerful country, may have

---

<sup>1</sup> In this case, economic power is defined as the ability of a country to exert significant influence through its control over resources and financial capital.

<sup>2</sup> Collier used the term “*greed and grievances*” instead of “*greed versus grievances*”, as he argued they are “two sides of the same problem”.

<sup>3</sup> For more insights of biased third-party intervention in conflict, see (Gent and Shannon, 2011)

<sup>4</sup> Herrera et al. have developed a two-period theoretical model, which allows power mismatch between two groups can evolve after conflict, to understand the dynamic of mismatch between political and military power. They suggest that this is key determinants of war and conflict. Chinese aid may change the relative mismatch between two groups, resulting in different outcomes of conflict. However, in this study, the mechanism is used only for further interpretation and discussion. See the literature reviews, and Herrera et al. (2022) for more details.

<sup>5</sup> After a war, either the resource owner or the aggressor will own the resource and settle the conflicts.

greater incentives to de-escalate conflict through non-violent deterrence against the rivals of its preferred group<sup>6</sup>, either in forms of backchannel diplomacy, or their expanding security presence in the region<sup>7</sup>. This is to maintain stabilisation to prevent risk of destruction in its strategically significant areas, including production sites and regions that are critical to its (the powerful country's) supply chains. In this case, high levels of aid received may accompany with security assurances backed by China's dominant geopolitical influence. While the first hypothesis suggests a potential escalation of local conflict, the second mechanism allows for the scenario where aid may reduce severe conflict, particularly in China's critical locations.

Research on Chinese aid has grown in recent years, largely due to the availability of data from aggregated, non-official sources. One of the primary datasets commonly used in this field of study is *AidData* (Goodman et al., 2024). The dataset has been geo-coded – this allows researchers to analyse data at more localised scales. As part of this approach, this paper aims to investigate the role of Chinese aid in shaping conflict dynamics at local level, with a particular focus on civil conflict in Sub-Saharan Africa, where majority of aid projects went to the Africa have been directed to the region. Using the updated geo-coded data set from *AidData* (Goodman et al., 2024) covering the period from 2000 to 2021, this study examines the impact of Chinese aid, specifically at district level<sup>8</sup>, following the approach of Sardoschau and Jarotschkin (2024). This more localised unit of analysis have been used recently in the field of conflict and Chinese aid due to the available of geo-coded data. The authors argue that their novel unit of analysis (district) has advantage of capture the fixed effects at local levels, while also accounting for the displacement effect of conflict within a district. This is a setback in research using grid-cell units, as this approach inadequately accounts for the shifting dynamics of conflict, since conflicts typically move from adjacent areas toward district centre. In contrast, many previous studies often examined the effect of aid and conflict at more aggregated levels, such as country and provincial level. Although it captures the displacement effects (including the spread of conflict across districts) and account for the larger amount of aid recorded at more aggregated levels (such as aid distributed at provincial level), this approach may overlook unobserved variables at more localised units. As most of Chinese aid and conflict events are recorded at district and sub-district levels, the analysis can be conducted using smaller units of targeting.

With the purpose of investigating Chinese aid from the view of a powerful third country's influence in a region, this research aims to examine the *overall effect*<sup>9</sup> of Chinese aid on conflict. By adopting an instrumental variable (IV) strategy (using China's surplus domestic production of five key input materials), this estimation technique can address the endogeneity of aid and conflict. Next, the study decomposes the total effect into components, reflecting variations in the impact of different types of aid and conflict. This is to investigate further about

---

<sup>6</sup> The deterrent either directly or indirectly by financing its preferred groups. See literature for more details.

<sup>7</sup> See Nantulya (2025).

<sup>8</sup> There are different names and definitions of this local level. In this study, it is the administration level 2 in Global Administrative Areas (GADM) dataset. More details are in the methodology part.

<sup>9</sup> The total effect of all types of aid on conflict overall in the region. Details are in methodology.

mechanism behind the impact, as suggested by theory. Research uses the sample of 1,351 Sub-Saharan districts in 43 SSA countries that received Chinese aid at least once in the examined period. Finally, as the key contribution of this research to existing literature, it accounts for the spatial dynamic of conflict in relation with ethnicity at district level. In doing so, the study expands the previous sample to include neighbouring areas. Particularly, research delves into the spatial dynamic of aid and conflict in areas inhabited by ruling ethnic groups versus excluded ethnic groups. By integrating spatial effects, this technique reduces spatial bias, which is more likely to occur when examining conflict at small geographical scale (K. S. Gehring et al., 2018). In addition, an important aim is to examine evidence of deterrence impact of China on regions controlled by powerless groups. To examine the effect in areas crucial for China's domestic production demand<sup>10</sup>, the study then restricts the sample to locations with mining activities and their neighbouring areas to test the theoretical implications related to civil conflict and resources.

The study has three main findings and contributions. *First*, the result shows solid evidence that Chinese aid increases conflict in SSA at district level. This impact is robust across sample sets and control variables, even when accounting for spatial effect. However, there is no evidence that Chinese aid increases the severity or violence of conflict. *Second*, Chinese aid accompanies with repression carried out by state-based groups against civilians. This supports the local grievance hypothesis. *Third*, there is evidence that Chinese assistance in the areas predominantly inhabited by excluded ethnic groups is associated with lower levels of state-militia conflict compared to other regions. However, the differential effect is insignificant when accounting for the decentralisation<sup>11</sup> effect in the areas. The study suggests two possible mechanisms: either the influence of these groups has been weakening, or the deterrence power arises from China's presence in the area. Interestingly, there is no significant evidence of this effect of aid in mining locations and their neighbouring area. By accounting for the spatial effect of conflict, these findings partly help explain the variations observed in studies using different units of analysis and different measures of conflict. While the grievances hypothesis may explain the repression of state-based groups on civilians, the mechanism by which Chinese aid affect conflict differently in areas controlled by powerless groups should be interpreted carefully within local context.

---

<sup>10</sup> As suggested by Battiston et al. (2025), China may have incentive to preserve the stability at areas with “*higher risk of destruction of natural resource (or capital and infrastructure needed for extraction)*”.

<sup>11</sup> Decentralisation in this case, is the phenomenon when conflict negatively spreads out in adjacent areas and simultaneously creating more conflict-zones.

## 2. Literature reviews

### 2.1 – *Foreign aid & civil conflict: the role of external intervention*

#### *Civil conflict, resource, and external intervention*

The importance of third-party intervention in conflict has been widely discussed in the literature from international relations, political science, and political economy. Beyond mediation efforts undertaken by peacekeeping forces and international organizations, third-party interventions by states or armed groups are often viewed as being driven by resource interests, particularly in context of Africa. While resource concentration tends to fuel conflict by creating predation incentives in the first place (Blattman and Miguel, 2010, p. 17), various economics and political factors may ease, sustain, amplify, and even spread the violence. In Sub-Saharan Africa, majority of conflict events are civil conflicts among small ethnic groups. The causes and consequences of war have been summarised in details by Blattman and Miguel (2010). They highlight foreign aid as an important form of international intervention that help explain patterns of civil conflict, whereas existing research (at that time) have been mainly focus on interactions among domestic armed groups. Civil conflict over resources can be explained by both local grievances and existing material incentives (opportunities) to fight (such as lootable resources). The dynamic commonly referred to as “*greed versus grievance*”. This argument has attracted substantial attentions in the political science and economics literature on conflict. Collier (2004) argued that greed and grievance are often “shade of the same problem”. However, while potential grievances exist in any society, the economic incentives become the decisive factor (Blattman and Miguel, 2010, p. 22). The hypothesis were challenged by Humphreys (2005), who indicates a weak states mechanism is the decisive factor rather than a rebel greed mechanism. A potential explanation for the argument is that, while the *greed versus grievances* framework explains the outbreak of conflict, multiple aspects of weak governance sustain the violence. Research in this field indicates that conflict arises and probably sustains due to multiple factors and its dynamics cannot be captured by simple set of variables.

Research on conflict, especially civil conflict, often faces the problem of endogeneity, as it can be affected by a variety of factors, and may also exhibit reverse causality. Hence, recent studies often use an exogenous shock to address endogeneity and specifically focus on certain resources (such as oil and gas, critical minerals) in a particular region (Morelli and Rohner, 2024, p. 6). Research on resource and conflict provides some notable features. As natural resources become increasingly scarce, conflicts in Africa are strongly influenced by mining activities and fluctuations in mineral prices. Berman et al. (2017) use spatial analysis to examine the effects of mineral price shocks, identifying a positive relationship between rising prices and civil violence in African countries between 1997 and 2010 at the local level. In addition, recent studies have focused on the role of asymmetries in the distribution of resources. Morelli & Rohner (2015) argue that conflicts are more likely to occur in areas where both resource concentration and ethnic group concentration are high. The study examines mismatches in term of oil holdings per capita and population density at both the ethnic group and country levels, showing that regions with an asymmetric distribution of oil face a significantly higher risk of conflict. These findings add more potential interpretations to the heterogeneity effect.

*Civil conflict: foreign aid as an external intervention*

From economic perspective, many studies have been investigated the topic of conflicts and third-party interventions from cost-benefit analysis, coupled with the presence of valuable natural resources. These studies provide some potential channels through which aid may affect conflict, as foreign assistance is a notable factor in African countries (Blattman and Miguel, 2010). China has emerged as a major aid donor in recent decades; therefore, the mechanism of how Chinese aid may affect conflict has been limited.

Within the context of civil conflict–resource–external intervention, this study discusses three potential channels in which foreign aid may affect conflict, accounting for characteristics of Chinese aid. *First*, the unconditional Chinese assistance<sup>12</sup> may (unintentionally) disproportionately benefit more powerful groups, resulting in grievances of the opponents. Chinese aid is often perceived as it biased toward dominant ethnic groups or incumbent governments. This can empower already powerful groups and lead to increased non-lethal repression by the state force (K. S. Gehring et al., 2018). In addition, in terms of trade, as Chinese aid is often in exchanged for the enter of Chinese commodities into the region, potentially leading to disputes in the areas<sup>13</sup>. Another criticism is that China often prioritises “*speed over safety*” in its construction projects (Parks et al., 2023), this may causes public resentment. *Second*, although China has emphasized its non-interferent policy, the country may form a partnership (*economic power* or *soft power*<sup>14</sup>) with either side and finance them through aid<sup>15</sup>. This leads to shifts in the balance of political and military power between these groups and their rivals, especially when bureaucratic governments exploit external lending to finance repression. The mechanism and outcomes are described in the theory of power war (Herrera et al., 2022). Assuming China supports the politically dominant side, their model suggests two possible outcomes: conflict is absent when military power is balanced, or repression occurs if the dominant group suspects<sup>16</sup> that its opponent is strengthening its military capabilities. Research also suggests a possibility of an indecisive war, which can lead to persistent conflict<sup>17</sup>. Based on the implications of the theory, Morelli et al. (2024) utilises machine learning technique to derive indicators from large dataset, empirically showing that higher power mismatch between military and political power increases the probability of engaging in war. Over the medium run, such dynamics may weaken the other competing groups and lower the likelihood of open conflict by consolidating the dominance of already powerful actors. While the first two channels differ in terms of how China and other actors become involved in the conflict, the outcome is largely the same: repression and violence against civilians and powerless groups. *Third*, following suggestions of earlier research (Blattman and Miguel, 2010, p. 40; Collier and Hoeffler, 2002) and empirical research of Dreher et al. (2017, 2021) about Chinese aid and economic growth, Chinese aid may reduce risk of civil conflict by promoting local economic development. Although the

---

<sup>12</sup> Chinese aid has less or even ambiguous conditions, compared with other aid donors like World Bank or the U.S., see (Dreher et al., 2021, 2017; K. S. Gehring et al., 2018)

<sup>13</sup> This mechanism is similar to research by Autor et al (2013).

<sup>14</sup> The ability of a country to influence other through persuasion rather than coercion.

<sup>15</sup> See (Dreher et al., 2019) for evidence of Chinese aid biased toward the African leaders’ birthplace when incumbent facing elections.

<sup>16</sup> This is also known as “*misperception*” in conflict studies.

<sup>17</sup> See Herrera et al. (2022), proposition 6, 7, 9.

third suggestion sounds valid, the causal mechanism remains ambiguous and is difficult to clarify; for example, the way in which economic growth could reduce conflict remains unclear.

In a recent study, Battiston et al. (2025) add to the knowledge of conflict over resource (or infrastructure for production) and third-party intervention. They refine a game-theory-based model to account for the economic interests of a third party, specifically analysing the role of a powerful third party in conflicts over resources. Their model is built upon the work of Collier (2004), who first introduced the theoretical model in which the relationship between natural resources and the probability of conflict is non-monotonic, or “*hump-shaped*”. The involvement of a third party in their model accounts for the deterrence of a powerful country, either based on its military or political strength. In the case of China, as a powerful country, it may adopt its huge concessional flows to consolidate economic and political power in the region. When resource value is high, a powerful country will have more incentive to side with either group to de-escalate violence through deterrence power. This is the case when a powerful country has heavily invested in infrastructure in the region, or they have already formed strong economic/political ties with one side. Therefore, any conflicts may create negative externality for China’s social and economic infrastructure (Battiston et al. (2025), Gallea and Rohner (2021); cited by Morelli and Rohner (2015)), triggering the involvement in regional conflict to preserve its interests. Chinese aid often comes with high degree of control over project implementation (Mironova and Whitt, 2018). Given the over controlling properties of its aid, China has clear incentive to intervene in conflicts in the region, especially the projects with infrastructure. The stabilisation is carried out through non-lethal deterrence, negotiation, or even backchannel diplomacy. In this case, the presence of Chinese power may diffuse tensions, directly or indirectly affecting the intensity and duration of conflicts. The implication aligns with the empirical findings of O’Mahony et al. (2018), who examine the locations of U.S. military bases worldwide. They indicate that the deterrence from the U.S. reduces the likelihood of interstate war and conflict in these areas. In addition, Gallea and Rohner (2021) emphasise the impact of globalisation on the risk of conflict in strategic territories close to maritime chokepoints. The result shows that the boom of world trade significantly reduces the likelihood of violent activities. These can be explained by the presence of the world most powerful arms forces (such as U.S., U.K., France) deterring conflict escalation in the areas. These studies propose an additional mechanism: aid can also diffuse conflict when it is accompanied by deterrence from a powerful external actor.

Regardless of which theoretical causal mechanism matters, the literature on aid and conflict indicates that interpreting the impact as a strict causal effect at aggregated levels is challenging and unnecessary in empirical research (Blattman and Miguel, 2010, p. 40). The estimation results are often integrated from multiple overlapping channels. Given these characteristics, the aim of this study is to examine the overall effect of Chinese aid on conflict in SSA and try to find the main possible channels that significant. To do so, the research decomposes the effect across different types of aid and conflict to capture the most significant channels of heterogeneity. As suggested in literature, conflict tends to spread over administrative border (Blattman and Miguel, 2010, p. 29; K. S. ; Gehring et al., 2018), therefore this study adopts spatial analysis technique to address the

potential bias. It then discusses the theoretical implications outlined above, focusing on civil conflict in SSA with a major concern: whether Chinese aid accompanied by repressions carried out by the powerful groups. Since natural resources play a key role in shaping third-party incentives in existing literature of conflict, the study particularly analyses the effect in mining locations and their neighbouring areas to account for both mining and production sites (which are typically located nearby). This is to examine the heterogeneity effect in such areas. However, this study argues that China's strategic interest in SSA should not be restricted in natural resources locations. Over the last thirty years, extensive aid and private investments from China have flowed into SSA countries to develop production and transportation infrastructure, cultural institutions, and other social assets across the region. The country has established trade relations with many SSA countries and their local governments. These engagements have deepened China's economic and sociopolitical presence beyond resource-rich areas, thereby strengthening the country's incentives to maintain stability across wider regions.

## 2.2 - *The impact of Chinese aids in conflicts*

Previous literature on the impact of aid on conflict has primarily focused on traditional donors such as the World Bank, many regional development banks, the U.S., and other countries and international organisations. Nevertheless, Chinese aid is distinct from traditional assistance. Two notable distinguishing features of Chinese aid are: first, it is framed as “not interfering in the internal affairs” and “not imposing any political conditions”, as stated by the State Council of China (2014); and second, it is often tied to China's strategic and economic interests in recipient countries. China has emerged as the world's largest manufacturing hub; therefore, maintaining stable and reliable supply chains has become crucial for its production capacity and economic performance. Over the past two decades, China has substantially increased the concessional aid flows to SSA. As a result, Chinese aid should be examined through the lens of both economics and political science. However, as Chinese aid is not recorded in official sources, it poses a significant challenge and limitations for empirical research in this area.

Pioneering empirical research on the impact of Chinese aid was conducted by Dreher et al. (2017, 2019, 2021), who developed a comprehensive dataset on Chinese foreign aid beginning in 2017 (*AidData*), and have subsequently updated the dataset. A series of their studies further examine the relationship between aid and development. Dreher et al. (2021) examine the effect of Chinese aid on economic growth in 138 countries in the period 2000-2014. The result shows a positive impact of Chinese aid on growth at country level. Moreover, their research approach offering important methodological contributions and empirical insights on distinctive characteristics of Chinese aid for subsequent research. A major contribution in terms of estimation technique is using the *shift-share* instruments<sup>18</sup> of key input material(s) for production<sup>19</sup> to address the endogeneity. The

---

<sup>18</sup> The instrument is interaction of shift and share components (shift × share), also known as *Bartik instruments*, see (Cunningham, 2021, p. 352)

<sup>19</sup> Dreher et al. (2019) use China annual production of crude steel in their first study in the field, then they add another five key input materials in their later work, following Bluhm et al. (2025).

*share* component is the proportion of receiving aid in the period that varies across units of analysis. Meanwhile, the *shift* component includes the annual production of the material(s) that varies through time. One concern is whether this type of IV violates the exclusion restriction; however, as Dreher et al. (2021) argued, the probability of receiving aid is absorbed by time and regional the fixed effects using in their models. The other concern is the validity of the *shift* component. Dreher et al. (2021) argue that China has been heavily invested in infrastructure projects abroad that demand steel from domestic production<sup>20</sup>. China had been experienced steel overproduction, and part of the surplus production was often shifted to Africa through aid projects (Dreher et al., 2019). The overproduction is similar to the shock of prices, which commonly used in addressing endogeneity in conflict research. However, the *shift and share* set up assumes the continuous difference-in-difference trend, meaning that this should be examined in empirical studies. The subsequent research of Dreher et al. (2021) expands the use of instrumental variable (IV) to include six key input materials for construction (steel, glass, iron, cement, and aluminium), and Chinese Net Foreign Reserve (source World Bank) (Dreher et al., 2021). This approach partly follows the study of Bluhm et al. (2025). Their research explores the impact of Chinese-financed infrastructure aid on the spatial distribution of economic activities worldwide at provincial level, using the annual production of the six materials to proxy Chinese's capacity to finance these projects. The result shows the significant spread-out effect of Chinese aid, especially in less developed regions (Bluhm et al., 2025). The study suggests further considerations on the spatial effect of aid and development should be needed in future research.

Using the dataset introduced by *AidData*, recent studies have examined the role of Chinese aid in conflict at local levels, particularly in the Africa. Given the complexity of conflict discussed in literature, this approach has a notable advantage that it allows to control for characteristics at local level. Sardoschau & Jarotschkin (2024) analyse a dataset of Chinese aid projects across 820 African districts from 2000 to 2012. As they argue, their novel unit of analysis (districts) can control for more localised level, since most previous studies of aid and conflict use country as the primary unit, and even studies using provincial level are limited. The IV in their model is the interaction term of China's annual steel production and share of aid received by each district in the examined period, as suggested by Dreher et al. (2017). Sardoschau & Jarotschkin (2024) indicate a positive correlation between Chinese aid and conflict during the period. Their study then mainly focusses on communal conflict. By incorporating civilian attitude toward China, they find that an increase in violence is more likely due to the interaction between resource influx and local political dynamics, rather than the attitude of civilians toward China. This provides little support for the hypothesis of grievances regarding civilians' attitude toward a third country<sup>21</sup>. Using the same IV but analysing the impact at country-level, Li et al. (2022) suggests that Chinese Other Official Flows (OOF) aid significantly reduces violence in country examined worldwide during the period 2000-2014, using data from Uppsala Conflict Data Program (UCDP) and *AidData*. They argue that OOF accounts for a major part of Chinese aid (about 80%). Chinese aid often focuses

---

<sup>20</sup> This is why the steel annual production is relevant to aid projects – the relevant condition in instrumental variable approach.

<sup>21</sup> The conclusion does not exclude the grievances against other local groups.

on financial support, to “assist the countries in greatest need<sup>22</sup>”. The result shows the negative effect, meaning Chinese aid reduces conflict at country level. At country and provincial level, Gehring et al. (2022) examine the relationship between Chinese aid and conflict in Africa (2000–2012), using the measurement of conflict as number of battle-related deaths, calculated from UCDP Georeferenced Event Dataset (GED). In contrast to previous research, they exclude the OOF as these projects “lack a development focus” and examine the flows of Official Development Assistance (ODA) only. Their view can be interpreted as focusing on the channel in which economic growth may alleviate conflict severity<sup>23</sup>. As the shift-share instrument has been criticised regarding the validity of exclusion restriction of the share, this paper employs a fixed-effect model which strictly control for regional and time fixed-effects, and other variables. The result shows no evidence aid at provincial level, even when adopting shift-share IV approach.

The mixed findings on the effects of Chinese aid on conflict outcomes suggest a substantial heterogeneity effect in empirical research, that is previously informed in theory. An analysis at more aggregated level is certainly facing the problem of dismissing significant causal effects. Another concern in the studies of conflict and aid is endogeneity, either arising from reverse causal effect or omitted variable. This challenges research to account for potential endogeneity and ensure more reliable results. Although many studies on Chinese aid have followed the IV approach introduced by Dreher et al. (2017, 2021) to address the endogeneity, concerns regarding the shift-share IV is valid, since the proportion of aid received during period may contain factors that can directly affect the conflict.

### *2.3 – Scope of the research and research questions*

Following the approach of Sardoschau & Jarotschkin (2024), this study aims examine the effect of aid and conflict at district level to capture the impact at a more localised scale. The provincial and district level (and equivalents) have been coded as administration level 1 (ADM1) and administration level 2 (ADM2) in many studies, following the geocoded data of Global Administrative Areas (GADM). Despite concerns about insufficient data of aid at ADM2 level (less than 50% number of aid) (Gehring et al., 2022), this is mainly due to the incompleteness of dataset in the older version. The latest updated Chinese aid data shows more than 84% of projects are located at ADM2 and their sub levels (see Appendix, Figure A3). The approach of focusing on the ADM2 level has been used in recent studies to investigate the impact of aid. Another approach in spatial analysis is using unit of grid-cells; however, while it can address the heterogeneity of scale, this approach has limitations because aid is typically allocated at the local administrative level and conflict has tendency to relocate to local centre, observation of aid and conflict by cells can be biased, especially if research does not account for spatial effect. Cell-level or ADM2 targeting has clear advantage of improving local control; however, it may also introduce spillover effects that biased the results. To address this concern, this study employs a Spatial Auto-regression (SAR) model, which accounts for spatial dependencies in the IV

---

<sup>22</sup> Critics view it as “on-request” assistance.

<sup>23</sup> The third mechanism – mentioned previously.

model (Betz et al., 2020; Cui et al., 2020). This technique helps adjust for potential spillover effects.

As types of aid is a major concern, the implications from theory<sup>24</sup> suggest many possible ways that either ODA or OOF may affect conflict. From the perspective that economic growth may reduce war and large-scale violence, ODA appears more relevant. However, although ODA is typically intended for development purposes, bureaucratic or weak governments<sup>25</sup> can appropriate for political purposes, rising local grievances in local communities. Majority of Chinese aid flows in the SSA is financial assistance, which is relevant when examine through the view of power mismatch, deterrence from a powerful third party. Given there are many potential causal effects, this research first assesses the combined effect of all types, then identify how the composition of aid shapes heterogeneous outcomes. The scope of this research, is the overall effect of assumed politically-biased Chinese aid and its potential outcomes and implications, as Blattman and Miguel (2010, p. 40) argue “we cannot necessarily interpret these statistical relationship as causal”.

Partly following research on Chinese aid from Dreher et al. (2017, 2019, 2021) and Bluhm et al. (2025), this study employs a shift-share IV strategy, using the interaction of common factor of the detrended<sup>26</sup> annual production of five important raw materials for constructions (iron, steel, cement, aluminium, and glass), interacted with the proportion of aid received in the period as the instrument. By adding more information of other materials, the material based IV extends the use of steel production (not detrended) in previous study of Sardoschau and Jarotschkin (2024). The set of five variables<sup>27</sup> aligns with the context of Sub-Saharan Africa, as surplus production of these materials often went to African countries as part of aid for infrastructure projects (Dreher et al., 2021). Therefore, these variables can proxy the capacity of China to provide aid in the region (Bluhm et al., 2025), offering more comprehensive information than using steel production alone as an instrument.

Despite having advantage of controlling heterogeneity at local level, the smaller unit of targeting imposes the problem of spillover effects across districts, which is likely to occur in research of conflict (Betz et al., 2020; Blattman and Miguel, 2010; Bluhm et al., 2025). Mixed results from previous research with different targeting levels suggest the displacement effect when conflicts diffuse from one region to another. To address the spatial correlation, this study adopts the instrumental variable (IV) estimation in spatial autoregressive (SAR) model<sup>28</sup> (Cui et al., 2020; Betz et al., 2020; Kripfganz and Sarafidis, 2025). Conflicts in Sub-Saharan Africa cannot be fully understood without considering them through the lens of ethnicity in the region. By integrating geo-spatial data on ethnic groups, this study investigates the effect among districts sharing the same dominant ethnicity, under the assumption that spillover effects are more likely to occur within the same ethnic groups. This approach was adopted by Gehring et al. (2018) in their discussion paper; however, their OLS analysis is conducted

---

<sup>24</sup> Three potential channels in which foreign aid may affect conflict that discussed above.

<sup>25</sup> It is the major concern in context of Africa, see (Bräutigam and Knack, 2004).

<sup>26</sup> Even the model controls for time fixed effect, the detrending technique eliminates concerns that the IV and conflict may be jointly driven by some macroeconomic trend.

<sup>27</sup> Instead of six key materials (including timber) introduced by (Bluhm et al., 2025)

<sup>28</sup> It is shortened as IV-SAR model.

at provincial level and find no spill-over effect among regions. This may be the case since conflict in SSA often occurs among small and localised groups, making it unlikely to spread across provinces. Moreover, their estimation using OLS method did not address for endogeneity of spatially dependent variables<sup>29</sup> (Betz et al., 2020).

This study examines the effects of Chinese aid on conflict in Sub-Saharan Africa between 2001 and 2021 at district level, with particular attention on civil conflict among actors. As discussed earlier in literature of aid and conflict, the further aim is to examine the outcomes: whether Chinese aid is associated with the repression toward powerless groups and civilians by more powerful groups, if such pattern exists. In context of SSA, China often forms the relationship with the government leaders (Dreher et al., 2019; Isaksson and Kotsadam, 2020), financing the incumbent governments through aids. By incorporating ethnicity data, this research can identify two actors: the government coalitions and the excluded/powerless/discriminated groups<sup>30</sup>. One expected outcome is Chinese aid may have differing impacts across groups, particularly, on the excluded ethnic groups. To examine the effects in different actors, this paper attempts to use the interaction variables of aid and these actors to capture the impact of (presumed) political-biased aid.

Finally, the research examines the heterogeneity of conflict across different types of conflicts and different categories of aid, while also testing robustness across model specifications with different control variables. Since the theoretical mechanisms are drawn from the literature on conflict in the presence of natural resources, the study narrows the sample to regions with natural resources and their neighbouring areas to analyse heterogeneity effects within these regions.

In summary, this research concentrates on the effect of Chinese aid on conflicts in Sub-Saharan Africa, addressing two main questions:

1. Did Chinese aid affect conflict in Sub-Saharan Africa at local level (in terms of number of events, fatalities, and intensity)?
2. Did Chinese aid contribute to government repression against other groups, if the pattern exists?

To answer this question, the study investigates on two sub-questions:

- Did Chinese aid affect state-based conflict against other groups?
- If an effect existed, was it distinct in areas controlled by powerless/excluded groups relatively to other locations?

In the first question, the research focuses on the overall effect of aid at district levels. It then examines the heterogeneity of the effect to identify which types of conflict are most affected and through which channel of aid the effect operates. Based on theoretical implications, the study aims to examine specifically on the state-based conflict to see whether there is evidence of repression carried out by stronger side, in this case, the government coalition<sup>31</sup>. Meanwhile, the other groups are narrowed down to militia groups and civilians only. To

---

<sup>29</sup> Bezt et al. (2020) address the endogeneity of spatially dependent variables by using the spatial lagged exogenous variables.

<sup>30</sup> The remaining groups is referred to as others. For more details on method, see Data and Method part.

<sup>31</sup> This is related to the grievance hypothesis

answer the second question, this study needs to clarify the ‘*repression*’<sup>32</sup> term. This is the challenge in second question. Not all state-based conflict is repression. While state-based conflict against the civilian groups can be described as repression, the state-militia conflict is not<sup>33</sup>. However, it could be expected that violence against powerless groups in their homeland is repression. Therefore, the study alternatively answers two sub questions: whether Chinese aid associated with state-based conflicts against other groups, and whether the effect differ between excluded groups and others. This approach aims to investigate further on whether Chinese aid, if at all, significantly contributes to repression in territories of political important to powerless ethnic groups. However, this research design is used to test for the outcomes only. As mentioned previously, since the channels of effect vary, any interpretations should be considered as a potential way where aid may lead to an increase/decrease in conflict.

---

<sup>32</sup> The definition of repression on conflict studies: “Repression involves efforts by people in power to demobilize dissent and social movements resisting a regime, corporation, or other influential institution” (Smithey, 2022)

<sup>33</sup> For examples the defensive war carried out by the government to protect civilians.

### 3. Data and Methods

#### *Handling geo-spatial data*

This study utilises the newly updated geo-coded *AidData* (Goodman et al., 2024) to examine Chinese aid in the period of 2000-2021. This dataset uses the Tracking Underreported Financial Flows (TUFF) method to collect data at project level from multiple open sources, including official news, statements from governments and ministries, and other research in multiple languages. The authors then geo-coded the dataset by combining the location information with satellite data. This is the most comprehensive and detailed dataset currently available. This research uses the subset data of 47 SSA countries and territories that are Chinese aid recipients. The final dataset of aid excludes the projects that is not recommended for aggregation, and the ODA recipients are not identified<sup>34</sup>. Since the geo-coded datasets may contains errors, the combination of multiple datasets needs to be handled carefully<sup>35</sup>. At district level, there are more than 80% of projects located within this level (Appendix, Figure A3). In this study, all levels of precision are included<sup>36</sup> (see Appendix, Figure A5). This enables researchers to examine the effect at more localised level (district) other than country and provincial levels. It is then combined with the administrative data in SSA – the Global Administrative Areas (GADM) dataset – to get observations by each district. The equivalent of district level is administrative level 2 (ADM2). The analysis includes the Armed Conflict Location and Event Data Project (ACLED) data for observations on conflict at ADM2 level, while data from the Uppsala Conflict Data Program (UCDP) used for limited estimation (only in Table 1). The ACLED data records more detailed conflict events at the regional level, as the target of this study is multiple types of conflict, with particular focus on civil conflict in SSA. However, as ACLED provides more details about local conflict, this often come at cost of missing data in areas experiencing the most severe violence.

On major contribution of this study is the analysis of spatial effects. To do this, the neighbouring areas must be identified<sup>37</sup>. This research uses the *Queen contiguity* to identify neighbour districts that share border with mining locations. It then uses k-Nearest Neighbor (kNN) technique to identify neighbours with the same ethnicity<sup>38</sup>. The data preparation is proceeded in Python language, including the calculation of spatial weighted matrixes. As these matrixes are strictly squared ( $n \times n$ )<sup>39</sup>, several steps have been made to bound the sample. The estimation step has been done in Stata 17.

Other datasets are listed below. All other datasets are geo-coded, except for data of annual production.

---

<sup>34</sup> There are total of 20 projects have been excluded.

<sup>35</sup> For more concerns about the techniques, the datasets are combined under EPSG:4326 geographic.

<sup>36</sup> One may concern that whether the level of “Within 5 km” should be included. However, with the total of more than 200 projects, excluding these projects may cause bias. Beside, the radius of 5 km within ADM2 level can be acceptable.

<sup>37</sup> For spatial analysis, data preparation is performed under Projected CRS: ESRI:102022.

<sup>38</sup> See the part about sample and variables for more details.

<sup>39</sup> It means all n districts have exactly total of n neighbours.

## Summary of datasets:

- Conflict data
  - The Uppsala Conflict Data Program (UCDP): UCDP Georeferenced Event Dataset (GED) Global version 24.1 (2001-2021)
  - The Armed Conflict Location and Event Data Project (ACLED) (2001-2021)
- Aid dataset
  - AidData: AidData's Geospatial Global Chinese Development Finance Dataset, Version 3.0 (2001-2021)
  - World Bank, US aid: Geocoded Official Development Assistance Dataset (GODAD), Version 1.0
- Administration data
  - Country Administration: Global Administrative Areas (GADM), panel data aggregated on provincial (administrative level 1 – ADM1) and district (administrative level 2 – ADM2) level
- China annual production of five key input materials (in 10,000 tons/year)
  - China's annual production of steel, iron, cement, glass, and aluminium: The National Bureau of Statistics of China (NBSC)
- Control variables data
  - Mineral Resources (geo-coded): location of mine in Sub-Saharan Africa - Mineral Resources Data System (MRDS)
  - Ethnic groups (geo-coded): GeoEPR - Geo-referencing Ethnic Power Relations
  - Population at local level by year: WorldPop: Spatial Demographic Data
  - Precipitation (mm/year): CHIRPS Pentad: Climate Hazards Centre Infra-Red Precipitation With Station Data (Version 2.0 Final)

### *Data sample and Quality*

This main analysis in this study uses the full sample of districts that received aid at least once during the examined period, excluding the district with total population under 40,000 people (in 2021). These are either small districts (in terms of areas), districts with extremely small population (in terms of population density), or merely errors of the intersection with population data. This might be the case since the famous problem called *sliver polygons*<sup>40</sup> is well-known in spatial data processing. Both population and population density can affect conflict – this is referred to as heterogeneity effect (Blattman and Miguel, 2010, p. 46). Blattman and Miguel point out the sparse population is more likely to experience conflict. Therefore, this study excludes the extreme cases (less than 40,000 people) where both sparse population and small areas may significantly affect the result. There may be concerns about the bias when excluding the outliers. The robustness check (Table 3) includes all sample of 1,501 districts for the reference. The final subset contains 1,351 districts with the total of 28,371 observations in 21 years. The quality of Chinese aid (*AidData*) is presented in Appendix, Figure A3.

In spatial analysis, the sample of the study expands to 2,880 districts, with a total of 51,840 observations. This is to include five nearest districts of all 1,351 districts mentioned above, using kNN method. As previously explained, some

---

<sup>40</sup> The problem where some tiny leftover polygons appear when intersecting spatial data.

techniques have been adopted to strictly bound the sample where 2,880 districts have exactly the total of 2,880 neighbours. It then accounts for the presence of mining locations and its neighbours. Therefore, the sample is reduced to 857 districts with 15,426 observations.

#### *Types of aid*

As previously mentioned, this study analyses all types of aid. By doing so, the result is expected to reveal the most significant effects with potential interpretations of causal effects. However, this study also includes the categories of aid type for more insights about heterogeneity of treatments. The aid types are divided in two ways: whether they are infrastructure projects or not, and whether they are in one of four types (production sectors, economic infrastructure and services, social infrastructure and services, or others). These are mutually exclusive in either way. In the first classification, infrastructure projects account for the majority of aid in both terms of number of aid projects and amount of aid disbursements. However, in the second way of classification, these types are systematically different in both terms (see Appendix, Figure A1, A6; Table A1). While in terms of aid counts, the economic and social projects account for the largest part of aid; the economic and production projects share the majority in terms of aid disbursement. Therefore, this study examines the Chinese aid in both terms of aid counts and disbursement amount. In the following section, economic infrastructure and services and production sectors are grouped together for interpretation, as these two types overlap in some terms.

#### *Types of conflicts*

ACLED data classifies conflict into several categories. To focus on the actors in conflict, this study divides these dyads into four main groups: state-based conflicts, militia conflicts, civilians only, and others. In context of Africa, this study delves into the civil conflicts among groups, especially the state-based conflicts. The state-based groups often have conflict with either militia groups or civilians. The classification is described as below table. In definition of repression of governmental groups against other groups, the militia groups and civilians will be further investigated.

**Table 1. Conflict classification**

<b>State-based conflicts</b>		
<b><i>State-based vs. militia</i></b>	<b><i>State-based vs. civilians</i></b>	<b><i>State-based - others</i></b>
State forces-Rebel group	State forces-Civilians	State forces only
State forces-Political militia	State forces-Rioters	<b><i>Others</i></b>
State forces-Identity militia	State forces-Protesters	State forces-State forces State forces-External/ Other forces
<b>Militia conflicts</b>		
Rebel group-Political militia	Political militia-Civilians	Identity militia-Civilians
Rebel group-Identity militia	Political militia-Rioters	Identity militia-Protesters
Rebel group-Civilians	Political militia-Protesters	Identity militia-Rioters
Rebel group-Rioters	Political militia-Identity militia	Identity militia only
Rebel group-Protesters	Political militia only	
Rebel group only		
<b>Civilians only</b>		

Protesters only	Rioters-Civilians	Rioters only
Rioters-Civilians	Rioters-Protesters	
<b>Others</b>		
External/Other forces – Civilians	External/Other forces – External/Other forces	External/Other forces only
Identity militia – External/Other forces	Rebel group – External/Other forces	Political militia – External/Other forces
Protesters – External/Other forces	Rioters – External/Other forces	

*The shift-share instrumental*

This study adopts the shift-share instrument, following series of research from Dreher et al. (2021, 2019, 2017). Given some critics about the shift-share instrument, Dreher et al. (2021) argue that the proportion of aid received by a district in the examined period (or the *share* components) is valid, since the possible mutual trend or any of their causal effects exist between the share component and conflict will be absorbed by year and regional-year fixed effects. They show little to no concerns, since the trend of the proportion of aid received between two groups (above average, and below average) almost completely parallel in examined period. Certainly, this does not mean the problem of violating the exclusion restrictions has been solved (Bluhm et al., 2025); however, the result might be acceptable in terms of internal validity. Therefore, following Dreher et al., the continuous parallel trend should be examined when using this type of IV. The graph of aid counts/aid disbursements of above-average recipient districts versus below-average recipient districts intuitively shows less to no concerns in prior to 2015; however, this would be a problem after the year 2015 (see Appendix, Figure A9). Alongside concerns of exclusion restriction, this suggests a probable structural change using this type of IV. This was due to the implementation of the Belt and Road Initiative (BRI). During this period, as Valdiglesias (2024) suggested, China have been expanding their assistance to other regions than traditional ones. China has significantly increased the number of aid projects in social infrastructure and services, but not the value of aid in this sector. Moreover, they have significantly promoted aid on production sectors, particularly in production of critical materials for green transition (Valdiglesias, 2024). Since the period is six years, I argue that the use of IV is still acceptable whenever the tests for a strong IV are valid. However, this implication implies that the use of IV should be seriously considered in further research, including the use of IV approach. In fact, some critics for this approach have been introduced in experimental research (Bluhm et al., 2025).

## 4. Empirical strategy

### 4.1 - The impact of Chinese aid on conflict

This part is about the estimation model of the effect of aid on conflict. The unit of observation has three levels: country ( $i$ ), time ( $t$ ), and district (ADM2 ( $d$ )). By adopting the IV techniques, the model estimates the Local Average of Treatment Effect (LATE). The baseline IV model estimates the effect using Two-Stage Least Squares (2SLS) technique takes the form as below:

$$Conflict_{dct} = \beta_1 CNAid_{d,t-2} + \beta_2 X'_{d,t-2} + \delta_{ct} + \varphi_d + \varepsilon_{dct} \quad (1)$$

$$CNAid_{d,t-2} = \alpha_1 (MatlProd_{t-3} \times \bar{P}_d) + \alpha_2 X'_{d,t-2} + \gamma_{ct} + \eta_p + \lambda_d + \varepsilon_{dct} \quad (2)$$

#### *Measurements of Chinese aid*

In this study, the measurement of Chinese aid (*CNAid*) consists of two types: the number of aid commitments, and total aid disbursement (USD, constant 2021). Both are logarithmically transformed with adjustment to zeros (by adding 1 for those observations). Given the insufficient data on year of aid implementation, this model uses data of aid commitment at year  $t$ . Since many aid projects have no disbursement data (Appendix, Figure A1), which probably due to missing, both measures of aid are employed to assess the *overall* effect of Chinese aid on conflict. Aid in a region is often followed by substantial investment from Chinese private sectors. Although the number of aid commitments cannot estimate precisely the direct social impacts of aid, this approach can approximate the broader effects of Chinese aid as a form of Chinese engagement in the area. These variables are introduced in logarithm form, with adjustment for zero values (by adding 1 in prior to logarithm transform). As the use of discrete variables (aid counts) raises concerns about non-linearity in OLS estimation, this is less concern when using the IV technique that strictly control at time and regional level, even though this is still a major setback. Despite this, other measurement of aid that can adjust for high skewness, such as aid disbursement per local GDP or per capita, may facing the problem of endogeneity, especially when examine at local levels. Following some previous research (Gehring et al., 2022; Sardoschau and Jarotschkin, 2024), this study adopts these two types of aid measurement, with awareness of the setback.

It is notable that the social infrastructure and services sector accounts for a major proportion of the total number of aid commitments. Meanwhile, the economic and production sectors share the largest parts in disbursement data. Estimations using the two different instrument variables will give different results. The classification of infrastructure projects has been provided in this third version of geo-coded Chinese aid data – this allows to check for heterogeneity of treatment effect for this type of aid. Infrastructure projects, which are often large in scale and strategically important, most clearly reflect Chinese influence through its economic interests and exercise of power. The estimations for each type of aid are included in the heterogeneity treatment effect part, including different categories of aid.

#### *Measurements of conflicts*

The variable *Conflict* is either number of conflict events; the deaths in conflict; or the intensity of conflict in country  $c$ , district  $d$ , time  $t$ . These first two variables have been logarithmically transformed with adjustment to zeros (by plus 1 after being logarithm transformed), while the intensity is the ratio of logarithm of deaths (with adjustment to zeros) per logarithm of conflict event (with adjustments to zeros). The death tolls and intensity of aid can provide information about the severity of violence. This is to capture the full dynamics of the conflict. The two-year lagged variable accounts for the time required for the aid commitment to be disbursed and exert an impact on local communities. This follows research from Dreher et al. (2021, 2017) and Gehring et al (2022). They suggest that Chinese aid is sufficient when it comes to time of disbursement, as they normally took from one or two years. In addition, the authors have performed several tests on the lags and concluded this level of lag is the most sufficient across models. One concern that is similar to aid measurement, is *Conflict* used in the model is discrete variable. Therefore, the magnitude of coefficients should be interpreted with caution.

#### *Instrumental variables*

The IV used in this study is the first common factor of China’s annual production (logged, detrended) of five key input materials for production, including steel, iron, cement, glass, and aluminium (Appendix, Figure A8). The variables are detrended to eliminate the possible common trends through which these factors can affect conflict in other channel than aid. This technique to better control for validation of exclusion restriction. Compared to other IVs used in previous research of Bluhm et al. (2025), this factor does not include timber. I argue that in the context of SSA, timber is not relevant since none of the SSA countries are major importers of this product. China’s production of timber had been suffered insufficient supply during the first half of the examined period (Wang et al., 2023). Moreover, the continent is capable of supplying the products itself. Another IV has been commonly used is the net foreign reserve of China. Again, empirical work (in this study) shows this variable is weak in some estimations. In fact, China has tendency to increase their aid to other region rather than SSA when its reserves is abundance (Valdiglesias, 2024). Following the previous work, this study uses the China annual domestic production of these five key input materials for construction. The *share* component ( $\overline{P_d}$ ) is calculated by number of year that a district receive aid divided by total year in the period. The interaction term (or *shift-share* instrument) is to approximate the competitiveness of receiving assistance from China among districts. However, as mentioned earlier, the interaction term implies that when China experiencing surplus production, it is more likely to deliver the aid to regions with more competitiveness (received more aid in the past). As previously argued, this might be a concern of this approach.

#### *Control variables*

One major advantage of using district level as unit of analysis is it enables strict control for local characteristics at small scale, as conflict is typically resulted from variety of factors (Blattman and Miguel, 2010). Models estimating conflict, therefore, often face the problem of omitting variables, including multiple characteristics in a specific region and time variants. In this study, the estimation

model controls for country, year, country-year ( $\delta_{ct}$ ), and district fixed-effects ( $\varphi_d$ ). This specification controls unobserved factors that vary across countries, over time, country in a specific year, and across districts. This allows the models to account for both temporal and spatial heterogeneity, following Sardoschau and Jarotschkin (2024). Moreover, the standard errors are clustered in two ways: country-year and districts. The setting follows (Gehring et al., 2022), as it allows the residuals to be correlated both at country-year and district levels. This reflects the fact that, conflict in one region can spread out to other areas and some may persist over time (Blattman and Miguel, 2010). By using the two-way clustered standard errors, the statistical inference appears to be more valid.

With the increasing availability of spatial data, this analysis controls some confounding variables ( $X'_{d,t-2}$ ), including population and climate shocks (precipitation shocks). Respectively using the detail data of *WorldPop* and *CHIRPS Pentad*, both variables varied across districts and time. Population can affect conflict due to heterogeneity effect (Blattman and Miguel, 2010), meaning in the area with large population, the probability of conflict increases<sup>41</sup>. Meanwhile, China may be more likely to deliver their aid at more populous area<sup>42</sup>, particularly the social infrastructure aid. However, since local population varies over time, there are risks that aid can directly affect local population. However, I include the variable in the baseline model for two reasons. First, the direct effect of aid on population (if any) must have lagged through time, in terms of social mobility and data recorded. Meanwhile, its impact on conflict and probability of receiving aid appears to be more instant and significant. Second, it can partly be addressed by using the lagged variable. Besides, for further concerns about bias, this variable is excluded from the models in the step of robustness check. The second cofounded variable, the precipitation shocks, is the difference between precipitation (mm/year) in time (t) minus its value in time (t-1). This is an indicator of climate shocks, significantly affecting agriculture activities in SSA, which in turns, encourages violence in the region (Von Uexkull et al., 2016). Climate crisis in the areas also attracts more aid. This variable is certainly exogenous.

The estimation employs two-year lagged values of the control variables, which helps reduce the likelihood of violating the condition and mitigates potential reverse causality in the model. However, this setting has limitations, one of them is that it does not account for autoregression. Many conflict events persist over time, stemming from hostility between groups in the past. Sardoschau and Jarotschkin (2024) add one-year lag of conflict to address for this concern; however, since the lagged variable is also endogenous, this may produce bias in results. Some dynamic approaches to address the problem may introduce insignificant results, as the dynamics in unit of district is insufficient<sup>43</sup>.

---

<sup>41</sup> This is due to multiple factors, such as more ethnic groups, different opinions, multiple dyads in prolonged conflicts...

<sup>42</sup> One may concern about population density; however, as the model controls for fixed effects at local levels, this use of these two variables is pretty much the same since the local area remains through time.

<sup>43</sup> To address autoregression, dynamic models use differentiate of dependent variable. Given the conflict event and aid in a district is sparse, such model are likely to produce insignificant results.

#### 4.2 - The IV – Spatial Autoregression model (IV – SAR)

$$\text{Conflict}_{dct} = \tau W_d \times \text{Conflict}_{dct} + \beta_1 \text{CNAid}_{d,t-2} + \beta_2 X'_{d,t-2} + \delta_{ct} + \varphi_d + \varepsilon_{dct} \quad (3)$$

One of the major problems with smaller unit targeting is the presence of spatial spillover effect. This makes the 2SLS model estimations biased. The study contributes to existing research by adding spatial lags into the model. To apply this model, the subset of data (which includes districts that received aid at least once in the period) needs to be expanded to their neighbouring districts<sup>44</sup>. This study adopts the IV-SAR model to examine the possible spatial spillover effect at district level, in which the spatial lag of dependent variable ( $\tau W_d \times \text{Conflict}_{dct}$ ) is included. Since the variable is endogenous, Cui et al. (2020) and Betz et al. (2020) introduce the use of weighted matrix of exogeneous dependent variables and their spatial lags as an additional IV, alongside the aid variable and its IV.

The remaining problem is choosing the weighted matrix ( $W_d$ ). In this paper, the neighbouring areas are identified as five closest districts. The weighted matrix is then calculated using the k-Nearest Neighbours (kNN) technique with inverse distance. This implies the closer districts are more likely to be affected. It is then standardized the inverse distance to [0,1] range to adjust for different scales among districts. Moreover, the weighted matrix is restricted to the same ethnicity only. This is due to the assumption that only same ethnic groups are considered for potential spillover effects<sup>45</sup>. In other words, it assumes conflict is more likely to spread within regions sharing the same ethnicity. By assuming this, the outcomes of models can be interpreted within the scope of ethnicity. To do so, this study overlaps the data with ethnicity data (EPR) and identifying the dominant ethnic group in a district by its controlled areas, whether the ethnic group controls for more than 50% of a district<sup>46</sup>. It then divided the dominant ethnic groups into three groups, based on whether the groups are in the government coalition (during all examined period), or they are excluded from the government (at least once)<sup>47</sup>. As a result, there are two types of spatial weigh matrix: the matrix of government coalitions, and the matrix of excluded ethnic groups – both are matrixes of groups sharing the same ethnicity. The purpose of this setting is to investigate whether conflict have different patterns within these groups, and whether the spatial effect amplifies or diffuse the effect of Chinese aid in one region. The analysis uses the package of `ivreghdfe` in Stata, which was introduced by Kripfganz and Sarafidis (2025), exclusively for these models with multiple dummies of control variables.

---

<sup>44</sup> See the part Data sample and Quality above

<sup>45</sup> To make sure conflict does not spread across border of groups with different ethnicity, I perform a test on the data, and the result is insignificant.

<sup>46</sup> This technique may raise concerns about the previously mentioned “*sliver-polygons*”, as well as the validity of EPR. Therefore, I use the term “dominant” as more than 50% of a district that controlled by the group rather than the group shares the largest part to partly address these concerns. The ERP is varied over time, but not frequently.

<sup>47</sup> This is to make sure the government coalition including all (politically) more powerful groups. The rest areas will be places where multiple groups inhabited.

#### 4.3 - The effect of Chinese aid on conflict in excluded groups' areas

$$\text{Conflict}_{dct} = \beta_1(\text{CNAid}_{dt-2} \times \text{Ethnic\_excl}_{dt-2}) + \beta_2 X'_{dt-2} + \delta_{ct-2} + \varphi_d + \varepsilon_{dct} \quad (4)$$

$$\text{CNAid}_{dt-2} = \alpha_1(\text{MatlProd}_{t-3} \times \text{Ethnic\_excl}_{dt-2} \times \overline{P_d}) + \alpha_2(\text{MatlF}_{t-3} \times \overline{P_d}) + \alpha_2 X'_{dt-1} + \gamma_{ct} + \lambda_d + \varepsilon_{dct} \quad (5)$$

Finally, to examine whether the presumed politically biased Chinese aid affecting differently in areas controlled by powerless groups, the study employs the interaction variable of aid and status of a dominant group in a district. The conflict types in the model are restricted to state-militia conflict only, as violence against civilians alone can be perceived as repression. As violence in these areas almost certainly to be defined as “repression”, this estimation setting is expected to reveal the repression dynamic of more powerful groups, in this case the government coalition, towards other groups. It then adopts the spatial analysis technique to adjust for spatial effect, to see whether the effect biased the result.

## 5. Estimation results

### 5.1. Descriptive statistics and sample size

All variables of the first sample with 1,351 districts in SSA is presented in Table 2. This sample includes all districts that have received aid at least once in during 2001-2021, except for small population districts (less than 40,000 people). This sample have 28,371 observations over 21 years.

**Table 2. Descriptive Summary**

	Mean	Sd	Min	Max
<b>ACLED</b>				
Total conflict events	3.91	21.38	0	838
State-based conflicts	1.5	11.12	0	575
State-based vs. militia	0.77	8.89	0	515
State-based vs. civilians	0.66	3.31	0	92
State-based vs. others	0.08	1	0	47
Civilian conflicts	1.08	6.96	0	252
Militia conflicts	1.17	7.53	0	313
External/Other forces	0.15	2.35	0	186
Total fatality	8.15	73.71	0	5,426
State-based conflicts	4.25	52.5	0	5,426
State-based vs. militia	3.35	48.79	0	5,426
State-based vs. civilians	0.8	11.01	0	926
State-based vs. others	0.13	3.81	0	481
Civilian conflicts	0.17	7.24	0	1,022
Militia conflicts	3.2	28.81	0	1,663
External/Other forces	0.53	15.36	0	2,001
<b>UCDP</b>				
Total conflict events	0.51	4.68	0	239
State-based conflict	0.25	3.33	0	236
Non-state conflict	0.07	0.69	0	45
One-sided violence	0.19	1.9	0	100
Total Fatality	4.87	60.35	0	4,374
State-based conflict	2.49	40.78	0	3,354
Non-state conflict	0.76	11.55	0	992
One-sided violence	1.62	29.04	0	2,870
<b>Chinese aid</b>				
Number of aid commitments (count)	0.20	0.67	0	14
Infrastructure				
Infrastructure aid	0.11	0.44	0	10
Non-infrastructure aid	0.09	0.42	0	14
Aid sectors				
Social	0.10	0.46	0	10
Economic	0.07	0.35	0	10
Production	0.02	0.14	0	4

Others	0.01	0.11	0	6
Aid disbursement (million constant 2021 USD)	5.68	65.79	0	4,400
Infrastructure				
Infrastructure aid	5.31	61.93	0	4,320
Non-infrastructure aid	0.37	20.47	0	2,330
Aid sectors				
Social	0.83	17.62	0	1,740
Economic	3.68	47.86	0	4,120
Production	0.98	37.32	0	4,400
Others	0.19	14.90	0	2,330
<b>Control variables</b>				
Population	345,781.9	524,713.4	613	8,384,884
Population density	995.6	3,492.0	0	75,118
Precipitation (mm/year)	1,125.7	565.1	0.30	4,337
Number of ethnic groups	1.77	1.07	0	10
<b>Instrument Variables</b>				
China Annual Production (million tons)				
Steel Production	636.4	280.6	151.6	1,064.8
Cement Production	1,785.9	636.2	661.0	2,492.1
Iron Production	564.4	222.8	155.5	889.0
Glass Production	656.9	244.5	209.6	1,017.3
Aluminium Production	20.7	12.0	3.6	38.5
Proportion of aid received				
Aid counts ratio	0.13	0.15	0.05	0.90
Aid disbursement ratio	0.09	0.11	0	0.76
Observations	28,371	T = 21	N = 1,351	

## 5.2. The impact of Chinese aid on conflict in Sub-Saharan Africa

### *The overall effect*

In Table 3, several estimation outputs of equation (1) on the impact of Chinese aid and conflict are presented in sample of 1,351 districts over 21 years. It then restricts sample based on some criteria to examine the heterogeneity effect. In this table, the dependent variables (column title) are number of conflict events, fatalities (death tolls), and intensity of conflict. Meanwhile, the explanatory variables are number of aid commitments and total value of aid disbursement (row title). Column (1) and (5) present the estimations of fixed effect model, control for country-year and district fixed-effects, while standard errors are two-way clustered at country-year and district level. This includes the result using UCDP dataset for comparison. The result shows little to no significance, as aid affect only number of conflict events at the 10% significant level, using ACLED data. Moreover, even showing no significance, the coefficients in models using aid disbursements and model using UCDP data is negative. However, as these models have problem of endogeneity, the result is used exclusively for analysing heterogeneity effect. The difference between fixed-effect model and IV models suggests that heterogeneity varies significantly across groups.

**Table 3. The effect of Chinese aid on conflict in Sub-Saharan Africa at district level (ACLED and UCDP data)**

<i>Explanatory variable:</i>	Number of aid commitments (t-2) (logged)				Aid disbursements (constant USD 2021) (t-2) (logged)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<b>ACLED</b>								
- Conflict event count (logged)	0.035* (0.018)	1.377*** (0.399)	1.435*** (0.543)	1.148*** (0.384)	-0.000 (0.001)	0.078*** (0.023)	0.079*** (0.024)	0.055*** (0.020)
- Fatalities (logged)		0.180 (0.358)	0.080 (0.453)	0.212 (0.459)		0.008 (0.024)	0.008 (0.024)	0.004 (0.026)
- Conflict intensity (deaths/ events, logged)		-1.197*** (0.448)	-1.355** (0.611)	-0.936** (0.455)		-0.072** (0.028)	-0.071** (0.029)	-0.051* (0.028)
<i>IV First stage</i>		0.122*** (0.026)	0.128*** (0.036)	0.134*** (0.030)		2.560*** (0.506)	2.987*** (0.506)	2.982*** (0.651)
R-squared	0.372				0.369			
Kleibergen-Paap rk Wald F statistic		22.460	12.853	20.012		25.531	25.957	20.987
<b>UCDP</b>								
- Conflict event count (logged)	-0.001 (0.011)				-0.000 (0.001)			
R-squared	0.163				0.163			
Observations	24,318	24,318	8,838	17,478	24,318	13,518	13,518	17,478
Groups	1,351	1,351	491	971	1,351	1,351	751	971

\*Standard errors are in parentheses, two-way clustered at country-year and district level. Level of significance: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Note: Column (1) and (5): Fixed effect model: Fixed effect at country-year and district level, two-way clustered standard error.

Columns (2), (3), (4) and (6), (7), (8): IV-2SLS models which include country, year, country-year, district fixed effects, population (logged), precipitation shock as control, and two-way clustered standard error.

All models, except (4) and (8), include precipitation shocks. Columns (2) and (6) use the full sample of Chinese aid recipient districts, excluding extremely small-population observations. Columns (3) and (7) restrict the sample to districts that received aid at least three times (column 3), or at least ten million USD (constant 2021 dollars) (column 7) during the period. Column (4) and (8) present the estimation results for mining areas and their neighbouring districts.

The result in column (2) and (6) is baseline IV-2SLS model, presented in equation (1) and (2). In columns (3) and (7), the sample is restricted to districts that received aid at a higher density than others. While the column (3) includes districts that received aid at least three times, column (7) includes districts that received at least ten million USD (constant 2021) during the period. The aim is to examine the heterogeneity effects of these groups. Column (4) and (8) examining the effect at mining locations and their neighbouring areas.

The result in baseline models shows that, 1% increase in number of Chinese aid projects can increase the number of conflict events by around 1.4%. Similarly, 1% increase in aid disbursements increases 0.08% number of conflict events. However, there is no evidence that Chinese aid affects the death tolls resulted in conflicts in the regions. As can be expected, Chinese aid significantly reduces the intensity of conflict, regardless of which measurement of aid is used. However, this is mainly due to the increase in conflict events, it should be interpreted as Chinese aid often associates with lower-intensity conflict. The coefficients of aid and conflicts appear to be higher in districts that received aid more frequently. Meanwhile, when examining the effect at mining locations and neighbouring areas, the effect seems to be lower, either using number of aid commitments or aid disbursements.

#### *Robustness check*

Table 4 shows robustness check for different sets of control variables<sup>48</sup>. To emphasise the importance of time-regional fixed effect (FE), column (1) and (2) control for only time and region FE. The result indicates that the specific factors of a country in a year, such as regime change, is important in explaining conflicts. It then respectively adds for more variables, such as time-regional FE and precipitation shock (this is quite strictly exogenous) in columns (2) and (7); population in columns (3) and (8); and the number of ethnic groups in a region in columns (4) and (9). Both population and number of ethnic groups in a district shows potential problems, since these variables can directly be affected by aid through migration. However, as indicated previously, the population can address bias rather than causing one. Columns (5) and (10) expand the sample to all districts that have received aid at least once during the period (do not exclude small population districts), using the baseline model.

The result shows no significant shifts when controlling for more variables such as population, precipitation, and number of ethnic groups in a district. Meanwhile, the regional-time FE and small population district in full sample significantly shift the coefficients. However, the coefficients remain positive across different sets of control, meaning the effect quite robust across models.

### *5.3. Chinese aid and the dynamics of intergroup conflicts*

#### *Types of aid*

Table 5 shows the heterogeneity of treatment effects. In which, several types of aid are examined. The result shows the effect of aid and conflict is significant in all groups. Although the infrastructure projects are, as expected, strongly relevant, the other non-infrastructure projects also show significant effect.

---

<sup>48</sup> As the estimation models show strong IV and stable, I did not include the robustness check for different models. The main source of heterogeneity is from control variables.

**Table 4. The effect of Chinese aid on conflict in Sub-Saharan Africa (ACLED data) – Robustness check of control variables**

<i>Independent variable:</i>	Number of aid commitments (t-2) (logged)					Aid disbursements (constant USD 2021) (logged)				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<i>ACLED</i>										
<i>Dependent variables:</i>										
- Conflict event count (logged)	0.971*** (0.305)	1.382*** (0.400)	1.377*** (0.399)	1.379*** (0.399)	1.427*** (0.401)	0.048*** (0.018)	0.078*** (0.023)	0.078*** (0.023)	0.078*** (0.023)	0.081*** (0.023)
- Fatalities (logged)	-0.425 (0.374)	0.185 (0.357)	0.180 (0.358)	0.184 (0.357)	0.238 (0.354)	-0.025 (0.024)	0.006 (0.024)	0.006 (0.024)	0.006 (0.024)	0.010 (0.024)
- Conflict intensity (deaths/ events, logged)	-1.396*** (0.400)	-1.197*** (0.448)	-1.197*** (0.448)	-1.194*** (0.446)	-1.191*** (0.438)	-0.074*** (0.026)	-0.072** (0.028)	-0.072** (0.028)	-0.071** (0.028)	-0.071*** (0.027)
<i>IV First stage</i>	0.113*** (0.021)	0.122*** (0.026)	0.122*** (0.026)	0.122*** (0.026)	0.120*** (0.025)	2.535*** (0.438)	2.560*** (0.507)	2.560*** (0.506)	2.573*** (0.506)	2.516*** (0.490)
<i>Control variables:</i>										
Number of ethnic groups	No	No	No	Yes	No	No	No	No	Yes	No
Population	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes
Climate shocks (Precipitation)	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Time FE and Regional FE	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Regional FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
K-P rk Wald F statistic	28.071	22.510	22.460	22.608	23.256	33.443	25.531	25.534	25.890	26.320
Observations	24,318	24,318	24,318	24,318	27,018	24,318	24,318	24,318	24,318	27,018
Groups	1,351	1,351	1,351	1,351	1,501	1,351	1,351	1,351	1,351	1,501

\*Standard errors are in parentheses, two-way clustered at country-year and district level. Level of significance: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Note: Columns (1), (2), (3), (4) and (6), (7), (8), (9) have different control variables. Column (4), (5), (9), (10) include all given control variables, in which columns (5) and (10) use the full sample of Chinese aid recipient districts.

**Table 5. Types of aid - Heterogeneous treatment effect (ACLED data)**

<i>Independent variable:</i>	Number of aid commitments (t-2) (logged)				Aid disbursements (constant USD 2021) (logged)			
	Infrastructure (1)	Non-infra- structure (2)	Production & Economic (3)	Social (4)	Infrastructure (5)	Non-infra- structure (6)	Production & Economic (7)	Social (8)
<i>Dependent variables:</i>								
- Conflict event count (logged)	1.378*** (0.396)	3.031** (1.388)	2.062** (0.970)	1.768*** (0.524)	0.089*** (0.027)	0.140** (0.071)	0.090*** (0.040)	0.097*** (0.027)
- Fatalities (logged)	0.123 (0.418)	0.357 (0.810)	0.901 (0.685)	0.147 (0.443)	0.011 (0.027)	0.018 (0.060)	0.041 (0.036)	-0.001 (0.030)
- Conflict intensity (deaths/ events, logged)	-1.255*** (0.481)	-2.673 (1.394)	-1.162 (0.783)	-1.620** (0.609)	-0.078** (0.032)	-0.122 (0.081)	-0.048 (0.035)	-0.098** (0.038)
<i>IV First stage</i>	0.122*** (0.026)	0.063** (0.026)	0.109** (0.046)	0.110*** (0.024)	2.656*** (0.602)	1.953** (0.909)	2.145*** (0.797)	2.993*** (0.589)
Observations	24,318	24,318	24,318	24,318	24,318	24,318	24,318	24,318
Groups	1,351	1,351	1,351	1,351	1,351	1,351	1,351	1,351
Kleibergen-Paap rk LM statistic & P-val	16.443***	5.754**	4.854**	16.905***	15.632***	3.890**	6.119**	17.737***
Kleibergen-Paap rk Wald F statistic	23.570	5.857	5.685	20.465	19.466	4.615	7.235	25.789

\*Standard errors are in parentheses, two-way clustered at country-year and district level. Level of significance: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

This reveals the overall effect of aid and conflict are spreads by types of aid, meaning the heterogeneity may vary within each type rather than between aid types.

*Types of conflict among actors*

In Table 6, the effect is examined by each type of conflicts, with the focus on the government conflict (or state-based conflict) toward other groups<sup>49</sup>. The models also include both types of aid measurement and three types of conflict measurement. The result pattern is the same with state-based conflict and overall effect of aid on conflict: Chinese aid increases conflict at local levels, but the effect mostly associates with low-intensity conflict (columns (1), (2)). In the columns from (3) to (6), results show Chinese aid significantly increases state-based conflicts, either versus militia groups or versus civilian. One notable result is, there is no evidence that Chinese aid reduces the intensity of state-based conflicts versus militia groups (columns (3), (5)). Meanwhile, there is little to no<sup>50</sup> evidence that aid associates with violence carried out by the militia groups against other actors (not including violence against the government) (columns (7), (8)). Chinese aid also positively affects conflict among small groups of civilians (columns (9), (10)). To sum up, Chinese aid mostly associates with state-based violence against the other groups and spurs violence among civilian groups.

**Table 6. The effect of Chinese aid on conflict by types of conflict**

Independent variable:	Aid counts (t-2) (logged)		Aid disbursements (t-2) (logged)	
<hr/>				
<i>State-based conflicts</i>	(1)		(2)	
- Event count (logged)	1.482*** (0.394)		0.083*** (0.022)	
- Fatalities (logged)	0.167 (0.287)		0.009 (0.019)	
- Conflict intensity (logged)	-1.314*** (0.447)		-0.074*** (0.025)	
	Militia (3)	Civilians (4)	Militia (5)	Civilians (6)
- Event count (logged)	0.364** (0.153)	1.440*** (0.381)	0.024** (0.010)	0.078*** (0.021)
- Fatalities (logged)	0.192 (0.198)	-0.008 (0.252)	0.013 (0.012)	-0.004 (0.017)
- Conflict intensity (logged)	-0.172 (0.126)	-1.448*** (0.472)	-0.012 (0.008)	-0.082*** (0.027)
<hr/>				
<i>Militia conflicts</i>	(7)		(8)	
- Event count (logged)	0.362* (0.212)		0.015 (0.013)	
- Fatalities (logged)	0.325 (0.299)		0.018 (0.022)	
- Conflict intensity (logged)	-0.037 (0.200)		0.004 (0.015)	
<hr/>				
<i>Civilian conflicts</i>	(9)		(10)	
- Event count (logged)	1.145***		0.067***	

<sup>49</sup> See Table 1 for more details about the classification.

<sup>50</sup> No evidence at 5% level of significant.

	(0.355)	(0.022)
- Fatalities (logged)	-0.115 (0.176)	-0.011 (0.012)
- Conflict intensity (logged)	-1.260*** (0.407)	-0.078*** (0.026)
K-P rk Wald F statistic	22.460	25.534
Observations	24,318	24,318
Groups	1,351	1,351

Standard errors are in parentheses, two-way clustered at country-year and district level. Level of significance: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ . K-P is an abbreviation for Kleibergen-Paap.

Note: Columns (1), (2): Coefficients of aid on state-based conflict versus all other groups. Columns (3), (5): state-based vs. militia groups; columns (4), (7): state-based vs. civilians. All estimations use the form of baseline models: column (2) and column (6) in Table 3.

### 5.3. Controlling for the spatial biased

The result of IV-SAR model (equation (3)) is presented in Table 7, focusing on two types: state-based conflict versus militia groups and state-based conflict versus civilians. The only dependent variable is number of conflict events. To examine the spatial effect, the study expands its sample to include 2,880 districts<sup>51</sup>. It then estimates the effect of aid on conflict with/without the spatial lag variable. By assuming the spatial effect will be different among government and non-government (powerless groups), this analysis includes both in the models as two types of spatial weights matrix: government coalitions and non-governmental groups. The estimation models use two types of aid measurements: number of aid commitments and aid disbursements.

One important result is, Chinese aid associates with more conflict carried out by the government at local areas, even when control for the spatial effect. Interestingly, the IV-SAR model reveals the significant negative spatial effect of conflicts in excluded ethnic groups. This implies a decentralise effect of conflict in the area. There are little to no significant spatial effect<sup>52</sup> in areas ruled by government coalition. However, the coefficients of spatial weighted matrix are positive across models, even significant in column (11) at 10% level of significance. This implies that, state-based conflict may have different pattern in these two areas. Moreover, this suggests the displacement effect at more aggregated level, implying research using more generalized unit of analysis may show little to no evidence.

Their control areas are visualised in Figure 1, divided into two periods to see the patterns over time. It can be seen that there are some clusters of districts experienced high number of conflict events in areas controlled by the government, while conflict seems to be decentralised. Notably, the controlled areas of excluded ethnic groups have been shrinking, while the regions controlled by the government have been expanding. To see how this patterns shape the dynamic of conflict differently between two groups, this study investigates the effect in the next models.

<sup>51</sup> See Data Sample and Quality part.

<sup>52</sup> At 5% level of significance.

**Table 7. The spatial-effect adjustments on the effect of Chinese aid on the number of state-based conflict events**

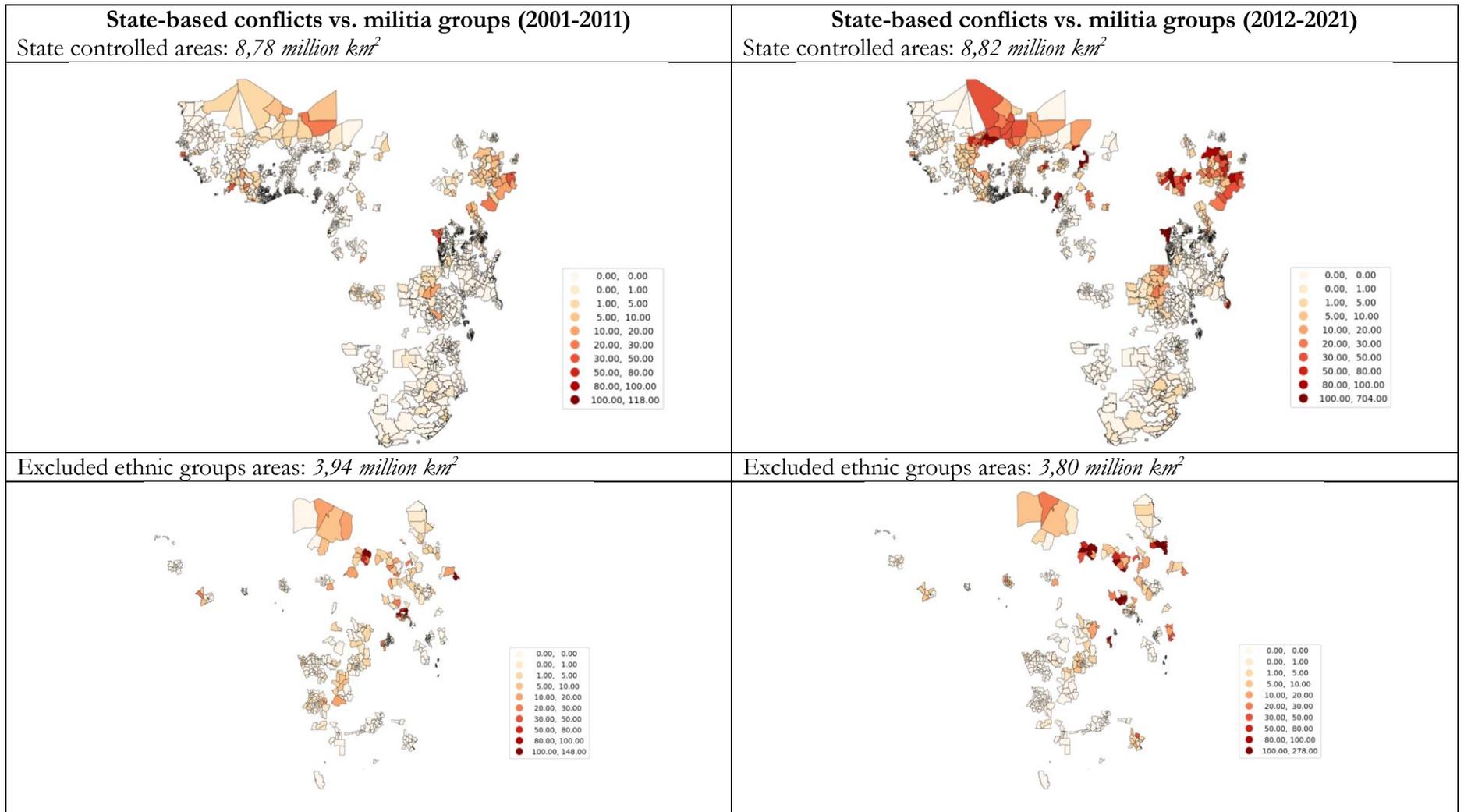
	State-based conflicts vs. militia groups				State-based conflicts vs. civilians			
<i>No spatial effects</i>	(1)	(2)		(3)	(4)			
Aid counts (t-2) (logged)	0.455*** (0.146)			1.340*** (0.309)				
Aid disbursements (t-2) (logged)		0.027*** (0.008)			0.068*** (0.015)			
K-P rk Wald F statistic	30.915	42.271		30.915	42.271			
<i>Spatial effects</i>	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Aid counts (t-2) (logged)	0.482*** (0.153)	0.409*** (0.176)			1.269*** (0.311)	1.374*** (0.288)		
Aid disbursements (t-2) (logged)			0.024*** (0.008)	0.022*** (0.010)			0.063*** (0.014)	0.064*** (0.014)
Spatial weights matrix:								
Government coalitions	0.143 (0.277)		0.333 (0.238)		0.002 (0.176)		0.267* (0.158)	
Non-governmental groups		-2.753** (1.176)		-2.276** (1.121)		-0.815*** (0.258)		-0.979*** (0.280)
Hansen test probability	0.284	0.821	0.088	0.168	0.535	0.457	0.536	0.230
Observations	51,840	51,840	51,840	51,840	51,840	51,840	51,840	51,840
Groups	2,880	2,880	2,880	2,880	2,880	2,880	2,880	2,880

\*Standard errors are in parentheses, two-way clustered at country-year and district level. Level of significance: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

K-P is an abbreviation for Kleibergen-Paap.

Note: Columns (5), (7), (9), (11): these models include spatial weight matrix of the ethnic groups that are *included* in the government coalitions; Columns (6), (8), (10), (12): these models include spatial weight matrix of the ethnic groups that are *excluded* in the government coalitions.

**Figure 1. Spatial allocation of state-based conflicts versus military groups and civilians (2,880 districts, 2001-2021)<sup>53</sup>**



<sup>53</sup> The effect of previously excluded ethnic groups joining government coalitions is addressed by restricting the analysis to groups that are consistently either in government or consistently excluded throughout the entire period (2001-2021).

#### 5.4, *The effect of “politically biased” aid*

Table 8 presents the estimation result of equation (4). It then adds spatial lag variable of excluded ethnic groups to address the spatial bias. There are two panels: the panel of recipient districts and neighbouring areas including 2,880 districts that have been used in previous estimation, and the panel of mining and neighbouring areas including 857 districts. While in the first panel, both number of aid commitments and aid disbursement are used; in the second panel, only aid disbursement is relevant in these areas.

In panel A, the result shows the impact of Chinese aid disbursements that delivered to regions controlled by excluded ethnic groups has significantly lower conflict events than the rest by 0.03% (at 5% level of significance) (column (5)). The coefficient is minus 0.5% in terms of aid counts (at 5% level of significance) (column (1)). However, the effects are absorbed when control for spatial effect, suggesting that the source of different may come from neighbouring areas. This shows a decentralise pattern of state-militia conflict in the regions.

To conclude, Chinese aid is associated with relatively lower state-militia conflict in regions controlled by excluded groups compared to other areas. Given the presence of spatial effects, this result may be driven by reductions in neighbouring areas than within the local districts themselves. The effect is unobserved in mining areas, meaning the classification of power is less relevant in conflict in the areas.

**Table 8. Comparison of the impact of Chinese aid on state-militia conflict at regions controlled by powerless groups versus the rest**

	State-based conflicts vs. militia groups	
<hr/> Panel A: Recipient districts and neighbouring areas <hr/>		
<i>Aid counts:</i>	(1)	(2)
Aid counts (t-2) (logged)	-0.504*	-0.623
× Excluded groups	(0.304)	(0.425)
Aid counts (t-2) (logged)	0.542***	0.527***
	(0.170)	(0.194)
Spatial weights matrix:		-2.513**
Non-governmental groups		(1.071)
K-P rk Wald F statistic	11.795	
Hansen test probability		0.974
<hr/>		
<i>Aid disbursements:</i>	(5)	(6)
Aid disbursements (t-2) (logged)	-0.034**	-0.029
× Excluded groups	(0.014)	(0.022)
Aid disbursements (t-2) (logged)	0.034***	0.027**
	(0.010)	(0.011)
Spatial weights matrix:		-2.482**
Non-governmental groups		(1.077)
K-P rk Wald F statistic	14.120	
Hansen test probability		0.368
Observations	51,840	51,840
Groups	2,880	2,880
<hr/>		
Panel B: Mining and neighbouring areas		
<i>Aid disbursements:</i>	(9)	(10)
Aid disbursements (t-2) (logged)	-0.021	-0.012
× Excluded groups	(0.015)	(0.014)
Aid disbursements (t-2) (logged)	0.029**	0.026**
	(0.014)	(0.012)
Spatial weights matrix:		-0.650
Non-governmental groups		(0.458)
K-P rk Wald F statistic	6.446	
Hansen test probability		0.511
Observations	15,426	15,426
Groups	857	857

\*Standard errors are in parentheses, two-way clustered at country-year and district level. Level of significance: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

K-P is an abbreviation for Kleibergen-Paap.

The odd-numbered columns: IV-2SLS models (equation (4)); the even-numbered columns: IV-SAR models

## 6. Limitations and Discussions

### 6.1 – Conclusions

To address for research questions, the estimations indicate three important findings. *First*, Chinese aid is associated with a higher level of conflict in local district areas. This effect is significant across types of aid and still robust when accounting for spatial effects. *Second*, Chinese aid significantly increases conflict of governments against civilian groups. This is a clearly a repression, supporting the hypothesis of local grievances. *Third*, Chinese aid in locations controlled by powerless ethnic groups associates with lower level of state-militia conflict compared to other groups. This can be explained by the reductions of violence in the neighbouring areas. This study proposes two possible mechanisms. First, the excluded groups have been weakening. Once conflict arises in a region (whether due to Chinese aid or not), the militia group's resources have been depleted, making them unlikely to carry out warfare in other regions. The shrinking areas of these group shows this might be the case. Second, China's deterrence power often accompanied with their local projects, especially when the value of the projects is high. China aid may associate with violence or protest in local area but discourage group rebellions in the neighbouring districts through the presence of their superpower. Lower levels of violence may reflect the presence of a dominant power.

### 6.2 – Discussions

Despite the vast amount of literature on conflict study, research on how aid may affect conflict is limited. Empirical studies on conflict and aid, therefore, mainly test for outcomes without examining the mechanism. In recent decade, China has emerged as one of the largest aid doner. Unlike Western countries, Chine uses aid as an economic instrument rather than merely a channel for grants. Therefore, their assistance should be analysed partly from an economic perspective. However, given the complexity of conflict and aid, any model can introduce bias. Empirical results, therefore, should be interpreted carefully. Otherwise, research on aid and conflict in future should focus on some specific aid types, conflict types, or some region.

The study introduces spatial analysis combine with IV model to this field of study. This aims to control for characteristics at a small-scaled, while addressing the spill-over effects. However, outcomes like the spatial pattern of conflict remains ambiguous without a more comprehensive theoretical framework. In addition, its models do not account for time lagged variables. Nevertheless, by linking theory of civil war and aid, this study introduced some possible channels for future research. Researchers either should investigate into the civil conflict and local grievances, not only the attitudes with China but also towards their opponents. In addition, findings on the excluded groups reveals some pattern that remains unclear, such as the decentralisation. Furthermore, this suggests power imbalance/mismatch may play a key role for conflict between government and arms groups in context of Sub-Saharan Africa.

## **Declarations**

### *Ethics Statement:*

This research uses secondary, publicly available data  
All analysis is conducted objectively, no biased opinions, value judgements.  
This research involves minimal to no risk regarding ethical or ethnic concerns.

### *AI Tools Statement:*

AI tool (ChatGPT) was used exclusively for general search support and clarification of concepts, language refinement from original human text, and wording improvements.  
They were not involved in content generation, result interpretation.

## **Acknowledgments**

First, I would like to send my special thanks to Dr. Ellisaios for his encouragement to pursue the topic from the very beginning. I am grateful for his patience and understanding, even when I struggled with deadlines.

I would also like to thank to Dr. Quang for his valuable comments on the model and for generously giving his time to support me.

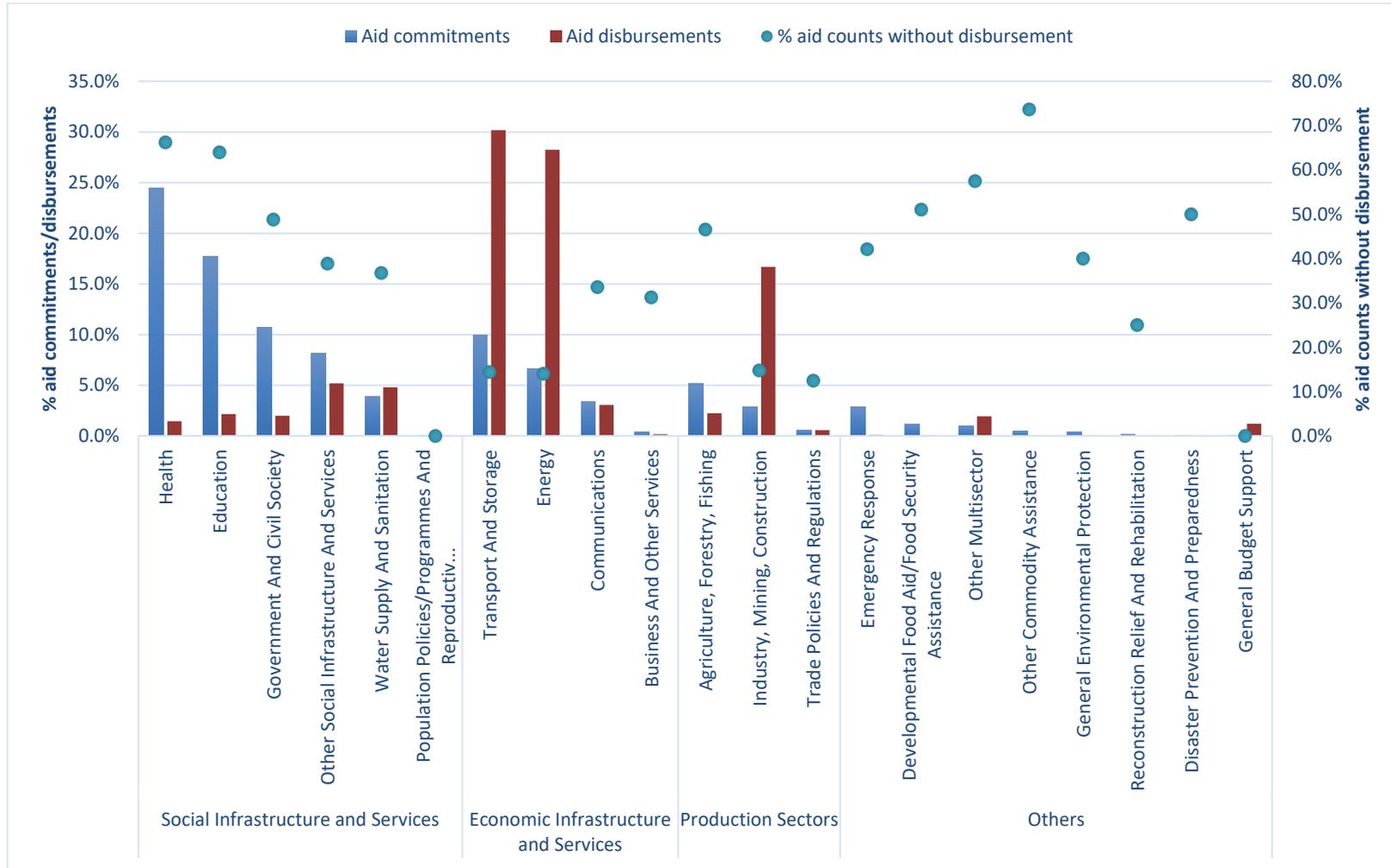
Special thanks to my mom – I would have not finished my thesis without her not being here.

Thank Libby, Q., L., TX. for all your conversations you had with me during that time.

Thank Dung for his comments as my peer reviewer and your unseen messages.

# APPENDIX

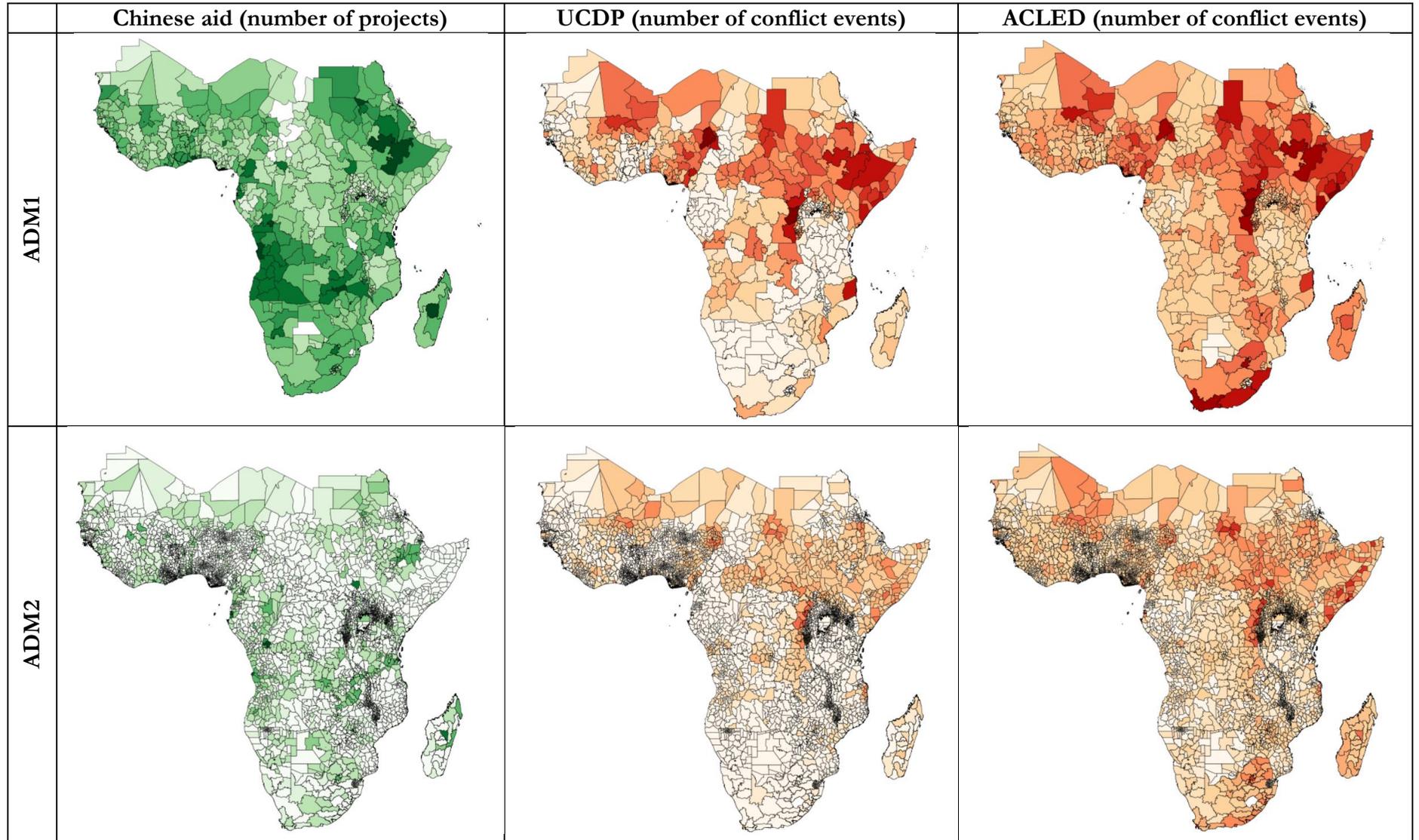
Figure A1. Percentage of Chinese aid by metric (count and total USD) and sectors (2001-2021, AidData)



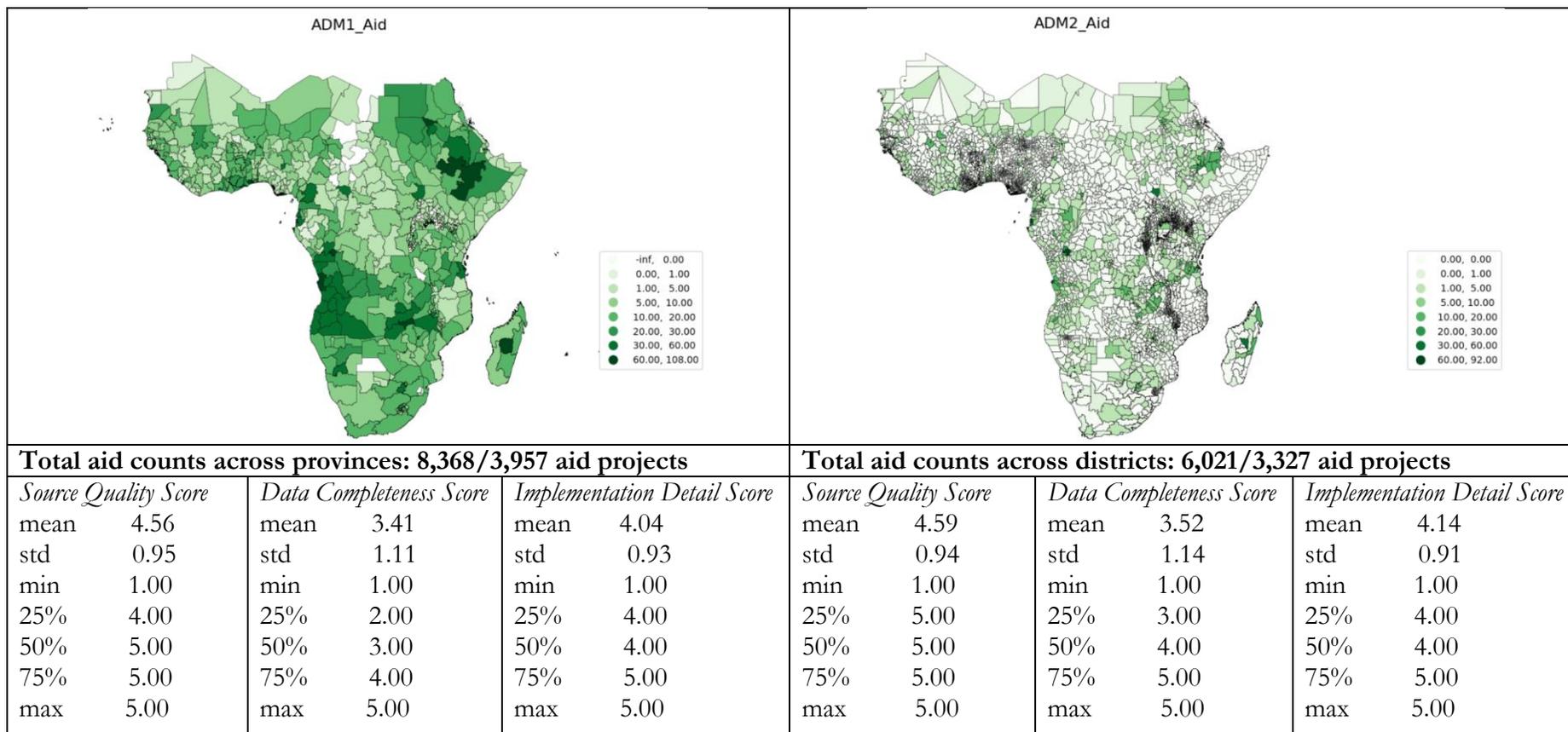
**Table A1. Chinese aid by sectors (2001-2021, AidData)**

Sector Name	Aid commitments	Aid disbursement	% aid without disbursement data
<b>Social Infrastructure and Services</b>	<b>64.9%</b>	<b>15.6%</b>	
Health	24.4%	1.4%	66.2%
Education	17.7%	2.2%	64.0%
Government And Civil Society	10.7%	2.0%	48.8%
Other Social Infrastructure and Services	8.2%	5.2%	38.9%
Water Supply and Sanitation	3.9%	4.8%	36.8%
Population Policies/Programmes and Reproductive...	0.0%	0.0%	0.0%
<b>Economic Infrastructure and Services</b>	<b>20.3%</b>	<b>61.6%</b>	
Transport And Storage	9.9%	30.2%	14.4%
Energy	6.6%	28.2%	14.1%
Communications	3.4%	3.0%	33.6%
Business And Other Services	0.4%	0.2%	31.3%
<b>Production Sectors</b>	<b>8.6%</b>	<b>19.5%</b>	
Agriculture, Forestry, Fishing	5.1%	2.2%	46.6%
Industry, Mining, Construction	2.9%	16.7%	14.8%
Trade Policies and Regulations	0.6%	0.6%	12.5%
<b>Others</b>	<b>6.1%</b>	<b>3.3%</b>	
Emergency Response	2.9%	0.1%	42.1%
Developmental Food Aid/Food Security Assistance	1.2%	0.0%	51.1%
Other Multisector	1.0%	1.9%	57.5%
Other Commodity Assistance	0.5%	0.0%	73.7%
General Environmental Protection	0.4%	0.0%	40.0%
Reconstruction Relief and Rehabilitation	0.1%	0.0%	25.0%
Disaster Prevention and Preparedness	0.1%	0.0%	50.0%
General Budget Support	0.0%	1.2%	0.0%
<b>Total</b>	<b>100%</b>	<b>100%</b>	

Figure A2. The locations of Chinese aid at ADM1 and ADM2 levels (2001-2021)



**Figure A3. Comparison of number of Chinese aid projects at provincial and district level, data source: AidData**



“*Source Quality Score*: This metric varies on a scale 1-5, with 1 indicating that the project/activity record is exclusively underpinned by unofficial sources and 5 indicating reliance upon multiple, official sources.

*Data Completeness Score*: This metric varies on a scale 0-5, with 5 indicating that the basic fields of the project/activity record are complete. The “threshold” for a score of 5 is similar to the key fields in the OECD-DAC’s Creditor Reporting System: an actual rather than estimated commitment year, a non-missing transaction amount, a flow type/flow class that is not defined as “Vague”, and identifiable funding, implementing, and receiving agencies.

*Implementation Detail Score*: This metric varies on a scale 0-5, with higher scores indicating that more implementation details have been captured in the project/activity record. The following implementation details are considered: whether the implementing agency (or agencies), implementation start and completion dates (actual or planned), and geographical locations of the project/activity are specified; and whether the project/activity has a specified sector allocation.” (Custer et al., 2023)

Figure A4. Allocations of Chinese aid by sectors (2001-2021), source: AidData

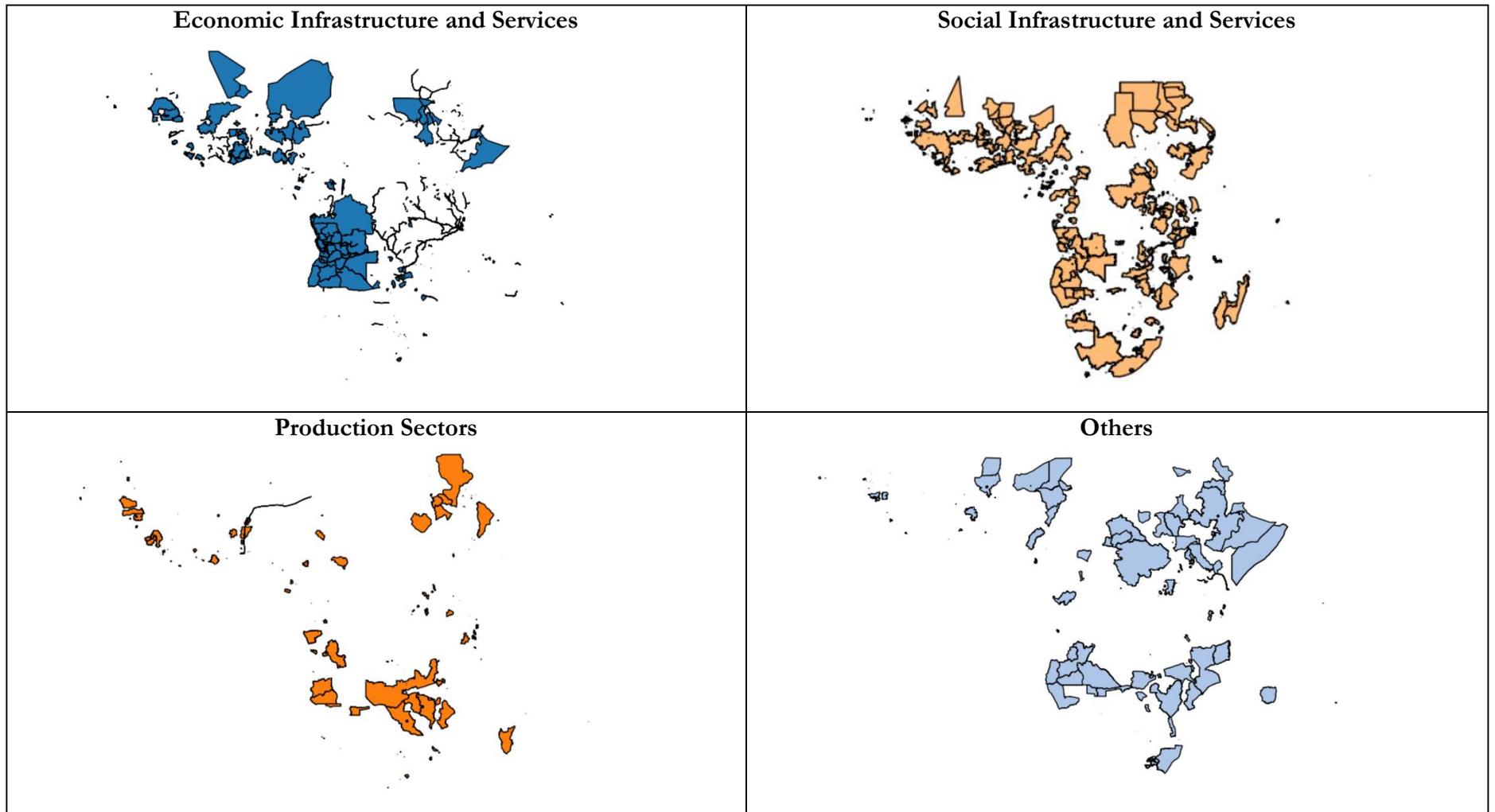
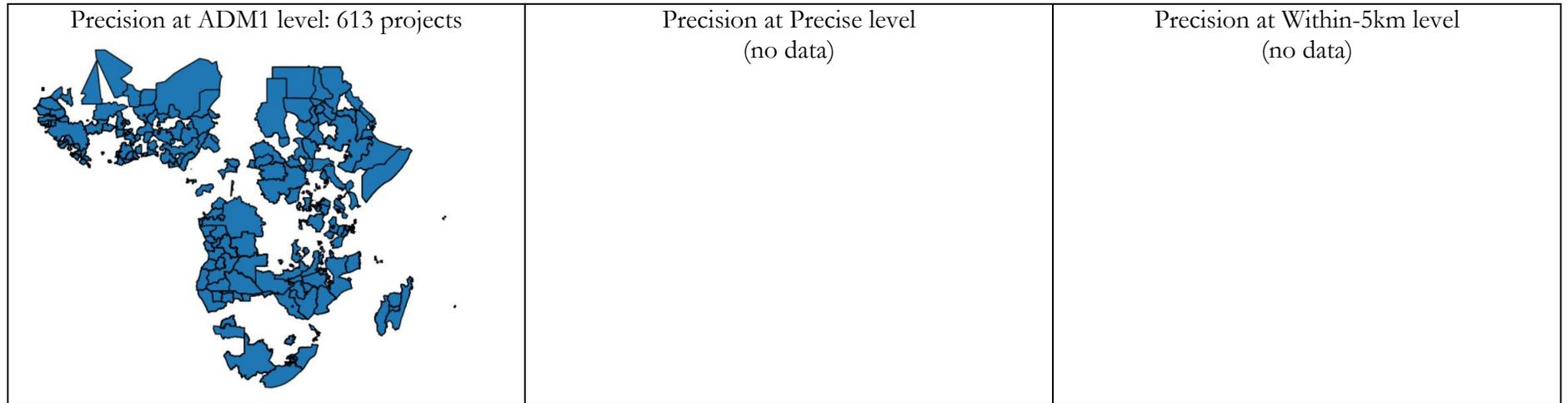


Figure A5. Precision of Chinese aid at district level (2001-2021, source: *AidData*)

Locations of 613 projects at administration level 1 only



Locations of 3,327 projects at administration level 2

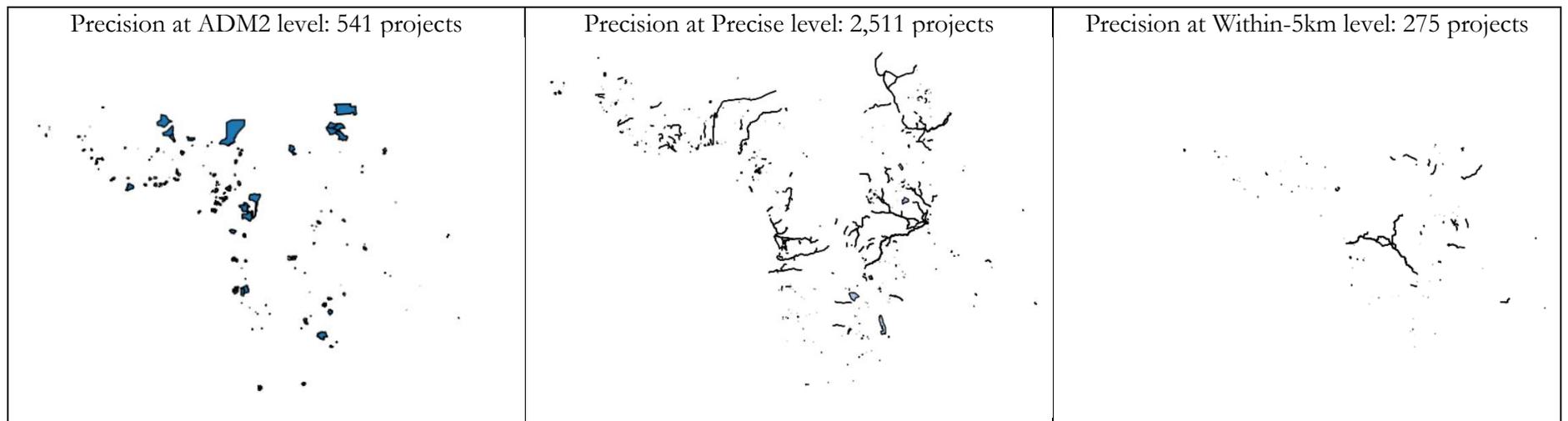
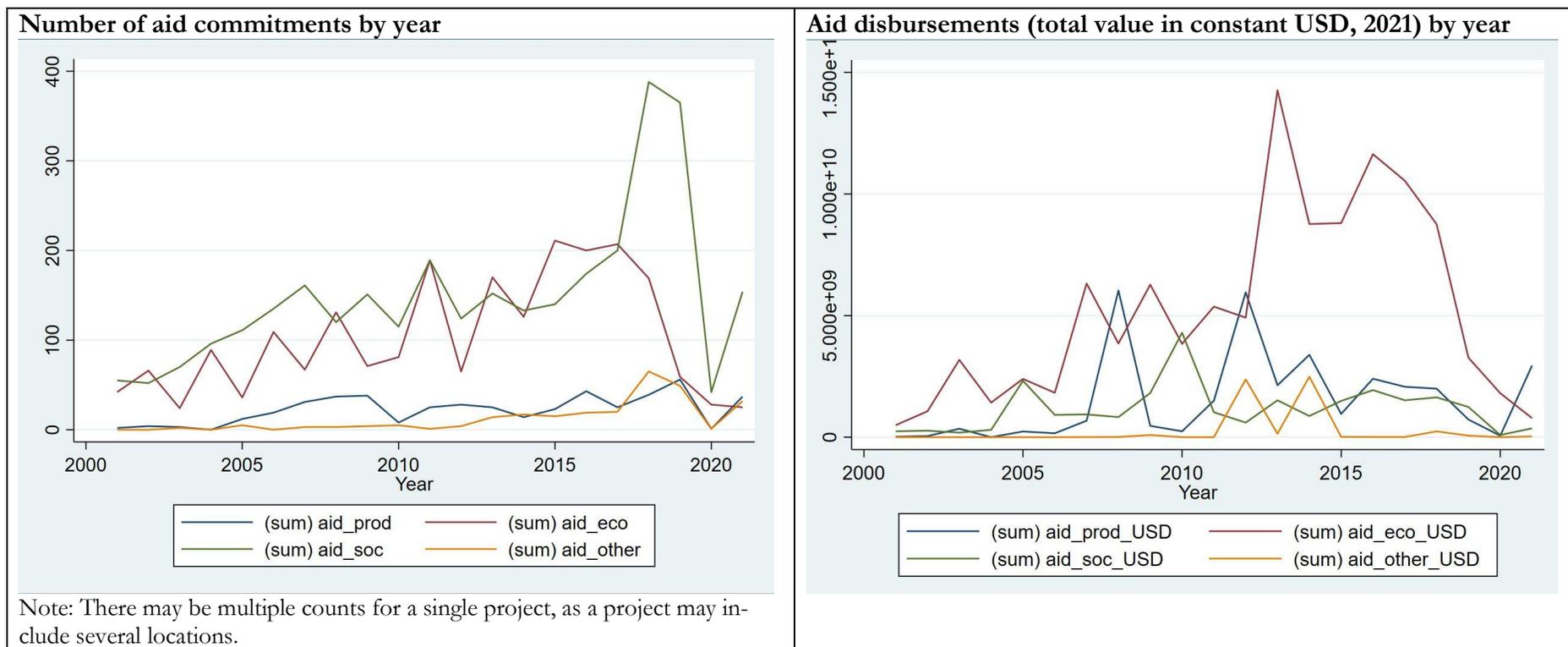


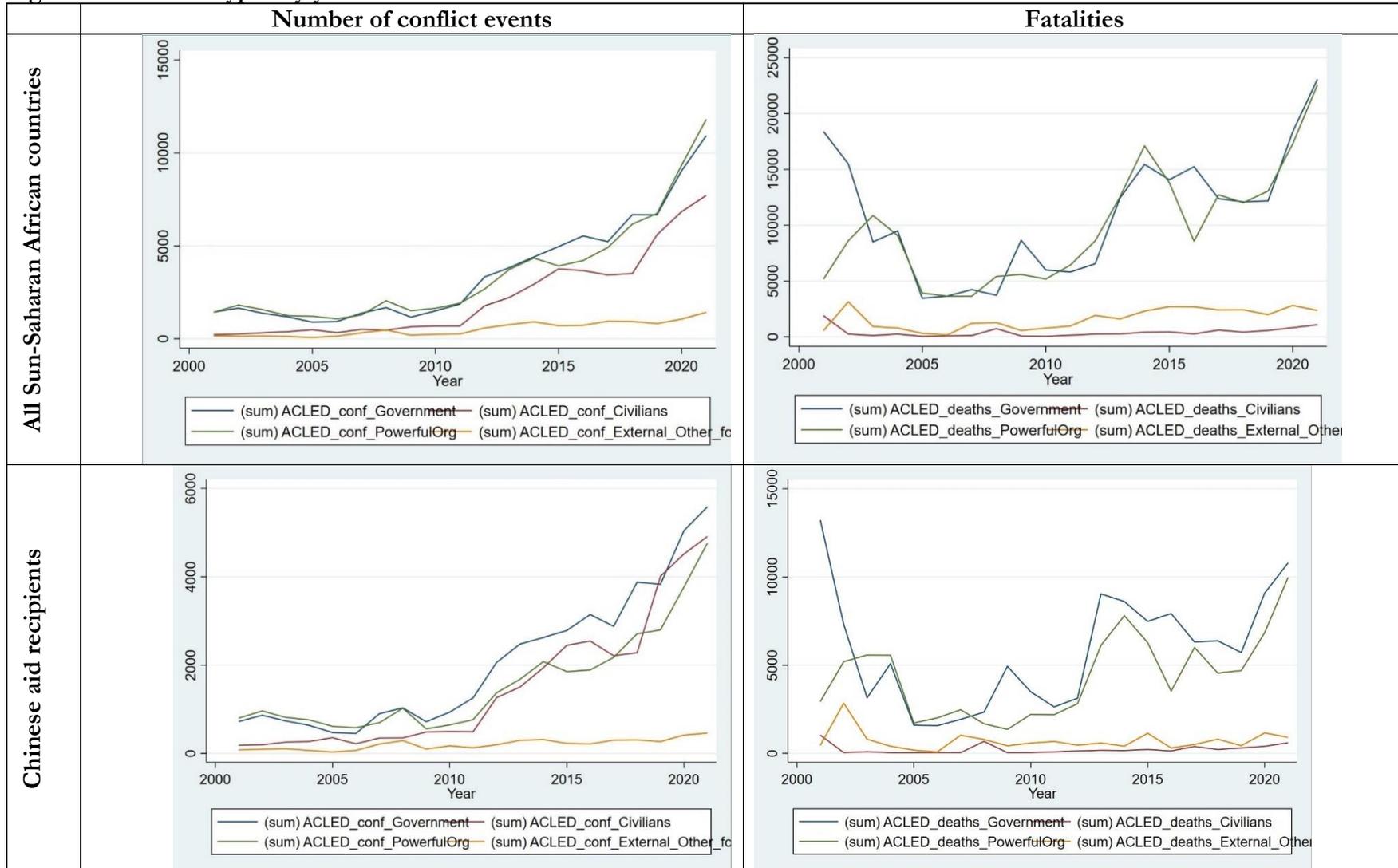
Figure A6. Chinese aid by year and sectors (2001-2021), source: AidData



Note:

Abbreviations: (sum) aid\_prod – aid counts in production sector; (sum) aid\_eco – aid counts in economics sector; (sum) aid\_soc – aid counts in social sector; (sum) aid\_other – aid counts in other sectors; (sum) aid\_prod\_USD – aid disbursements (total USD) in production sector; (sum) aid\_eco\_USD – aid disbursements (total USD) in economics sector; (sum) aid\_soc\_USD – aid disbursements (total USD) in social sector; (sum) aid\_other\_USD – aid disbursements (total USD) in other sectors.

Figure A7. Conflict types by year: number of conflict events and fatalities



Note: Government: State-based conflict against other groups; Powerful groups: Militia groups' conflict against other groups, except for state-based forces; Civilians: Conflict among civilians only

Figure A8. The instrument variable: Common factor of five key input materials for construction

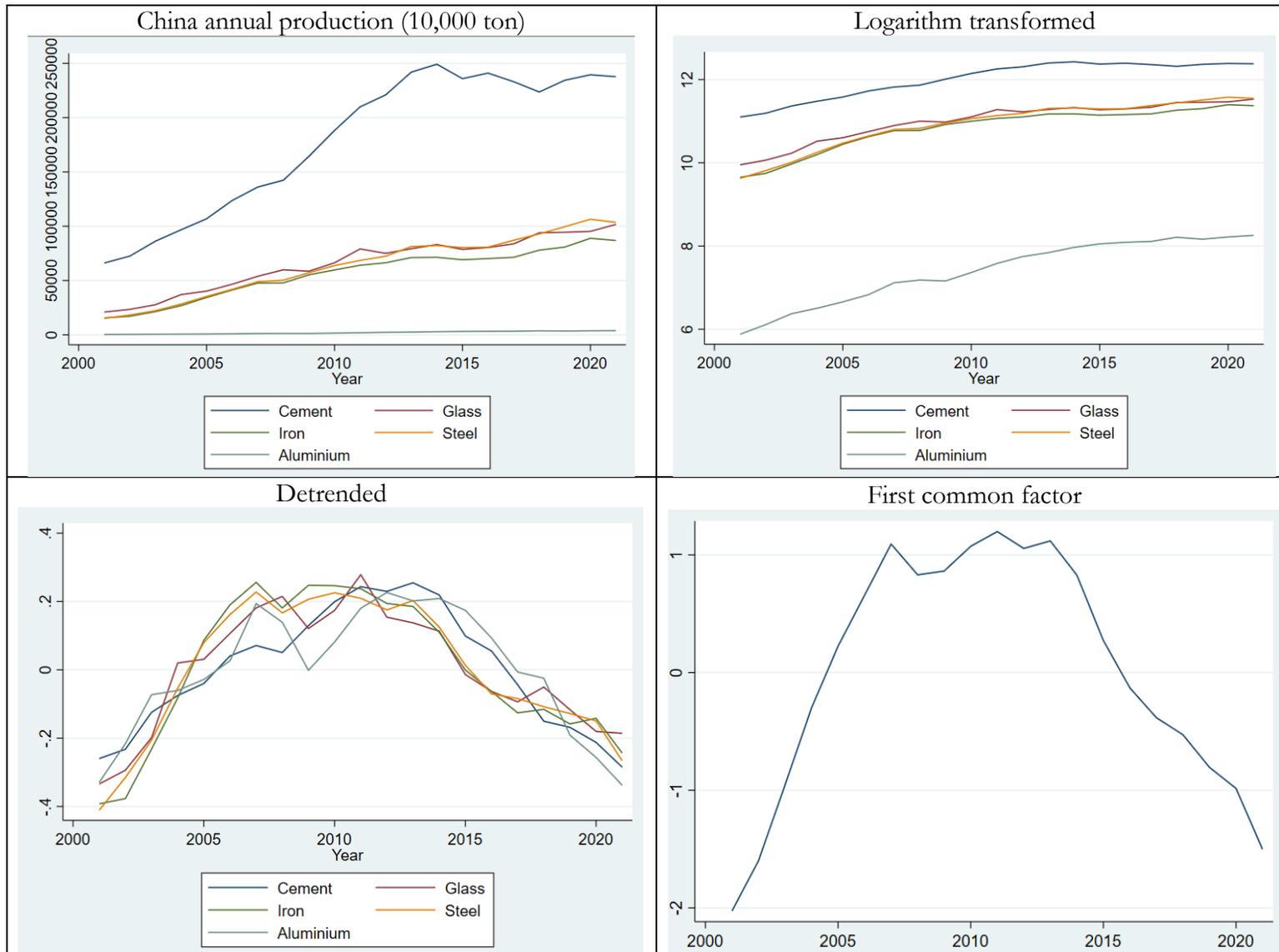
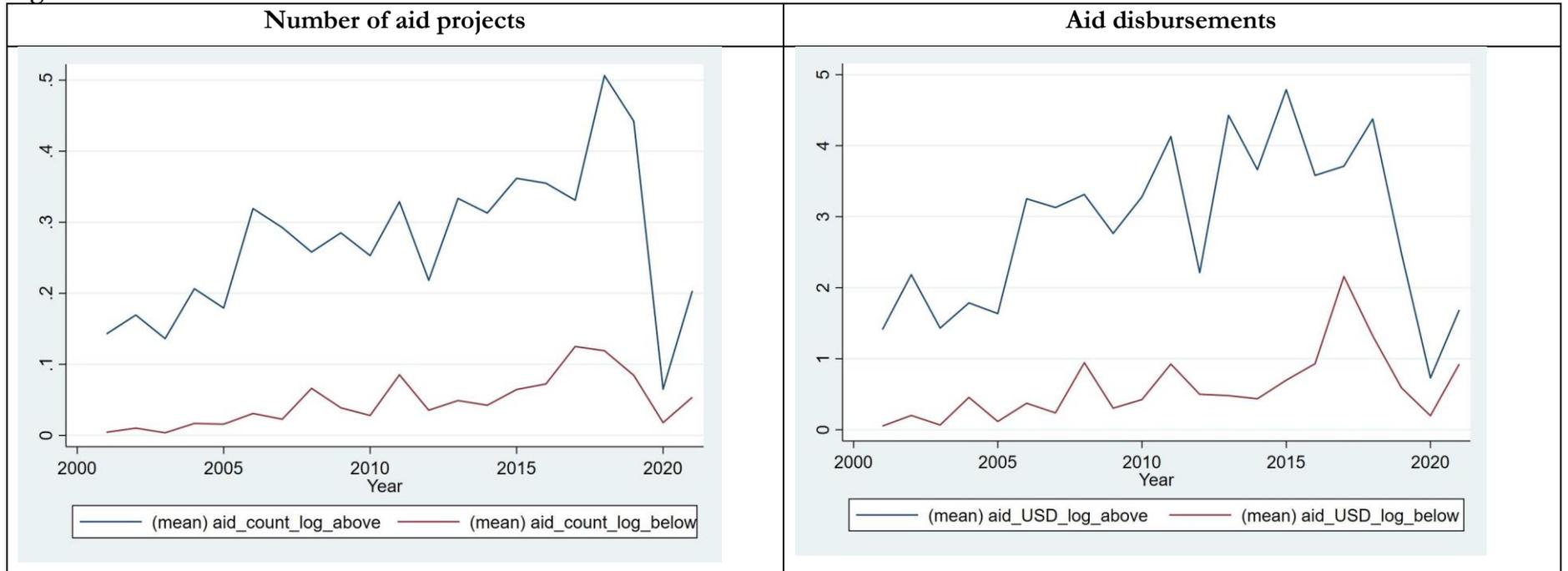


Figure A9. Parallel trends check for shift-share IV





## References

- Abdel-Latif, H., El-Gamal, M., 2024. Fraying Threads: Exclusion and Conflict in Sub-Saharan Africa. *IMF Work. Pap.* Volume 2024: Issue 004, 35.
- Autor, D.H., Dorn, D., Hanson, G.H., 2013. The China Syndrome: Local Labor Market Effects of Import Competition in the United States. *Am. Econ. Rev.* 103, 2121–2168. <https://doi.org/10.1257/aer.103.6.2121>
- Battiston, G., Bizzarri, M., Franceschin, R., 2025. Third-party interest, resource value, and the likelihood of conflict. *Eur. J. Polit. Econ.* 86, 102635. <https://doi.org/10.1016/j.ejpoleco.2024.102635>
- Berman, N., Couttenier, M., Rohner, D., Thoenig, M., 2017. This Mine Is Mine! How Minerals Fuel Conflicts in Africa. *Am. Econ. Rev.* 107, 1564–1610. <https://doi.org/10.1257/aer.20150774>
- Betz, T., Cook, S.J., Hollenbach, F.M., 2020. Spatial interdependence and instrumental variable models. *Polit. Sci. Res. Methods* 8, 646–661. <https://doi.org/10.1017/psrm.2018.61>
- Blattman, C., Miguel, E., 2010. Civil War. *J. Econ. Lit.* 48, 3–57. <https://doi.org/10.1257/jel.48.1.3>
- Bluhm, R., Dreher, A., Fuchs, A., Parks, B.C., Strange, A.M., Tierney, M.J., 2025. Connective financing: Chinese infrastructure projects and the diffusion of economic activity in developing countries. *J. Urban Econ.* 145, 103730. <https://doi.org/10.1016/j.jue.2024.103730>
- Bräutigam, D.A., Knack, S., 2004. Foreign Aid, Institutions, and Governance in Sub-Saharan Africa. *Econ. Dev. Cult. Change* 52, 255–285. <https://doi.org/10.1086/380592>
- Cabestan, J.-P., 2023. The Belt and Road Initiative and China's Hegemony in Africa. *Orbis* 67, 544–564. <https://doi.org/10.1016/j.orbis.2023.08.005>
- Collier, P., 2004. Greed and grievance in civil war. *Oxf. Econ. Pap.* 56, 563–595. <https://doi.org/10.1093/oep/gpf064>
- Collier, P., Hoeffler, A., 2002. AID, Policy and Peace: Reducing the risks of civil conflict. *Def. Peace Econ.* 13, 435–450. <https://doi.org/10.1080/10242690214335>
- Cui, G., Sarafidis, V., Yamagata, T., 2020. IV Estimation of Spatial Dynamic Panels with Interactive Effects: Large Sample Theory and an Application on Bank Attitude Toward Risk. *SSRN Electron. J.* <https://doi.org/10.2139/ssrn.3642451>
- Cunningham, S., 2021. *Causal Inference: The Mixtape*. Yale University Press. <https://doi.org/10.2307/j.ctv1c29t27>
- Custer, S., Dreher, A., Elston, T.-B., Escobar, B., Fuchs, A., Ghose, S., Lin, J.J., Malik, A.A., Parks, B.C., Solomon, K., Strange, A., Tierney, M.J., Vlasto, L., Walsh, K., Wang, F., Zhang, S., 2023. Tracking Chinese Development Finance: An Application of AidData's TUFF 3.0 Methodology. *Williamsbg. VA AidData*.
- Dreher, A., Fuchs, A., Hodler, R., Parks, B.C., Raschky, P.A., Tierney, M.J., 2019. African leaders and the geography of China's foreign assistance. *J. Dev. Econ.* 140, 44–71. <https://doi.org/10.1016/j.jdevco.2019.04.003>

- Dreher, A., Fuchs, A., Parks, B., Strange, A., Tierney, M.J., 2021. Aid, China, and Growth: Evidence from a New Global Development Finance Dataset. *Am. Econ. J. Econ. Policy* 13, 135–174. <https://doi.org/10.1257/pol.20180631>
- Dreher, A., Fuchs, A., Parks, B., Strange, A.M., Tierney, M.J., 2017. Aid, China, and Growth: Evidence from a New Global Development Finance Dataset.
- Elbadawi, I., Sambanis, N., 2000. Why Are There So Many Civil Wars in Africa? Understanding and Preventing Violent Conflict.
- Escobar, B., Malik, A.A., Zhang, S., Walsh, J., Joosse, A., Parks, B.C., Zimmerman, J., Fedorochko, R., 2025. Power Playbook: Beijing’s Bid to Secure Overseas Transition Minerals. Williamsburg, VA: AidData at William & Mary.
- Findley, M.G., Marineau, J.F., 2015. Lootable resources and third-party intervention into civil wars. *Confl. Manag. Peace Sci.* 32, 465–486. <https://doi.org/10.1177/0738894214530828>
- Gallea, Q., Rohner, D., 2021. Globalization mitigates the risk of conflict caused by strategic territory. *Proc. Natl. Acad. Sci.* 118, e2105624118. <https://doi.org/10.1073/pnas.2105624118>
- Gehring, K., Kaplan, L.C., Wong, M.H.L., 2022. China and the World Bank—How contrasting development approaches affect the stability of African states. *J. Dev. Econ.* 158, 102902. <https://doi.org/10.1016/j.jdeveco.2022.102902>
- Gehring, K.S., Wong, M.H.L., Kaplan, A.W., Kaplan, L.C., 2018. Aid and conflict at the subnational level: Evidence from World Bank and Chinese development projects in Africa Discussion Paper Series, No. 657.
- Gehring, K.S., Wong, M.H.L., Kaplan, L., 2018. Aid and conflict at the subnational level: Evidence from World Bank and Chinese development projects in Africa (Working Paper No. 657). Discussion Paper Series.
- Gent, S.E., Shannon, M., 2011. Bias and the Effectiveness of Third-Party Conflict Management Mechanisms. *Confl. Manag. Peace Sci.* 28, 124–144. <https://doi.org/10.1177/0738894210396774>
- Goodman, S., Zhang, S., Malik, A.A., Parks, B.C., Hall, J., 2024. AidData’s Geospatial Global Chinese Development Finance Dataset. <https://doi.org/10.1038/s41597-024-03341-w>
- Herrera, H., Morelli, M., Nunnari, S., 2022. A Theory of Power Wars. *Q. J. Polit. Sci.* 17, 1–30. <https://doi.org/10.1561/100.00019136>
- Humphreys, M., 2005. Natural Resources, Conflict, and Conflict Resolution: Uncovering the Mechanisms. *J. Confl. Resolut.* 49, 508–537. <https://doi.org/10.1177/0022002705277545>
- Isaksson, A.-S., Kotsadam, A., 2020. Chinese Aid to Africa: Distinguishing Features and Local Effects. *SSRN Electron. J.* <https://doi.org/10.2139/ssrn.3643781>
- Kripfganz, S., Sarafidis, V., 2025. Estimating Spatial Dynamic Panel Data Models with Unobserved Common Factors in *Stata*. *J. Stat. Softw.* 113. <https://doi.org/10.18637/jss.v113.i06>

- Li, J., Long, X., Jiang, Q., 2022. Aid and conflict: Evidence from Chinese aid. *China Econ. Q. Int.* 2, 111–123. <https://doi.org/10.1016/j.ceqi.2022.05.004>
- Mironova, V., Whitt, S., 2018. Social Norms after Conflict Exposure and Victimization by Violence: Experimental Evidence from Kosovo. *Br. J. Polit. Sci.* 48, 749–765.
- Morelli, M., Ogliari, L., Hong, L., 2024. Power mismatch and civil conflict: an empirical investigation. *Econ. Policy* 39, 45–105. <https://doi.org/10.1093/epolic/eiad030>
- Morelli, M., Rohner, D., 2024. Natural resources and conflict: The crucial role of power mismatch and geographic asymmetries, in: *Handbook of the Economics of Conflict*. North-Holland, pp. 307–323. <https://doi.org/10.1016/bs.hoec.2024.10.002>
- Morelli, M., Rohner, D., 2015. Resource concentration and civil wars. *J. Dev. Econ.* 117, 32–47. <https://doi.org/10.1016/j.jdeveco.2015.06.003>
- Nantulya, P., 2025. China Widening Its Influence in Africa through Expanded Security Engagements. *Afr. Cent.* URL <https://africacenter.org/spotlight/china-influence-africa-security-engagements/> (accessed 11.9.25).
- Parks, B.C., Malik, A.A., Escobar, B., Zhang, S., Fedorochko, R., Solomon, K., Wang, F., Vlasto, L., Walsh, K., Goodman, S., 2023. Belt and Road Reboot: Beijing’s Bid to De-Risk Its Global Infrastructure Initiative. *AidData at William & Mary, Williamsburg, VA.*
- Ross, M.L., 2004. What Do We Know about Natural Resources and Civil War? *J. Peace Res.* 41, 337–356. <https://doi.org/10.1177/0022343304043773>
- Sardoschau, S., Jarotschkin, A., 2024. Chinese aid in Africa: Attitudes and conflict. *Eur. J. Polit. Econ.* 81, 102500. <https://doi.org/10.1016/j.ejpoleco.2024.102500>
- Smithey, L.A., 2022. *Encyclopedia of Violence, Peace, & Conflict (Third Edition)*, *Encyclopedia of Violence, Peace, Conflict (Third Edition)*. ed. Academic Press.
- The State Council of China [WWW Document], 2014. URL <https://english.www.gov.cn/> (accessed 11.10.25).
- Valdiglesias, J., 2024. Structural Changes on the Chinese Global Foreign Aid Expenditure. *Chin. Polit. Sci. Rev.* <https://doi.org/10.1007/s41111-024-00258-y>
- Von Uexkull, N., Croicu, M., Fjelde, H., Buhaug, H., 2016. Civil conflict sensitivity to growing-season drought. *Proc. Natl. Acad. Sci.* 113, 12391–12396. <https://doi.org/10.1073/pnas.1607542113>
- Wang, Y., Sun, X., Zhu, C., 2023. China’s wood-based forest product imports and exports: trends and implications. *Int. For. Rev.* 25, 503–516. <https://doi.org/10.1505/146554823838028184>