UC San Diego, School of Global Policy and Strategy

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Autocracies are less likely to receive Chinese aid: Evidence from Chinese aid data, 2019-2021

1. Introduction

Recent debates characterize Chinese foreign aid as uniquely favoring authoritarian regimes (Dreher et al., 2019; Bader, 2015). This research challenges this view by examining AidData's Global Chinese Development Finance Dataset 3.0 (Custer et al., 2023). Analyzing Chinese aid flows from 2019-2021 alongside development indicators, we discover that autocracies are actually less likely to receive Chinese aid during this period—contradicting the assumption that China's aid systematically favors authoritarian governments. Through statistical analysis controlling for economic indicators, diplomatic relations, and regional factors, we show regime type significantly predicts Chinese aid allocation, though underlying mechanisms remain complex. Our research contributes to understanding China's strategic aid priorities (Brazys & Vadlamannati, 2021) and challenges simplistic narratives about its global influence strategy. The paper reviews theory, methodology, findings, and discusses implications.

2. Theory and Hypotheses

Our theoretical framework challenges simplistic characterizations of Chinese aid allocation by proposing a more nuanced relationship between regime type and aid flows. We build upon institutional theory (North, 1990) and strategic aid allocation literature (Dreher et al., 2019) to understand China's evolving approach to development assistance.

Drawing on strategic aid allocation theory, we hypothesize a complex interplay where:

H1: Autocracies generally receive less Chinese aid but with important exceptions for specific autocratic regimes that have historically received substantial Chinese assistance.

Chinese aid allocation exhibits strong path dependency, with established relationships persisting regardless of regime type. Rather than following purely ideological motivations, China employs "strategic pragmatism" that prioritizes long-term influence over immediate political considerations. This approach reflects principles from historical institutionalism, where early decisions create self-reinforcing patterns that shape future resource distributions. Initial investments in select autocratic regimes have established institutional and diplomatic channels that continue to influence aid flows, even as broader patterns shift away from autocracies. This hybrid allocation strategy balances multiple factors beyond simple regime preferences, demonstrating China's increasingly sophisticated approach to foreign assistance.

3. Data Description

Our analysis merges two country-level datasets. From AidData's Global Chinese Development Finance Dataset (Version 3.0), we use "Aid to all sectors" as our dependent variable, measuring the average Chinese aid commitments in millions USD (2019-2021), and "Aid to all sectors baseline" capturing previous commitments (2013-2018). From Our World in Data, we incorporate "autocratic regime" as our treatment variable (1=autocracy, 0=democracy) based on V-Dem Institute's political regime classification, with closed (0) and electoral (1) autocracies coded as autocratic, and electoral (2) and liberal (3) democracies as democratic.

Control variables include: Transparency International's "corruption index" (0-100 scale, higher values indicate less corruption); World Bank's "share of population in extreme poverty" (percentage living below $2.15 daily); and World Bank's "GDP per capita" (inflation-adjusted with PPP adjustments) – all averaged for 2000-2018. All control variables are continuous, and are summarized in Table 1.

    i.   **Descriptive summary of key variables and transformations**

Table 1: Descriptive summary of key variables of interest

Variable	Mean	SD	Min	Max	Range	Missing
Aid -all sectors (million USD)	51.53	82.02	0.00	463.61	463.61	93
Aid -baseline all sectors (million USD)	157.24	303.02	0.00	3,078.72	3,078.72	93
Regime is autocratic (1=Yes, 0 otherwise)	0.46	0.50	0.00	1.00	1.00	60
Corruption perception index(0-100)	43.10	19.36	8.83	90.00	81.17	55
Share of population in extreme poverty(%)	10.35	16.04	0.00	67.33	67.33	91
GDP per capita (thousand USD)	24,948.42	25,345.34	918.95	142,393.40	141,474.45	22

Note: Data sources: AidData's Global Chinese Development Finance Dataset (Version 3.0), 2000-2021, with means computed for aid across years 2019-2021, unit of observation is entity, year and AidData Record ID. Our World in Data averages for 2000-2018, compiled from V-Dem Institute, Transparency International, and World Bank, unit of observation, is a country-year pair.

Table 1 shows Chinese aid declining dramatically from 157.24 to 51.53 million USD between periods. Autocracies comprise 46% of potential recipients, with wide variation in governance, development, and poverty metrics. Missing data could create bias in estimates. Figure 1 reveals skewed distributions in aid and poverty variables; we logarithmically transformed aid measures while keeping poverty data in its original scale for interpretability.
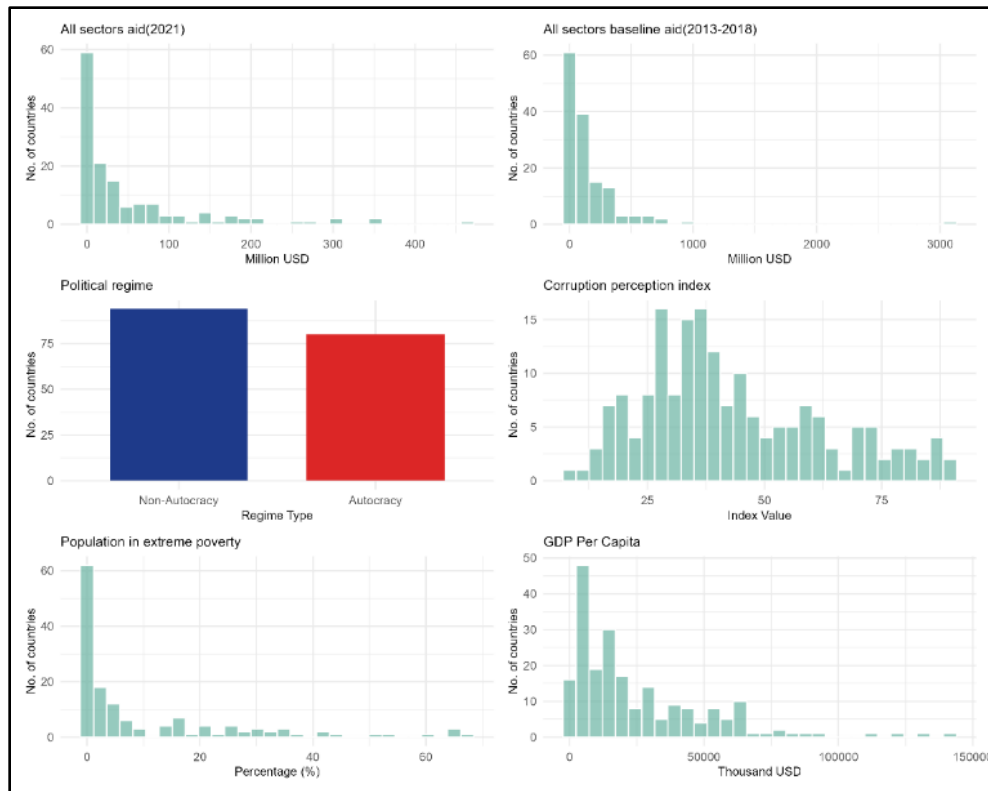
Figure 1: Distribution in key variables of interest, data sources include: AidData's Global Chinese Development Finance Dataset (Version 3.0), 2000-2021, with means computed for aid across years 2019-2021; and Our World in Data averages for 2000-2018.

ii.   Comparing autocracies and democracies by global governance and development indicators

Figure 2 displays key variables across regime types. Democracies show higher corruption perception index values (less corruption) and GDP per capita than autocracies. Conversely, autocracies exhibit higher extreme poverty levels and received more baseline aid (2013-2018). Error bars indicate confidence intervals. These systematic differences highlight the importance of including these variables as controls in our regression models, as omitting them would likely bias results.
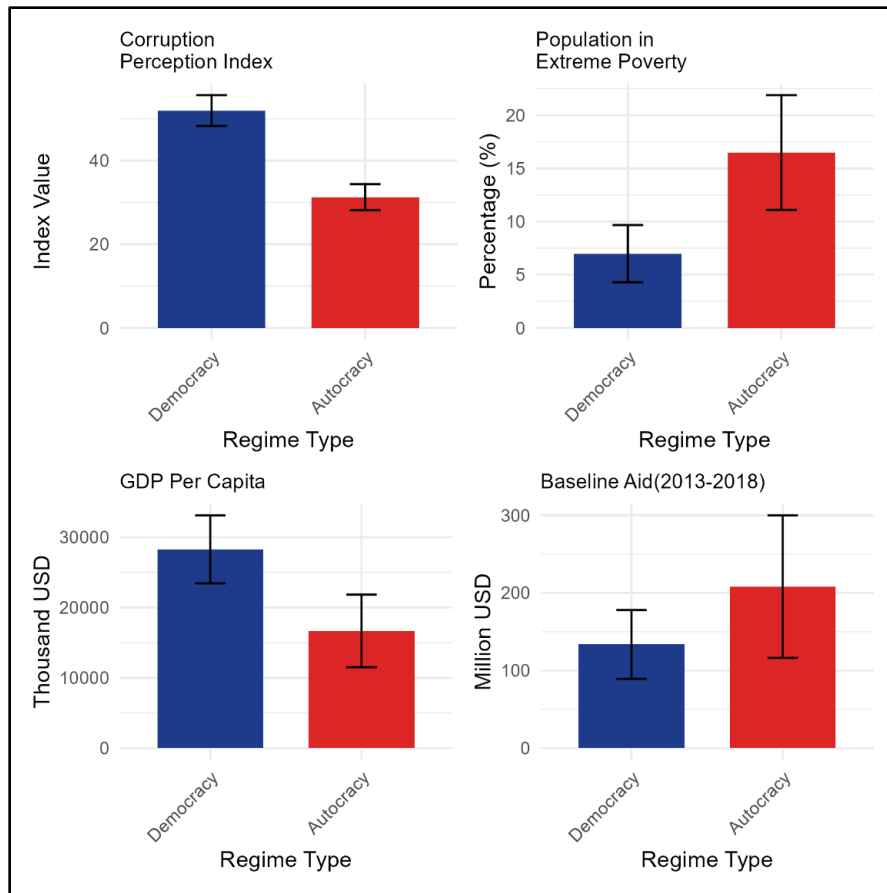
Figure 2:Global Governance and development indicators summary by regime type.
Data sources include: AidData's Global Chinese Development Finance Dataset
 (Version 3.0), 2000-2021, with means computed for aid across years 2019-2021;
and Our World in Data averages for 2000-2018

Figure 3 reveals linear relationships between baseline aid (2013-2018) and predicted 2021 aid for both regime types. Autocracies display a steeper slope, indicating a stronger baseline aid effect. The lines' intersection demonstrates how autocracies overcome their initial disadvantage, confirming the significant interaction between aid allocation and regime type.
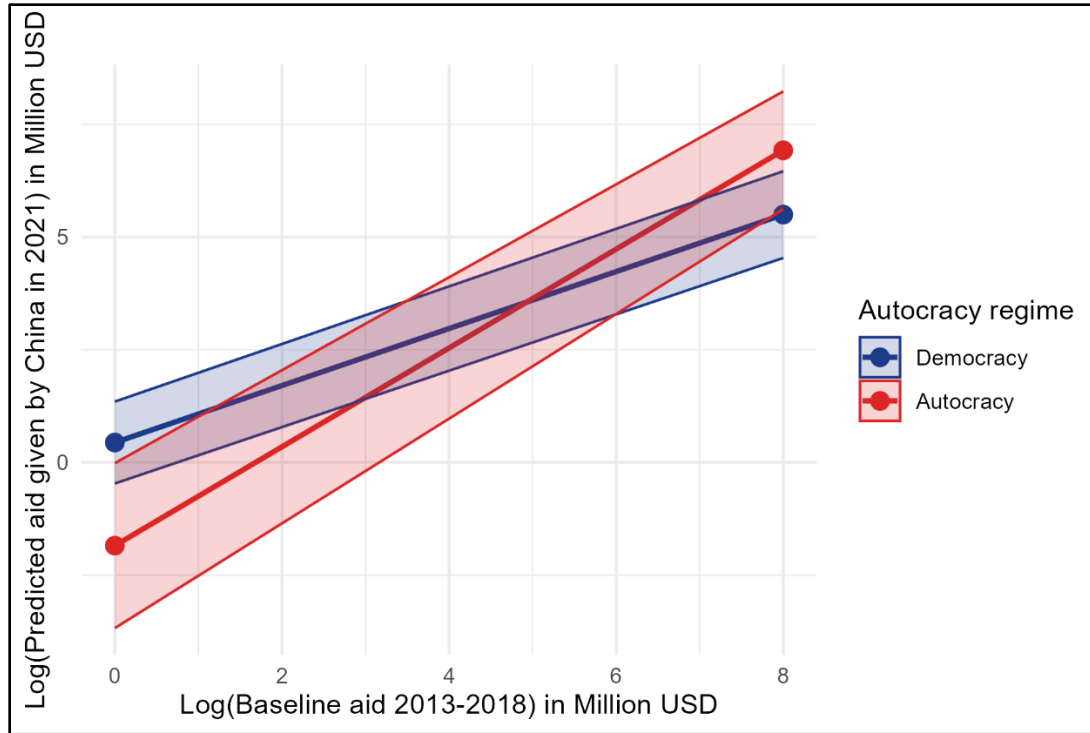
Figure 3: Interaction effect between regime type and baseline aid on Chinese aid allocation (2019-2021)"

4. Methodology

Our analysis employs progressive regression models to investigate the relationship between regime type and Chinese aid allocation. We begin with a baseline bivariate model:

Baseline regression model: Log (Aid all sectors) = β_0 + β_1 (Autocratic regime) + ε

Our preferred specification that accounts for potential confounders and interaction effects is:

Final regression model: Log (Aid all sectors) = β_0 + β_1 (Autocratic regime) + β_2(Corruption index) + β_3(Extreme poverty share) + β_4(GDP per capita) + β_5Log(Aid all sectors baseline) + β_6(Autocratic regime) * Log(Aid all sectors baseline))+ β_7(Region) + ε

Where β_0, β_0, ..., β_7 are regression coefficients, ε is the error term.

This expanded model controls for governance quality, development needs, path dependency, and regional factors even though we risk introducing multicollinearity, which we diagnose in the appendices. We incorporated region fixed effects into our regression models accounting for unobserved region-specific effects that might influence both aid selection and amounts. These

fixed effects account for historical, cultural, and geopolitical characteristics while maintaining statistical power given our cross-sectional dataset.

5. Findings

Table 2 reveals that foreign aid allocation follows historical patterns rather than governance factors. Baseline aid emerges as the strongest predictor of Chinese aid (p<0.001), dramatically boosting model explanatory power from 7.4% to 42.7%. All other factors constant, a 1% increase in baseline aid led to a 0.8% increase in future aid on average. Countries with autocratic regimes receive approximately 42.3% less aid than comparable non-autocratic regimes, though this finding is not statistically significant.

Corruption and poverty show minimal impact, yet autocracies with established aid relationships continue receiving preferential treatment via baseline aid (p<0.05). While corruption perception briefly appears significant in model 4, it loses significance when controlling for baseline aid. Regional effects slightly improve model fit (R²=0.483) without substantially altering coefficient patterns.

These findings demonstrate that aid allocation adheres to established precedents rather than responding to governance improvements or development needs.

Table 2: Chinese Aid Allocation to Autocracies: Historical relationships dominating over governance indicators. Dependent variable: Aid allocation to all sectors 2019-2021

	M1	M2	M3	M4	M5	M6	M7
Intercept	2.956***	3.427***	3.789***	3.880***	2.895***	3.127***	2.986***
	-0.201	-0.656	-0.806	-0.806	-0.598	-0.614	-0.673
Autocratic regime	0.141	0.022	0.124	0.013	−0.153	−0.442	−0.550
	-0.284	-0.335	-0.401	-0.395	-0.345	-0.362	-0.374
Corruption perception index		−0.011	−0.018	−0.042*	−0.004	−0.008	−0.009
		-0.016	-0.018	-0.02	-0.015	-0.015	-0.016
Share of population in extreme poverty			−0.004	0.01	0.008	0.009	0.014
			-0.009	-0.013	-0.009	-0.009	-0.011

GDP per capita				0.000*	0	−0.000	−0.000
				0	0	0	0
Log (baseline aid)					0.808***	0.632***	0.604***
					-0.096	-0.106	-0.112
Autocratic regime × Log (baseline aid)						0.464*	0.421*
						-0.211	-0.204
Regional Effects							YES
Observations	123	122	90	88	88	88	88
R²	0.002	0.008	0.02	0.074	0.427	0.459	0.483
Adjusted R²	−0.006	−0.008	−0.014	0.029	0.393	0.419	0.416

Note: * p < 0.05, ** p < 0.01, *** p < 0.001. Data sources include: AidData's Global Chinese Development Finance Dataset (Version 3.0), 2000-2021, with means computed for aid across years 2019-2021; and Our World in Data averages for 2000-2018.

6. Limitations and Conclusion

Chinese aid allocation predominantly follows historical patterns rather than responding to governance indicators or development needs. While autocracies generally receive less aid, those with established aid relationships continue receiving preferential treatment, suggesting selective partnership rather than systematic democracy promotion. These findings indicate path dependency in allocation decisions that may undermine strategic targeting of aid resources.

To enhance the strategic impact of Chinese aid, policymakers should reassess allocation criteria to prioritize governance indicators and development needs over historical patterns. Establishing transparent, merit-based evaluation frameworks can ensure aid is directed where it can achieve the greatest developmental and strategic outcomes, reducing path dependency and promoting more equitable and effective partnerships.

Limitations include our cross-sectional approach, which prevents causal claims about regime changes and aid flows over time. Potential omitted variables such as natural resources, geopolitics, and bilateral relations may explain observed patterns, while data missingness suggests selection bias. Future research should incorporate longitudinal data and additional context-specific factors.

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7. Appendices

A: Regression Diagnostics

a. Linearity

The points in Figure 4 appear randomly scattered without obvious clustering or patterns. This rules out possibility of nonlinearity.
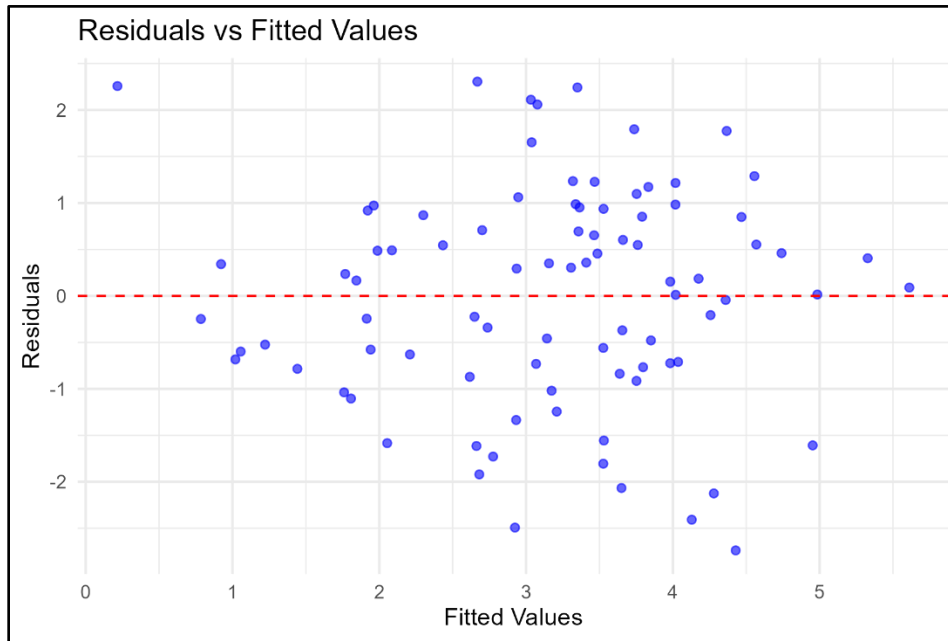

Figure 4: Plot of residuals versus fitted values from the final regression model in Table 2

b. Mean of error term

The average of the residuals calculated from the model is 9.337198e-17, a very small number close "0". So, this assumption holds.

c. Multicollinearity

We calculated Variance Inflation Factors (VIF) for all independent variables using a standard OLS model, as "lm_robust" isn't compatible with the VIF function. As expected, Table 3 shows multicollinearity in the interaction term. We addressed this in our final model (Table 2) by centering the baseline aid variable—subtracting its overall mean from each observed value—then

recomputed the VIF again using this corrected model, which confirmed that all independent variables were no longer collinear.

Table 3: variance Inflation Factors

Variable	VIF
Autocratic regime	16.74
Corruption perception index	2.25
Share of population in extreme poverty	2.26
GDP per capita	2.93
Log(baseline aid)	2.16
Region	3.01
Autocratic regime × Log(baseline aid)	18.54

Note: VIFs all IVs computed from a standard OLS regression specification.

d. Homoscedasticity / heteroscedasticity

We tested homoscedasticity both visually and statistically. The plot of residuals against predicted values (Figure 4) shows no obvious pattern, and the Breusch-Pagan test (p=0.535) confirms that the regression homoscedasticity assumption holds.

e. Normality plot

The density plot, fitted from residuals computed using the initial model compares residual distribution (black line) to a normal distribution (red line). With n=88 observations, the residuals generally follow normal distribution but show slight deviations with a flatter peak and heavier left tail around -2. The bandwidth parameter is 0.4288.
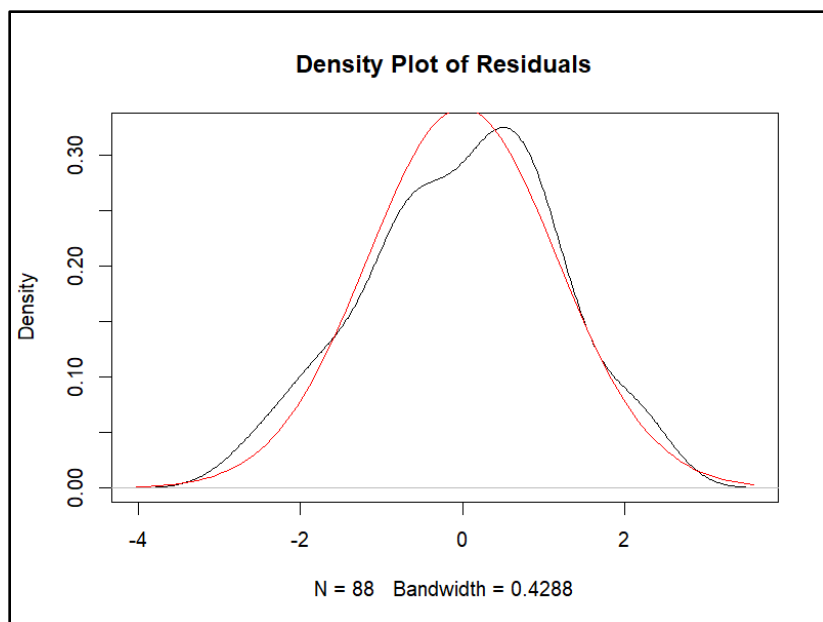
Figure 5: Density plot of residuals.

B: Pre- Gauss-Markov test of assumptions regression results:

Before conducting the Gauss-Markov assumptions tests, analysis across seven progressive models reveals that baseline aid emerges as the strongest predictor of current Chinese aid allocation (p<0.001), dramatically improving model explanatory power from 7.4% to 42.7% when introduced in M5. While earlier models show minimal relationships between aid and governance indicators, M6-M7 reveal that autocracies generally receive less aid (p<0.05), but with an important exception: autocracies with established aid relationships benefit from a significant positive interaction effect (p<0.05). This suggests path dependency in Chinese aid decisions where historical relationships outweigh regime characteristics. GDP per capita and corruption perception initially appear significant but lose relevance once baseline aid is controlled. Results are presented in Table 4.

Table 4: Initial regression model (before addressing violations of GM assumptions). Chinese Aid Allocation to Autocracies: Historical relationships dominating over governance indicators. Dependent variable: Aid allocation to all sectors 2019-2021

	M1	M2	M3	M4	M5	M6	M7
Intercept	2.956***	3.427***	3.789***	3.880***	−0.316	0.614	0.583
	-0.201	-0.656	-0.806	-0.806	-0.671	-0.723	-0.808
Autocratic regime	0.141	0.022	0.124	0.013	−0.153	−2.287*	−2.222*
	-0.284	-0.335	-0.401	-0.395	-0.345	-1.034	-1.048
Corruption perception index		−0.011	−0.018	−0.042*	−0.004	−0.008	−0.009
		-0.016	-0.018	-0.02	-0.015	-0.015	-0.016
Share of population in extreme poverty			−0.004	0.01	0.008	0.009	0.014
			-0.009	-0.013	-0.009	-0.009	-0.011
GDP per capita				0.000*	0	−0.000	−0.000
				0	0	0	0
Log(baseline aid)					0.808***	0.632***	0.604***
					-0.096	-0.106	-0.112
Autocratic regime × Log (baseline aid)						0.464*	0.421*
						-0.211	-0.204
Regional Effects							YES
Observations	123	122	90	88	88	88	88
R^2	0.002	0.008	0.02	0.074	0.427	0.459	0.483
Adjusted R^2	−0.006	−0.008	−0.014	0.029	0.393	0.419	0.416

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Data sources include: AidData's Global Chinese Development Finance Dataset (Version 3.0), 2000-2021, with means computed for aid across years 2019-2021; and Our World in Data averages for 2000-2018.

C: Outlier treatment

After careful analysis, I've identified 57 potential outliers based on individual measures of outliers threshold. However, given our relatively small regression sample size of 85 observations, I've decided to apply a more conservative approach. An observation will only be classified as an outlier if it exceeds all four detection thresholds simultaneously (studentized residuals, DFFITs, Cook's distance, and leverage)—what we might term an "egregious" outlier. This stringent classification is appropriate given our limited sample. Using these combined criteria, I'm pleased to report that no observations have been flagged as outliers requiring removal from our analysis.