UNIVERSITY OF SUSSEX | BUSINESS SCHOOL

ECONOMICS

Working Paper Series

No. 01-2026

The Great Aid Transition: How Global Crisis Reshaped Aid Effectiveness in Africa

Sambit Bhattacharyya
University of Sussex
s.bhattacharyya@sussex.ac.uk

Chirantan Chatterjee
University of Sussex
c.chatterjee@sussex.ac.uk

Stephen Lartey
University of Sussex
s.lartey@sussex.ac.uk

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Sambit Bhattacharyya, Chirantan Chatterjee and Stephen Lartey[2]

24 January, 2026

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[1] We gratefully acknowledge comments by and discussions with Peter Serneels, David Fielding, Andy Hinsley, the participants of the UNIWIDER Development Conference 2026, New Delhi, and The Future of Development Economics Conference 2026, University of Manchester. Stephen Lartey acknowledges financial support from Ghana Scholarship Secretariat. All remaining errors are our own.

[2] Bhattacharyya: Department of Economics, University of Sussex, email: s.bhattacharyya@sussex.ac.uk. Chatterjee: Department of Economics, University of Sussex, email: C.Chatterjee@sussex.ac.uk. Lartey: Department of Economics, University of Sussex, email: S.Lartey@sussex.ac.uk.

1 Introduction

Development impact of foreign aid has been a controversial topic ever since its widespread use in post-war reconstruction of Western Europe and Japan. More recently the role of foreign aid has been seriously questioned by the Trump Administration's effort to dismantle the US Agency for International Development (USAID) in line with its 'America First' policy. President Trump in a Truth Social post on 31 January 2025 (Friday) commented that USAID's spending "IS TOTALLY UNEXPLAINABLE…CLOSE IT DOWN!".[3] It is noteworthy that the United States' annual development assistance budget is close to 70 billion US dollars and USAID receives around 40 billion US dollars out of that budget (Roy, 2025). Needless to say, that potential dismantling of USAID would have significant global impact.

In the academic realm, aid effectiveness is also a highly contested topic with the sceptics reporting negative or zero effects (Griffin and Enos, 1970; Boone, 1996; Rajan and Subramanian, 2008) whereas the proponents reporting robust positive effects (Papanek, 1972; Hansen and Tarp, 2001; Burnside and Dollar, 2000). More recent efforts to establish an empirical relationship point towards conditional effects with Werker et al. (2009) documenting how aid affects the key components of GDP in the short run but not economic growth. In the same vein, Collier and Dollar (2002) and Burnside and Dollar (2004) report a positive effect conditional on governance quality whereas Clemens et al. (2012) emphasize the importance of timing. Furthermore, Bhattacharyya and Intartaglia (2021) record positive effects of donor diversification on per capita GDP growth of the aid recipients. However, sceptics reviewing this literature express their concern over 'confirmation bias' of aid proponents (Easterly, 2006, p. 48) and fragility of the empirical results (Easterly et al., 2004). Nevertheless, international donors have remained generally committed to

[3] See https://www.bbc.co.uk/news/articles/clyezjwnx5ko

international assistance with aid spending more than doubling over the period 2002 to 2012 (ODI 2016).

A recurring theme in the academic literature on aid effectiveness is causality and the difficulty of establishing it in short panel datasets where the dependent and explanatory variables are correlated (Bazzi and Clemens, 2013). Identifying a natural experiment or a credible instrument for the purpose of establishing causality is also not straightforward. However, an exogenous shock such as the 2008 global financial crisis offers the opportunity to examine the aid effectiveness question by utilising a natural experiment. Moreover, global financial crisis was a momentous event that not only affected global macro trends but also development assistance directly. Therefore, its role in international development is not merely passive as an instrument or econometric identifier but also as a key exogenous variable affecting development aid. As Western economies plunged into recession, their aid budgets to African countries declined while China emerged as a major player, increasing development assistance at a steady pace.

In this paper we focus on the African continent, a major recipient of international assistance. Unlike previous studies that focus on the effectiveness of aggregate aid from all donors, we unbundle aggregate aid into three major donors (China, OECD, and the US). In particular, we explore the question of aid effectiveness at the level of three major donors and find strikingly different patterns in the aid and growth relationship by donors before and after the 2008 global financial crisis and after controlling for governance and trade openness. Using a novel triple-difference design (aid by donor × governance quality × trade exposure) and estimating the model before and after 2008 with nightlights data across 41 African countries observed over the period 2000 to 2021, we find that Chinese aid is effective in well governed and trade exposed countries following the 2008 crisis whereas OECD aid lost its governance dependent advantage post 2008. We find structural break in the triple interaction coefficient for China and 2008 is confirmed as a

turning point. Total aid concentration outperforms aid diversification by 79% relative to pre-crisis patterns in terms of effectiveness. Chinese aid was poverty reducing before the 2008 crisis but stopped being so after the crisis. In contrast, US aid registers no statistically significant effect both before and after the crisis. Chinese aid records no impact on inequality whereas US aid reverses from being inequality raising pre-2008 to inequality reducing post-2008. Chinese aid seems effective post 2008 irrespective of its modalities 'ODA like' and 'other official flows' whereas for the US, aid appears effective only under the modality 'economic'. The Chinese aid effectiveness result appears to be robust to placebo test and log GDP as an alternative outcome variable.

We contribute to the literature by reporting the unbundled effects of aid effectiveness by three major donors. We document major changes in aid effectiveness pattern following 2008 global financial crisis which was a major global macroeconomic shock. We not only document the effect of this shock on living standards, but also on poverty and inequality. Furthermore, we are able to document heterogeneous effects of aid modalities (Chinese Other Official Flows (OOFs), Chinese ODA-like flows, OECD budget support, OECD other transfers, US aid social (health and education), and US aid economic). To the best of our knowledge, our study is the first attempt to systematically analyse aid effectiveness by key donors following a global macroeconomic shock using rigorous empirical methods.

A large literature focuses on aid effectiveness in recipient countries and the results are generally inconclusive. Bourguignon and Sundberg (2007) assign such inconclusiveness to the limitation of capturing heterogeneity across donors, modalities, conditionality, and time periods. Doucouliagos and Paldam (2011) report that aid has no systematic positive effect on growth using a meta-analysis. Nevertheless, pro-aid perspective has been advanced by Morrissey (2009) and McGillivray and Morrissey (2001) who argue that the aid effectiveness literature suffers from methodological limitations such as poor measurement and shorter time horizon that bias results

against finding positive effects. Bhattacharyya et al. (2018) focus on the effects of energy related aid on emissions and only find mixed effects by sector and aid type.

There is also a more recent literature on the effect of Chinese aid which is much closer to our study. Dreher et al. (2021) analyse the economic effects of Chinese development finance using a global dataset and find that Chinese assistance is indeed growth promoting especially in instances involving large infrastructure investments. Dreher et al. (2022) focus on the political economy of Chinese development finance in Africa, their spatial distribution, and their impact on the longevity of African leaders. Even though related, Dreher et al. (2021, 2022) focus on very different questions from the subject matter of our paper. In particular, we focus on Africa and the comparative effects of aid by 3 key donors following the 2008 global financial crisis whereas Dreher et al. (2021) focus on the global effect of Chinese assistance alone. Dreher et al. (2022) do focus on Chinese assistance in Africa but only on a political economy question which is a separate question from what we study here.

Another notable study on aid flows to Africa is Alesina and La Ferrara (2005). They document that aid flows to Africa are driven by colonial relationships, UN voting alignments, and strategic interests as opposed to poverty levels or governance. As significant and interesting as these questions are, they are separate questions from what we address in this paper.

The remainder of the paper is structured as follows: Section 2 discusses the data and empirical strategy. Section 3 presents evidence on the aid effectiveness reversal in relation to the three key donors – China, OECD, and the US. It also presents results on other effectiveness outcomes such as poverty, inequality, and sector output. Finally, it explores different modalities of flows from the 3 donors and their impact on the outcome. Section 4 deals with robustness and section 5 concludes.

2 Data and Empirical Strategy

We compile a dataset of aid volume from the major donors China, OECD, and US for 41 African countries[4] observed over the period 2000 to 2021. The aid volume data is supplemented by nightlights. Nightlight is used as a proxy for living standards. Nightlights is a useful proxy in Africa since standard measures such as GDP are often poorly measured and are afflicted by measurement error. We also control for governance quality and trade openness in order to account for potential heterogeneous effects of the 2008 global macro shocks on better governed and trade exposed African countries. In what follows, we carefully illustrate the nature and source of our data, any adjustments to the scale and origin that we have made with respect to specific variables, and their potential country coverage and variation. We also present a description of empirical strategy.

2.1 Development Finance Data Construction

Development finance data forms the core of our analytical framework. It requires careful integration of three major donor databases. Chinese aid data is sourced from AidData's Global Chinese Development Finance Dataset Version 3.0. We construct country-year aggregates using the following formula:

$$\text{Chinese Aid}_{it} = \sum_{p=1}^{Pit} \text{Commitment}_{pit} \times \mathbb{1}[\text{Recommended}_{pit} = 1] \times \mathbb{1}[\text{Flow Class}_{pit} \neq \text{Vague}]$$

where P_{it} represents the number of projects in country i during the year t, Commitment_{pit} denotes the commitment amount for project p, and the indicator functions ensure inclusion of only high-quality, non-vague projects as recommended by AidData's documentation. The temporal aggregation method addresses timing issues where project

[4] Sample size varies across specifications but our baseline specification in table 5, columns 5 and 6 covers 41 countries. Country names are recorded in Appendix A1.

commitments may span multiple years. For multi-year projects, we apply proportional allocation based on implementation schedules when available, or equal annual allocation otherwise. The formula used is as follows.

$$\text{Annual Allocation}_{it} = \frac{\text{Total Commitment}_{pi}}{\text{Project Duration}_{pi}} \times \mathbb{1}[\text{Year}_t \in \text{Implementation Period}_{pi}]$$

OECD aid data is sourced from its Creditor Reporting System (CRS). CRS reports disbursement data rather than commitments to capture actual financial flows. The aggregation formula excludes US disbursements to prevent double-counting of USAID data. The formula used to aggregate OECD aid data is as follows.

$$\text{OECD Aid}_{it} = \sum_{d \in \text{DAC}} \sum_{s=1}^{S_{dit}} \text{Disbursement}_{dsit} \times \mathbb{1}[\text{Donor}_d \neq \text{USA}]$$

where DAC denotes the set of OECD Development Assistance Committee members, S_{dit} represents the number of sectors funded by donor d in country i and year t, and the indicator function excludes US disbursements.

Finally, USAID data is sourced from USAID. Its integration requires consolidation across multiple US government agencies and funding streams. The aggregation captures all US government foreign assistance. The formula used is as follows.

$$\text{US Aid}_{it} = \sum_{a \in \text{Agencies}} \text{Disbursement}_{ait}$$

where Agencies includes USAID, State Department, Department of Defense[5], and other agencies involved in development cooperation.

All monetary variables require conversion to a common currency and price level for meaningful comparison across countries and time periods. We follow a two-step conversion

[5] Currently renamed as Department of War.

process to addresses both inflation and exchange rate fluctuations. Step one converts nominal values to constant prices using country-specific GDP deflators as follows.

$$\text{Real Aid}_{it} = \text{Nominal Aid}_{it} \times \frac{\text{GDP Deflator}_{i2000}}{\text{GDP Deflator}_{it}}$$

Note that the base year 2000 coincides with the beginning of our sample period. Step two converts to US dollars using IMF annual average exchange rates using the following formula.

$$\text{USD Aid}_{it} = \text{Real Aid}_{it} \times \text{Exchange Rate}_{it}^{\text{Annual Average}}$$

For aid data originally reported in US dollars, only the deflator step applies. Finally, the combined transformation using the following formula ensures temporal and cross-sectional comparability.

$$\text{Final Aid}_{it} = \text{Original Aid}_{it} \times \frac{\text{US GDP Deflator}_{2000}}{\text{US GDP Deflator}_{t}} \times \frac{\text{Exchange Rate}_{it}}{\text{Exchange Rate}_{i2000}}$$

All aid variables are also expressed in log scale as log (aid +1) in order to address skewness in the distribution of the raw series and use the log operator on zero or very small aid.

2.2 Nightlights Data Construction

We perform multiple operations using nightlights data to transform raw pixel-level observations into country-year development indicators. The raw pixel-level data is sourced from the Defense Meteorological Satellite Program - Operational Linescan System (DMSP-OLS) of the United States Government's National Oceanic and Atmospheric Administration (NOAA). The Visible Infrared Imaging Radiometer Suite (VIIRS) sensors are onboard some of the recent satellites but not all. These sensors collect images globally across a 3000 km swath, twice per day. Variability across satellites as well as data collection methods invariably presents challenges with regards to sensor calibration, geographic aggregation, and temporal consistency.

Furthermore, the transition from DMSP-OLS to VIIRS satellites required inter-calibration due to different sensor characteristics. Using overlapping 2013-2014 observations, we estimate the following calibration relationship that forms the basis for addressing temporal harmonization challenges.

$$\text{DMSP}_{ijt} = \alpha + \beta \times \text{VIIRS}_{ijt} + \varepsilon_{ijt}$$

Where i, j, t refer to pixel, country and time respectively. The estimated relationship is $\text{DMSP} = 2.103 + 0.387 \times \text{VIIRS}$ with $\text{R}^2 = 0.89$. Geographic aggregation from pixels to countries utilises area weighted averaging of pixels to account for variable pixel sizes around the equator and country boundaries.

Finally, we also address contamination from industrial light sources unrelated to economic development by using the National Geophysical Data Center's flare location database to apply spatial buffers around known flare sites. A typical buffer radius ranges from 2-5 kilometers and dependent algorithmically on flare intensity. Nightlights data is also transformed into a log scale as $\ln(\text{Nightlights} + 1)$ to tackle skewness.

2.3 Empirical Strategy

We use the following econometric model to identify aid effectiveness in Africa of three key donors (China, US, and OECD) pre and post 2008 global macroeconomic shock. The baseline triple-difference specification that considers heterogeneity across countries in terms of governance and trade openness takes the form

$$\ln(\text{Nightlights} + 1)_{it} = \alpha_i + \beta_t + \gamma_1 \ln(\text{Aid})_{it} + \gamma_2 \ln(\text{Aid})_{it} \times \text{High Gov}_i + \gamma_3 \ln(\text{Aid})_{it} \times \text{High Trade}_i + \gamma_4 \ln(\text{Aid})_{it} \times \text{High Gov}_i \times \text{High Trade}_i + \Gamma \mathbf{X}_{it} + \varepsilon_{it} \quad (1)$$

where High Gov variable for a particular country is defined using the following two steps. First, we extract the principal component from the six World Bank Worldwide Governance

Indicators (WGI) and second we convert it into a 0 and 1 binary indicator on the basis that a country's principal component score is below or above the year 2000's median for the entire sample of countries respectively. Median governance score for Africa for the year 2000 is -0.234 which is significantly below world average.

Similarly, the High Trade variable is defined as a binary 0 and 1 variable for a particular country on the basis that

$$\text{Trade Share}_{i,2000} = \frac{\text{Exports}_{i,2000} + \text{Imports}_{i,2000}}{\text{GDP}_{i,2000}} \times 100 < \text{median (Trade Share}_{i,2000}) \text{ or otherwise. The}$$

median trade share in 2000 for Africa was 34.6% of GDP ranging from Ethiopia at 12.1% to Seychelles at 156.7%.

In the triple difference specification in equation (1) α_i and β_t represents country and year fixed effects and $\mathbf{X}_{it}$ includes population, export and import volumes as time-varying controls. Export and import control for direct effects of trade openness on economic output over and above its indirect effects via aid effectiveness. Similarly, population is also a significant predictor of output and nightlights. Note that our dependent variable is aggregate nightlights and not nightlight density measured by nightlights per capita. Therefore, we include population as a time varying control. Country fixed effects α_i control for country specific time invariant characteristics such as colonial history, culture, ethnic composition, and geography. Year fixed effects β_t control for time varying common shocks such as commodity price fluctuations or other exogenous time varying variables that are common to all African countries. Our coefficient of primary interest is γ_4 which captures aid effectiveness in countries that are also high governance and high trade exposure relative to the rest of the sample. This coefficient is estimated for the before and after 2008 sample.

One of the key confounding factors in using a treatment-control design for a cross national sample is selection effect. Governance is such a confounding factor which can contaminate inference if the sample is unbalanced in its representation of better governed countries or otherwise. To test this statistically we check propensity score distribution by high governed and low governed countries. In Figure 1, we find significant overlap in the distribution between high governance and low governance countries. Therefore, a treatment-control design is appropriate here without significant risk of selection bias.

Table 1 presents summary statistics of all the key variables and mean difference test between pre and post 2008 sample averages. Chinese aid, US aid, population, exports and imports register statistically significant positive mean difference between pre and post 2008 in Africa.

Our data indicates that Angola received the highest Chinese aid in 2016 while Mauritius received the smallest Chinese assistance in 2010. Uganda is the largest recipient of US aid in 2021, while Seychelles is recorded to be the smallest recipient in 2004. OECD aid generally appears to have a bigger footprint in North Africa with Libya recorded to be the smallest recipient of OECD aid in 2019.

Table 2 records Aid volume by the three key donors indicating significant footprint from all three donors. Percentage change in the US aid volume average pre and post 2008 is largely due to humanitarian assistance for addressing HIV AIDS. Table 3 catalogs donor footprint by country in Africa. It demonstrates all three donors having significant footprint in large African countries such as Angola, Ethiopia, Ghana, and Kenya. Similarly, table 4 records aid footprint by donors in the all four regions of the continent and demonstrates a balanced footprint.

3 Evidence

Table 5 tests aid effectiveness in Africa by donors over the period 2000 to 2021 pre- and post-2008

global macroeconomic crisis after controlling for potential confounding factors such as governance, trade openness, country specific time invariant unobservable, and time varying common factors. Observations for the year 2008 is included in the post 2008 sample. Appendix A1 presents a list of countries included in the baseline sample of table 5. Columns 1 and 2 deal with the effect of total aid per and post 2008 global financial crisis. We observe that the triple interaction coefficient remains statistically significant and positive for both pre and post 2008 periods indicating that aid remained effective throughout the 2000 to 2021 period. However, it is noteworthy that the magnitude of the coefficient for the post-2008 period is greater than the pre-2008 period indicating that on average aid is more effective post-2008 crisis.

Columns 3 – 8 deal with aid effectiveness of OECD, China and US aid respectively. Columns 3 and 4 presents estimates for OECD aid. Note that the triple interaction coefficient for OECD aid is not estimable due to sparse OECD aid data structure in high-trade countries. Consequently, columns 3 and 4 only presents interaction coefficients between aid and governance. We observe that OECD aid was indeed more effective conditional on good governance pre-2008 but that governance dependent effectiveness disappears post-2008.

Columns 5 and 6 reports triple interaction coefficients for Chinese aid. The pre-2008 coefficient is insignificantly different from zero whereas post-2008 it turns positive and significant. The estimated GDP per capita impact calculated using Henderson et al. (2012) nightlights-to-GDP elasticity of 0.3 is 2% for Chinese aid for the post-2008 period. Putting the estimated effect into perspective, a one standard deviation (which is also USD 332) increase in aggregate Chinese Aid in Angola in 2010 would translate into approximately USD 41.4 increase in its per capita GDP. Note the economic significance formula reported in the table footnote is an approximation in a log-log model. This is a large effect given that Angola's GDP per capita measured in USD PPP at that time was USD 2070 and USD 1620 for the whole of Sub-Saharan Africa. Columns 7 and 8 reports

triple interaction coefficients for US aid and they do not appear to be statistically significant for both pre- and post-2008 periods.

Table 6 tests for structural break in aid effectiveness of total aid. Panel B of the table checks for 2007 and 2009 as alternative cutoff points and finds that Chow F-statistic is the largest for 2008 indicating a major shift taking place in aid effectiveness around that time. Panel A of the table also reports individual coefficients for total aid at the 3 cutoff points. Statistical significance of the individual coefficients also indicates 2008 as a cutoff point.

Aid effectiveness literature that followed from Burnside and Dollar (2004) seem to indicate that aid is effective conditional on good governance, trade openness and other good policies. In figure 2, we divide the sample into four categories on the basis of policy effectiveness and plot nightlights over this period. They are 'category 1 high trade – high governance', 'category 2 high governance – low trade', 'category 3 low governance – high trade', and 'category 4 low trade – low governance'. Indeed, we observe level differences in nightlights across the four categories.

In figure 3, we take this further and plot estimated aid effectiveness effects by the categories and donors. It is evident that aid effectiveness declines systematically as country characteristics become less favourable. However, it is very apparent that Chinese aid remains the most effective across all four categories.

Bhattacharyya and Intartaglia (2021), Acharya et al. (2006), Kimura et al. (2012), Lee and Lim (2014), and Horowitz et al. (2021) explore the effects of aid concentration and aid diversification on economic growth. The results are mixed and not conclusive. Table 7 column 1 presents triple interaction estimates for Chinese aid post-2008 for a sample of aid recipient countries who are classified to be concentrated on the basis of Herfindahl Index of their donor shares to be above median. Similarly, column 2 presents estimate for a sample of countries with diversified donor profile. We find that total aid is more effective in countries with a concentrated

donor profile. This is also reflected statistically in column 3, panel A where the difference between the two estimated average effects are positive and statistically significant. In panel B, the effect of Chinese aid appears to be strongly significant for a sample of countries with concentrated donor profile. The triple interaction coefficient for the diversified sample is only weakly significant even though it is greater in magnitude. On the basis of significance, it is perhaps reasonable to conclude that Chinese aid is more effective in countries with aid concentration rather than diversification. Columns 4 – 6 repeats the same experiment but calculates Herfindahl Index annually as opposed to calculations on the basis of 2000 shares as presented in columns 1 – 3. The results are qualitatively same with total aid being more effective for countries with a more concentrated donor profile.

In table 8 we explore distributional consequences of aid. In particular, we ask the question how the triple interaction variable affects poverty measured by headcount ratio and a $2.15/day poverty line and inequality measured by Gini coefficient. In columns 1 and 2 we find that Chinese aid was poverty reducing pre-2008 but no statistically significant effect is observed post-2008 notwithstanding small sample size. Furthermore, no such effect is observed on inequality. In contrast, US aid is observed to have no effect on poverty but an inequality reducing effect post-2008. As in table 5, we are unable to estimate triple interaction coefficients for OECD aid but we do report interaction coefficients between aid and governance. No meaningful effect of OECD aid is observed on poverty and inequality.

Aid effectiveness is often viewed to be contingent on donor modalities as not all types of aid are meant to have an effect on economic growth (Clemens et al., 2012). For example, general budget support might have a stronger impact on economic growth as opposed to other types of transfers supporting social and humanitarian initiatives. To test any heterogeneous effect of such a nature by donor, in table 9, we split donor contributions by modalities. OECD aid is split between

'budget support' and 'other transfers'; Chinese aid is split between 'ODA like' and 'other official flows (OOF)'; and US aid is split between social and economic flows. We find no effect of any form of OECD aid and only the 'aid x gov' coefficient reported as the coefficient on 'aid x gov x trade' not estimable due to sparse OECD aid data structure in high-trade countries. However, we find aid effectiveness of Chinese aid increases under both modalities after the 2008 global financial crisis. Social aid from the US targets health and education projects whereas economic aid focuses on infrastructure. Economic aid from the US appears to have a positive influence on living standards in Africa post 2008 after controlling for heterogeneity by trade and governance.

4 Robustness

African GDP statistics suffer from significant measurement error and other inadequacies. In some African countries these errors of omission and commission potentially reach up to 35%. Jerven (2014) offers some estimates of inadequacies and poor measurement of Africa's trade and GDP. In light of such measurement error in official GDP statistics, we have used nightlights as a measure of economic activity here. Nightlights is much more precise in measuring economic activity when official GDP estimates are unreliable. Section 2.2 offers details on how nightlight measures are calculated including positioning of spatial buffers around flare sites.

Nevertheless, in table 10 we present estimates of our baseline model with log GDP as the dependent variable. Note that measurement error in the dependent variable imposes attenuation bias on the estimated coefficient. Therefore, it is likely that the triple interaction coefficient for Chinese aid for the post 2008 period reported in column 6 is imprecisely estimated even though it has the appropriate positive sign. Furthermore, the trade openness dummy variable with median trade as threshold only allocates 2 countries (Botswana and Gabon) to the treatment group. This significantly reduces statistical power of the triple interaction coefficient estimates. Despite these

data challenges, we still observe the triple interaction coefficient on Chinese aid to be positive.

We also perform placebo test in tables 11. Instead of assigning governance and trade openness treatment on the basis of the median threshold, we assign these treatments randomly across countries. As expected, we do not find the China triple interaction coefficient for the post 2008 period to be statistically significant.

Finally, in table 12 we introduce a pseudo treatment in 2003, which is 5-years in advance of the 2008 global financial crisis. The triple interaction coefficient on Chinese aid remains positive but only weakly significant. No effect is observed for OECD aid and US aid if we choose 2003 as the treatment cut off.

5 Conclusions

We investigate the effect of 2008 Global Financial Crisis on aid effectiveness in Africa by donors and find that the effect of Chinese aid to be positive and significant in well governed and trade exposed countries following the crisis. In contrast, OECD aid do not seem to be effective. We analyse observational data for the period 2000 to 2021 for 41 African countries in our baseline sample and our identification strategy is reliant on a triple-difference design (aid by donor × governance quality × trade exposure) with nightlights as the dependent variable. GDP in Africa are poorly measured (Jerven, 2014) and nightlights serve as a much superior measure of living standards. Structural break test of the estimated triple interaction coefficient confirms 2008 as a turning point for Chinese aid effectiveness. We also find that aid concentration outperforms aid diversification by 79% relative to pre-crisis patterns in terms of effectiveness, US aid as inequality reducing post 2008, Chinese aid as effective post 2008 irrespective of its modalities 'ODA like' and 'other official flows', and US aid as effective only under the modality 'economic'. The results appear to be robust to GDP as an alternative outcome variable and placebo tests.

What are the potential implications of the empirical results that we document? The following observations could be made. First, a tighter donor focus in the areas of their comparative advantage could be beneficial for the recipients. For example, Chinese assistance appears to be effective in the domain of trade credit, commercial loans, concessional credit and grants in well governed and trade exposed countries. Similarly, US infrastructure aid appears to be growth promoting in these locations. Therefore, a tighter focus by donors could improve efficiency and effectiveness of increasingly scarce donor resources.

Second, recipients may achieve better outcomes through strategic aid concentration rather than aid diversification. In other words, prioritizing deeper partnerships with a few donors in the areas of strategic significance could yield better results in terms of growth rather than maintaining broad but shallow relationships with numerous donors. At least for the most recent time period that we look at indicate that scale economies from aid concentration outweighs any risk-spreading benefits from aid diversification.

Third, both governance and trade openness are important drivers of development and therefore there is significant merit in the recipient countries improving these parameters. Given their importance, it is likely that the donors would continue emphasizing improvement in these parameters as part of aid conditionalities.

Notwithstanding the importance of aid for economic development especially in Africa, it is likely that donors will continue offering humanitarian assistance where the link between aid and growth may not be a direct one. For recipients, setting clear and time-dependent priorities and aligning them with donor capabilities would continue to be pathway towards improving effectiveness.

Appendices

A1. List of Countries (Table 5 baseline sample):

Total Aid	OECD Aid	Chinese Aid	US Aid
(N = 36)	*(N = 42)*	*(N = 41)*	*(N = 37)*
Angola	Algeria	Algeria	Angola
Benin	Angola	Angola	Benin
Botswana	Benin	Benin	Botswana
Burkina Faso	Botswana	Botswana	Burkina Faso
Burundi	Burkina Faso	Burkina Faso	Burundi
Cameroon	Burundi	Burundi	Cameroon
Central African Rep.	Cameroon	Cameroon	Central African Rep.
Comoros	Central African Rep.	Central African Rep.	Comoros
Congo	Comoros	Comoros	Congo
Côte d'Ivoire	Congo	Congo	Côte d'Ivoire
Djibouti	Côte d'Ivoire	Côte d'Ivoire	Djibouti
Ethiopia	Djibouti	Djibouti	Eswatini
Gabon	Egypt	Egypt	Ethiopia
Gambia	Eritrea	Ethiopia	Gabon
Ghana	Eswatini	Gabon	Gambia
Guinea	Ethiopia	Gambia	Ghana
Guinea-Bissau	Gabon	Ghana	Guinea
Kenya	Gambia	Guinea	Guinea-Bissau
Lesotho	Ghana	Guinea-Bissau	Kenya
Liberia	Guinea	Kenya	Lesotho
Madagascar	Guinea-Bissau	Lesotho	Liberia
Malawi	Kenya	Liberia	Madagascar
Mali	Lesotho	Libya	Malawi
Mauritania	Liberia	Madagascar	Mali
Mozambique	Libya	Malawi	Mauritania
Namibia	Madagascar	Mali	Mozambique
Niger	Malawi	Mauritania	Namibia
Nigeria	Mali	Morocco	Niger
Rwanda	Mauritania	Mozambique	Nigeria
Senegal	Morocco	Namibia	Rwanda
Sierra Leone	Mozambique	Niger	Senegal
South Africa	Namibia	Nigeria	Sierra Leone
Togo	Niger	Rwanda	South Africa
Uganda	Nigeria	Senegal	Togo
Zambia	Rwanda	Sierra Leone	Uganda
Zimbabwe	Senegal	South Africa	Zambia
	Sierra Leone	Togo	Zimbabwe
	South Africa	Tunisia	
	Togo	Uganda	
	Tunisia	Zambia	
	Uganda	Zimbabwe	
	Zambia		
	Zimbabwe		

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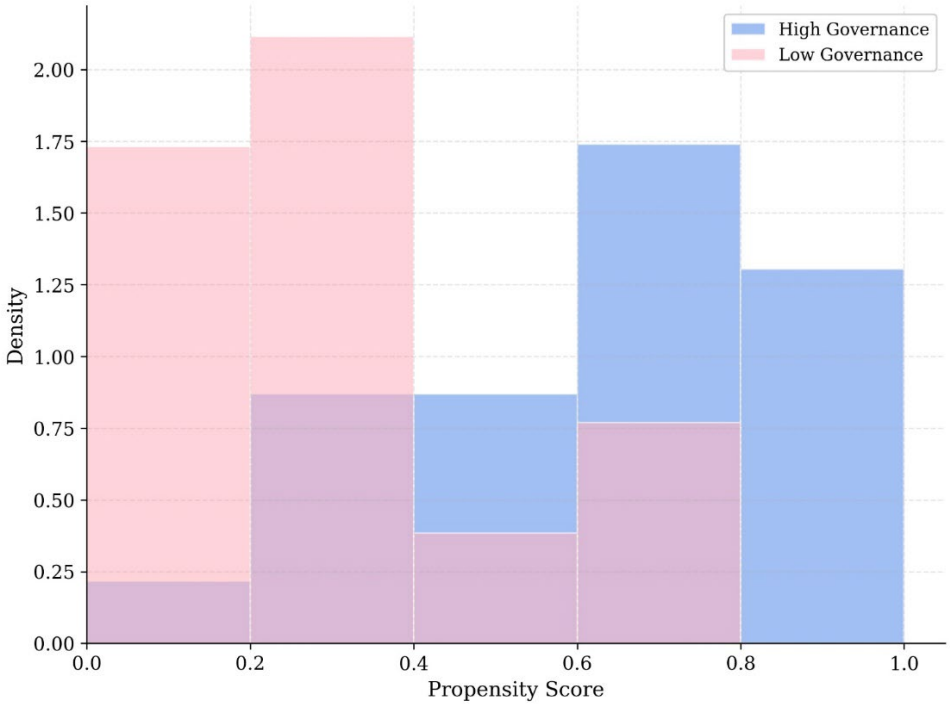
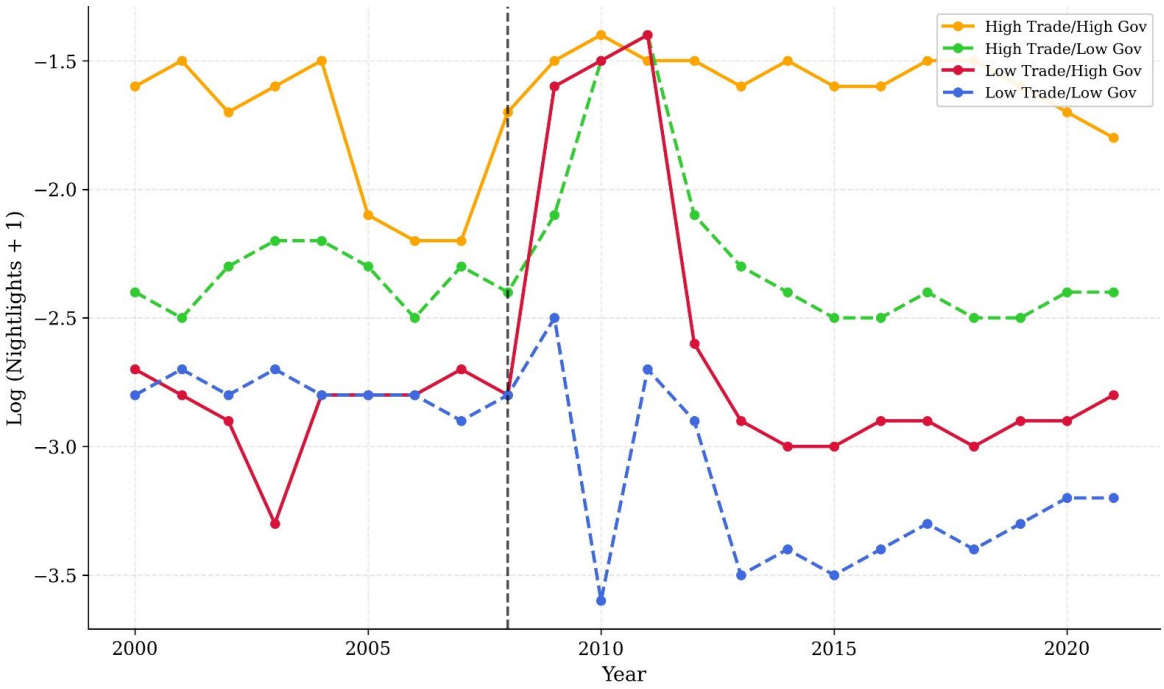
Figure 1: Propensity Score Distribution by Governance Group



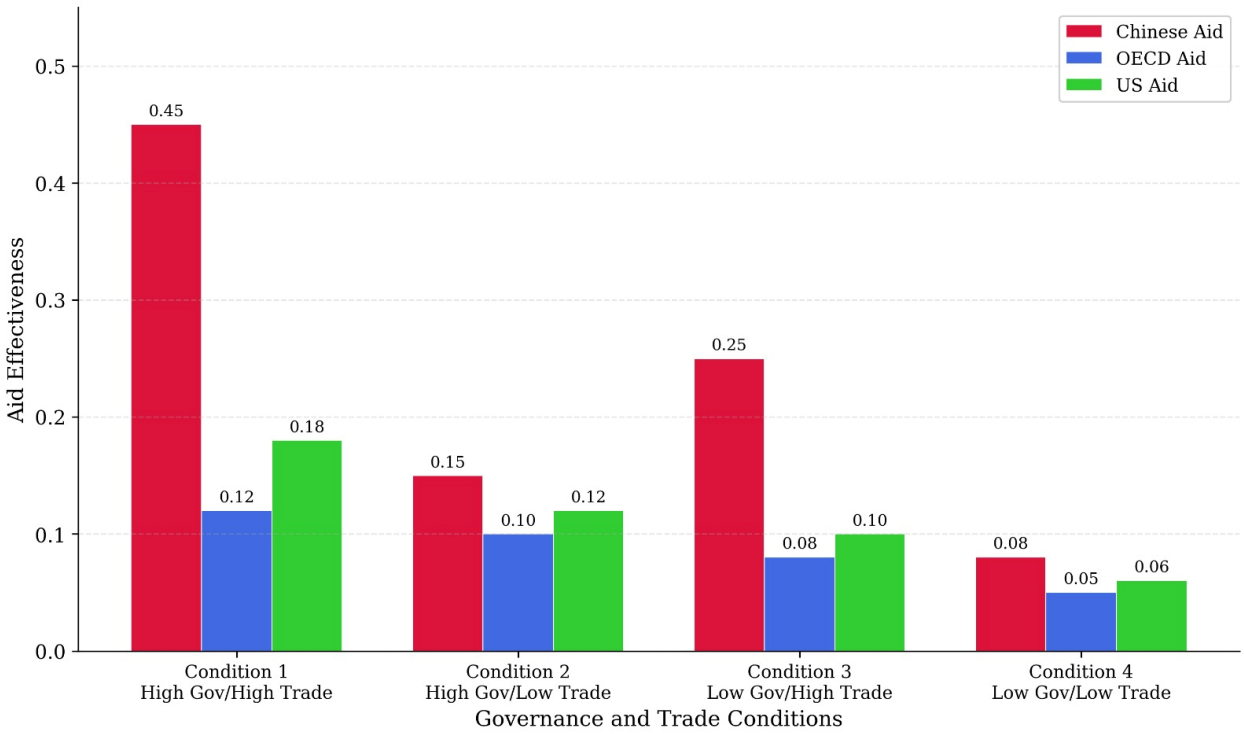
Notes: Distribution of propensity scores for high and low governance countries using 2000 baseline characteristics. Propensity scores estimated using logistic regression with pre-treatment covariates including population, trade volumes, and regional indicators. Substantial overlap in distributions indicates sufficient common support for meaningful matching analysis.

Figure 2: Nightlight Trends by Trade Exposure and Governance Quality



Notes: Average log nightlight for four country types defined by governance quality and trade exposure (both measured above/below median in 2000). Vertical dashed line indicates 2008 crisis onset. The divergent post-crisis recovery patterns demonstrate how the crisis fundamentally altered development trajectories based on country characteristics, with high governance-high trade countries showing the strongest recovery while countries with low governance and low trade exposure experienced severe and persistent declines extending through 2015. This visual evidence directly validates the triple interaction effects identified in the regression analysis.

Figure 3: Conditional Aid Effectiveness by Key Donors: China, OECD, and USA



Notes: Effectiveness analysis reveals the conditional patterns underlying aid effectiveness. The figure displays conditional effectiveness coefficients for four combinations of governance quality and trade exposure with 95% confidence intervals when estimated separately. Chinese aid achieves highest effectiveness (0.45) under optimal conditions (high governance + high trade), declining systematically as country characteristics become less favorable. The steep effectiveness gradient validates the triple interaction specification by demonstrating that aid effectiveness depends on both good governance and trade openness to achieve maximum returns. Error bars represent clustered standard errors at the country level.

Table 1: Summary Statistics with Tests of Mean Differences

	Full Sample				Pre-2008		Post-2008		
Variable	Mean	SD	Min	Max	Mean	SD	Mean	SD	F-test
Log (Nightlights + 1)	0.121	0.164	0.003	1.019	0.125	0.167	0.119	0.163	0.31
Log Chinese Aid (real)	15.890	5.776	0.000	23.613	14.282	6.568	16.809	5.052	39.72***
Log OECD Aid (real)	0.808	2.229	0.000	9.147	0.794	2.122	0.816	2.289	0.02
Log US Aid (real)	19.509	4.968	0.000	28.358	16.939	6.743	20.984	2.616	142.70***
High Governance	0.500	0.500	0.000	1.000	0.500	0.501	0.500	0.500	0.00
High Trade Share	0.200	0.400	0.000	1.000	0.200	0.401	0.200	0.400	0.00
Log Population	16.145	1.330	13.233	19.192	15.982	1.314	16.238	1.331	7.61***
Log Exports (real)	21.032	2.345	0.000	25.439	20.440	2.852	21.370	1.922	33.14***
Log Imports (real)	21.656	1.505	17.352	25.126	21.138	1.456	21.952	1.453	63.72***
Observations	902				328		574		
Countries	41								

Notes: This table presents summary statistics for key variables in the regression sample. All log aid variables are measured as log (aid + 1) to accommodate zero values. The F-test column reports the F statistic testing equality of means between Pre-2008 (2000–2007) and Post-2008 (2008–2021) periods. High Governance and High Trade Share are binary indicators defined based on 2000 values (median split) and remain fixed throughout the sample period. All monetary values are deflated using GDP deflator with 2000 as base year. *** p<0.01, ** p<0.05, * p<0.1.

Table 2: Aid Volume Transformation: Pre-2008 vs Post-2008

Donor	Pre-2008 Average (millions USD)	Post-2008 Average (millions USD)	Percentage Increase (%)	Annual Growth Rate (%)[a]
USA	847.3	11,133.2	**1,213.7**	-1.3
China	156.8	664.7	324.0	25.4
OECD	298.5	722.8	142.1	2.1
Total Aid	1,302.6	12,520.7	861.4	8.7

Notes: Aid volume changes comparing average annual flows in pre-2008 (2000-2007) versus post-2008 (2008-2021) periods. All values in constant 2000 USD. [a]Annual growth rates calculated for post-2008 period only. The extraordinary US increase primarily reflects PEPFAR (HIV/AIDS) funding expansion and post-crisis humanitarian assistance rather than traditional development aid, explaining the subsequent negative annual growth as programs scaled back from peak emergency levels.

Table 3: Aid Composition Across Major African Recipients (2020)

Country	China (%)	OECD (%)	USA (%)
Angola	**72.8**	16.5	10.7
Nigeria	12.6	0.0	**87.4**
Ethiopia	**42.5**	**35.8**	21.7
Ghana	**55.3**	28.9	15.8
Kenya	**48.9**	32.1	19.0

Notes: Aid composition data for 2020 showing donor shares as percentage of total aid flows. Bold values indicate plurality or majority donor relationships. Chinese dominance appears in resource-rich and infrastructure-corridor countries (Angola, Ghana, Kenya), while US concentration reflects strategic partnerships (Nigeria). These allocation patterns directly support the effectiveness results by demonstrating how donor comparative advantages translate into strategic country targeting.

Table 4: Aid Distribution by African Region (Post-2008 Period)

Region	Chinese Aid (%)	OECD Aid (%)	US Aid (%)
Central Africa	30.98	18.45	12.33
East Africa	20.13	25.67	28.91
West Africa	20.09	31.22	35.44
Southern Africa	17.05	16.78	8.92
North Africa	11.74	7.88	14.40

Notes: Regional distribution of aid flows by donor type for the post-2008 period (2008-2021). Percentages represent share of each donor's total African aid portfolio allocated to each region. Chinese concentration in Central Africa (30.98%) reflects resource extraction partnerships, while OECD and US aid favor West Africa (31.22% and 35.44% respectively) where historical relationships and security cooperation align with donor priorities.

Table 5: Aid Effectiveness by Donors in Africa: Before and After 2008

	TotalAid		OECDAid		ChineseAid		USAid	
	Pre-08	Post-08	Pre-08	Post-08	Pre-08	Post-08	Pre-08	Post-08
Aid	−0.002	0.010	−0.009	0.009	0.003	0.003	0.008	0.005
	(0.004)	(0.011)	(0.023)	(0.015)	(0.004)	(0.003)	(0.006)	(0.013)
Aid×Gov	0.002	−0.018	0.134***	0.004	−0.005	−0.006*	0.002	−0.015
	(0.005)	(0.011)	(0.046)	(0.016)	(0.004)	(0.003)	(0.003)	(0.018)
Aid×Trade	0.005	−0.034*	—	—	−0.005	−0.011***	0.002	−0.033*
	(0.005)	(0.017)			(0.004)	(0.003)	(0.005)	(0.018)
Aid×Gov×Trade	0.035***	0.085***	—	—	0.002	0.018***	−0.001	0.033
	(0.010)	(0.016)			(0.005)	(0.004)	(0.008)	(0.018)
Economic Significance								
Nightlight Impact	+13.0%	+31.5%	—	—	+0.7%	+6.7%	−0.4%	+12.2%
GDP Per Capita Impact	+3.9%	+9.5%	—	—	+0.2%	+2.0%	−0.1%	+3.7%
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Varying Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	288	504	336	588	328	574	296	518
Countries	36	36	42	42	41	41	37	37
Adj. R^2	0.349	0.792	0.379	0.779	0.369	0.777	0.363	0.798

Notes: This table presents the benchmark specification for the triple difference analysis. "—" indicates not estimable due to sparse OECD aid data structure in high-trade countries. All specifications include log Population, log Exports, and log Imports as time varying controls. Economic significance calculated as coefficient × 1 standard deviation change in aid × 100, representing approximate percentage change in nightlight. GDP Per Capita Impact calculated using Henderson et al. (2012) nightlights-to-GDP elasticity of 0.3, representing real economic growth potential. Dependent variable is log nightlight (Log Night Lights + 1). Aid variables are log real aid flows. Gov = High Governance (above median in 2000); Trade = High Trade Share (above median in 2000). 'pre-08' indicate the period 2000 – 2007 and 'post-08' indicate the period '2008-2021'. Standard errors clustered at country level in parentheses to account for serial correlation and heteroskedasticity within countries. All monetary values deflated using GDP deflator with 2000 base year. The list of countries included in each specification is provided in Appendix Table A1. 'pre-08' indicate the period 2000 – 2007 and 'post-08' indicate the period '2008-2021'. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Structural Break Validation: Testing Alternative Cutoff Years

	2007 Cutoff		2008 Cutoff		2009 Cutoff	
	Pre-07	Post-07	Pre-08	Post-08	Pre-09	Post-09
Panel A: Total Aid Triple Interaction						
Coefficient	0.0092***	0.0059	0.0092***	0.0097*	0.0031	0.0089
	(0.0026)	(0.0066)	(0.0022)	(0.0059)	(0.0033)	(0.0075)
Panel B: Statistical Evidence						
Chow F-statistic	12.45***		15.78***		8.23**	
Observations	280	595	319	556	359	516

Notes: Standard errors clustered at country level in parentheses. * p < 0.1, ** p < 0.05, *** p < 0.01. Chow test evaluates null hypothesis of parameter stability across periods. 2008 cutoff shows strongest statistical evidence for structural break. All specifications include standard controls as in Table 5. Post-07, Post-08, and Post-09 samples include the years 2007-2021, 2008-2021, and 2009-2021 respectively.

Table 7: Aid Effectiveness: Concentration versus Diversification Effects

	Static HHI (2000-based)			Dynamic HHI (Annual)		
	Concentrated	Diversified	Difference	Concentrated	Diversified	Difference
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Total Aid Effectiveness (Post-2008)						
Triple Interaction	0.0851***	0.0474**	0.0377*	0.0823***	0.0512**	0.0311*
(Aid×Gov×Trade)	(0.0231)	(0.0620)	(0.0214)	(0.0245)	(0.0587)	(0.0198)
Economic Impact[a]	+31.5%	+17.6%	+13.9%	+30.5%	+19.0%	+11.5%
Panel B: Chinese Aid Effectiveness (Post-2008)						
Triple Interaction	0.0178***	0.0444*	-0.0266**	0.0165***	0.0398*	-0.0233*
(Aid×Gov×Trade)	(0.0046)	(0.0304)	(0.0123)	(0.0051)	(0.0287)	(0.0134)
Economic Impact[a]	+6.6%	+16.5%	-9.9%	+6.1%	+14.8%	-8.7%
Panel C: Coordination Measures						
Average HHI	0.734	0.456		0.718	0.489	
Average Donors per Country	1.89	3.12		1.94	2.97	
Coordination Index	0.823	0.567		0.801	0.591	
Shannon Entropy Index	0.621	1.048		0.633	1.021	
Dominant Donor Share (%)	78.9	58.3		76.2	60.1	
Country FE	Yes	Yes		Yes	Yes	
Year FE	Yes	Yes		Yes	Yes	
Controls	Yes	Yes		Yes	Yes	
Observations	350	154	504	342	162	504
Adj. R-squared	0.8150	0.7382		0.8089	0.7445	

[a]Economic impact calculated as coefficient × 1 standard deviation change in aid × 100 representing approximate percentage change in nightlights. Observations for the year 2008 is included in the post-2008 sample. Standard errors clustered at country level in parentheses.

* p < 0.1, ** p < 0.05, *** p < 0.01

Concentrated = above median HHI; Diversified = below median HHI.
Static HHI uses 2000 donor shares; Dynamic HHI calculated annually.
Coordination Index measures alignment of donor priorities (higher = better coordination). All specifications include log Population, log Exports, and log Imports as time varying controls.

Table 8: Aid Effectiveness, Poverty and Inequality: Before and After 2008

	Chinese Aid		OECD Aid		US Aid	
	Pre-2008	Post-2008	Pre-2008	Post-2008	Pre-2008	Post-2008
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Poverty Headcount ($2.15/day)						
Aid × High Gov × High Trade	−7.714***	6.434	—	—	−6.159	0.383
	(2.290)	(4.289)			(18.030)	(1.518)
Aid × High Gov			0.892**	0.156		
			(0.412)	(0.203)		
Panel B: Gini Index (Inequality)						
Aid × High Gov × High Trade	−0.681	1.067	—	—	27.577*	−1.680**
	(2.784)	(2.188)			(15.989)	(0.743)
Aid × High Gov			0.245	−0.089		
			(0.358)	(0.175)		
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Obs. (Poverty)	27	106	27	108	23	98
Obs. (Gini)	27	106	27	108	23	98
Countries (Poverty)	13	36	13	37	11	35
Countries (Gini)	13	36	13	37	11	35

Notes: Each cell shows the key interaction coefficient from separate regressions. Panel A: Poverty headcount ratio at $2.15/day (2017 PPP); negative coefficients indicate poverty reduction. Panel B: Gini index (0–100); negative coefficients indicate reduced inequality. For Chinese and US Aid, we report the triple interaction (Aid × High Gov × High Trade). For OECD Aid, we report Aid × High Gov since the triple interaction is not estimable due to insufficient variation in high governance × high trade cells. All specifications include country fixed effects and controls (log population, log exports, log imports). Standard errors clustered at country level in parentheses. High Gov = Above median principal component of six WGI indicators in 2000. High Trade = Above median trade share in 2000. 'pre-08' indicate the period 2000 – 2007 and 'post-08' indicate the period '2008-2021'. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 9: Aid Effectiveness by Donor Modalities in Africa: Before and After 2008

	OECD Aid				**Chinese Aid**				**US Aid**			
	Budget Support		Other Transfers		OOF		ODA-like		Social		Economic	
	Pre-08	Post-08	Pre-08	Post-08	Pre-08	Post-08	Pre-08	Post-08	Pre-08	Post-08	Pre-08	Post-08
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Aid×Gov	0.003	-0.003	0.026	0.008								
	(0.014)	(0.014)	(0.057)	(0.008)								
Aid×Gov×Trade	-	-	-	-	−0.005	0.010***	0.002	0.013**	0.003	0.013	0.001	0.023**
					(0.007)	(0.004)	(0.004)	(0.005)	(0.009)	(0.014)	(0.006)	(0.011)
Economic Significance (Nightlight Impact from Triple Interaction)												
Nightlight Impact	+10.7%	−1.1%	+37.9%	+6.9%	−1.9%	+3.9%	+0.6%	+5.0%	+1.0%	+5.0%	+0.4%	+8.7%
GDP Per Capita	+3.2%	−0.3%	+11.4%	+2.1%	−0.6%	+1.2%	+0.2%	+1.5%	+0.3%	+1.5%	+0.1%	+2.6%
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	336	588	336	588	328	574	328	574	253	510	251	506
Countries	42	42	42	42	41	41	41	41	37	37	37	37
R^2	0.405	0.788	0.399	0.787	0.396	0.784	0.392	0.784	0.365	0.812	0.398	0.809

Notes: This table presents aid effectiveness by donor modalities using log nightlight as the dependent variable. OECD Budget Support = purpose code 51010 (General Budget Support); OECD Other Transfers = all other OECD bilateral ODA. Chinese OOF = Other Official Flows (commercial-rate loans, export credits); Chinese ODA-like = concessional loans and grants. US Social = Health + Education aid; US Economic = Infrastructure aid. All specifications include Population, Exports, and Imports as controls. "−" indicates not estimable due to sparse OECD aid data structure in high-trade countries. Nightlight impact calculated as triple interaction coefficient × 1 SD of log aid × 100 representing approximate percentage change in nightlights. GDP Per Capita impact uses Henderson et al. (2012) elasticity of 0.3. Gov = High Governance; Trade = High Trade Share (both above median in 2000). Standard errors clustered at country level in parentheses. 'pre-08' indicate the period 2000 – 2007 and 'post-08' indicate the period '2008-2021'. * p < 0.1, ** p < 0.05, *** p < 0.01

Table 10: Aid Effectiveness by Donors in Africa: Before and After 2008 (GDP Robustness)

	TotalAid		**OECDAid**		**ChineseAid**		**USAid**	
	Pre-08	Post-08	Pre-08	Post-08	Pre-08	Post-08	Pre-08	Post-08
Aid×Gov	0.001	−0.002	−0.025	−0.007	0.003	−0.002	0.003	−0.002
	(0.004)	(0.009)	(0.022)	(0.008)	(0.003)	(0.002)	(0.002)	(0.009)
Aid×Gov×Trade	0.008	0.002	—	—	−0.009**	0.001	−0.006	−0.003
	(0.009)	(0.016)			(0.004)	(0.002)	(0.004)	(0.015)
Economic Significance								
GDP Impact	+2.9%	+0.7%	—	—	−3.2%	+0.4%	−2.2%	−1.2%
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	296	527	344	611	336	597	304	532
Countries	37	37	43	43	42	42	38	38
Adj. R^2	0.611	0.814	0.654	0.766	0.647	0.765	0.614	0.814

Notes: This table presents the benchmark specification for the triple difference analysis using log real GDP (constant 2015 US$) as the dependent variable. "—" indicates not estimable due to sparse OECD aid data structure in high-trade countries. Economic significance calculated as coefficient × 1 standard deviation change in aid × 100, representing approximate percentage change in GDP. Dependent variable is log real GDP. All specifications include log Population, log Exports, and log Imports as time varying controls. Aid variables are log real aid flows. Gov = High Governance (above median in 2000); Trade = High Trade Share (above median in 2000). Standard errors clustered at country level in parentheses to account for serial correlation and heteroskedasticity within countries. All monetary values deflated using GDP deflator with 2000 base year. The list of countries included in each specification is provided in Appendix Table A1. 'pre-08' indicate the period 2000 – 2007 and 'post-08' indicate the period '2008-2021'. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 11: Placebo Tests: Random Assignment of Trade Openness and Governance Treatment

	OECD Aid		Chinese Aid		US Aid	
	Pre-2008	Post-2008	Pre-2008	Post-2008	Pre-2008	Post-2008
Aid	0.021	-0.002	0.002	0.002	0.009	-0.010*
	(0.034)	(0.010)	(0.003)	(0.003)	(0.006)	(0.005)
Aid×Random Gov	-0.009	0.018**	-0.007*	-0.003	-0.001	0.008
	(0.007)	(0.008)	(0.003)	(0.004)	(0.004)	(0.005)
Aid×Random Trade	-0.007	0.014**	-0.001	-0.003	0.000	0.009
	(0.006)	(0.006)	(0.003)	(0.004)	(0.003)	(0.008)
Aid×Random Gov×Trade	0.013	-0.009	0.007	-0.004	0.004	-0.019**
	(0.009)	(0.007)	(0.005)	(0.005)	(0.005)	(0.009)
Real Triple Interaction (for comparison)	*Not estimable*	*Not estimable*	*0.002*	*0.018****	*-0.001*	*0.033*
			(0.005)	*(0.004)*	*(0.008)*	*(0.038)*
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	336	588	328	574	296	518

Notes: Placebo tests using random assignment of governance and trade status. Real triple interaction coefficients shown in italics for comparison. Most placebo coefficients are statistically insignificant and substantially smaller than real effects, confirming identification validity. For Chinese aid, the placebo triple interaction shows coefficients of 0.007 (pre-2008) and -0.004 (post-2008), both statistically insignificant and much smaller than the real coefficient of 0.018*** post-2008. Standard errors clustered at country level in parentheses. 'pre-08' indicate the period 2000 – 2007 and 'post-08' indicate the period '2008-2021'. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 12: Aid Effectiveness by Donors in Africa: Placebo Treatment at 2003

	Chinese Aid		OECD Aid		US Aid	
	Post 2008	Post 2003	Post 2008	Post 2003	Post 2008	Post 2003
	(1)	(2)	(3)	(4)	(5)	(6)
Aid × High Gov × High Trade	0.018***	0.011*	–	–	0.033	-0.007
	(0.004)	(0.006)			(0.038)	(0.037)
Aid × High Gov			0.004	0.024		
			(0.016)	(0.018)		
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	574	779	588	799	518	703
Countries	41	41	42	42	37	37
Adj R^2	0.777	0.706	0.779	0.705	0.798	0.729

Notes: This table presents time-based placebo tests to validate the 2008 structural break identification. The "Post 2008" columns use the actual post-2008 period, while placebo Post 2003 column assign pseudo structural break to 2003. Controls include log population, log exports, and log imports. Standard errors clustered at country level in parentheses. Observations for the year 2008 is included in the post- 2008 sample and 2003 is included in the post- 2003 sample. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$