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Contesting Influence: U.S. Aid Responses to Chinese Financing

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Abstract

Competition between the United States and China is likely to shape the course of history in the coming years. Does foreign aid constitute an arena of confrontation? Using the OECD Creditor Reporting System and the Global Chinese Development Finance Dataset, we study the relationship between the aid-commitment strategies of Beijing and Washington. Employing an instrumental variables approach, we find that the United States increases its aid commitments in recipient countries where China commits more funds. The effect is stronger when the United States has close political or commercial ties with the recipient country and is larger in years of heightened US–China political disagreement. These findings are consistent with a framework in which the two countries compete to acquire influence over the recipient countries.

Keywords: International aid, Donor coordination, US-Sino competition.

JEL Classification: F35, O19.

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1 Introduction

During recent decades, the United States (US) has progressively revised its relationship with China. In 1998, during a visit to Peking University, President Clinton referred to the twenty-first century as “China’s century”.¹ Just over two decades later, the first Trump administration launched a fierce trade war with Beijing portraying China as hostile to US interests (McFaul, 2020; Fajgelbaum et al., 2024). In his inauguration speech, President Biden emphasized that the US and China are “*in competition for the 21st century*”.² During the second Trump administration, the trade war intensified, with a series of escalating reciprocal tariffs. The Sino–US rivalry now extends to many domains, including technology and innovation (Kennedy and Lim, 2018) and the military sphere (Allison, 2017). In this paper, we examine whether and to what extent China and the US also compete in the realm of state aid.

A large body of literature shows that foreign aid is often used as a policy instrument through which donor countries seek to expand their political influence and influence recipients foreign policy (Morgenthau, 1962; Thacker, 1999; Calomiris, 2000; Whang et al., 2019). Against this backdrop, Beijing’s 2013 launch of the Belt and Road Initiative (BRI) represents a significant attempt to project geopolitical and economic influence abroad through large-scale official finance (Shambaugh, 2015; Natsios, 2020).³ In light of the political returns to state aid documented in the literature, and of the intensifying competition between China and the United States to expand their spheres of influence (Edel and Brands, 2019; Tierney, 2024), we ask whether, and how, US aid allocation across recipient countries responds to China’s growing overseas financing.

In a framework in which political and strategic interests shape foreign aid policy, donor allocations can be strategic complements or substitutes. When aid is used to extract political concessions from recipient governments, donor returns decrease in the number of other donors active in the same country (Dudley and Montmarquette, 1976; Steinwand, 2015). This creates incentives to avoid head-to-head competition and to coordinate implicitly by targeting different recipients. By contrast, the desire to limit the political and strategic influence of the rival can lead to coordination failures, in which donors concentrate their aid on the same set of countries. Our evidence aligns with this second type of response. In our baseline specification, a 1% increase in Chinese aid to a recipient country is associated with a 0.33% increase in US aid.

To address the potential endogeneity between US and Chinese aid, we employ a Bartik-style instru-

¹“*In the 21st century – your century – China and the United States will face the challenge of security in Asia. On the Korean Peninsula, where once we were adversaries, today we are working together for a permanent peace and a future free of nuclear weapons*”. The full speech is available at [White House Archive](#).

²See also Josh Rogin, [Washington Post](#), 10 February 2022.

³In 2014, Xi Jinping stated: “*We should increase China’s soft power, craft a compelling Chinese narrative, and better communicate China’s message to the world.*”

mental variables strategy. Specifically, we instrument Chinese aid commitments using the interaction between a time-varying aggregate shock and a predetermined country-specific exposure measure. Following [Dreher et al. \(2021\)](#), the aggregate shock captures annual fluctuations in China’s over- or underproduction of key industrial inputs (cement, steel, glass, iron, and aluminum). The exposure component measures a recipient country’s diplomatic alignment with China, operationalized as the share of sample years in which the country does not recognize Taiwan. The underlying premise of the first component of the instrument is that fluctuations in China’s industrial overcapacity affect the availability of Chinese government-backed development financing for overseas infrastructure projects. Because the Chinese economy is characterized by a substantial government presence in the economy and persistent excess capacity in strategic industrial sectors, periods of overproduction in key industrial inputs are likely to increase the supply of official development financing for projects that rely intensively on such materials. Conversely, periods of lower excess capacity are expected to coincide with lower financing in overseas development projects such as infrastructure-related activities ([Dreher et al., 2021](#); [Bluhm et al., 2025](#)). The second component of the instrument builds on the extensive literature identifying political alignment between donors and recipients as a key determinant of international aid allocation. In this context, the absence of diplomatic recognition of Taiwan is commonly interpreted as support for the *One China* policy, which recognizes the People’s Republic of China as the sole legitimate government of China and consequentially precludes recognizing Taiwan’s independence. Accordingly, countries that do not recognize Taiwan are typically viewed as more politically aligned with Beijing. The share of sampled years in which a recipient country does not maintain diplomatic relations with Taiwan captures levels of foreign policy alignment that are relevant to Chinese aid allocation decisions.

Conditional on country and year fixed effects, the interaction term is identified from heterogeneous exposure to common aggregate shocks. The exclusion restriction of the instrument may potentially be violated if countries more diplomatically aligned with China differ systematically in ways that affect US aid allocations, particularly during periods of heightened Chinese industrial overcapacity. However, provided that year-to-year fluctuations in China’s industrial overcapacity are unrelated to unobserved determinants of US aid allocation across recipient countries, the identifying assumption underlying our instrument remains plausible. In this setting, country fixed effects absorb time-invariant cross-country differences, including persistent geopolitical characteristics associated with diplomatic alignment toward China and Taiwan, while year fixed effects absorb common global shocks. Another concern is that Chinese production may covary with global macroeconomic conditions. If so, our instrument partly reflects global commodity cycles rather than China-specific supply conditions, which could violate the exclusion restriction if global shocks directly affect US aid allocation. To address this

concern, we conduct a robustness check by residualizing the Chinese production index with respect to a global commodity-price index and use the resulting residual as our measure of overproduction. Accordingly, in this case, identification is driven by variation in Chinese production that is orthogonal to global commodity price dynamics.

Although our findings are consistent with a framework in which the United States and China strategically compete for influence over recipient countries, alternative interpretations of the underlying mechanism remain possible. In some contexts, increases in both Chinese and US aid may reflect parallel responses to recipient-country needs, such as economic crises, post-conflict reconstruction, humanitarian emergencies, or broader development challenges, rather than purely strategic competition. Likewise, both China and the United States may share interests in promoting regional stability or supporting development in vulnerable states. Our empirical strategy, while mitigating concerns related to reverse causality and common shocks, cannot fully rule out the possibility that part of the estimated response reflects convergent rather than purely competitive forms of international engagement. That said, the identification strategy and several patterns in the data are more naturally interpreted through the lens of strategic competition for political influence.

First, our instrument combines exogenous variation in Chinese industrial overcapacity with a measure of diplomatic alignment surrounding the Taiwan issue. Accordingly, the IV strategy identifies a local causal effect of Chinese development finance on US aid allocations among countries where exogenous fluctuations in Chinese industrial overcapacity translate more strongly into Chinese financing due to diplomatic alignment with Beijing. In particular, the cross-country variation driving our estimates is measured on countries where recognition of Taiwan is contested or subject to change. The IV coefficient should therefore be interpreted not as the broad average effect of Chinese aid across all recipients, but as a local average treatment effect capturing how US aid responds to Chinese financing where diplomatic alignment with Beijing is politically consequential.

Moreover, we show that the US response to Chinese aid is stronger in countries where US commercial, political, or security interests are stronger, and intensifying in periods of heightened US–China political disagreement following the rise of Xi Jinping. These patterns are difficult to reconcile with comovement driven by overlapping interests in promoting economic development in recipient countries and regional stability, and are instead consistent with US efforts to counter China’s growing influence through aid allocation.⁴ A simple theoretical framework, presented in the Online Appendix, captures this type of strategic interaction between competing donors and helps rationalize our findings.

⁴If similarity in aid allocations were driven solely by recipient-country shocks, we would not expect it to be systematically stronger precisely where US political or security interests are greatest, nor to intensify during periods of heightened US–China disagreement.

2 Related Literature

Our paper sits at the intersection of three strands of research: the political-economy determinants of foreign aid; the strategic interaction among donors, including substitution, coordination, and competition; the rise of China as a major development financier, and the responses of traditional donors.

The stated purpose of foreign aid is to accelerate economic growth in developing countries (Rosenstein-Rodan, 1961), and decades of debate continue about whether aid achieves this objective and decades of debate continue about whether aid achieves this objective (Bauer, 1976; Burnside and Dollar, 2000; Easterly, 2003; Easterly et al., 2004; Easterly, 2009). Despite the controversy, OECD donors continue to allocate significant resources to aid budgets. In 2023, this totaled a record USD 223.7 billion in official development assistance, roughly 0.37% of donors' gross national income. Yet aid allocation is shaped not only by developmental concerns, but also by strategic and political considerations. A large literature shows that donors use aid to pursue political concessions, secure alliances, and reward strategically aligned recipients (Morgenthau, 1962; McKinlay and Little, 1977; Thacker, 1999; Alesina and Dollar, 2000; Calomiris, 2000; Lebovic, 2005; Whang et al., 2019). Colonial ties (Alesina and Dollar, 2000), bilateral trade and export interests (Berthélemy et al., 2006; Dreher et al., 2015), recipient institutions and corruption (Boone, 1996; Alesina and Weder, 2002; Svensson, 1999), and human-rights performance (O'Donnell, 2007) all shape bilateral aid allocation patterns. Strategic considerations also influence multilateral lending decisions (Lang and Presbitero, 2018; Aiyar et al., 2024). Related literature examines whether aid, in turn, changes recipient institutions, with mixed evidence on democratization (Bermeo, 2011; Knack, 2004; Kersting and Kilby, 2014).

A distinct theoretical literature studies donor interaction. In the seminal contribution, Dudley and Montmarquette (1976) model donors that derive benefits from the political concessions extracted from a recipient. Because each donor's return is decreasing in the presence of others, donors have an incentive to specialize and avoid head-to-head competition. Mascarenhas and Sandler (2006) take this logic to the data, testing Nash–Cournot behavior against cooperative behavior for fifteen major donors over 1970–2001. They find no evidence of cooperation among major donors and conclude that aid is better described as a non-cooperative allocation in which donors treat each other's contributions either as substitutes or, for some donors, as complements. Annen and Moers (2017) extend this framework by showing that fragmented aid can arise as an inefficient equilibrium when donors aim to maximize the relative impact of their own programs. Steinwand (2015) provides an explicit "compete or coordinate" framework, deriving conditions under which donors converge on the same set of recipients (competition) or split them up through implicit lead-donorship arrangements (coordination); the model's predictions hinge on whether aid functions as a private or public good and on the salience of political returns.

Our theoretical appendix offers a complementary two-leader formalization in which competition arises endogenously as the equilibrium of a contest for influence over a subordinated country.

The empirical aid-allocation literature has progressively moved away from treating each donor in isolation. [Frot and Santiso \(2011\)](#) apply herding indices borrowed from financial economics and detect significant herding among bilateral DAC donors, comparable in magnitude to that observed in financial markets, though absent among multilateral agencies. [Davies and Klasen \(2019\)](#) study how bilateral flows from one donor depend on flows from all other bilateral and multilateral donors. They find that aid flows are significantly correlated across donors a phenomenon they label as herding. This leads the so-called darling recipient countries to receive more aid, especially from large donors, while other recipient countries, called orphans, receive little attention. This pattern is echoed in the cooperation index of [Fuchs et al. \(2015\)](#), which we exploit in our descriptive evidence. [Barthel et al. \(2014\)](#) further explore empirically strategic interactions among donors and find that donors competing in export goods or services in a recipient country do compete in aid spending on economic infrastructure and production projects, while no such pattern is detected for aid targeted at social projects.⁵

A growing literature examines how the expansion of Chinese development finance has reshaped the strategic landscape. A first set of papers examines the response of multilateral development banks, which are often described as conduits for Western influence ([Kilby, 2009](#)). [Hernandez \(2017\)](#) shows that the World Bank attaches significantly fewer conditions to its loans in African countries that also receive Chinese funding, a pattern consistent with the Bank loosening its terms to remain competitive against a less-conditional financier. [Humphrey and Michaelowa \(2019\)](#) document that both the World Bank and, more strongly, the African Development Bank commit more infrastructure finance in countries favored by China, while bilateral OECD donors do not exhibit the same reaction. [Zeitzi \(2021\)](#) finds that the World Bank shifts a larger share of its portfolio toward infrastructure-intensive sectors when recipients receive more Chinese development finance, interpreting this as "emulation" rather than differentiation. [Watkins \(2022\)](#) studies the recipient side and shows that Chinese assistance reduces compliance with World Bank project conditions in Sub-Saharan Africa, weakening the leverage of traditional financiers. A second set of papers focuses on bilateral donor responses to Chinese finance. [Kilama \(2016\)](#) provides early evidence of competition between traditional OECD donors and China in Africa. [Asmus-Bluhm et al. \(2025\)](#) construct a geocoded dataset of Indian Exim Bank projects and show, at the sub-national level, that India is significantly more likely to locate a project in a province where China financed a project in the previous year, with the effect strongest where India is more popular relative to China and where the two donors have a similar export structure. Closely related to

⁵A different pattern is observed in the context of sovereign loans, where Western countries tend to lend to allies rather than compete with China for debtors (see [Bunte and Kinne \(2025\)](#)).

our study, R othel (2025) uses a dataset of geocoded aid projects for 157 countries over 2000–2020 and studies the responses of four major Western countries to the increase of China’s aid. R othel (2025) finds that Western aid is significantly more likely to be allocated to regions where China has previously operated, that the response is concentrated in Sub-Saharan Africa, and that the United States and Germany are the most responsive Western donors. We differentiate from R othel (2025) by focusing on the political and military interests that drive aid competition between the US and China. Second, our IV strategy follows a Bartik-style design in which recipient countries’ recognition of Taiwan serves as the exposure component, while exogenous variation in China’s overproduction of industrial inputs provides the shock component. Recognition of Taiwan constitutes a core foreign-policy issue for China and a central determinant of its diplomatic relations with recipient countries. Finally, in line with this choice, we further differentiate from R othel (2025) by studying the US aid response across four strategic dimensions simultaneously: US–China political disagreement (and its evolution before and after Xi Jinping’s rise), bilateral trade exposure, US military presence, and the recipient’s own political distance from the United States.

3 Empirical Analysis

3.1 International Aid

Data on China state aid come from Custer et al. (2023). The dataset covers 20,985 projects in 165 low- and middle-income countries, funded by loans and grants from Chinese official institutions. It spans 22 commitment years (2000–2021) and includes a wide range of sectors as well as both financial and in-kind transfers. The dataset is consistent with the OECD definition of official financial flows, encompassing both Official Development Assistance (ODA) and Other Official Flows (OOF).⁶ Each project is further categorized into one of five intent-based classifications: Development, Commercial, Representational, Mixed, or Military.⁷

From the original dataset, to better align with the data on US aid, we retain only projects with a

⁶Projects are classified as ODA if they satisfy three criteria: (i) their primary objective is to promote economic development and welfare in the recipient country; (ii) they are implemented in a country eligible for ODA based on its income level; and (iii) the official commitment is concessional, including grants, technical assistance, or loans with a grant element. Projects receiving official support that do not satisfy all three criteria are classified as OOF. When insufficient information prevents reliable classification as ODA or OOF, projects are coded as "Vague".

⁷"Development" projects primarily aim to promote economic development and welfare in the recipient country. "Commercial" projects aim to advance China’s commercial interests, for example, by supporting exports of Chinese goods and services. "Representational" projects are those that primarily seek to promote a bilateral relationship with another country or promote the language, culture, or values of the country from which the financial transfer originated. "Mixed" projects pursue multiple objectives and cannot be clearly identified as development-, commercial-, or representational-oriented. "Military" projects aim to advance China’s security interests or strengthen the military presence in the recipient country.

development objective, which account for approximately 77% of the total. Moreover, we exclude the COVID-19 years from the sample. This leaves us with around 16,000 projects, of which almost 90% are classified as ODA. In our baseline specification, we consider all types of aid. As a robustness check, we focus only on aid classified as ODA, which consists of more concessional forms of financing.

Data on US international aid are sourced from the OECD’s Creditor Reporting System. We consider projects and activities over the 20-year period from 2000 to 2019. The dataset includes around 26,000 projects, more than 99% of which are classified as ODA.

Aid activities by both China and the United States can be summarized through a series of figures and maps. Figure 1 provides an overview of Chinese international aid. Panel 1a reports the amount of aid committed by China in USD (on a logarithmic scale) across world regions during the sample period. Africa and Asia receive the largest share of Chinese aid commitments. Panel 1b displays total Chinese aid over time (also on a logarithmic scale). On average, Chinese aid commitments grew by approximately 11% per year during the sample period.

[Figure 1 here]

Aid activities for the US present a similar picture (Figure 2). Asia and Africa are the regions where most of the funds are allocated. However, the amount of USD committed by the US exhibits a much modest growth rate compared to China (5% yearly average).

[Figure 2 here]

We use the donor coordination index proposed by Fuchs et al. (2015) to illustrate the similarities between US and Chinese aid allocation strategies. For each recipient–year pair, the index measures the similarity between the share of total annual aid allocated by the United States to a recipient country and the corresponding share allocated by China. The index ranges from zero to one. It takes the value of zero when at least one of the two donors does not provide aid to the recipient country in a given year, and a value of one when both donors allocate the same share of their total annual aid to that recipient country. Figure 3 reports the annual average level of aid coordination between the United States and China over the sample period. The pronounced upward trend indicates that the aid allocation patterns of the two donors have become increasingly similar over time.

[Figure 3 here]

Examining the evolution of the index across recipient countries further reveals that this growing similarity is driven primarily by countries in South America and Africa. As shown in Figure 4, the

overlap in the geographic distribution of Chinese and US aid expanded most markedly in these regions between 2001 and 2019.

[Figure 4 here]

3.2 Instrumental Variable

To assess the US response to Chinese aid, we estimate the following model:

$$\log(1 + \text{US aid})_{it} = \alpha + \beta \log(1 + \text{China Aid})_{it} + \gamma' X_{it} + \mu_i + \lambda_t + u_{i,t}. \quad (3.1)$$

where US aid_{it} and China Aid_{it} denote, respectively, the amount of aid committed by the United States and China to the recipient country i in year t , and $X_{i,t}$ is a vector of control variables. We include a standard set of covariates commonly used in the aid-allocation literature. First, we control the real GDP per capita of the recipient and its squared term to capture the documented non-linear relationship - between income and aid, as donors tend to focus resources on countries at intermediate income levels (Alesina and Dollar, 2000). Second, we account for the quality of domestic institutions using the World Bank’s Worldwide Governance Indicators, since institutional quality is widely believed to shape both the allocation and the effectiveness of aid (Burnside and Dollar, 2000). Finally, we control for natural disasters, measured by the number of deaths caused by such events. All control variables are averaged over the three years preceding the aid commitment, ensuring that they are predetermined with respect to the donor’s annual allocation decision.

Table 1 reports the baseline OLS panel estimates of the elasticity of US aid allocation on Chinese aid and the set of controls, with and without country and year fixed effects. Without fixed effects (columns 1–2), Chinese aid and US aid are positively and significantly correlated. However, once we control for country and year fixed effects (columns 3–4), the coefficient on Chinese aid becomes small and statistically insignificant, suggesting that the correlation between US and Chinese aid is driven by time-invariant country characteristics and common shocks. Moreover, as Chinese aid is likely to respond endogenously to similar recipient needs and strategic considerations as US aid, the OLS estimates are likely to be biased. This reinforces the case for an identification strategy based on exogenous variation in Chinese aid, which we pursue using an instrumental variable approach. We instrument Chinese financing to a recipient country with a composite variable consisting of two components. The first captures the overall supply of Chinese funds in a given year, while the second captures the political alignment between the recipient country and Beijing. In the next two sections, we describe the two components of our instrumental variable in detail.

[Table 1 here]

3.2.1 Chinese Overproduction

The Chinese government regards domestic inputs such as steel and aluminum as strategic commodities and thus manufactures these materials at levels significantly exceeding domestic consumption. International aid campaigns therefore represent an outlet for this excess production. Thus, there should be a positive correlation between Chinese overproduction and Beijing’s willingness to initiate overseas projects (Dreher et al., 2021).

This reasoning applies broadly to all sectors, since most projects in various domains involve physical construction and depend heavily on imported Chinese construction materials (Bluhm et al., 2025; Dreher et al., 2021). Therefore, China’s excess production of raw materials is likely a key factor that influences the general level of official Chinese funding. We obtain data on the Chinese production of five raw materials—aluminum, cement, glass, iron, and steel—from the China National Bureau of Statistics. Following the approach of Dreher et al. (2021), we extract the principal component of the cyclical fluctuations within these series.⁸ Henceforth, we refer to this variable as *Chinese Overproduction*. Figure 5 (panel 5a) displays, for each year, the Chinese Overproduction and China’s total annual commitment (in log) in state aid.

[Figure 5 here]

3.2.2 Relationship with Taiwan

Guided by its *One China* principle, the Chinese government opposes Taiwan developing diplomatic relations with other countries, or any relations of a state-to-state nature, and opposes Taiwan participating in the United Nations system and other intergovernmental international organizations (Rich, 2009). Consistent with this view, Fuchs and Klann (2013) document that China uses trade to reward or punish countries according to their positions on highly relevant political issues. In this perspective, the fact that a recipient country does not have a diplomatic relationship with Taiwan can be interpreted as support for the *One China* principle. Therefore, Beijing should allocate more aid to recipient countries that do not recognize Taiwan (Dreher et al., 2021).

We source data on the political recognition of Taiwan from the Ministry of Foreign Affairs of Taiwan. For each country-year observation, we create a dummy variable that takes the value of 1 if the country recognizes the government of Taiwan in that year, and 0 otherwise. We then consider the fraction of years over our sample period during which the receiving country recognizes the government

⁸We extrapolate the cyclical component by applying the Hodrick-Prescott filter to the series.

of Taiwan. In this way, we obtain a variable that captures the intensity over the sample period of the diplomatic relations between the recipient country and Taiwan. In the rest of the paper, we will refer to this variable as *Relationship with Taiwan*.

Figure 6 plots the average commitment of China to state aid (on logarithmic scale) for the different observed values of the probability of recognizing Taiwan in our sample. The decreasing relationship suggests that the longer a recipient country maintains diplomatic relations with Taiwan, the smaller the amount of aid it receives from China.

[Figure 6 here]

Our instrument would violate the exclusion restriction if countries with different intensities of diplomatic relations with Taiwan experienced differential changes in US aid for reasons unrelated to Chinese aid. To mitigate this concern, we implement two tests. First, we estimate a specification in which US aid is regressed on the interaction between $1 - \textit{Relationship with Taiwan}$, the full set of controls used in Table 1, and year dummies, including country fixed effects and clustering of standard errors at the country level (with 2013 as the omitted year). Figure 7 plots the estimated coefficients on the interaction terms over time. The coefficients are essentially flat and close to zero, indicating no systematic trends in US aid across countries with different intensities of diplomatic relations with Taiwan, either before or after Chinese aid became a major factor.

[Figure 7 here]

As a second test, we ask how Chinese and US aid evolve around the moment of diplomatic realignment, that is, when a country changes its recognition status vis-à-vis Taiwan. If shifts in Taiwan recognition were systematically associated with discrete changes in US aid independently of Chinese financing, then our alignment component would have a direct effect on US aid and the exclusion restriction would be violated. By tracing the dynamics of Chinese and US commitments around recognition switches, we can assess whether diplomatic realignments primarily operate through their impact on Chinese aid, as required for the soundness of our IV strategy, or whether they also coincide with independent shifts in US aid.

In our sample, 15 countries switch recognition and they do exactly once. Fourteen of them cease to recognize Taiwan, while one country (St. Lucia) moves from non-recognition to recognition. In Section A.1 of the empirical Appendix, we document the characteristics of these countries and the timing of their recognition switches. Figure 8 compares the evolution of Chinese and US financing around recognition switches, considering the 14 countries that exit from Taiwan recognition.⁹ While

⁹Results, available upon request, are essentially unchanged when we drop St. Lucia from the analysis.

purely descriptive, the figure shows that Chinese aid for switchers tends to rise in the years leading up to the recognition change and stabilizes thereafter, whereas US financing displays an essentially flat path over the same time window.

[Figure 8 here]

3.3 IV Regression

In accordance with the discussion in the previous section, the following model represents the first stage of our instrumental variable estimation.

$$\begin{aligned} \log(1 + \text{China Aid}_{i,t}) = & \beta \times \text{Chinese Overproduction}_{t-1} \times (1 - \text{Relationship with Taiwan}_i) + \\ & + X_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t} \end{aligned} \quad (3.2)$$

Where: (i) Chinese Overproduction_{*t*-1} is the excess production of raw materials calculated as described in Section 3.2.1, and (ii) Relationship with Taiwan_{*i*} is the intensity over the sample period of the diplomatic relations between the recipient country *i* and Taiwan calculated as described in Section 3.2.2.

As discussed in Section 3.2, Chinese Overproduction is positively correlated with Chinese supply of aid. Instead, the Relationship with Taiwan is negatively correlated with Chinese financing. Therefore, we expect a positive value for β . Table 2 shows the estimates for the first and second stages of our IV regression. As expected, the instrument we adopt is strongly positively associated with Chinese financing. When we instrument for Chinese financing, a positive, statistically significant relationship with US aid commitments emerges: a 1% increase in Chinese aid to a given country results in around 0.3% increase in US aid to the same country.

[Table 2 here]

For completeness, Table A1 in the appendix reports reduced-form regressions of US aid directly on our instrument. The instrument is positively and significantly associated with US aid, consistent with the IV estimates in Table 2.

4 Discussion

An important feature of our identification strategy is that countries with different political alignment with Taiwan have different exposure to Chinese overproduction shocks. Countries that change their

recognition status during the sample period play an important role, as they generate intermediate values of our Taiwan-recognition measure and correspond to settings where diplomatic alignment with Beijing is politically contested. This has two implications. First, it reinforces the interpretation of our instrument as capturing a politically significant margin of Chinese engagement. That is, Chinese aid is particularly responsive to Chinese overproduction shocks in countries where diplomatic alignment with Beijing is at stake. Second, it implies that the local average treatment effect identified by our IV pertains to environments in which geopolitical alignments are salient and potentially malleable.

Motivated by this interpretation, we next examine whether the US response to Chinese aid is systematically stronger precisely where broader US strategic stakes are higher along political, economic, and security dimensions. In particular, we study how the comovement identified varies with Sino-US political disagreement, bilateral trade exposure, US military presence, and the recipient's political distance from the United States, as one would expect under a competition-for-influence view of aid (Fuchs et al., 2015; Steinwand, 2015).

We focus on four dimensions. First, we examine how the US response depends on the degree of political disagreement between Washington and Beijing, measured by the coincidence of the votes that US and China cast at the UN. If aid is used as a foreign-policy tool, one would expect the US reaction to Chinese financing to be stronger when the bilateral relationship is more adversarial. Second, we study heterogeneity by the intensity of a recipient's trade relations with the United States. Greater trade integration increases the potential costs of political realignment for the recipient, and thus the value for the US of maintaining influence. Third, we consider the US military presence in the recipient country as a proxy for its national-security relevance. Countries hosting a larger share of US troops are more central to security interests, so we would expect US aid to react more strongly to Chinese engagement there. Finally, we investigate whether the US response to Chinese aid varies with the political alignment between the recipient country and the United States. If aid allocation reflects foreign-policy considerations, one might expect the US reaction to Chinese financing to depend on how close the recipient's broader diplomatic orientation is to Washington.

To estimate heterogeneous effects, we adopt a control-function approach in the spirit of Wooldridge (2015). In the first stage, we regress the Chinese aid on the instrument and all covariates and obtain the residuals. In the second stage, we regress US aid on Chinese aid, the heterogeneity variable and its interaction with Chinese aid and first stage covariates and residuals. If the exclusion restriction holds, this procedure provides consistent estimates of the interaction effect in the presence of an endogenous regressor. Compared to a 2SLS that instruments both Chinese aid and the interaction by using the instrument interacted with the heterogeneity variable, the control-function approach is often more efficient and treats the interaction as structurally related to Chinese financing rather than as a

separate endogenous regressor (Wooldridge, 2015; Dreher et al., 2021).

4.1 Sino–US Political Tensions

Since 1949, the United States and China have experienced periods of both tension and cooperation.

After Mao Zedong’s Communist Party victory in 1949, the US perception of the *loss of China* reduced the scope for diplomatic engagement between the two countries (Zedong, 1969; Crean, 2023; Li, 2024). From 1949 to 1970, Sino–US relations remained consistently hostile and were marked by frequent propaganda attacks on both sides.

Following the Nixon administration, diplomatic and economic relations between the two countries steadily improved over the next two decades. On 1 January 1979, the United States transferred diplomatic recognition from Taipei to Beijing, and Deng Xiaoping’s January 1979 visit to Washington initiated a series of important exchanges that continued until the spring of 1989 (Vogel, 2013).

Tensions rose following the events of Tiananmen Square. In response to China’s human rights violations, the US imposed various economic sanctions on China (Lampton, 2024). Relations between the two countries began to improve again under the Clinton administration, which visited the PRC in June 1998 (Barilleaux and Kim, 1999).

Since 2000, i.e., during our sample period, Sino–US relations have been marked by two key developments. During the Global Financial Crisis, the Chinese leadership began to view the United States as in decline and publicly discussed China’s rise as a world power (Economy, 2014).

Several years later, in November 2012, Xi Jinping became General Secretary of the Chinese Communist Party. He launched a series of reforms to reorganize the Party and increase China’s international influence (Economy, 2018; Mingjiang, 2008). Domestically, he broke with the communist tradition of collective leadership and advanced economic reforms to strengthen the role of the market. Internationally, he promoted the Belt and Road Initiative, officially launched in September 2013, which aimed to deepen China’s connectivity with more than 150 countries through large-scale infrastructure investments, as well as expanded trade and financial cooperation (Fallon, 2015).

[Figure 9 here]

A large body of literature infers political affinity from UN voting patterns. Following this strand, we represent the history of the Sino–US political relationship using the alignment index and database provided by Fjelstul et al. (2025). In a nutshell, for each year, the index measures the share of resolutions in the United Nations General Assembly on which China and the United States cast the same vote. Lower values are interpreted as years of increased political disagreement between Beijing

and Washington. In our analysis, we focus on resolutions designated as *important* for the interests of the United States, that is, resolutions on which the US State Department reports having lobbied other countries, as documented in the annual report *Voting Practices in the United Nations* submitted to Congress since 1983. These resolutions are precisely those where substantive political and strategic interests are at stake. Therefore, we regard alignment on important votes as a more meaningful indicator of underlying diplomatic relations.¹⁰

Figure 9 plots the voting similarity between US and China. Focusing on Panel 9b, representing our sample period, two distinct periods emerge. In the early years, the rapprochement process that began under the second Clinton administration appears to have continued. Subsequently, however, China and the US embarked on a path of political divergence. The turning point appears to have occurred after the election of Xi Jinping as General Secretary of the Chinese Communist Party (November 2012).

[Figure 10 here]

If foreign aid is used as a foreign-policy tool, one would expect the US response to Chinese aid in a given recipient country to be stronger in years of heightened political disagreement between the United States and China. In Table 3, we investigate this idea by interacting Chinese aid with the UN voting coincidence between the United States and China.

[Table 3 here]

We start by interacting Chinese aid with the US–China voting coincidence, smoothed using a three-year moving average. The interaction term is positive and statistically insignificant (column 2 of Table 3). On its own, this pattern does not support the view that US aid responds more strongly to Chinese aid when political disagreement is higher. However, Figure 10 shows that US–China political relations in our sample period can be divided into two distinct phases: an initial period of relative rapprochement, followed by a phase of increasing political divergence after the rise of Xi Jinping to power. If aid is used as a competitive foreign policy tool, one would expect political disagreement to matter primarily in the latter phase.

Motivated by this evidence, in columns 3 and 4 we estimate a triple interaction between Chinese aid, voting coincidence, and a dummy equal to one for years after Xi Jinping’s election as General Secretary of the Chinese Communist Party. The coefficient of the triple interaction is negative and statistically significant, indicating that, after Xi’s rise, the US response to Chinese aid becomes stronger as the political disagreement between the two countries increases.

¹⁰The US State Department’s *Voting Practices* report for 2024 defines important resolutions as resolutions “that directly affected important United States interests”.

We view these results as suggestive rather than definitive: political tensions alone do not appear to amplify the US response to Chinese aid in the early 2000s. Instead, the sensitivity of US aid to Chinese financing becomes closely tied to US–China political disagreement only in the post-Xi period, when the bilateral relationship turns more adversarial and China’s overseas lending expands markedly. We regard this pattern as consistent with a competitive use of aid, concentrated in years of increased geopolitical rivalry.

4.2 US Trade and Aid

We next examine whether the US response to Chinese aid is stronger in countries that are more commercially integrated with the United States. Bilateral trade is a natural proxy for the state of economic relations between aid recipients and the US economy. US exports to the recipient country capture its importance as a destination market for US firms, while US imports from the recipient reflect its role as a supplier of goods—often commodities or basic inputs—to the United States.

[Figure 11 here]

Consistent with the existing literature (Berthélemy et al., 2006), our data suggest a positive relationship between trade and aid (Figure 11). If aid is used, in part, to protect commercial interests and market access for domestic firms, one would expect the US reaction to Chinese financing to be stronger where US exports are larger. Table 4 tests this prediction. Estimates indicate that US aid responds more strongly to Chinese financing in countries that are important export markets for the United States.

[Table 4 here]

4.3 US Military Presence

National security has long been a central consideration in US foreign assistance, from the Marshall Plan’s role in containing Soviet influence in postwar Europe (Hogan, 1987) to post-9/11 security partnerships such as aid to Pakistan and the large civil-military packages for Afghanistan and Iraq. In this section, we study whether the US response to Chinese aid is stronger in countries that are more salient for US national-security interests.

We measure US national-security interests in a recipient country by the share of US troops deployed in the country overttotal troops located in the sub-region. Using data on US troop deployments from Kane (2024) and the UN sub-region geoscheme, for each year we first compute the total number of US troops in each sub-region and then, for each recipient, its share of the regional total. This normalization

controls for aggregate changes in regional military engagement (e.g., overall escalation or drawdown) and captures how much of the US military presence in a region is concentrated on a given country. It is also consistent with the idea that the United States may project force and monitor developments in one country by stationing troops in neighboring countries within the same sub-region.

Figure 12 shows the distribution of US aid across deciles of US military presence in recipient countries. The figure clearly shows a marked difference between the amount of aid the United States distributes to countries in the top decile of military presence and the rest of the distribution.

[Figure 12 here]

In Table 5, we test the interaction between Chinese aid and the terciles of the US military presence in a recipient country. To capture countries with particularly high US military relevance, we construct a dummy variable equal to one for recipients in the top two deciles (9th and 10th) of the distribution of US military presence. Grouping the 9th and 10th deciles allows us to focus on the upper tail of the distribution, where US military attention is most concentrated, while retaining sufficient observations for estimation. The table shows that the interaction between Chinese aid and the high-presence dummy (countries in the 9th–10th deciles of US military presence) is positive and statistically significant. This indicates that the US response to Chinese financing is particularly strong in countries that absorb a large share of US troops in their sub-region, which is consistent with the idea that US aid reacts more aggressively to Chinese aid where US security interests are most at stake.

[Table 5 here]

4.4 Political Distance From the United States

We next examine whether the US response to Chinese aid depends on the political alignment between the recipient country and the United States.

As in Section 4.1, we measure the political affinity between the US and the recipient country using the voting coincidence sourced from Fjelstul et al. (2025). To reduce noise in voting behavior, we smooth the series by taking a three-year moving average.

[Table 6 here]

Table 6 shows that the interaction between Chinese aid and voting coincidence is positive and statistically significant. That is, the US response to Chinese financing is strongest in countries that are politically closer to Washington and becomes weaker as recipients move further away in terms of UN voting behavior. This pattern suggests that US aid is used more aggressively to reinforce or defend existing political alignments vis-à-vis China.

5 Robustness

In this section, we present a series of robustness checks to validate our main results.

5.1 Additional Controls

Our baseline results remain robust when we add covariates that the literature identifies as key determinants of aid. In Table 7, we include a dummy equal to 1 for country-year observations in which the recipient country is under an IMF arrangement. This control is motivated by evidence that multilateral organizations such as the IMF allocate resources partly in line with the political interests of their main shareholders (Thacker, 1999; Calomiris, 2000; Aiyar et al., 2024). Since the US is a principal player in the IMF, strategic interaction between Beijing and Washington could also operate through IMF lending programs. We also include the UN voting coincidence measures between the recipient country and the two donors, constructed as the described above.

[Table 7 here]

5.2 Alternative Instrument

A potential concern regarding our instrument is that the time variation of the Taiwan’s recognition correlates with the provision of the China Aid. To break this correlation, in Table 8, we modify the instrument we adopt in our baseline. That is, instead of consider the fraction of years over our sample period during which the receiving country recognizes the government of Taiwan, we compute this fraction over the period 1995–2005. Moreover, we drop from our sample the first 5 years. Table 8 shows the results.

[Table 8 here]

A related concern is that our alignment proxy based on the share of years recognizing Taiwan might pick up only a small number of diplomatic switches and thus rely on limited variation. To address this, we construct an alternative measure of political alignment: for each recipient, we compute the maximum number of consecutive years in which the country recognizes Taiwan over our sample period. Higher values of this variable indicate a more persistent diplomatic link with Taipei and, therefore, a weaker and less stable alignment with Beijing. We then replace $(1 - \text{Relationship with Taiwan})$ in the instrument with this alternative alignment measure. Table 9 reports the corresponding IV estimates. The first-stage coefficient on the interaction between Chinese Overproduction and the maximum consecutive years of Taiwan recognition remains strong and statistically significant, and

the second-stage elasticity of US aid with respect to Chinese aid is very similar in magnitude to our baseline. This robustness exercise reinforces our interpretation of the instrument as capturing the interaction between Chinese supply shocks and long-run political alignment, rather than relying on a handful of recognition switches.

[Table 9 here]

Another possible concern is that our baseline Chinese production index may still capture global demand and price cycles. If so, our instrument may partly capture global demand or price shocks rather than China-specific supply conditions, and such shocks could in principle affect US aid allocation directly, violating the exclusion restriction. To visualize this correlation, Figure 13 plots Chinese Overproduction alongside the global all-commodity price index, available from the IMF website. To address this issue, we construct an alternative instrument in which we first regress our Chinese production index on the growth rate of world industrial production (Baumeister and Hamilton, 2019) and on the growth rate of the IMF industrial input price index, and take the residuals as a purged production shock. We then interact this residual series, lagged by one year, with $1 - \textit{Relationship with Taiwan}$ to obtain a purged instrument. The first-stage and second-stage results are very similar to our baseline estimates: the purged instrument remains strongly correlated with Chinese aid, and the estimated effect of Chinese aid on US aid is virtually unchanged in magnitude and significance. This suggests that our main findings are not driven by global demand or commodity-price cycles, but rather by China-specific capacity shocks. Table 10 reports the results.

[Figure 13 here]

[Table 10 here]

5.3 ODA Aid

As we discussed above, in our dataset the vast majority of US projects are categorized as ODA. Instead, around 77% of Chinese projects fall in this category. However, the positive association between US and Chinese aid allocation is still present also when we only consider Chinese financing that can be categorized as ODA (Table 11).

[Table 11 here]

5.4 Timing of the US Response

Our baseline regressions relate Chinese and US aid in the same calendar year, in line with most of the existing literature on donor competition, which typically works with annual commitment data and year fixed effects. However, aid decisions involve information and procedural lags, so a purely contemporaneous causal interpretation may be too strong. To allow for delayed responses, we construct three-year moving averages of Chinese aid. We retain the same IV structure, interacting Chinese overproduction with our Taiwan-recognition measure, and average the shock and exposure components over the corresponding windows. Table 12 shows that the IV elasticity of US aid with respect to Chinese aid remains positive and statistically significant. This pattern suggests that US aid responds to Chinese engagement over a multi-year horizon, consistent with a causal mechanism that allows for observation, internal deliberation, and budgetary procedures.

[Table 12 here]

6 Conclusion

This paper studies whether the rise of China as a major aid donor has altered the way the United States allocates its own foreign aid. Using project-level data from the OECD Creditor Reporting System and AidData’s Global Chinese Development Finance Dataset for 2000–2019, we document a positive association between Chinese and US aid commitments at the country–year level. To address endogeneity in Chinese aid, we exploit an instrumental-variables strategy that combines Chinese overproduction of key industrial inputs with the recipient’s long-run probability of recognizing Taiwan, and we show that our main results are robust to purging overproduction of global commodity-price dynamics and to pre-dating Taiwan recognition.

Across specifications, we find that a 1 percent increase in Chinese aid to a recipient country is associated with roughly a one-third percent increase in US aid. We then explore how this response varies across geopolitical and economic environments. The US reaction to Chinese financing is stronger in countries that are closer to the United States in UN voting, more important as export markets, and host a disproportionately large share of US troops in their sub-region. By contrast, we find weaker or no systematic evidence of a stronger response in countries that are politically distant from the United States, primarily serve as suppliers, or have limited US military presence.

Taken together, these patterns are consistent with a view of foreign aid as one instrument in a broader contest for influence, in which the United States adjusts its aid in response to Chinese engagement, particularly where its own political, commercial, and security stakes are highest. At the

same time, our evidence is inherently reduced-form and cannot fully rule out alternative mechanisms such as common shocks or coordination in the provision of international public goods. We view our results as documenting a robust empirical regularity—systematic comovement between US and Chinese aid that is amplified along strategic dimensions—and as a starting point for future work on the consequences of this competition for recipient countries’ development trajectories and political choices.

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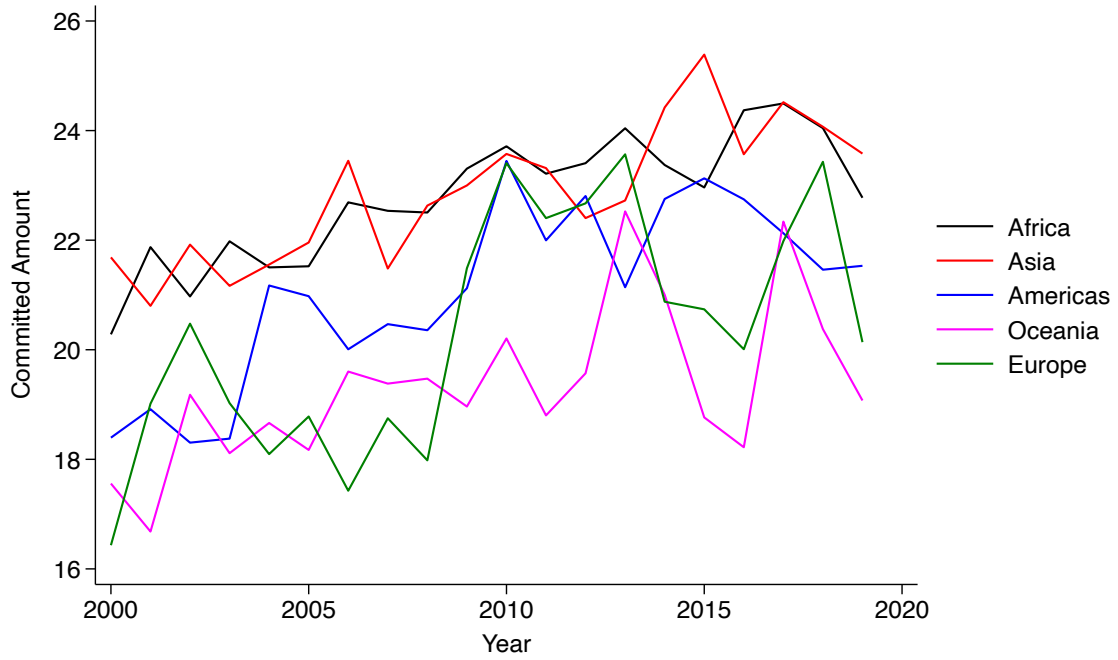
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7 Figures

Figure 1: Chinese International Aid

(a) Committed amount of dollars (log) per year and by region



(b) Committed amount of dollars (log) per year

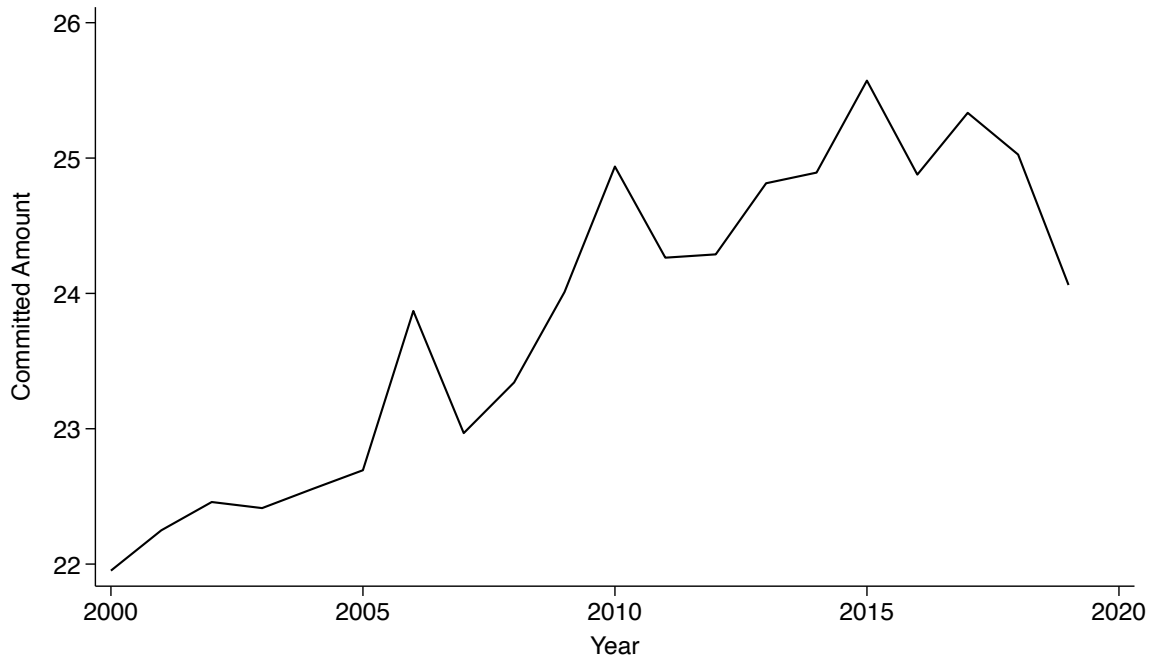
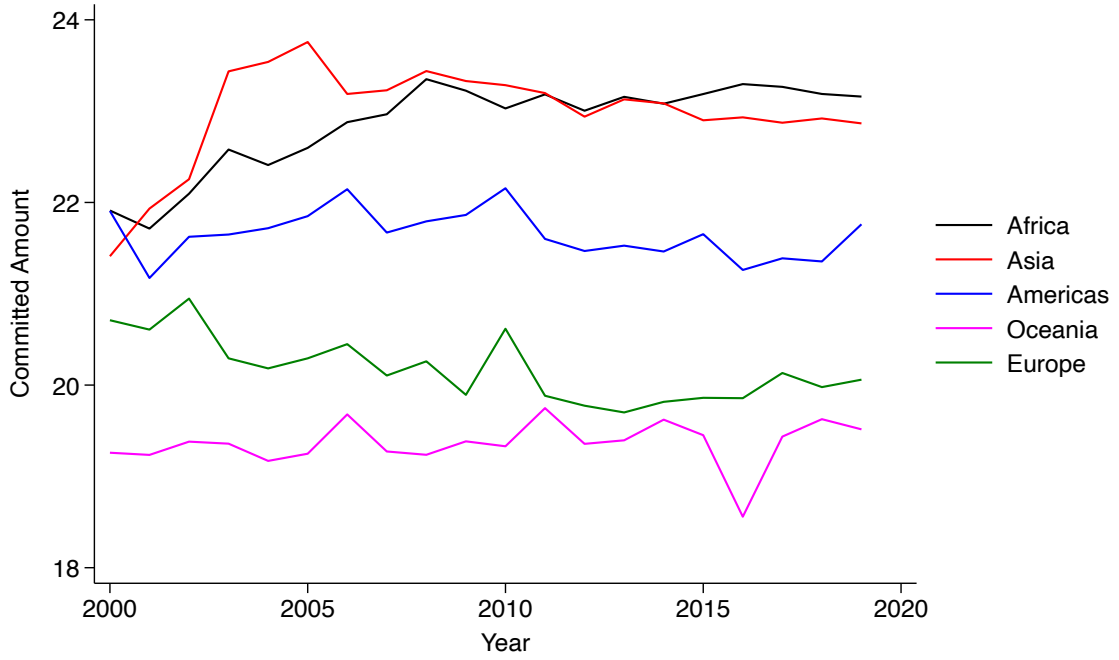


Figure 2: US International Aid

(a) Committed Amount of Dollars (log) per Year and by Region



(b) Total Committed Amount of Dollars (log) per Year

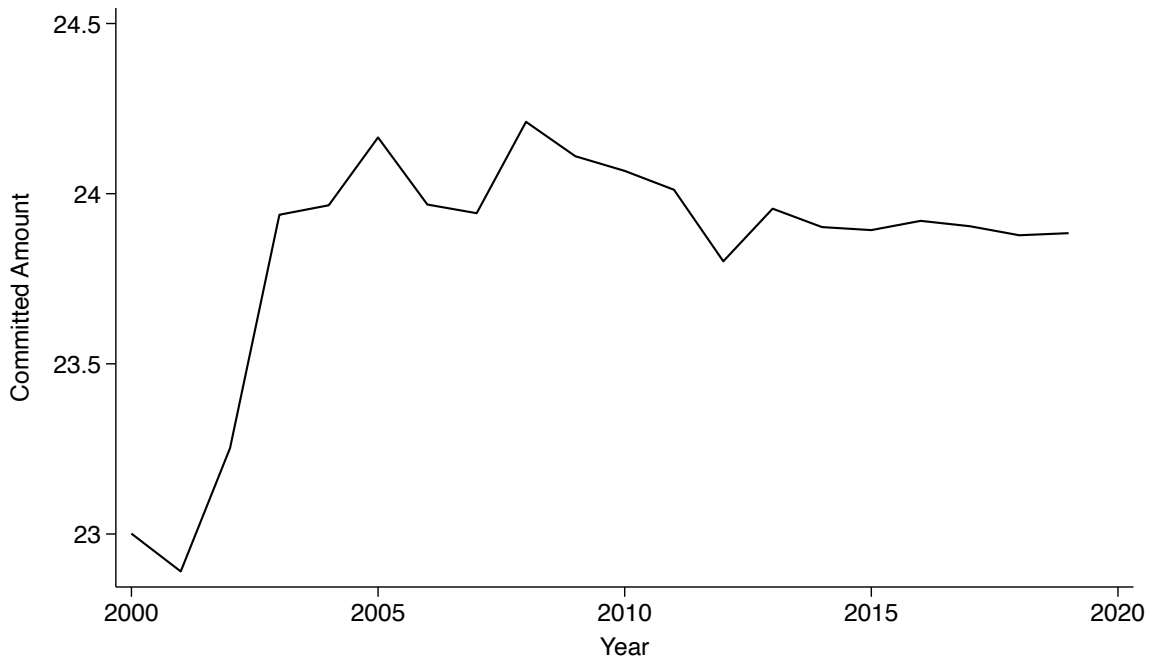
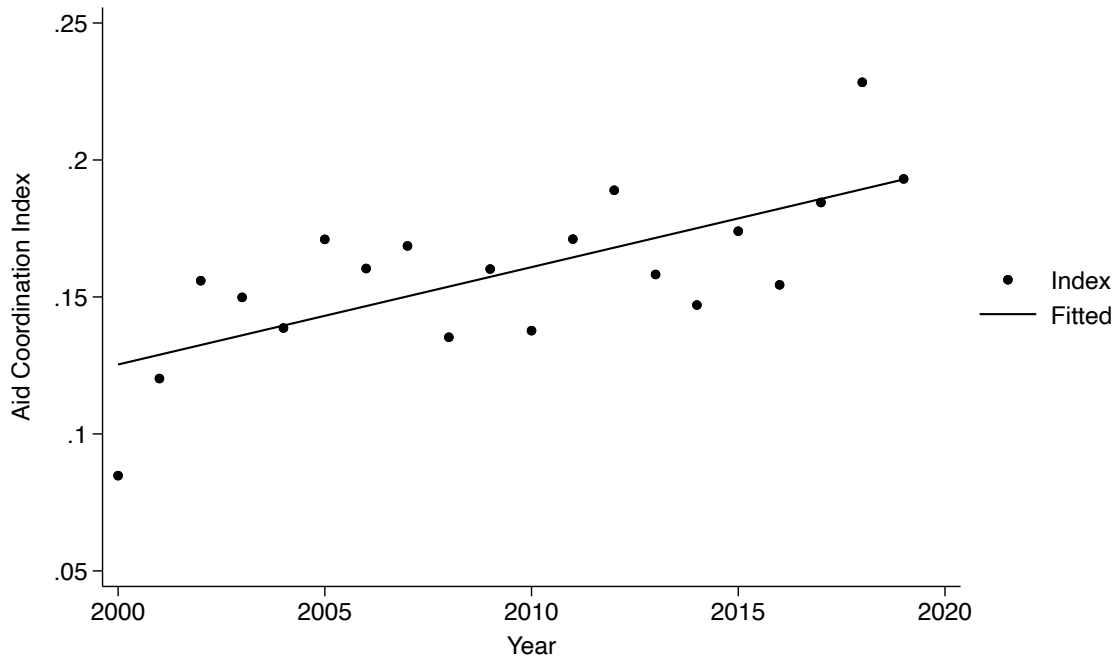


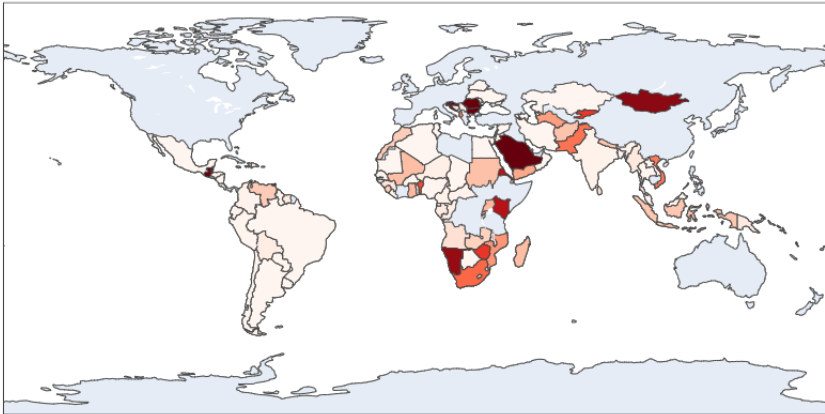
Figure 3: Aid Coordination Index Between US and China



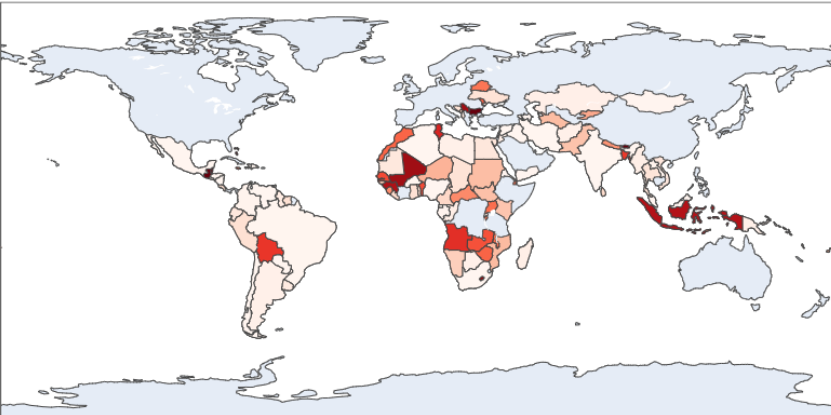
Notes: The graph shows the donors coordination index proposed by [Fuchs et al. \(2015\)](#), and its linear fit, between U,S, and China over the sample period. The index is computed as follows. For a pair of donors d_1 d_2 , let $x_{1,t}^i$ and $x_{2,t}^i$ be the share of funds that the two donors allocate to a recipient country i in a given period t . The coordination aid index is then computed as $\frac{1}{N} \sum_{i=1}^N \frac{\min\{x_{1,t}^i, x_{2,t}^i\}}{\max\{x_{1,t}^i, x_{2,t}^i\}}$

Figure 4: US-China Coordination Index Across Countries

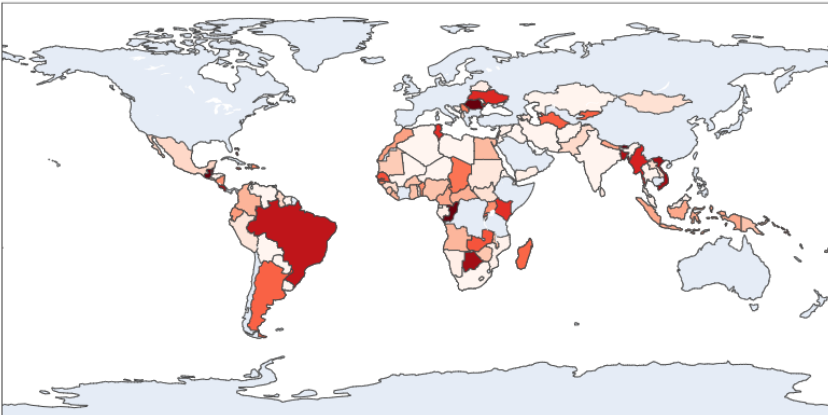
(a) 2001



(b) 2011

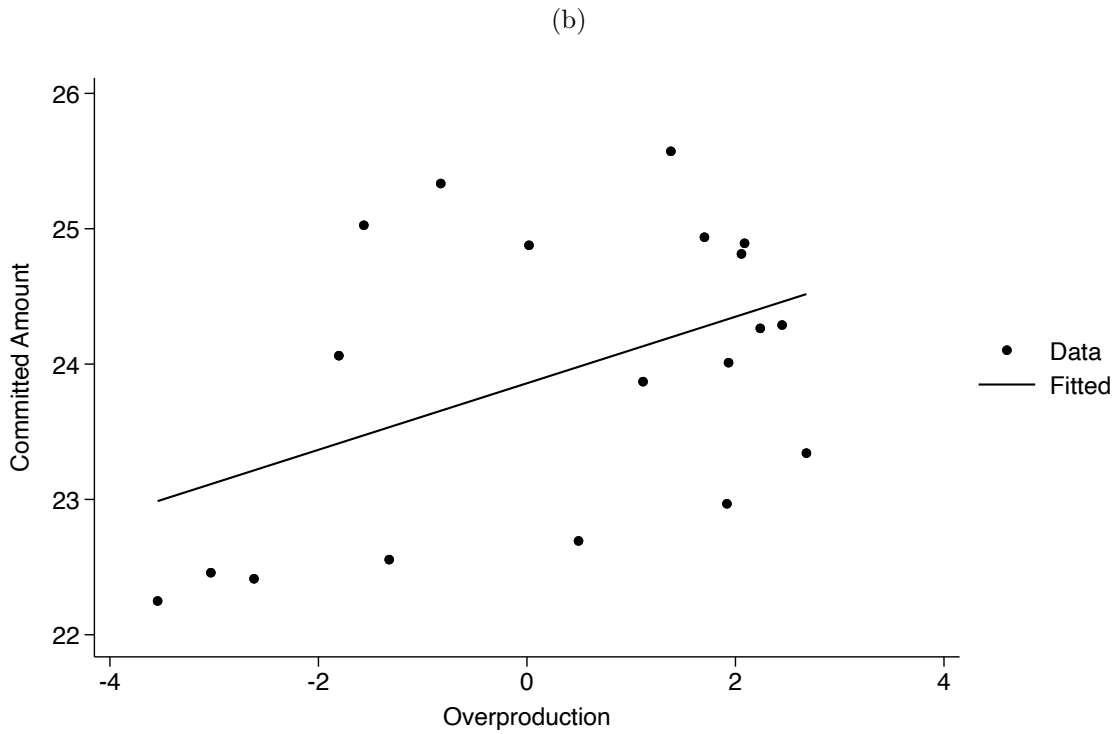
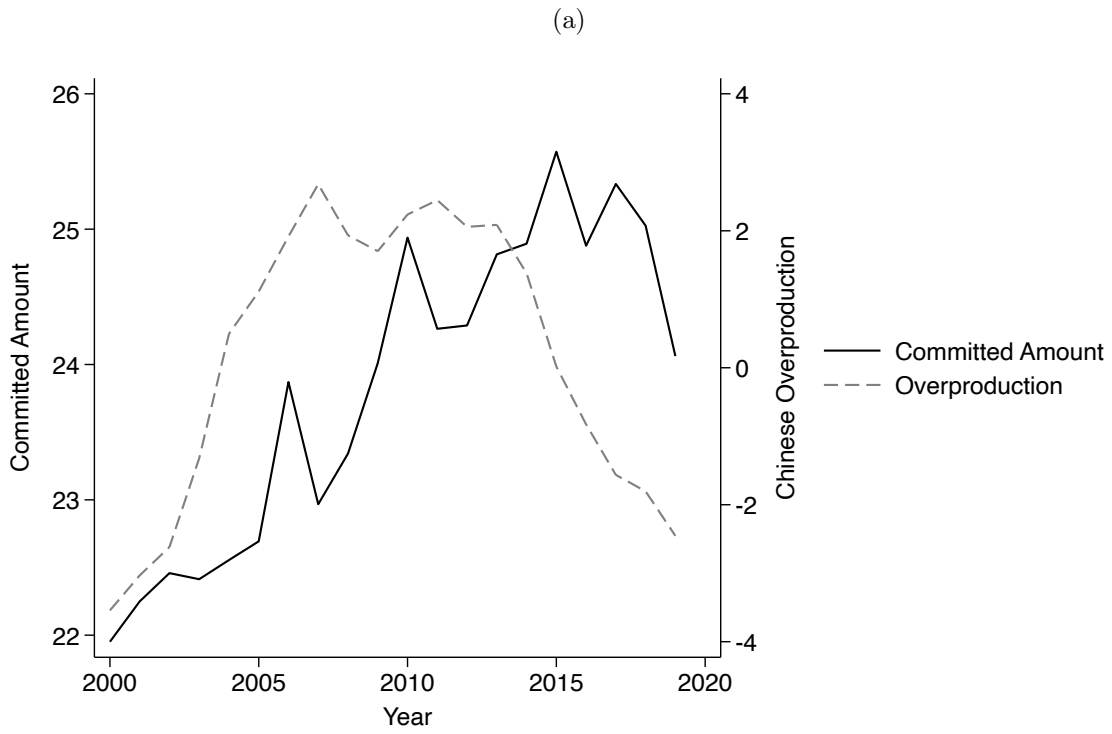


(c) 2019



Notes: The maps show the coordination index proposed by Fuchs et al. (2015) for US and China in three different years.

Figure 5: Chinese Overproduction as Predictor of Chinese Aid



Notes: Panel 5a shows the time series of total Chinese financing (left y -axis) and Chinese overproduction of industrial inputs (right y -axis). Panel 5b shows the scatter plot and linear fit of total Chinese financing in a given year against Chinese overproduction of industrial inputs in the previous year.

Figure 6: Diplomatic Relationship with Taiwan as a Predictor of Chinese Aid

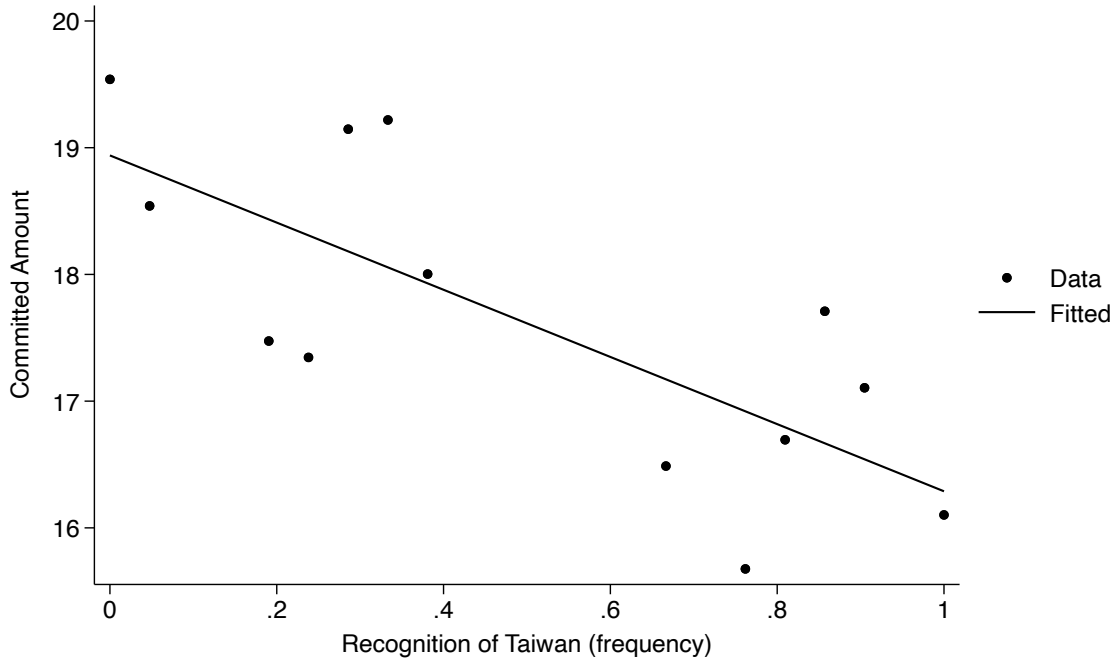
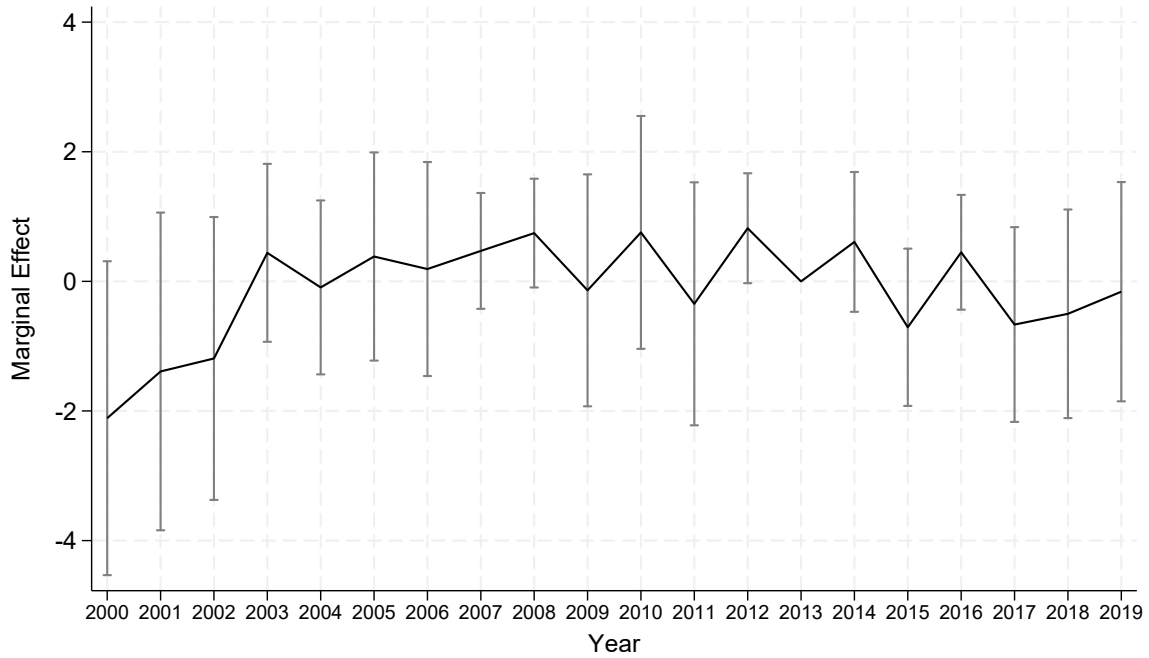
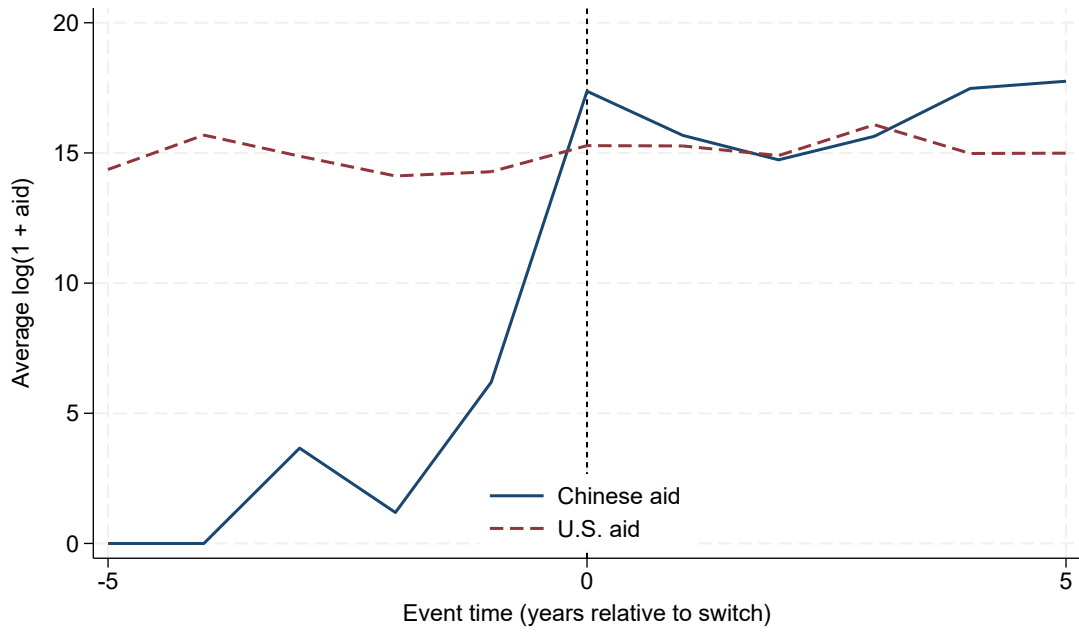


Figure 7: Marginal Effect of Diplomatic Relations with Taiwan



The figure plots the estimated coefficients from a regression of US aid on the interaction between the variable 1 – *Relationship with Taiwan* and year dummies, including controls, country and year fixed effects and clustering at the country level (2013 is the omitted year).

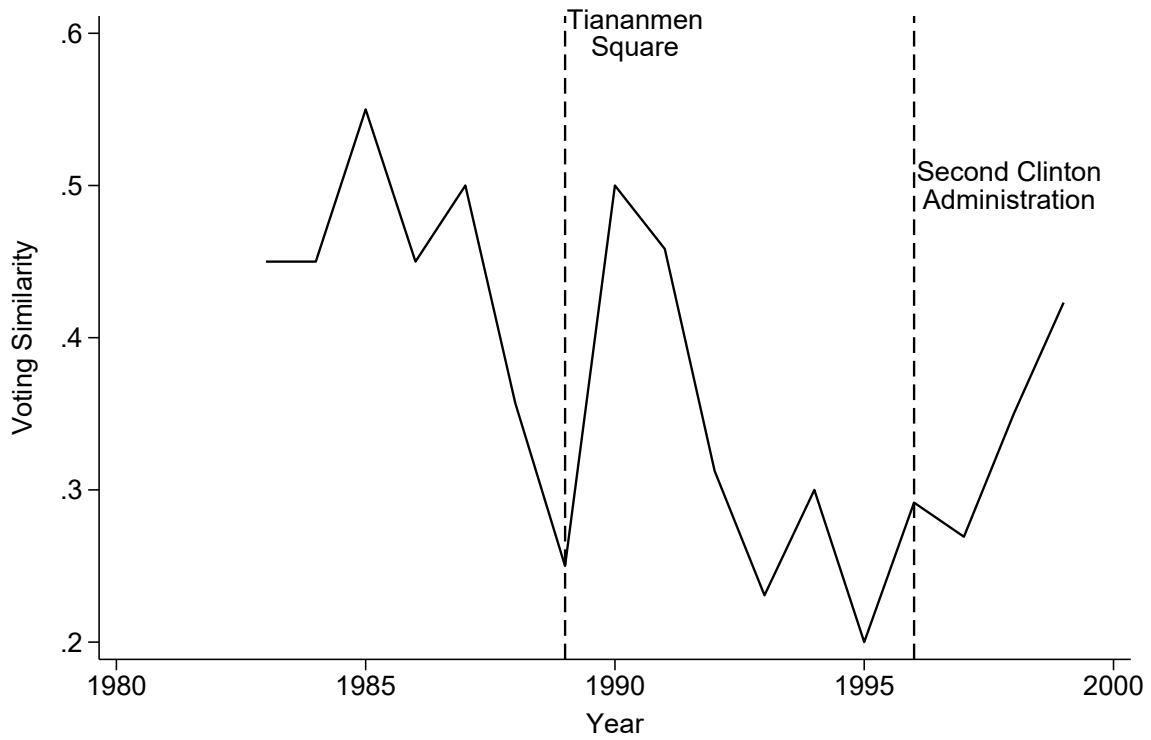
Figure 8: Chinese and US aid Around Exits from Taiwan Recognition



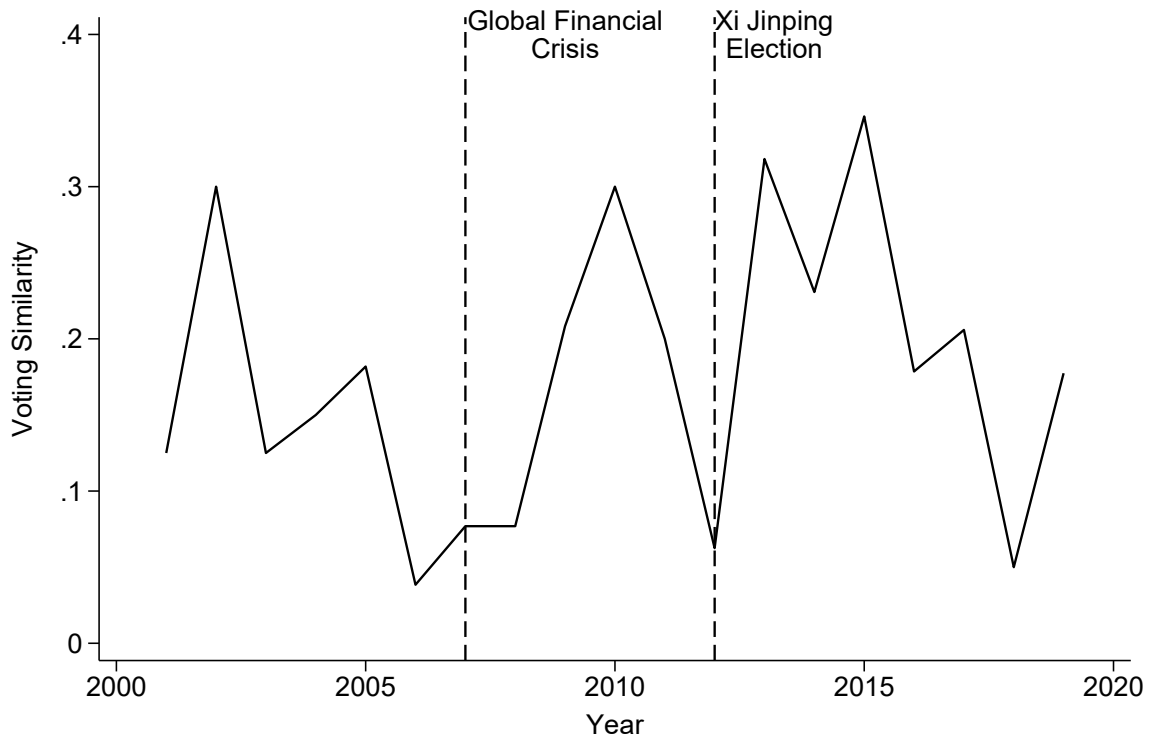
Notes: The figure shows average Chinese and US aid around the year in which a country ceases to recognize Taiwan (event time $t = 0$). For each switching country, we define event time as calendar year minus the year of the switch and compute the average of $\log(1 + \text{Chinese aid})$ and $\log(1 + \text{US aid})$ across all switchers for event times $t \in [-5, 5]$. Aid is measured as total annual commitments (in constant US dollars).

Figure 9: UN Voting Coincidence Between US and China

(a) Pre 2000

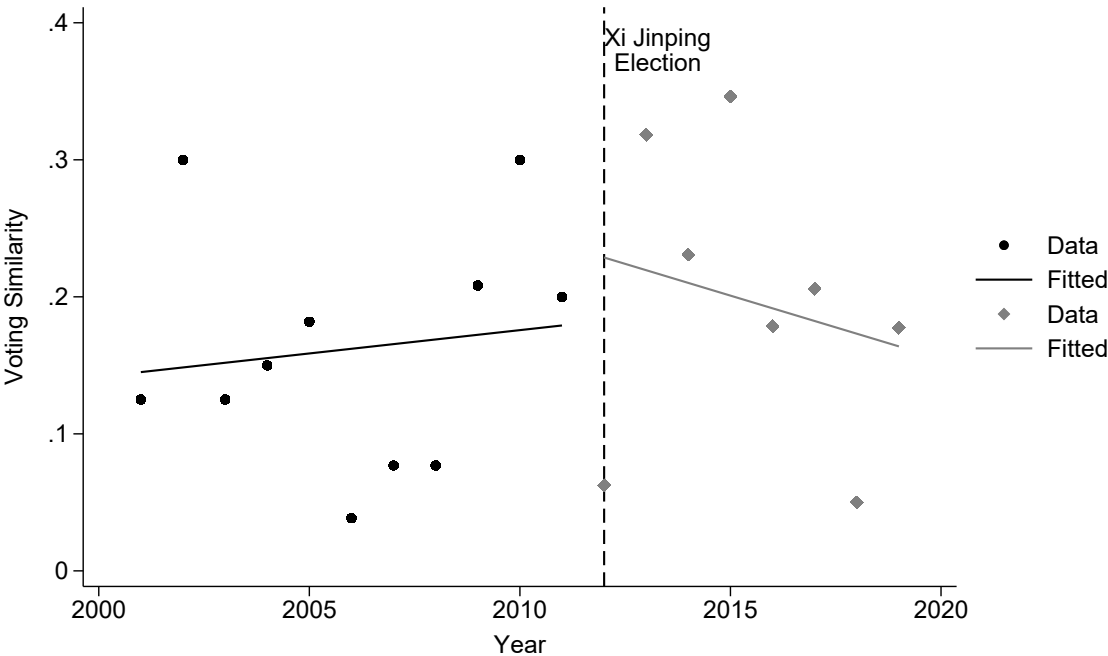


(b) Post 2000



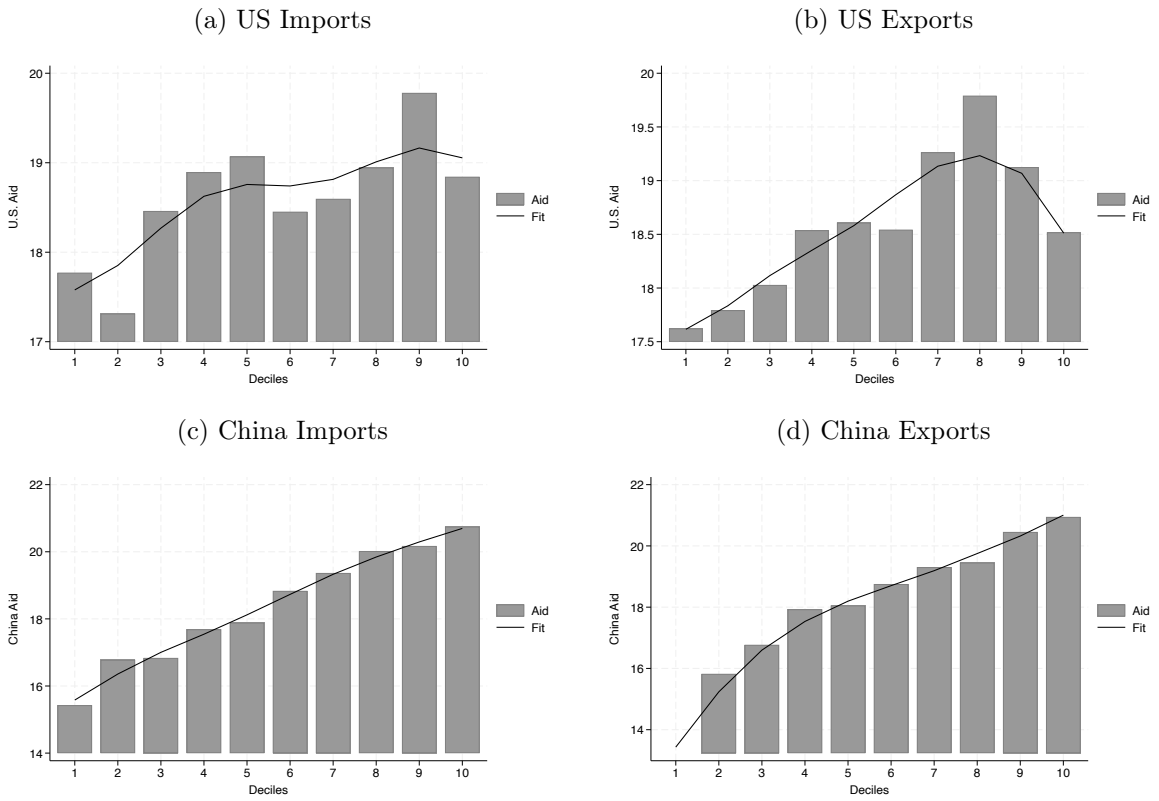
Notes: The figure shows the UN voting coincidence measure between the United States and China, constructed from the database provided by Fjelstul et al. (2025) for important resolutions. Smaller values are associated with greater political disagreement.

Figure 10: UN Voting Coincidence Between US and China: Pre and Post Xi Jinping's Election



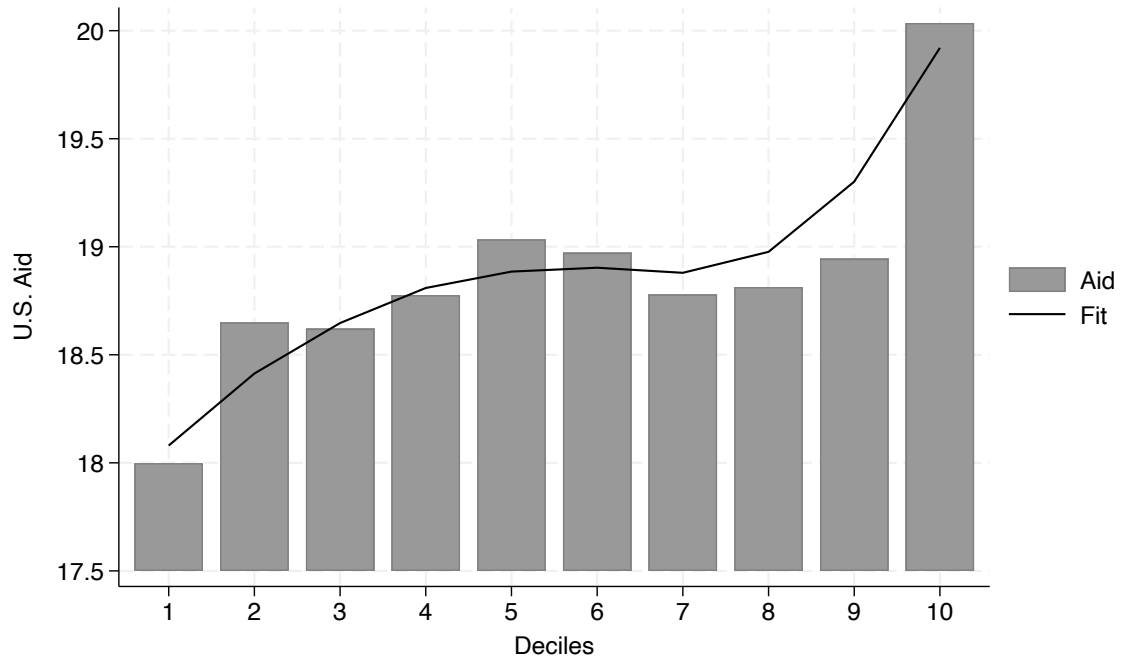
Notes: The figure shows the UN voting coincidence measure between the United States and China, constructed from the database provided by Fjølseth et al. (2025) for important resolutions since 2000. Following the election of Xi Jinping as General Secretary of the Chinese Communist Party (November 2012), the trend of political rapprochement between the two countries reversed.

Figure 11: Trade and State Aid



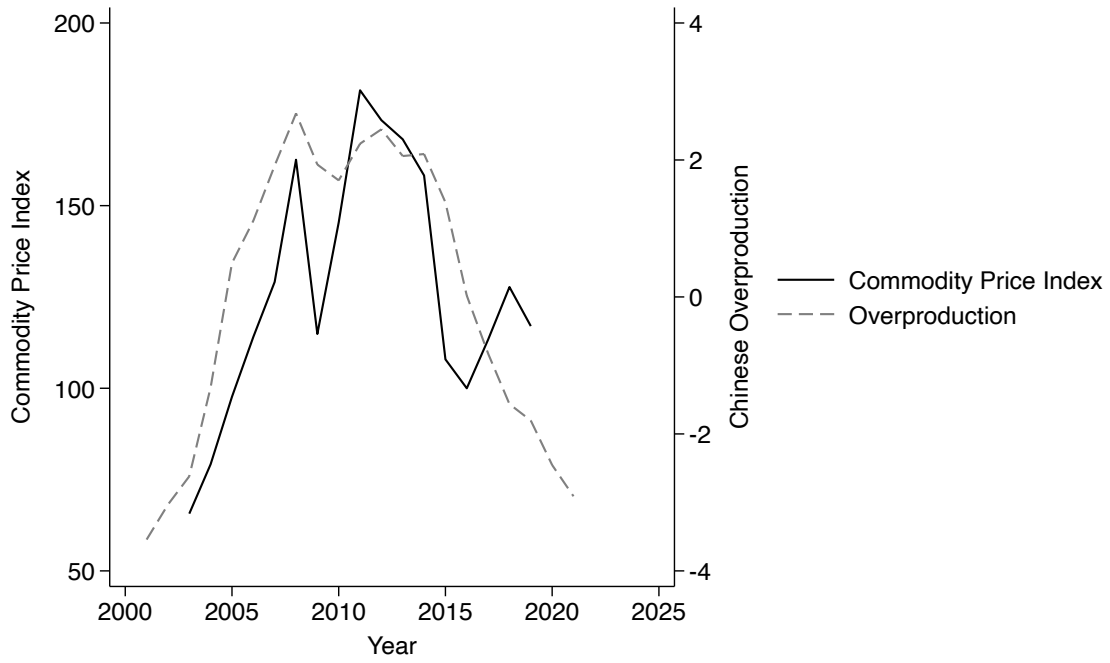
Notes: The figure shows US and Chinese aid across deciles of the donor's imports from and exports to recipient countries.

Figure 12: US Military Presence and US aid



Notes: The figure shows US aid across deciles of US military presence in recipient countries.

Figure 13: Commodity Price Index and Chinese Overproduction



Notes: The figure shows the total log amount (in US dollars) that China commits to provide in a given year alongside the global all-commodity price index, available from the IMF website starting in 2003.

8 Tables

Table 1: OLS Panel Regression

	(1)	(2)	(3)	(4)
	US aid	US aid	US aid	US aid
China Aid	0.0416** (0.0168)	0.0191 (0.0150)	0.0230* (0.0126)	0.00436 (0.0113)
Real GDP PC			17.03*** (3.058)	12.84*** (4.603)
Real GDP PC (square)			-1.171*** (0.199)	-0.836*** (0.299)
High Institution Quality			-1.009*** (0.330)	-0.789** (0.338)
Natural Disaster Fatalities			2.049*** (0.574)	1.776** (0.710)
Constant	13.62*** (0.521)	19.77*** (0.417)	-44.67*** (11.62)	-26.25 (17.56)
Observations	3,240	3,240	2,681	2,681
Number of Country	162	162	152	152
Country FE	NO	YES	NO	YES
Year FE	NO	YES	NO	YES

Clustered standard errors in parentheses

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

Notes: Estimates from an OLS panel regression in which the dependent variable is the log amount (in US dollars) that the United States commits to provide to a recipient country in a given year. China Aid is the log amount (in US dollars) that China commits to provide to a recipient country in a given year. Real GDP PC is the three-year moving average of the recipient's real GDP per capita. High Institution Quality is a dummy equal to 1 for country-year observations whose institutional quality index is at or above the annual median, and 0 otherwise. The institutional quality index is constructed as the sum of two Worldwide Governance Indicators: (i) Regulatory Quality, capturing perceptions of the government's ability to design and implement policies and regulations that promote private-sector development, and (ii) Government Effectiveness, capturing perceptions of the quality of public services. Natural Disaster Fatalities is the three-year moving average of deaths from natural disasters over population. Standard errors are clustered at the country level.

Table 2: IV Results: Baseline

	(1) First Stage	(2) Second Stage
Chinese Overproduction×(1 –Relationship with Taiwan)	0.682*** (0.215)	
China Aid		0.297* (0.171)
Real GDP PC	-4.542 (7.589)	15.65*** (4.795)
Real GDP PC (square)	0.186 (0.516)	-0.981*** (0.314)
High Institution Quality	-0.178 (0.547)	-0.602* (0.361)
Natural Disaster Fatalities	5.422*** (0.807)	0.578 (0.987)
Constant	36.07 (27.84)	
Observations	2,571	2,571
Number of Country	144	144
Country FE	YES	YES
Year FE	YES	YES
Cragg-Donald Wald F statistic	13.778	
Kleibergen-Paap F statistic	10.683	

Clustered standard errors in parentheses

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

Notes: Estimates from an IV where in the first stage we use Chinese Overproduction×(1 –Relationship with Taiwan) to instrument the log amount (in US dollars) that China commits to provide to a recipient country in a given year. In the second stage, the dependent variable is the log amount (in US dollars) that the US commits to provide to a recipient country in a given year. Real GDP PC is the three-year moving average of the recipient's real GDP per capita. High Institution Quality is a dummy equal to 1 for country-year observations whose institutional quality index is at or above the annual median, and 0 otherwise. The institutional quality index is constructed as the sum of two Worldwide Governance Indicators: (i) Regulatory Quality, capturing perceptions of the government's ability to design and implement policies and regulations that promote private-sector development, and (ii) Government Effectiveness, capturing perceptions of the quality of public services. Natural Disaster Fatalities is the three-year moving average of deaths from natural disasters over population. Standard errors are clustered at the country level. Country and year fixed effects are included in all specifications.

Table 3: Effect of Sino–US Political Disagreement

	(1)	(2)	(3)	(4)
	First Stage	Second Stage	First Stage	Second Stage
Chinese Overproduction $\times(1 - \text{Relationship with Taiwan})$	0.682*** (0.215)		0.682*** (0.215)	
China Aid		0.287* (0.147)		0.309** (0.148)
Voting Coincidence	-46.19*** (11.65)	12.14 (10.37)	0.522 (28.71)	14.89 (15.78)
China Aid \times Voting Coincidence		0.223 (0.172)		0.276 (0.196)
Post Xi Jinping			4.117* (2.229)	-0.538 (0.633)
China Aid \times Post Xi Jinping				0.117* (0.0625)
China Aid \times Voting Coincidence \times Post Xi Jinping				-0.433* (0.261)
Real GDP PC	-4.542 (7.589)	15.57*** (4.601)	-4.542 (7.589)	14.72*** (4.748)
Real GDP PC (square)	0.186 (0.516)	-0.975*** (0.301)	0.186 (0.516)	-0.921*** (0.313)
High Institution Quality	-0.178 (0.547)	-0.598* (0.330)	-0.178 (0.547)	-0.584* (0.327)
Natural Disaster Fatalities	5.422*** (0.807)	0.613 (0.937)	5.422*** (0.807)	0.321 (0.919)
Constant	46.81* (27.67)	-44.95** (19.02)	35.95 (28.12)	-42.89** (19.80)
Observations	2,571	2,571	2,571	2,571
Number of Country	144	144	144	144
Country FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Clustering standard errors in parentheses

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

Notes: Estimates from a control-function approach (Wooldridge, 2015). In the first stage we use Chinese Overproduction $\times(1 - \text{Relationship with Taiwan})$ to instrument the log amount (in US dollars) that China commits to provide to a recipient country in a given year. In the second stage, the dependent variable is the log amount (in US dollars) that the US commits to provide to a recipient country in a given year. Voting Coincidence is the UN voting coincidence measures between US and China constructed from the database provided by Fjelstul et al. (2025). Post Xi Jinping is a dummy equal to 1 for years after 2012 and 0 otherwise. Real GDP PC is the three-year moving average of the recipient's real GDP per capita. High Institution Quality is a dummy equal to 1 for country-year observations whose institutional quality index is at or above the annual median, and 0 otherwise. The institutional quality index is constructed as the sum of two Worldwide Governance Indicators: (i) Regulatory Quality, capturing perceptions of the government's ability to design and implement policies and regulations that promote private-sector development, and (ii) Government Effectiveness, capturing perceptions of the quality of public services. Natural Disaster Fatalities is the three-year moving average of deaths from natural disasters over population. Standard errors are clustered at the country level. Country and year fixed effects are included in all specifications.

Table 4: US Trade and the Response to Chinese Aid

	(1) First Stage	(2) Second Stage
Chinese Overproduction \times (1 – Relationship with Taiwan)	0.675*** (0.213)	
China Aid		0.274* (0.153)
US Exports (D9–D10)	1.068 (0.953)	-1.020** (0.425)
US Exports (D9–D10) \times China Aid		0.0365* (0.0206)
US Imports (D9–D10)	1.913*** (0.741)	0.237 (0.750)
US Imports (D9–D10) \times China Aid		-0.0286 (0.0239)
Real GDP PC	-3.745 (7.419)	15.43*** (4.623)
Real GDP PC (square)	0.122 (0.503)	-0.967*** (0.302)
High Institution Quality	-0.245 (0.540)	-0.582* (0.333)
Natural Disaster Fatalities	5.465*** (0.788)	0.648 (0.954)
Constant	33.69 (27.30)	-40.75** (17.71)
Observations	2,571	2,571
Number of Country	144	144
Country FE	YES	YES
Year FE	YES	YES

Clustered standard errors in parentheses

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

Notes: Estimates from a control-function approach (Wooldridge, 2015). In the first stage, we use Chinese Overproduction \times (1 – Relationship with Taiwan) as an instrument for the log amount (in US dollars) that China commits to provide to a recipient country in a given year. In the second stage, the dependent variable is the log amount (in US dollars) that the United States commits to provide to a recipient country in a given year. US Exports (D9–D10) is a dummy variable equal to 1 for countries in the two highest deciles of the distribution of imports from the United States. US Imports (D9–D10) is a dummy variable equal to 1 for countries in the two highest deciles of the distribution of exports to the United States. Real GDP PC is the three-year moving average of the recipient's real GDP per capita. High Institution Quality is a dummy equal to 1 for country-year observations whose institutional quality index is at or above the annual median, and 0 otherwise. The institutional quality index is constructed as the sum of two Worldwide Governance Indicators: (i) Regulatory Quality, capturing perceptions of the government's ability to design and implement policies and regulations that promote private-sector development, and (ii) Government Effectiveness, capturing perceptions of the quality of public services. Natural Disaster Fatalities is the three-year moving average of deaths from natural disasters over population. Standard errors are clustered at the country level. Country and year fixed effects are included in all specifications.

Table 5: US Military Presence and the Response to Chinese Aid

	(1) First Stage	(2) Second Stage
China Aid		0.268* (0.149)
Chinese Overproduction $\times(1 - \text{Relationship with Taiwan})$	0.682*** (0.215)	
US Military Presence (D9–D10)	-0.0879 (0.677)	-1.171 (0.752)
China Aid \times US Military Presence (D9–D10)		0.0689** (0.0323)
Real GDP PC	-4.622 (7.570)	15.23*** (4.514)
Real GDP PC (square)	0.191 (0.513)	-0.957*** (0.298)
High Institution Quality	-0.179 (0.547)	-0.594* (0.328)
Natural Disaster Fatalities	5.421*** (0.807)	0.652 (0.935)
Constant	36.46 (27.86)	-39.71** (17.33)
Observations	2,571	2,571
Number of Country	144	144
Country FE	YES	YES
Year FE	YES	YES

Clustered standard errors in parentheses

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

Notes: Estimates from a control-function approach (Wooldridge, 2015). In the first stage, we use Chinese Overproduction $\times(1 - \text{Relationship with Taiwan})$ as an instrument for the log amount (in US dollars) that China commits to provide to a recipient country in a given year. In the second stage, the dependent variable is the log amount (in US dollars) that the United States commits to provide to a recipient country in a given year. US Military Presence (D9–D10) is a dummy variable equal to 1 for countries in the two highest deciles of the distribution of US military presence. To construct this variable, we use US troop deployment data from Kane (2024). Following the United Nations sub-region geoscheme, for each year we sum US troops deployed in each sub-region and compute, for each recipient country, the share of those troops stationed in that country in that year. Real GDP PC is the three-year moving average of the recipient's real GDP per capita. High Institution Quality is a dummy equal to 1 for country-year observations whose institutional quality index is at or above the annual median, and 0 otherwise. The institutional quality index is constructed as the sum of two Worldwide Governance Indicators: (i) Regulatory Quality, capturing perceptions of the government's ability to design and implement policies and regulations that promote private-sector development, and (ii) Government Effectiveness, capturing perceptions of the quality of public services. Natural Disaster Fatalities is the three-year moving average of deaths from natural disasters over population. Standard errors are clustered at the country level. Country and year fixed effects are included in all specifications.

Table 6: US–Recipient Political Distance and the Response to Chinese Aid

	(1) First Stage	(2) Second Stage
Chinese Overproduction×(1 –Relationship with Taiwan)	0.695*** (0.222)	
China Aid		0.211 (0.159)
Voting Coincidence (with US)	0.432 (2.399)	-0.132 (2.160)
China Aid×Voting Coincidence (with US)		0.192** (0.0916)
Real GDP PC	-4.874 (7.943)	15.04*** (4.463)
Real GDP PC (square)	0.207 (0.539)	-0.933*** (0.291)
High Institution Quality	-0.136 (0.554)	-0.610* (0.330)
Natural Disaster Fatalities	5.341*** (0.822)	1.020 (0.945)
Constant	37.43 (28.92)	-39.44** (17.46)
Observations	2,543	2,543
Number of Country	144	144
Country FE	YES	YES
Year FE	YES	YES

Clustered standard errors in parentheses

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

Notes: Estimates from a control-function approach (Wooldridge, 2015). In the first stage, we use Chinese Overproduction×(1 –Relationship with Taiwan) as an instrument for the log amount (in US dollars) that China commits to provide to a recipient country in a given year. In the second stage, the dependent variable is the log amount (in US dollars) that the United States commits to provide to a recipient country in a given year. Voting Coincidence (with US) denotes the UN voting coincidence measures between US and the recipient country constructed from the database provided by Fjelstul et al. (2025). Real GDP PC is the three-year moving average of the recipient’s real GDP per capita. High Institution Quality is a dummy equal to 1 for country–year observations whose institutional quality index is at or above the annual median, and 0 otherwise. The institutional quality index is constructed as the sum of two Worldwide Governance Indicators: (i) Regulatory Quality, capturing perceptions of the government’s ability to design and implement policies and regulations that promote private-sector development, and (ii) Government Effectiveness, capturing perceptions of the quality of public services. Natural Disaster Fatalities is the three-year moving average of deaths from natural disasters over population. Standard errors are clustered at the country level. Country and year fixed effects are included in all specifications.

Table 7: Robustness: Additional Controls

	(1) First Stage	(2) Second Stage
Chinese Overproduction $\times(1 - \text{Relationship with Taiwan})$	0.677*** (0.235)	
China Aid		0.374* (0.192)
Real GDP PC	-0.857 (7.392)	13.47*** (5.095)
Real GDP PC (square)	-0.0744 (0.494)	-0.790** (0.333)
High Institution Quality	-0.265 (0.520)	-0.590* (0.350)
Natural Disaster Fatalities	5.629*** (0.909)	0.102 (1.160)
IMF Lending	-0.395 (0.512)	0.850** (0.423)
US Imports	-0.234*** (0.0632)	0.0709 (0.0527)
US Exports	0.344*** (0.0772)	-0.128* (0.0776)
China Imports	-0.00514 (0.0560)	-0.0893 (0.0606)
China Exports	0.0832 (0.0589)	0.0319 (0.0505)
Voting Coincidence (with US)	-4.150 (4.113)	1.538 (3.222)
Voting Coincidence (with China)	-4.588 (4.164)	-0.640 (2.833)
Constant	28.48 (28.25)	
Observations	2,543	2,543
Number of Country	144	144
Country FE	YES	YES
Year FE	YES	YES
Cragg-Donald Wald F statistic	13.059	
Kleibergen-Paap F statistic	8.824	

Clustered standard errors in parentheses

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

Notes: Estimates from an IV where in the first stage we use Chinese Overproduction $\times(1 - \text{Relationship with Taiwan})$ to instrument the log amount (in US dollars) that China commits to provide to a recipient country in a given year. In the second stage, the dependent variable is the log amount (in US dollars) that the US commits to provide to a recipient country in a given year. Real GDP PC is the three-year moving average of the recipient's real GDP per capita. High Institution Quality is a dummy equal to 1 for country-year observations whose institutional quality index is at or above the annual median, and 0 otherwise. The institutional quality index is constructed as the sum of two Worldwide Governance Indicators: (i) Regulatory Quality, capturing perceptions of the government's ability to design and implement policies and regulations that promote private-sector development, and (ii) Government Effectiveness, capturing perceptions of the quality of public services. Natural Disaster Fatalities is the three-year moving average of deaths from natural disasters over population. IMF Lending is a three year average of a dummy variable that takes value of 1 if the recipient country is under an IMF arrangement in a given year. US Imports denote the value of US imports from the recipient in a given year, smoothed using a three-year moving average. US Exports denote the value of US exports to the recipient, treated analogously. China Imports denote the value of Chinese imports from the recipient in a given year, smoothed using a three-year moving average. China Exports denote the value of Chinese exports to the recipient, treated analogously. Voting Coincidence (with i) denotes the UN voting coincidence measures constructed from the database provided by Fjelstul et al. (2025) between the recipient country and $i = \text{US, China}$, smoothed using a three-year moving average. Country and year fixed effects are included in all specifications. Standard errors are clustered at the country level.

Table 8: Robustness: Instrument Using Taiwan Recognition, 1995–2005 Window

	(1) First Stage	(2) Second Stage
Chinese Overproduction×(1 –Relationship with Taiwan)	0.972** (0.410)	
China Aid		0.365* (0.216)
Real GDP PC	-7.971 (10.16)	17.84*** (6.873)
Real GDP PC (square)	0.473 (0.691)	-1.129** (0.448)
High Institution Quality	-0.139 (0.797)	-0.376 (0.425)
Natural Disaster Fatalities	4.427*** (0.867)	0.103 (0.826)
Observations	1,999	1,999
Number of Country	144	144
Country FE	YES	YES
Year FE	YES	YES
Cragg-Donald Wald F statistic	16.850	
Kleibergen-Paap F statistic	6.072	

Clustered standard errors in parentheses

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

Notes: Estimates from an IV specification in which, in the first stage, we use Chinese Overproduction×(1 –Relationship with Taiwan) as an instrument for the log amount (in US dollars) that China commits to provide to a recipient country in a given year. In this table, Relationship with Taiwan is constructed as the share of years over the period 1995–2005 in which the recipient recognizes the Taiwanese government, and the sample is restricted to years after 2005. In the second stage, the dependent variable is the log amount (in US dollars) that the United States commits to provide to a recipient country in a given year. Real GDP PC is the three-year moving average of the recipient's real GDP per capita. High Institution Quality is a dummy equal to 1 for country–year observations whose institutional quality index is at or above the annual median, and 0 otherwise. The institutional quality index is constructed as the sum of two Worldwide Governance Indicators: (i) Regulatory Quality, capturing perceptions of the government's ability to design and implement policies and regulations that promote private-sector development, and (ii) Government Effectiveness, capturing perceptions of the quality of public services. Natural Disaster Fatalities is the three-year moving average of deaths from natural disasters over population. Country and year fixed effects are included in all specifications. Standard errors are clustered at the country level.

Table 9: Alternative Measure of Political Alignment (Max Consecutive Years of Taiwan Recognition)

	(1) First Stage	(2) Second Stage
Chinese Overproduction×Max Consecutive Year Taiwan Recognition	-0.0319*** (0.0105)	
China Aid		0.302* (0.180)
Real GDP PC	-4.772 (7.556)	15.88*** (4.792)
Real GDP PC (square)	0.202 (0.514)	-0.997*** (0.314)
High Institution Quality	-0.169 (0.534)	-0.614* (0.353)
Natural Disaster Fatalities	5.372*** (0.819)	0.573 (1.007)
Constant	34.86 (27.62)	
Observations	2,589	2,589
Number of Country	145	145
Country FE	YES	YES
Year FE	YES	YES
Cragg-Donald Wald F statistic	12.85	
Kleibergen-Paap F statistic	9.79	

Clustered standard errors in parentheses

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

Notes: Estimates from an IV specification in which the instrument is constructed as Chinese Overproduction interacted with the maximum number of consecutive years in which the recipient recognizes Taiwan over the sample period. The dependent variable in the second stage is the log amount (in US dollars) that the United States commits to provide to a recipient country in a given year. Real GDP PC is the three-year moving average of the recipient's real GDP per capita. High Institution Quality is a dummy equal to 1 for country-year observations whose institutional quality index is at or above the annual median, and 0 otherwise. The institutional quality index is constructed as the sum of two Worldwide Governance Indicators: (i) Regulatory Quality, capturing perceptions of the government's ability to design and implement policies and regulations that promote private-sector development, and (ii) Government Effectiveness, capturing perceptions of the quality of public services. Natural Disaster Fatalities is the three-year moving average of deaths from natural disasters over population. Country and year fixed effects are included in all specifications. Standard errors are clustered at the country level.

Table 10: Robustness: Overproduction Residualized

	(1) First Stage	(2) Second Stage
Residualized Overproduction $\times(1 - \text{Relationship with Taiwan})$	0.700*** (0.233)	
China Aid		0.305* (0.162)
Real GDP PC	-4.548 (7.592)	15.69*** (4.823)
Real GDP PC (square)	0.186 (0.516)	-0.983*** (0.316)
High Institution Quality	-0.176 (0.550)	-0.601* (0.363)
Natural Disaster Fatalities	5.501*** (0.850)	0.545 (0.971)
Constant	35.84 (27.84)	
Observations	2,571	2,571
Number of Country	144	144
Country FE	YES	YES
Year FE	YES	YES
F Statistics		13.79

Clustered standard errors in parentheses

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

Notes: Estimates from an IV where in the first stage we replace the Chinese Overproduction with the residuals of a regression where the dependent variable is the Chinese Overproduction and the independent variable is the growth rate of world industrial production (Baumeister and Hamilton, 2019) and the growth rate of the IMF industrial input price index. The alternative instrument is then defined as the interaction between this residual overproduction term and $(1 - \text{Relationship with Taiwan})$. In the second stage, the dependent variable is the log amount (in US dollars) that the US commits to provide to a recipient country in a given year. Real GDP PC is the three-year moving average of the recipient's real GDP per capita. High Institution Quality is a dummy equal to 1 for country-year observations whose institutional quality index is at or above the annual median, and 0 otherwise. The institutional quality index is constructed as the sum of two Worldwide Governance Indicators: (i) Regulatory Quality, capturing perceptions of the government's ability to design and implement policies and regulations that promote private-sector development, and (ii) Government Effectiveness, capturing perceptions of the quality of public services. Natural Disaster Fatalities is the three-year moving average of deaths from natural disasters over population. Country and year fixed effects are included in all specifications. Standard errors are clustered at the country level.

Table 11: Robustness: Oda Aid

	(1) First Stage	(2) Second Stage
Chinese Overproduction $\times(1 - \text{Relationship with Taiwan})$	0.619*** (0.201)	
China Aid		0.327* (0.187)
Real GDP PC	4.543 (7.761)	12.82*** (4.590)
Real GDP PC (square)	-0.403 (0.524)	-0.794*** (0.296)
High Institution Quality	0.0182 (0.601)	-0.661* (0.360)
Natural Disaster Fatalities	8.835*** (1.294)	-0.702 (1.573)
Constant	2.961 (28.40)	
Observations	2,571	2,571
Number of Country	144	144
Country FE	YES	YES
Year FE	YES	YES
Cragg-Donald Wald F statistic	13.014	
Kleibergen-Paap F statistic	10.047	

Clustered standard errors in parentheses

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

Notes: Estimates from an IV where in the first stage we use Chinese Overproduction $\times(1 - \text{Relationship with Taiwan})$ to instrument the log amount (in US dollars) of ODA that China commits to provide to a recipient country in a given year. In the second stage, the dependent variable is the log amount (in US dollars) that the US commits to provide to a recipient country in a given year. Real GDP PC is the three-year moving average of the recipient's real GDP per capita. High Institution Quality is a dummy equal to 1 for country-year observations whose institutional quality index is at or above the annual median, and 0 otherwise. The institutional quality index is constructed as the sum of two Worldwide Governance Indicators: (i) Regulatory Quality, capturing perceptions of the government's ability to design and implement policies and regulations that promote private-sector development, and (ii) Government Effectiveness, capturing perceptions of the quality of public services. Natural Disaster Fatalities is the three-year moving average of deaths from natural disasters over population. Country and year fixed effects are included in all specifications. Standard errors are clustered at the country level.

Table 12: IV Results with Three-Year Moving Averages

	(1) First Stage	(2) Second Stage
Chinese Overproduction $\times(1 - \text{Relationship with Taiwan})$	0.645*** (0.175)	
China Aid		0.329* (0.183)
Real GDP PC	-2.309 (7.504)	15.06*** (4.842)
Real GDP PC (square)	0.0483 (0.513)	-0.942*** (0.318)
High Institution Quality	-0.476 (0.418)	-0.499 (0.349)
Natural Disaster Fatalities	4.995*** (0.694)	0.565 (0.924)
Constant	27.45 (27.39)	
Observations	2,571	2,571
Number of Country	144	144
Country FE	YES	YES
Year FE	YES	YES
Cragg-Donald Wald F Statistics	29.227	
Kleibergen-Paap F statistic	14.420	

Clustered standard errors in parentheses

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

Notes: Estimates from an IV specification using three-year moving averages of aid. The dependent variable in the second stage is the log amount (in US dollars) that the United States commits to provide to a recipient country. The endogenous regressor is the three-year moving average of the log amount that China commits over years $t - 2, t - 1, t$. The instrument is constructed as Chinese Overproduction, averaged over years $t - 2, t - 1, t$, interacted with $(1 - \text{Relationship with Taiwan})$. Real GDP PC is the three-year moving average of the recipient's real GDP per capita. High Institution Quality is a dummy equal to 1 for country-year observations whose institutional quality index is at or above the annual median, and 0 otherwise. The institutional quality index is constructed as the sum of two Worldwide Governance Indicators: (i) Regulatory Quality, capturing perceptions of the government's ability to design and implement policies and regulations that promote private-sector development, and (ii) Government Effectiveness, capturing perceptions of the quality of public services. Natural Disaster Fatalities is the three-year moving average of deaths from natural disasters over population. Country and year fixed effects are included in all specifications. Standard errors are clustered at the country level.

A Empirical Appendix

Table A1: Reduced Form

	(1) US aid
Chinese Overproduction $\times(1 - \text{Relationship with Taiwan})$	0.203** (0.101)
Real GDP PC	14.30*** (4.585)
Real GDP PC (square)	-0.926*** (0.297)
High Institution Quality	-0.655** (0.329)
Natural Disaster Fatalities	2.189*** (0.722)
Constant	-31.17* (17.59)
Observations	2,571
Number of Country	144
Country FE	YES
Year FE	YES

Clustered standard errors in parentheses

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

Notes: Estimates from a reduced-form panel regression in which the dependent variable is the log amount (in US dollars) that the United States commits to provide to a recipient country in a given year. Real GDP PC is the three-year moving average of the recipient's real GDP per capita. High Institution Quality is a dummy equal to 1 for country-year observations whose institutional quality index is at or above the annual median, and 0 otherwise. The institutional quality index is constructed as the sum of two Worldwide Governance Indicators: (i) Regulatory Quality, capturing perceptions of the government's ability to design and implement policies and regulations that promote private-sector development, and (ii) Government Effectiveness, capturing perceptions of the quality of public services. Natural Disaster Fatalities is the three-year moving average of deaths from natural disasters over population. Country and year fixed effects are included in all specifications. Standard errors are clustered at the country level.

A.1 Taiwan Recognition Switches

Table A2: Countries Switching from Recognition to Non-Recognition of Taiwan, 2000–2019

Country	Region	Year of switch
Burkina Faso	Sub-Saharan Africa	2018
Costa Rica	Latin America and the Caribbean	2008
Dominica	Latin America and the Caribbean	2004
Dominican Republic	Latin America and the Caribbean	2018
Gambia	Sub-Saharan Africa	2014
Grenada	Latin America and the Caribbean	2005
Kiribati	Micronesia	2019
Liberia	Sub-Saharan Africa	2004
North Macedonia	Southern Europe	2000
Malawi	Sub-Saharan Africa	2008
Senegal	Sub-Saharan Africa	2006
El Salvador	Latin America and the Caribbean	2018
Sao Tome and Principe	Sub-Saharan Africa	2017
Chad	Sub-Saharan Africa	2007

B Online Appendix

The economy lasts for two periods, initial and final, and consists of three countries: a subordinated country (s), and two leader countries ($l = 1, 2$). In the final period, the country s adopts a policy $p \in \mathbb{R}$. The leader l is characterized by a parameter $\theta_l \in \mathbb{R}$ denoting its preferences over the possible policies that the subordinated country can implement. In the model, we assume that the leaders have conflicting interests. That is, $\theta_1 \neq \theta_2$.

In the initial period, the two leaders can devote resources to influence the subordinated country's decision. The use of these resources can be interpreted in different ways. They may represent direct economic instruments—such as state aid, trade concessions, or financial support—that confer influence over the subordinated country's government and change its incentives to adopt a given policy. Alternatively, they may represent political or diplomatic pressure. We denote by $a_l \in \mathbb{R}_+$ the resources devoted by leader l to influence the subordinated country.

Observing the pair (a_1, a_2) , the country s chooses the policy p that maximizes its utility. We assume that the country s is indifferent across all policies. However, we assume that s may be affected by international retaliation imposed by leader l whenever the chosen policy does not reflect the leader's preferences. The intensity of retaliation is proportional to both the mismatch between the chosen policy and the leader's preferred policy and the amount of resources invested, a_l . Therefore, the losses that country s faces when leader l retaliates are given by $\omega_l a_l (p - \theta_l)^2$.

The parameter $\omega_l > 0$ captures the weight that the subordinated country attaches to retaliation by leader l . From the perspective of country s , it reflects the strength of pre-existing ties with leader l . For example, if country l is the main trading partner of country s , retaliation by l may include the suspension of trade agreements, which would cause greater losses than in a situation with no trade between the two countries.

Because the policy decision affects the subordinated country only through leaders' retaliation, maximizing country s 's utility is equivalent to minimizing retaliation losses. Thus, country s solves:

$$\min_p \mathcal{L}_s = \omega_1 a_1 (p - \theta_1)^2 + \omega_2 a_2 (p - \theta_2)^2 \quad (\text{B.1})$$

As \mathcal{L} is strictly convex in p , the first-order condition is necessary and sufficient for characterizing the optimal policy. Solving the first-order condition yields:

$$p^*(a_1, a_2) = \frac{\omega_1 a_1}{\omega_1 a_1 + \omega_2 a_2} (\theta_1 - \theta_2) + \theta_2 \quad (\text{B.2})$$

From (B.2), we get:

$$\frac{(p^* - \theta_l)^2}{\Delta_\theta^2} = \left(\frac{\omega_{-l} a_{-l}}{\omega_l a_l + \omega_{-l} a_{-l}} \right)^2 \quad (\text{B.3})$$

where Δ_θ denotes the difference between the political preferences of the two leaders, $\Delta_\theta = \theta_l - \theta_{-l}$.

That is, the distance between the implemented policy p^* and the preferences of leader l is a decreasing, convex function of the resources it devotes, a_l . The rate at which the implemented policy approaches θ_l as a_l varies depends on the parameter ω_l . The higher ω_l , the faster the implemented policy p^* approaches the preferences of leader l .

During the first period, the leaders simultaneously choose the amount of resources to devote to influencing country s , anticipating that the subordinated country will select p according to (B.2). In choosing how many resources to devote, each leader faces a trade-off: if it devotes no resources, the implemented policy will not match its preferences; if it devotes resources, those resources cannot be used to pursue other objectives not modeled here. In other words, using resources to influence country s has an opportunity cost. Therefore, each leader's problem can be stated as a cost-minimization problem.

$$\min_{a_l} \mathcal{L}_l = \frac{\gamma_l}{2} \left(p^*(a_l, a_{-l}^e) - \theta_l \right)^2 + a_l \quad (\text{B.4})$$

where a_{-l}^e denotes leader l 's expectation about the amount of resources used by the other leader. The parameter γ_l reflects the weight that leader l attaches to the policy implemented in the subordinated country s . Ceteris paribus, the higher γ_l , the higher the disutility that leader l experiences when the subordinated country implements a policy that diverges from θ_l .

Definition 1. The equilibrium of the model is characterized by a triplet (a_1^*, a_2^*, p^*) such that:

1. The policy implemented by the subordinated country minimizes \mathcal{L}_s . That is p^* satisfies (B.2)
2. The resources chosen by leader l minimize its loss function \mathcal{L}_l , given its expectations about the resources used by the other leader $-l$. That is:

$$\mathcal{L}_l(a_l^*, a_{-l}^e) \leq \mathcal{L}_l(a'_l, a_{-l}^e) \quad \text{for all } a'_l \in \mathbb{R}_+. \quad (\text{B.5})$$

3. Leaders' expectations are confirmed. That is, $a_{-l}^e = a_{-l}^*$ for any l .

From our equilibrium definition, it follows that the equilibrium choices of the leaders must lie at the intersection of their reaction functions. Taking the derivative of \mathcal{L}_l with respect to a_{-l} , we can characterize the leader's leader l 's reaction function as follows:

$$\gamma_l \left(p^* - \theta_l \right) \frac{\partial p^*}{\partial a_l} + 1 = 0 \quad (\text{B.6})$$

Equation (B.6) states that the reaction function of the leader l can be decomposed in two terms. The first term reflects the fact that variations in a_l induces variations in the distance between the policy implemented by the subordinated country and the preferences of the leader l . The second term reflects the opportunity costs of the usage of resources.

By combining (B.2) and (B.6), we can get an explicit reaction function of the leader l .

$$a_l(a_{-l}) = \left[\frac{\Delta_\theta \omega_{-l} a_{-l}}{\omega_l} \right]^{\frac{2}{3}} \gamma_l^{1/3} - \frac{\omega_{-l}}{\omega_l} a_{-l}. \quad (\text{B.7})$$

Figure 1: The Reaction Function of the Leader l

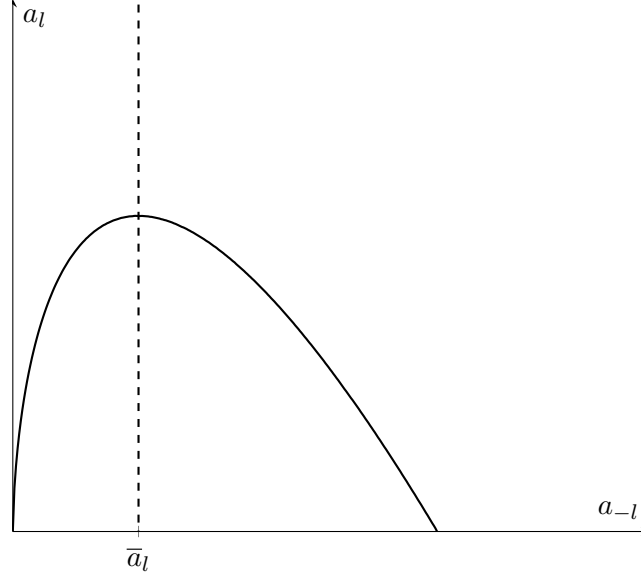


Figure 1 depicts leader l 's reaction function in the (a_{-l}, a_l) plane. The reaction function is not monotone: depending on the a_l , the leaders' strategies can be strategic substitutes or strategic complements. More specifically, leader l 's reaction function is increasing in a_{-l} (i.e., there is strategic complementarity) if and only if

$$a_{-l} \leq \frac{8}{27} \Delta_\theta^2 \frac{\omega_l}{\omega_{-l}} \gamma_l = \bar{a}_l. \quad (\text{B.8})$$

Intuitively, when a_{-l} is extremely large, the effect of a_l on the subordinated country's decision is vanishingly small. In this case, leader l finds it optimal to reduce the resources used to influence the subordinated country as a_{-l} increases further.

Proposition 1. The equilibrium of the model is characterized as follows:

$$a_1^* = \frac{\omega_2 \gamma_2 \Delta_{\theta_1}^2}{\omega_1 \left(1 + \sqrt{\frac{\gamma_2 \omega_2}{\gamma_1 \omega_1}}\right)^3}, \quad a_2^* = \frac{\omega_1 \gamma_1 \Delta_{\theta_2}^2}{\omega_2 \left(1 + \sqrt{\frac{\gamma_1 \omega_1}{\gamma_2 \omega_2}}\right)^3}, \quad p^* = \frac{\Delta_{\theta_1}}{1 + \sqrt{\frac{\gamma_1 \omega_1}{\gamma_2 \omega_2}}} + \theta_2. \quad (\text{B.9})$$

Proof. Definition 1 implies that the leaders' equilibrium choices must lie at the intersection of their reaction functions. However, this is a necessary but not sufficient condition. In fact, by (B.7), the reaction functions intersect at $a_l = a_{-l} = 0$, which cannot be an equilibrium. Suppose that when

$a_l = a_{-l} = 0$, the subordinated country randomizes over all policies $p \in \mathbb{R}$. Then, the probability that the implemented policy equals θ_l is zero.

Therefore, when $a_{-l}^e = 0$, choosing $a_l = 0$ yields losses equal to $\gamma_l(p - \theta_l)^2$. For any alternative strategy $a_l' \neq 0$, given $a_{-l}^e = 0$, leader l can induce the subordinated country to implement policy θ_l , and thus incurs losses equal to a_l' . Because this holds for arbitrarily small $a_l' > 0$, it follows that $a_l = 0$ cannot be optimal when $a_{-l}^e = 0$. Hence, $a_l = a_{-l} = 0$ cannot arise in equilibrium.

Suppose now that $a_l \neq 0$ and $a_{-l} \neq 0$. From (B.7), we have that:

$$\omega_l a_l + \omega_{-l} a_{-l} = \omega_l \gamma_l^{1/3} \left[\frac{\Delta_{\theta_l} \omega_{-l} a_{-l}}{\omega_l} \right]^{2/3} = \omega_{-l} \gamma_{-l}^{1/3} \left[\frac{\Delta_{\theta_l} \omega_l a_l}{\omega_{-l}} \right]^{2/3} \quad (\text{B.10})$$

Hence,

$$\frac{a_l}{a_{-l}} = \sqrt{\frac{\gamma_l \omega_{-l}}{\gamma_{-l} \omega_l}}. \quad (\text{B.11})$$

Combining the above condition with (B.7) leads to:

$$a_l^* = \frac{\omega_{-l} \gamma_{-l} \Delta_{\theta_l}^2}{\omega_l \left(1 + \sqrt{\frac{\gamma_{-l} \omega_{-l}}{\gamma_l \omega_l}} \right)^3} \quad (\text{B.12})$$

Finally, substituting (a_l^*, a_{-l}^*) into (B.2) yields the equilibrium policy. \square

Combining the equilibrium outcomes described by (1) and the condition (B.8), we can determine whether, in equilibrium, the resources employed by the leader l increases as a_{-l} increases. Replacing a_{-l} with the equilibrium value in (B.8) leads to

$$\frac{\partial a_l}{\partial a_{-l}}(a_{-l}^*) > 0 \iff \sqrt{\frac{\gamma_{-l} \omega_{-l}}{\gamma_l \omega_l}} < 2 \quad (\text{B.13})$$

When (B.13) holds for both leaders, the leaders' strategies are strategic complements in equilibrium.

To illustrate the intuition behind condition (B.13), start from (B.3). Taking the derivative of the right-hand-side with respect to a_l leads to:

$$\frac{1}{\Delta_l^2} \frac{\partial \left(p^* - \theta_l \right)^2}{\partial a_l} = -2 \left(\omega_{-l} a_{-l} \right)^2 \left(\omega_l a_l + \omega_{-l} a_{-l} \right)^{-3} \quad (\text{B.14})$$

Replacing a_l and a_{-l} with their equilibrium values leads to:

$$\frac{1}{\Delta_l^2} \frac{\partial \left(p^* - \theta_l \right)^2}{\partial a_l} = -\frac{2}{\gamma_l} \quad (\text{B.15})$$

Therefore, condition (B.13) reduces to comparing how quickly the policy implemented by the subordinated country converges to each leader's preferred policy as the amount of resources employed varies. When (B.13) holds for leader l but not for leader $-l$, increasing a_l produces only modest variation in p^* ; accordingly, leader $-l$ optimally responds by slightly decreasing a_{-l} and saving resources.

Taking derivatives of the equilibrium values, we obtain the following comparative statics results:

Proposition 2. In equilibrium, we have that:

(i)

$$\frac{\partial a_l^*}{\partial \Delta_\theta^2} > 0; \quad \frac{\partial a_l^*}{\partial \gamma_l} > 0 \quad (\text{B.16})$$

(ii)

$$\frac{\partial a_l}{\partial a_{-l} \partial \Delta_\theta^2} > 0; \quad \frac{\partial a_l^*}{\partial \gamma_{-l}} > 0 \quad (\text{B.17})$$

The results presented in the proposition do not depend on whether the leaders' strategies are strategic complements or strategic substitutes. The first line describes how the parameters affect the equilibrium value of a_l . In particular, the resources that a leader devotes to influencing the subordinated country's decision increase when the political distance between the two leaders increases and when the weight that leader l attaches to the policy implemented in the subordinated country increases. These results are intuitive.

When the political distance between the two leaders increases, a leader's disutility from the subordinated country adopting a policy closer to the other leader's preference increases. Consequently, leaders devote more resources to influencing the subordinated country's decision.

Similarly, when γ_l increases, leader l 's disutility from the subordinated country adopting a policy that does not match its preferences increases. Therefore, leader l is willing to devote more resources to influencing the subordinated country's decision.

The second line of Proposition (2) describes how the parameters affect the sensitivity of the resources chosen by one leader to the resources chosen by the other, i.e., the slope of the reaction functions. Leaders respond more aggressively to each other's attempts to gain influence over the subordinated country's decision when the political distance between the two leaders increases, or when the weight that leader l attaches to the policy implemented in the subordinated country increases. The reason is the same as above: when a leader's disutility from the subordinated country adopting a policy closer to the other leader's increases, the leader becomes more sensitive to variations in p^* induced by changes in the other leader's resources.

The next proposition provides comparative static results for the remaining parameters of the model

Proposition 3. In equilibrium, we have that:

(i)

$$\frac{\partial a_l^*}{\partial \omega_l} < 0 \iff \frac{\partial a_l}{\partial a_{-l}}(a_{-l}^*) > 0; \frac{\partial a_l^*}{\partial \omega_{-l}} > 0 \iff \frac{\partial a_l}{\partial a_{-l}}(a_{-l}^*) > 0; \frac{\partial a_l^*}{\partial \gamma_{-l}} > 0 \iff \frac{\partial a_l}{\partial a_{-l}}(a_{-l}^*) > 0$$

(ii)

$$\frac{\partial a_l}{\partial a_{-l} \partial \omega_l} < 0 \iff \frac{\partial a_l}{\partial a_{-l}}(a_{-l}^*) > 0 \tag{B.18}$$

The effects of ω_l , ω_{-l} , and γ_{-l} on a_l depends on whether, from the point of view of the leader l , in equilibrium, the strategies are complement strategic or substitute.

To illustrate, consider an increase in ω_l . For any a_l , the decision of the subordinated country moves towards θ_l . This effect tends to reduce a_l , since ω_l and a_l are perfect substitutes in influencing the subordinated country's decision. At the same time, it affects the rate at which p^* approaches

At the same time, ω_l affects the rate at which p^* approaches leader l 's preferred policy. The higher ω_l , the faster the implemented policy p^* approaches leader l 's preferred policy. This effect tends to increase a_l , because each additional unit of resources becomes more effective at pushing the implemented policy toward θ_l .

Because the rate at which p^* approaches θ_{-l} also depends on the resources employed by leader $-l$, the net effect depends on a_{-l}^* . If a_{-l}^* is sufficiently small (i.e., $a_{-l}^* \leq \bar{a}_l$), the distance between p^* and θ_l becomes insensitive to a_l . Therefore, the first effect prevails and a_l^* decreases as ω_l increases.

Conversely, if a_{-l}^* is sufficiently large (i.e., $a_{-l}^* \geq \bar{a}_l$), the first effect is small and a_l^* increases as ω_l increases.

The same reasoning applies to the effects of ω_{-l} on a_l^* . When ω_{-l} increases, for any given a_l , the subordinated country's decision moves away from θ_l . This effect tends to increase a_l , because leader l can use additional resources to offset the effect of ω_{-l} on p^* . At the same time, variations in ω_{-l} affect the rate at which p^* approaches θ_{-l} as a_l varies.

For a_{-l}^* sufficiently small (i.e., $a_{-l}^* \leq \bar{a}_l$), the distance between p^* and θ_l becomes insensitive to a_l . In this case, the positive effect of ω_{-l} dominates and a_l^* increases as ω_{-l} increases. However, if a_{-l}^* is sufficiently large (i.e., $a_{-l}^* > \bar{a}_l$) the negative effect dominates.

Finally, from (B.7), the parameter γ_{-l} affects a_l only through a_{-l} . Proposition 2 informs us that a_l increases as γ_l increases. Therefore, a_l^* increases as γ_{-l} increases if and only if, in equilibrium, the strategies are complement strategic.

The second line of Proposition (3) informs about the effect of ω_l on the slope of the reaction functions. The leader l responds less aggressively to the rival's attempts to gain influence over the subordinated country's decision when ω_l increases.

This result is due to the fact that, as mentioned above, in an equilibrium with strategic complementarity between leaders' actions there is a substitution effect between ω_l and a_l . Consequently, as ω_l increases, leader l 's strategy becomes less sensitive to leader $-l$'s strategy.