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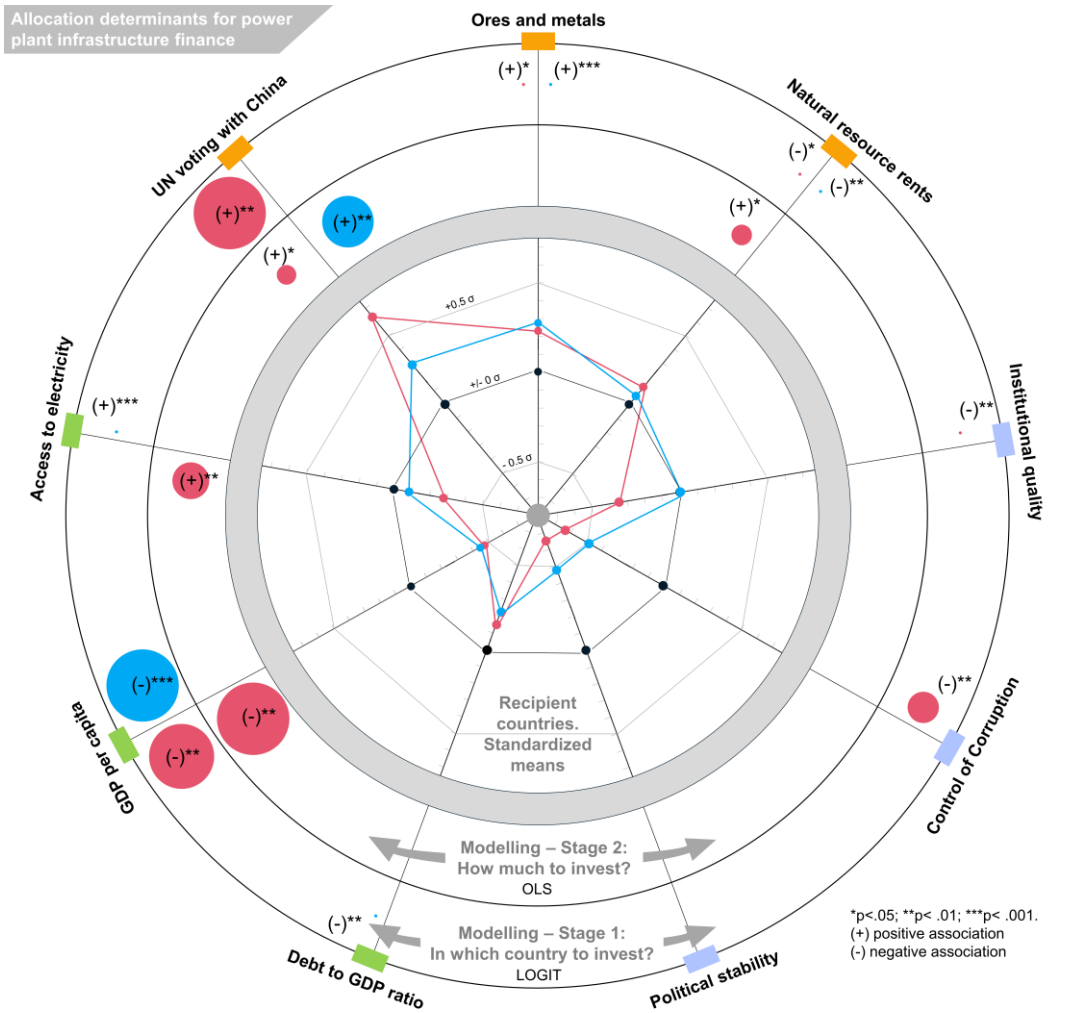
Determinants of Chinese and Western-backed development finance in the global electricity sector



Actors: Chinese Developmental Institutions — Western-backed Multilateral Development Banks. Global power plant funding transactions 1999-2018. *Variable categories*: = Donor interest. = Recipient merit. = Recipient need. Dependent variables: Stage 1: binary power plant infrastructure investment indicator. Stage 2: funded power plant capacity in MW for countries where investment is present. Circle size proportional to standardized regression weight.

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Determinants of Chinese and Western-backed development finance in the global electricity sector

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SUMMARY

Despite China's recent rise as major public finance provider for the electricity sector of the developing world, there is limited knowledge on the determinants of the allocation of its portfolio. Building on a newly constructed unit-level dataset with global investments into power plant infrastructure from Chinese Developmental Institutions (CDIs) and Multilateral Development Banks (MDBs), a two-part model (1999-2018) and 39 primary interviews, we investigate the influence of variables related to self-interest, need and merit. We find that countries politically aligned with China on human rights with low control of corruption and institutional quality scores are more likely to receive CDI finance. In contrast to common claims, resource endowments do not play an important role. Furthermore, over time, CDIs move closer to the MDB portfolio, increasingly supporting plants in wealthier countries with lower investment risks and higher electrification rates – a trend that might aggravate already severe investment gaps for low-income countries.

China, Western World, Development Finance, Electricity Sector, Determinants

Context & Scale

Building on a newly constructed unit-level dataset that unveils power plant infrastructure finance from Chinese Developmental Institutions (CDIs) and Multilateral Development Banks (MDB) to a considerably greater extent than this has been done before we find that CDIs increasingly support power projects in countries that are politically aligned with China on human rights whilst simultaneously shifting towards concentrating their investments into wealthier countries with higher electrification rates (thereby approximating the portfolio of Multilateral Development Banks). A continuation of the trends we identify would leave some of the poorest countries without the finance needed to address their severe generation infrastructure gaps. In addition, meeting net-zero goals will require a significant and time-critical adaptation of the status quo of capital mobilization and allocation.

INTRODUCTION

Meeting net-zero goals by 2050 is estimated to require a sevenfold increase of the current annual capital spending (2020) in the energy sector of the developing world to more than $1 trillion per year[1]. Given the lack of domestic resources and high investment risks in the electricity sector of developing countries[2] public international finance plays a critical role[3,4]. Historically, western-backed Multilateral Development Banks (MDBs) have been considered the pivotal finance providers for power projects in the developing world[3,5,6]. Recent research, however, indicates that in the last 20 years Chinese Developmental Institutions (CDIs) have rapidly emerged as major public finance providers for the global electricity sector[7].

Despite increasing attention and much commentary on the drivers of the Chinese foreign expansion in the power sector and beyond since the initiation of China's Going-Out strategy in 1999 and the following Belt and Road Initiative (see common claims in Fig. 1), empirical quantitative studies moving beyond qualitative analyses[e.g.,8,9] are sparse. There is only a handful of studies that empirically analyzed determinants of Chinese development-related state financing flows in general (see Supplemental Table A1 for a literature review), with very limited knowledge about the determinants at the sector level[10]. Empirical evidence in the energy sector is close to non-existent, consisting of three recent studies[11,12,13] that only cover the two major Chinese policy banks (China Development Bank (CDB), Export-Import Bank of China (ExIm)) and are limited concerning the covered time period and investigated determinants (see Supplemental Table A2). This lack of analysis can be explained by difficulties in tracking the international activities of CDIs. China's officially published information on its public financing activities abroad is not aligned with OECD standards and is provided at an aggregated level with very limited information on projects and recipients[10,14].

To address this gap, we compiled a unit-level dataset that contains global investments into building new power plant infrastructure from CDIs as well as Western-backed MDBs for the period 1999-2020. The dataset draws on commercial data tracking, publicly available datasets, and more than 1000 supporting documents to match identified financial transactions from the major CDIs active in the electricity sector to power plants around the world. In addition to China's two major policy banks development funds and two China-backed MDBs are considered (as defined in the next section). Building on the international development and relations literature that is concerned with understanding allocation determinants of aid[15-21] and more commercially oriented state financing flows[14,21,22], the influence of variables related to national self-interest, recipient country need and recipient country merit on the allocation of the identified power plant investments is investigated using a two-part model (OLS, LOGIT), kernel density estimators and supporting primary interviews (39 experts).

Building on the newly constructed dataset that unveils CDI funding in the electricity sector to a considerably greater extent than this has been done before we find that countries politically aligned with China on human rights with low control of corruption and institutional quality scores are more likely to receive CDI finance, albeit patterns differ by institutions and technologies. Over time, CDIs become more self-interested as measured by political alignment on human rights and increasingly less considerate of recipient needs as measured by GDP per capita, although their initial focus on institutionally weaker countries with lower electrification rates (in comparison to MDBs) has made important contributions in high-risk environments with limited alternative finance options. A continuation of recent temporal expansion patterns that we observe for CDIs (convergence of finance towards countries with lower investment risks and higher wealth, decreasing overall investments) and the lack of consideration of the access to electricity in finance allocation for CDIs and MDBs alike is likely to aggravate the already severe investment gaps for low-income countries.

The remaining part of this work is structured as follows: First, we provide a brief overview of the conceptual framework and the research hypotheses. Second, we present a descriptive comparison of the geographical distribution and country-level determinants associated with power investment decisions of CDIs and MDBs for the full period for which data is available (ranging up to 2020). Third, we present the results of the econometric two-part models covering the period 1999-2018, followed by implications for public policy and a conclusion.

DEFINITIONS, RESEARCH MODEL AND HYPOTHESES

The unit-level dataset used in this study tracks the involvement of all potentially relevant CDIs active in the energy sector for power plants globally in the period 1999-2020. The following institutions are considered: China's two major policy banks (China Development Bank, Export-Import Bank of China), twenty regional and bilateral development funds (e.g., Silk Road Fund, see Table A4 for the full list) and two newly established multilateral institutions with China as a major shareholder (Asian Infrastructure Investment Bank, New Development Bank). This represents a recent compilation of a list of all relevant Chinese Developmental Institutions active in the energy by Gallagher et al.[23] according to which the newly established institutions next to China's policy banks "will increase China-backed development finance by at least an order of magnitude" (p. 320). Whereas this grouping is driven by the aim to provide an as comprehensive picture as possible it is also important to mention the underlying sample heterogeneity. Table A3 provides transparency and details on the underlying heterogeneity of the covered actors and ranks them by the degree to which the Chinese government can influence decisions. We disaggregate the determinant analysis by institutions as far as this is possible in the empirical approach.

To enable a comparison, the dataset is expanded to funding activities of Western-backed MDBs (i.e. traditional MDBs as defined by Steffen and Schmidt[3] with a country from the global north among their shareholders and boards), thereby (only) excluding the Islamic Development Bank and Development Bank of Latin America (see Table A3 for the list of covered MDBs). Given the distinct characteristics of Chinese development finance, which is not aligned with OECD criteria[24], and the heterogeneity of power plant finance providers beyond CDIs[25,26] there is no "natural" comparison group. Western-backed MDB have been selected as comparison group as they are considered as the pivotal finance providers in the electricity sector and as they have a set of similar features with CDIs (Supplemental Section H provides details for the selection process that also considered National Development Banks, Export Credit Agencies/National Export-Import Banks and funds from the Global North). We define development finance as all financial instruments employed by the developmental institutions under consideration (i.e., loans with different degrees of concessionality and occasionally equity investments and guarantees in the final sample) with excluding pure capacity building activities. (See Table A3 for covered institutions with their employed financial instruments).

Figure 1 displays the conceptual model that has been developed to synthesize and guide the selection of the variables to be tested in the statistical analysis of allocation drivers of the power infrastructure funding. It builds on the aid allocation literature according to which "a proper description of bilateral aid allocation behavior requires combining both self-interest of donor variables and variables that take into account the recipient needs and merits "[15 p. 183, 21,27,28] as this avoids omitted variable biases[15,27]. A synthesis of common claims on the underlying drivers of the Chinese development-related foreign expansion in the energy sector and beyond from various sources (that are specified in Fig. 1 with the claims) guided the variable selection. The derivation details for the displayed hypotheses in Figure 1 (+ = positive association, - = negative association) are provided in Supplemental Section B and the indicators used for their operationalization are defined in more detail in the supplemental experimental procedures. The influence of the selected indicators (A1-K3 in Fig. 1) on the investment decisions in the main statistical analysis (1999-2018) is modeled in two stages (D1 and D2 in Fig. 1). The first stage determines the influence of the investigated determinants on the probability of receiving finance considering 136 countries (*Where to invest?*). The second stage focuses on strictly positive observations for country-year-dyads by applying linear models to explain commitments as measured by the funded unit-level based capacity in MW (*How much to invest?*). Expert interviews and various supporting analyses that are all specified in detail in the experimental procedures and supplemental material section are used to complement the main statistical analysis.

Whereas our study is concerned with allocation behavior of developmental institutions it is important to note that decisions on investments in recipient countries are influenced and ultimately made by actors in the recipient countries[9,29], which are not in the focus of this study. See for example Gallagher et al.[29] for a recent interview-based study that creates a nuanced view on the role of domestic agency in four major recipient countries of Chinese coal finance.

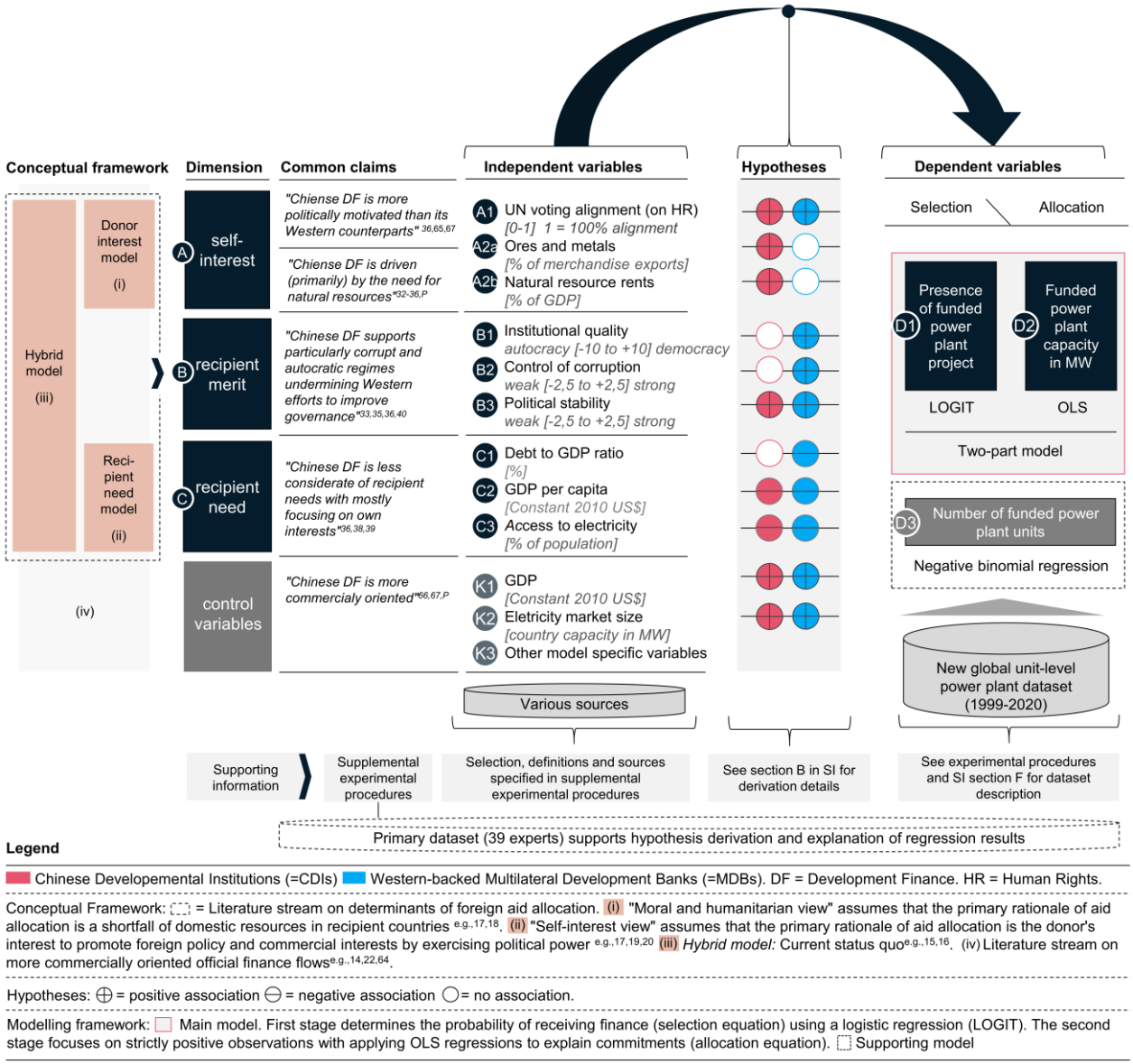

Figure 1. Simplified illustration of research model with conceptual framework, variables and modelling strategy. Created by the authors. The conceptual model of drivers of investment and the selection of variables builds on the research articles[14,16,21,22,32,33,35,40,64], policy reports[34,39,65,66], conducted primary interviews (=P) and other sources[38,67] and supporting information as specified in the figure. Common claims are oftentimes case-study based with very limited and partly mixed empirical evidence supporting or rejecting them. The claims thereby constitute selective but prevalent views/findings in the mentioned sources. Note: Index A1 reflects voting alignment of recipient countries in the UN General Assembly for important human rights votes where China and the US disagree.

RESULTS AND DISCUSSION

Figure 2 displays the geographical distribution of power plant cumulative capacity facilitated by CDIs and Western-backed MDBs over the 1999-2020 period as captured in the underlying main unit-level dataset of this publication. As described in more detail in Supplemental Figure G1, the underlying dataset represents the most comprehensive compilation to date, indicating that the involvement of CDIs in the global electricity sector outside China is considerably higher than hitherto estimated. The total identified 166 GW of CDI-supported capacity (including capacity not yet connected to the grid) represents 8.5% of the total active capacity (as of April 2020) in CDI recipient countries as reported in GlobalData[30].

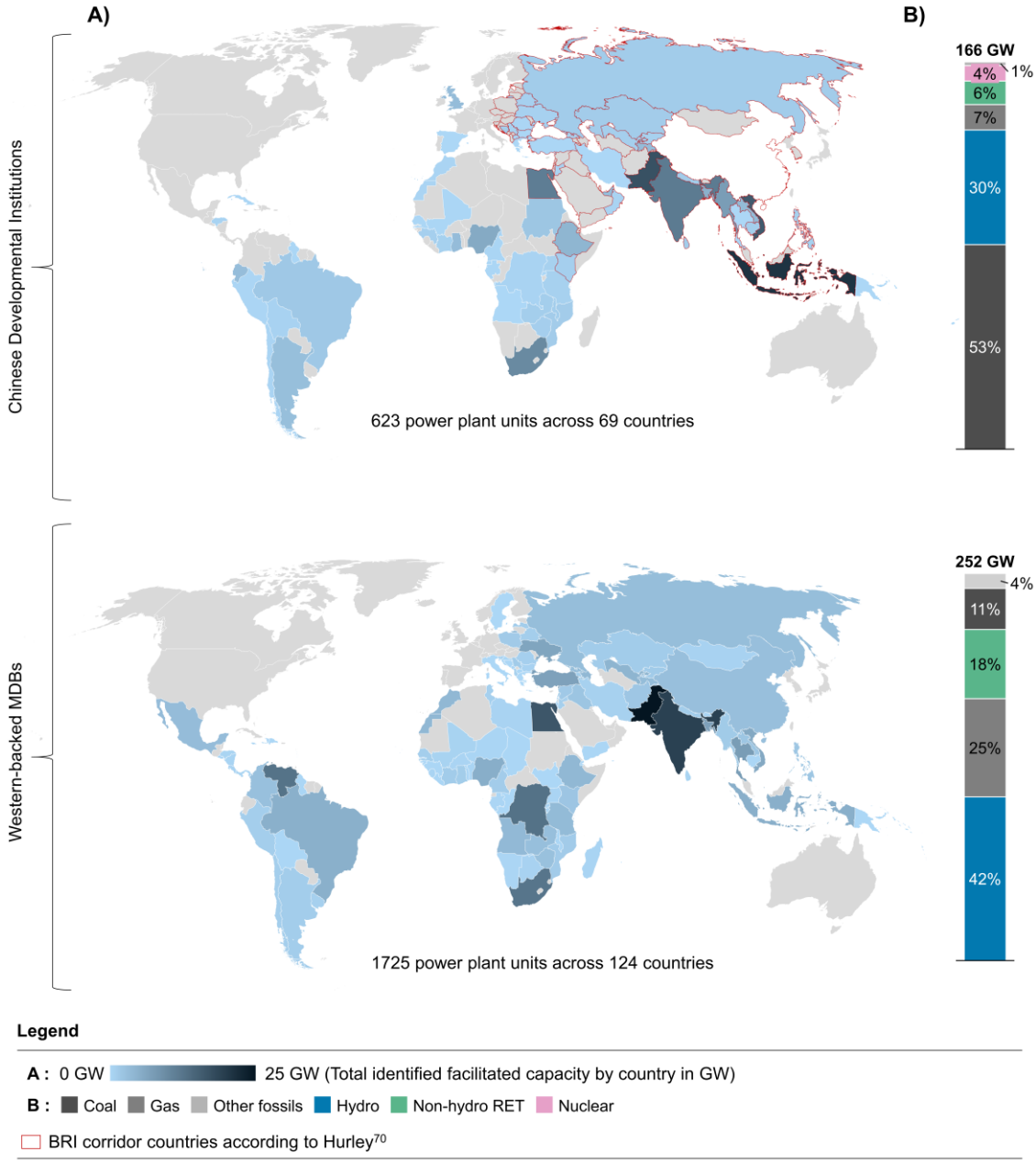

Figure 2. Geographical distribution of CDI and Western-backed MDB-funded power plant capacity in comparative perspective. The globally added incremental power plant capacity resulting from identified financial transactions in the period 1999-2020 is displayed by country (A) and technology (B). The identified 166 GW of CDI-funded capacity equals to 3.2 % of the World's total power generation capacity outside China in 2017[72].

Figure 2 illustrates that allocation of CDI finance expands considerably beyond the initial BRI corridors (36 countries outside BRI corridors) reaching large parts of the developing world and its portfolio distinguishes itself with a considerably higher share of coal-funded capacity (53% vs. 11% for MDBs with no identifiable MDB investments after 2015, see Figure C3). The identified CDI funded coal-fired capacity outside China (of which more than half of the capacity (46.5 GW) is still in the pipeline as of April 2020) will create lock-in for decades, just in a time where large-scale renewables are becoming cost-competitive in many contexts[31] and the climate crisis is asking for urgent action to decarbonize the electricity sector. Additional descriptive statistics for the dependent variables (number of supported projects and capacities broken down by institutions, technologies, and time periods) are provided in Supplemental Section C.

How recipient country profiles differ

A standardized mean comparison for the main investigated determinants of CDI and Western-backed MDB recipient countries is displayed in Figure 3. In contrast to the commonly stated view that Chinese development finance is primarily attracted by resource endowments[32-36] and the notion that China is focusing on heavily indebted countries with pursuing a "dept trap diplomacy"[37-39], the debt-to-GDP ratios and levels of resource endowments (for both used indicators) are comparable across the CDI and MDB portfolios (see Fig. 3).

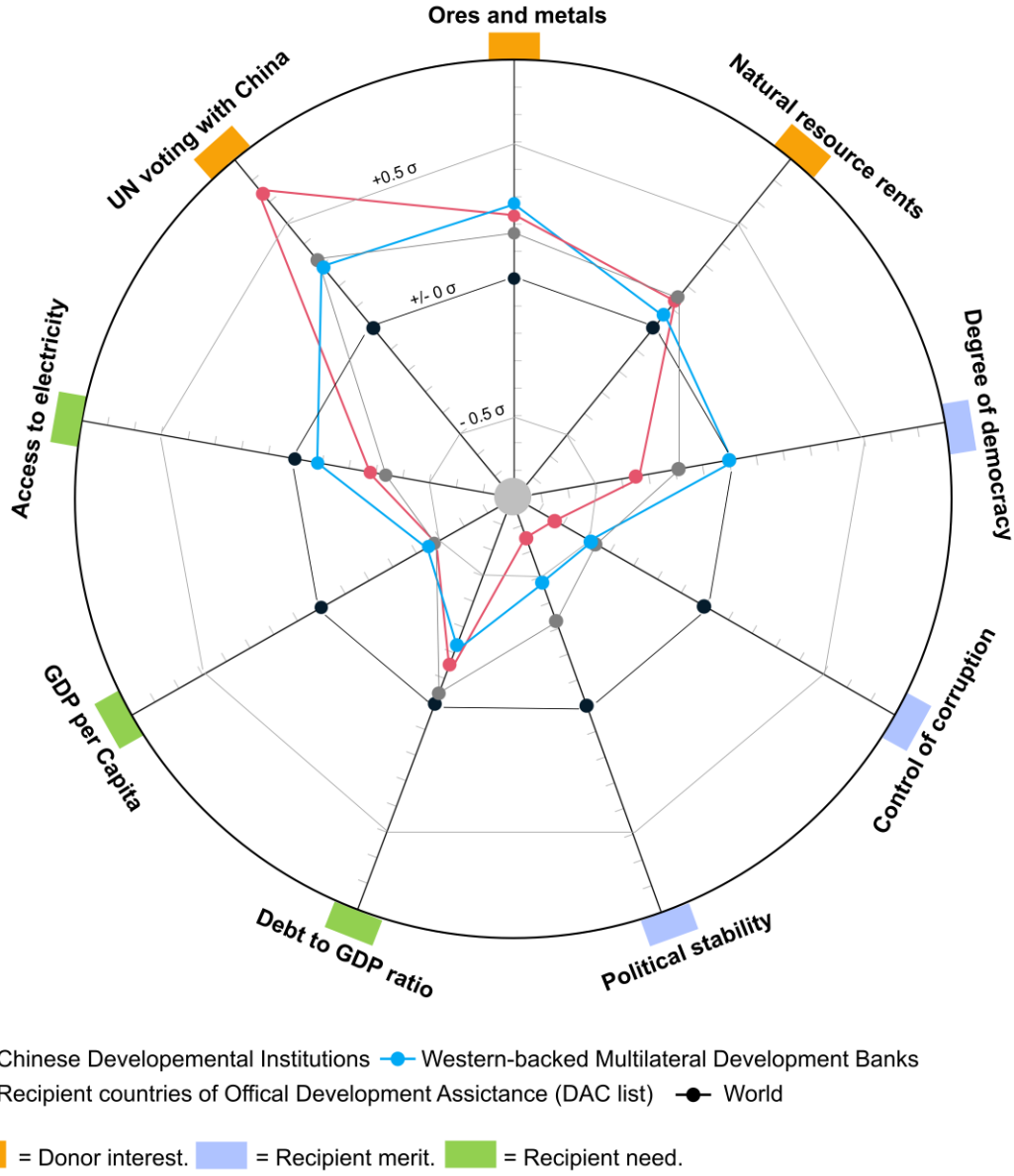

Figure 3. Standardized mean comparison for main investigated determinants

Means for recipient countries of CDI and Western-backed MDB power plant finance expressed as standard deviation from the world population mean and available data in the period 1998-2019. Population (world) values for available countries and years are z-transformed for each variable. Only those country-year dyads where support was received in the subsequent year are considered for recipient country mean calculation for CDIs and MDBs. The Official Development Assistance (ODA) recipient countries refer to 146 countries that received ODA (all types) as reported by the Development Assistance Committee[68]. All years with available data are considered for the DAC country mean calculation (not only the years when ODA was received). Supplemental Table D1 provides further descriptive statistics (n, M, SD, available years) for the investigated determinants. Supplemental Table C3 supports the robustness of results across unweighted and different forms of weighted (by number of projects and supported capacities) means.

In line with conventional wisdom and case study-based claims from the literature on international relations[33,35,36,40], we find that CDIs are invested in countries that have lower control of corruption, political stability and democratization scores as compared to Western-backed MDBs and recipient countries of official development assistance in general (see Fig. 3). Research has found that corruption, low regulatory quality, and political instability usually discourage private cross-border investments into the electricity sector and are linked to higher investment risks[11,41-43]. Hence, whereas some policymakers and experts criticize China's engagement in institutionally weak countries (as undermining Western efforts to reward good governance[35]) [33,36,40] the observed complementarity between the Chinese and Western finance may have helped to secure finance for some of the poorest countries with particularly low electrification rates (see Fig 3), which may historically had difficulties attracting other finance types given their high institutional investment risks. A potential explanation for this observation might be that the (historical) presence of Western-backed MDBs in more stable, low-risk environments crowded parts of the Chinese involvement out towards more risky but unserved areas, albeit this does not seem to be the case in all recipient countries. In Uganda, for example, the initial presence of the IFC and the World Bank was followed by large Chinese investments in the country[44,45] (Interview ID PU5). The results (presented in Figure 3) are robust to a weighting of the means by the number of supported projects and supported capacities, except for a few capacity-weighted means that are skewed by large projects (see Supplemental Table C3)

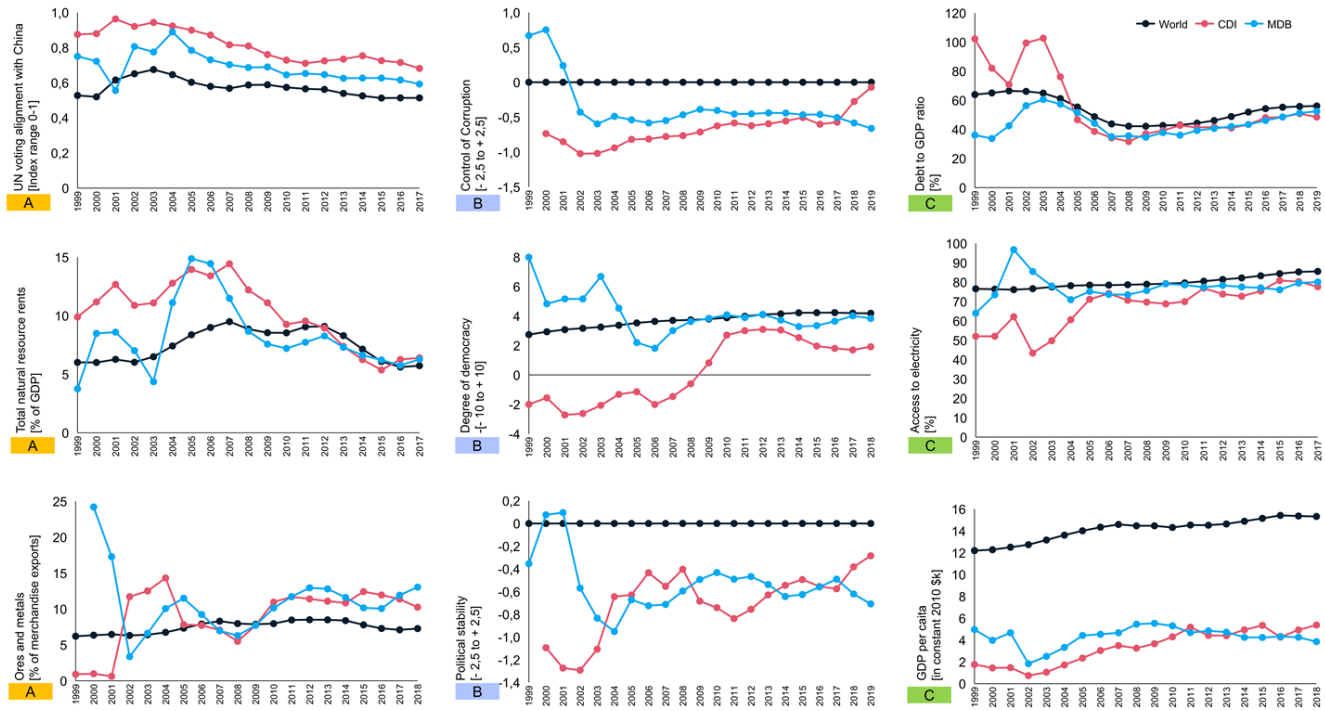

Figure 4. Temporal distribution of the mean value of the investigated determinants for available data in the period 1999-2019. Note: Last displayed year for different indicators ranges from 2017 until 2019 which reflects data availability. The means are displayed as a three-year rolling average except for the last year where the average of the last two years is taken. For the CDI and MDB sample, only those country-year dyads where finance was received in the subsequent year are considered for recipient country mean calculation. Supplementary Table D1 provides further descriptive statistics (n, M, SD) for the investigated determinants.

How investment patterns shift over time

A systematic comparison of the density functions in the period before and after the initiation of China's BRI (see Supplemental Section E) together with an analysis of the temporal distribution of the mean value of the investigated determinants (see Fig. 4) suggests that, over time, the profile of CDI power investments is converging with those of Western-backed MDB portfolio in several (risk-related) dimensions. The distribution of the debt-to-GDP ratios (expressed as kernel density estimation) for recipient countries of CDI and Western-backed MDB's support indicates that the initial presence of highly indebted countries with a debt-to-GDP ratio above 100% during the period 1998-2012 completely disappeared in the period 2013-2019 on the Chinese side, unlike what can be observed for the world distribution as well as for Western-backed MDBs (see Fig. 5). Supplemental note D1 further supports that a migration towards countries with lower debt-to-GDP ratios is more prevalent than a reduction of ratios in supported countries over time. In addition, there is a strong trend towards supporting projects in countries with higher democratization, control of corruption, and political stability scores (see Fig. 4). These characteristics are also more frequent in countries with higher GDP per capita and access to electricity and the shifts are distinct from observed trends in the world distribution in the same time period (see Supplemental Section E).

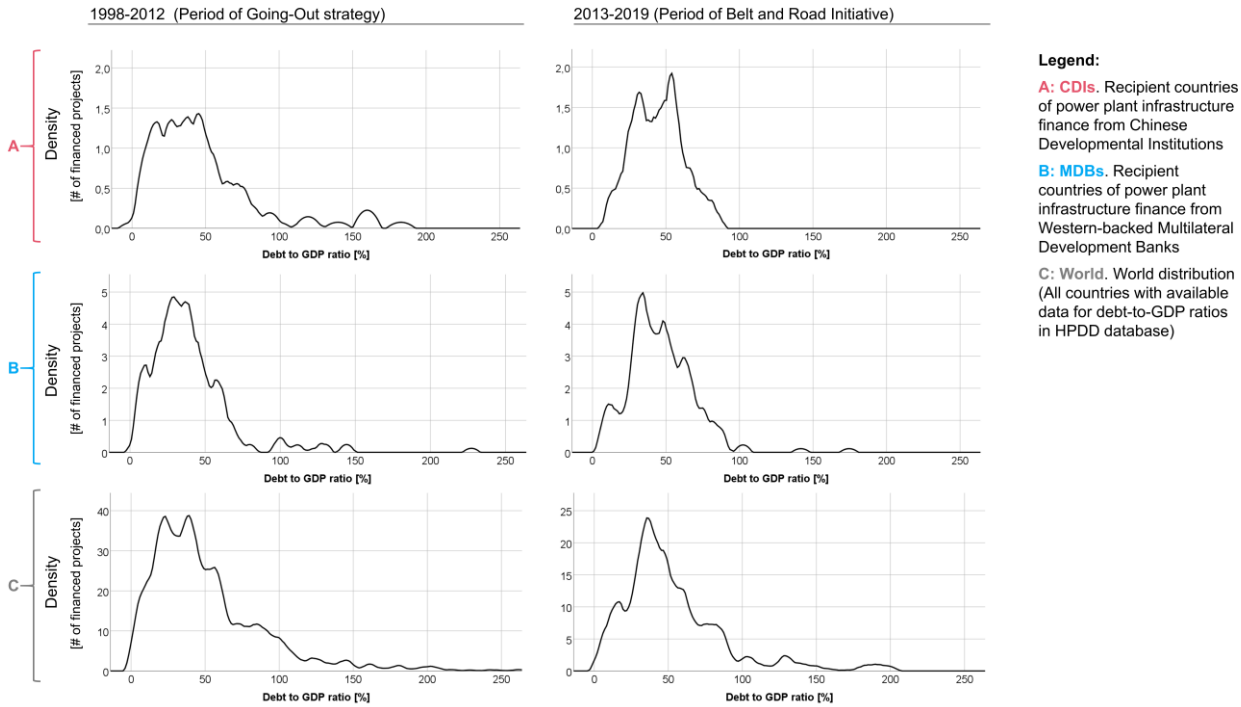

Figure 5. Kernel density functions of debt-to-GDP ratios for countries that received power plant finance from CDIs and MDBs. Density functions are displayed for the time period before (1998-2012) and after the initiation of China's Belt and Road initiative (2013-2019) in a comparative perspective to the world distribution. The world distribution represents the density functions for all countries in the world for which data for debt-to-GDP ratios was available in the International Monetary Fund Historical Public Debt Database[69] (the selection of countries in the world distribution is unrelated to power plant finance that those countries received). The Y-axis represents the probability distribution of the number of financed projects. Note: Only those years where finance was received in the subsequent year are considered for part B-C.

Due to the limited share of financed capacity (5.7%, see Supplemental Table C2) of the newly established China-backed MDBs (AIIB, NDB), the observed portfolio convergence cannot be attributed to the occurrence of those new actors. This indicates that a recently published observation that China's two major policy banks are more risk-taking (as measured by the OECD risk rating for the top 20 recipient countries in the period 2005-2017) in comparison to Western MDBs[23] might not apply anymore. An equally weighted composite index of the risk-related variables of this study indicates that the averaged investment risk (as measured by this proxy) for the CDI portfolio for the first time falls below the value for the MDB portfolio in 2018 (see Supplemental Fig. C2).

The findings from the statistical analysis of the data regarding the increased risk aversion of Chinese finance in terms of shifting away from poorer countries with greater needs were confirmed by the results from the expert interviews. Several respondents from the primary interviews (see Supplemental Table G.1. for an overview of the interviews) also observed an increased risk aversion on the Chinese side (Interview ID PS17, PS15. PU1, PS11). Interviewees attributed this risk aversion to (inter alia) decreasing financial resources in domestic China in the context of an economic slowdown that started already before the pandemic (Interview ID PU5, PU1) and they expect the investment selectivity to further increase in the context of the global pandemic (Interview ID PU1, PU5). An increased risk aversion might also explain the observed downturn of CDI-funded plant capacity after 2017 (see Supplemental Fig. C1), which, if continued, could leave some of the poorest and institutionally weakest countries without power plant finance.

Determinants

Table 1 and Table 2 present the summarized results of the main econometric two-part models for different time-periods (1999-2012, 2013-2018) and technologies (fossils, renewables). Supplemental Section D provides full results for supporting regression models (e.g., negative binomial regressions, disaggregation by institutions) as well as supporting statistics and model specifications on which we refer selectively in the main text. Results are presented by dimensions of our conceptual framework (self-interest, merit, need).

How self-interest is influencing finance allocation

UN voting on human rights

As shown in more detail in Table 1, we observe that CDI investments are more likely to be made in countries that have similar political views as measured by voting alignment in important human rights questions in the United Nations General Assembly (UNGA) where China and the US disagree (see supplemental experimental procedures for index details). An increase of this UN voting index of one unit (one unit = 0.1; range 0-1) is associated with an increase of the likelihood of receiving Chinese power plant finance by 49% at 0.05 significance level and Chinese-funded power plant capacity (MW) by nearly 10% at 0.10 significance level. The likelihood of receiving Chinese finance when voting in line with China nearly doubles in the period after the initiation of China's BRI (odds ratio = 6.44; 2013-2018) when compared to the period before (odds ratio = 3.65, 1999-2012) and the effect seems to be stronger (i.e. by significance and effect size) for fossil-fuel-based finance as opposed to financing for renewables (which might reflect preferences of countries with similar human right positions as the technology choice is considered to be demand driven[29]). (Table 1-2).

In contrast, we find that the decisions of Western-backed MDBs regarding which countries to invest in are unrelated to political alignment as measured by UN voting similarity between recipients and the US on human rights (Table 1, modelling stage 1). The respective regression coefficient differs significantly from the one in the CDI regressions ($z = 1.908$, $p < .10$, see Table D10). While an analysis of how much power plant capacity to invest in (Table 1, modelling stage 2) shows that such decisions are, against what one might expect, positively related to human rights positions of China at 0.05 significance level (with no statistically significant differences between coefficients between CDI and MDB models, see Table D11), we find that this observation may be driven by the construction of large hydropower projects in a few countries with high alignment rates with China on human rights voting, including Pakistan, India, Congo (Dem. Rep.) and Venezuela. This is also supported by the difference between the project and capacity weighted means for the UN voting proxy (see Supplemental Table C3). When we reduce the impact of a few really large projects using a negative binomial regression with the number of financed projects as the dependent variable (which is insensitive to the size of the projects), we find that MDB investments measured by the number of financed projects are also unrelated to UN voting behavior (see Supplemental Table D6 and D7). This is one of the main differences between the portfolios of CDIs and MDBs.

While Dreher and Fuchs[16], which also used UN voting similarity as proxy for political alignment in their comparative multi-sector study (1996-2005), concluded that "China does not pay substantially more attention to politics compared to Western donors" (p. 988), our work concluded the opposite for the electricity sector. As our study did not identify any grants in our sample that Dreher et al.[14] recently found to be the only Chinese development finance

category to be significantly positively related to UN voting alignment a higher share of grants reflected in some of the underlying data in this study cannot explain the observed difference. In addition, for 80 plants (roughly a quarter of our sample) where flow class information was available from Dreher et al.[46] (see Table C4) only 23% of CDI transactions constituted more concessional ODA-like flows which is in the same range as in the aggregated study from Dreher et al.[14], albeit the inability to track the degree of concessionality comprehensively for our full sample can be considered as a limitation of our study.

Hence, although the comparison comes with limitations due to different covered time periods and study designs (see Supplemental Table A5 for a detailed comparison), it indicates that sectoral differences might play an equally or more important role than the degree of concessionality (of finance types) in finance allocation. A potential explanation for the role of sectors might be that power plant infrastructure entails high costs and risks when compared to other (non-infrastructure-related) development finance types[47]. This would be in line with the answers of several respondents from the primary interviews which suggested that higher investment risks may come at the cost of additional political support (Interview ID NP4, PU2, PS15).

Resource endowments

We observe that Chinese and Western power plant finance follow largely the same patterns concerning the consideration of resource endowments in finance allocation. Looking at the most commonly[48] used indicator to test the Chinese resource-seeking motivation beyond development finance, we observe a significant positive relationship between the wealth of exported ores and metals (as measured by the percentage of merchandise exports) and the likelihood of receiving Chinese (at 0.05 significance level) and Western (at 0.01 significance level) power plant finance with comparably small effect sizes (see Table 1) and no statistically significant differences between coefficients (see Table D10). An increase of 1% in ores and metal exports is associated with an increase of the likelihood of receiving power plant finance by 1.2 % for CDIs and 1.6 % for MDBs. Furthermore, for both types of funding providers, the effect seems to originate from the fact that there is a correlation between countries' hydropower potential and the wealth of ores and metals (see Supplemental Note D1). This means that countries with significant hydropower potential (and ores) are more likely to receive power financing for hydropower projects (see Table 2). As shown in more detail in Supplemental Table D8 the ores and metals indicator loses its significance when controlling for the hydropower potential. Hence, the observed positive relationship for the most commonly used ores and metals indicator and CDI and MDB power investments might be more a statistical artifact related to a correlation between hydropower potential and ores than a good proxy to approximate China's resource-seeking motivation.

In addition, the likelihood of receiving Chinese, as well as Western-backed MDB power plant finance, is negatively related (both with small effect sizes at the 0.05 significance level) to natural resource endowments as measured by the sum of oil, natural gas, coal, forest and mineral rents expressed as GDP share. Likewise, there are no statistically significant differences between coefficients (see Table D10). The only structural and statistically significant difference ($z = 1.655$, $p<.10$, Table D11) that can be observed between CDIs and Western-backed MDBs is that the supported power plant capacity on the Chinese side (in the second modeled decision stage) increases significantly at the 10 percent level with higher natural resource rents, albeit the effect sizes are small. An increase of 1% in the natural resource rents is associated with an increase of the CDI-funded power plant capacity in MW by 2.1 %, which is a considerably smaller effect than expected, given the fact that some researchers[11,49] estimate that nearly half of Chinese energy loans are commodity-backed (i.e. part of the loan is repaid with transactions on the underlying collateral (e.g., coal for coal plants)).

Hence, in contrast to conclusions from case study based research[32-36], some of our primary data respondents (Interview ID PU1, PS6, PS2, PU5, PS5) and adding to the sparse mixed empirical findings of more aggregated studies (Supplemental Table A1), resource endowments in recipient countries do not seem to play an important role in the global allocation of finance of CDIs in the global electricity sector. Undue generalization from hitherto dominating case study research and limitations of the proxies used in empirical research (see ores and metals proxy) might explain the observed discrepancy.

How recipient-merit is influencing finance allocation

In contrast to Western-backed MDBs, the likelihood of receiving Chinese power plant support significantly increases for countries with lower control of corruption scores (at 0.05 significance level). An increase of the control of corruption index of one unit (range -2,5 to +2,5) is associated with a decrease of the likelihood of receiving Chinese power plant support by 42% and the effect seems to become stronger and more significant in the period after the initiation of the BRI (2013-2018) than in the period of the Going-Out strategy (1999-2012) (see Table 1). The observed negative relationship between corruption control and Chinese development-related energy finance is in line with the recently published study from Niczyporuk and Urpelainent[11]. But unlike the findings from Niczyporuk and Urpelainen[11] and more aggregated empirical studies[14,16], we observe a negative relationship between the likelihood of receiving Chinese power plant finance and levels of democratization at the 0.05 significance level. An increase of the Polity2 index of one unit (range: autocracy -10 to +10 democracy) decreases the likelihood of receiving Chinese power plant finance by 4.2 %. In contrast to CDI finance and the narrative that MDBs reward good governance[50], recipient merit-related factors do not seem to play a role driving Western-backed MDB finance in the electricity sector.

Hence, in line with conventional wisdom and non-empirical claims[33,35,36,40] the involvement levels of CDIs in the global electricity sector are significantly negatively related to levels of institutional quality and control of corruption scores. This, in turn, results in long-lived fossil-fuel-based (mostly coal-fired, see Fig. 2) power stations in institutionally weak environments, which is linked to immense environmental, social and economic risks (Interview NP5, PU5). Less competition from other finance providers (e.g., MDBs) (Interview PS5) and a strong link to Chinese state-owned companies as de-facto risk hedging mechanism during project implementation (Interview ID PS1) might be a potential explanation for the observed investment concentration in institutionally weaker environments. The finding that the negative relation to control of corruption and democratization scores seems to originate primarily from the power lending portfolio from the Export-Import Bank of China, which is more inclined to support Chinese exports when compared to other actors, supports the view (Interview ID PS1) that willingness to take risk might be associated with additional commercial return (see Supplemental Table D9 for a disaggregation of the analysis by actors).

How recipient-need is influencing finance allocation

As hypothesized, Table 1 demonstrates that the poorer the country, as measured by GDP per capita, the higher the likelihood to receive power plant infrastructure finance for both finance types when the whole observation period (1999-2018) is considered. An increase of GDP per capita by 1% is correlated with a decrease of the likelihood to receive support by 0.6% for CDIs (at 0.05 significance level) and by 1.2% for MDBs (at 0.001 significance level). The higher poverty orientation on the side of MDBs differs significantly (as measured by the differences between the regression coefficients) from the one in the CDI models ($z = -3.325$, $p < .001$, Table D10). In addition, the size of the observed effect nearly halves for Chinese finance from the period before the initiation of the BRI in comparison to the following five years (losing its statistical significance), whereas Western-backed MDBs increased their focus on poorer countries in the same period. Likewise, the amount of financed capacity loses its significant poverty orientation in the period after the initiation of the BRI (2013-2018) on the Chinese side, albeit it is unrelated for Western-backed MDBs for both time periods (see Table 1). Hence, whereas the observed poverty orientation in the period before the initiation of its BRI is in line with aggregated findings from Dreher and Fuchs[14], more recently CDIs in the electricity sector seem to lose their orientation towards low-income countries, which might be explained by their increasing risk aversion.

Furthermore, the need for electricity as measured by the access to electricity on the household level does not seem to play a role in the allocation of power plant infrastructure finance for both finance types. An increase of the access to electricity by one percent is correlated with an increase of the likelihood to receive finance from Western-backed MDBs by 2.2 % at the 5 percent significance level. Whereas the decision in which country to invest does not seem to be influenced by the access to electricity on the Chinese side, the amount of funded power plant capacity increases by 1.1 % for every additional percent of the population with access to electricity (at 0.05 significance level). This might be explained by the fact that investments are directed towards the electricity demand by commercial and industrial sectors in major load areas as opposed to increasing the access to electricity on the

household level. In addition, half of the 750 million people that still lack access to electricity live in fragile and conflict-affected high-risk areas[51] that might inhibit public investments.

A qualitative analysis from a working group of the G20 Agenda for Sustainable Development[47] supports this view: "Rather than encouraging capital to flow to places where it is scarce, globally-mobile capital flows to places where it is most secure." (p.3). This is also reflected in the observation that the likelihood to receive power plant finance from MDBs decreases with higher debt-to-GDP ratios (at 0.05 significance level), unlike to CDIs where debt-to-GDP ratios are unrelated to finance allocation which is in line with the observation in other sections of this work that CDIs are more risk-taking than MDBs. (One of the respondents of the primary interviews also raised the hypothesis that some countries might apply for development finance support not because they are in need for it, but because they get better conditions than on the market (Interview ID AC3)).

Hence, CDIs seem to be losing their poverty orientation (as measured by GDP per capita) and we do not find evidence that the allocation of Chinese as well as Western power plant support is directed towards the need for electricity as measured by access to electricity. This might have severe implications for some of the poorest countries that might have difficulties to obtain alternative support. However, it is important to mention that we are unable to control for all potential confounding factors that might influence the access to electricity (e.g., power market structure, utility behavior) and that our study is not covering the projected demand for electricity as another important and conceptually different proxy for the need for electricity (see supplemental experimental procedures for more details). In addition to the already discussed increasing risk aversion a strong downturn in capital spending of MDBs in the electricity sector since 2010[ref.3] might have made more room for CDIs in wealthier countries which would be in line with the previously mentioned crowding-out hypothesis.

How allocation differs by institutions

The CDB and ExIm comparably allocate finance except for the difference that the higher observed commercial orientation (i.e. positive relation to electricity market size) and the observed negative relation to control of corruption and institutional quality scores observed in the aggregate analysis seems to originate from the ExIm (see Table D9). Furthermore, against what one might expect and in contrast to the ExIm, the allocation from the CDB is unrelated to poverty as measured by GDP per capita (at 0.05 significance level). In addition, to some extent contradicting the findings from Dreher et al.[14] that more commercially oriented finance flows will be less influenced by foreign policy interests we observe that the allocation of the ExIm is likewise (and with greater effect size and significance level in comparison to the CDB) significantly positively related to similar political views as measured by voting alignment in important human rights questions in the United Nations General Assembly (UNGA) where China and the US disagree (at 0.05 significance level, see Table D9).

For the more recently established development funds and the two newly established multilateral institutions with China as major shareholder the sample sizes are (still) too small to derive meaningful empirical conclusions. Given the high aggregated estimates for the development finance volume of China-backed energy and infrastructure-related development funds (US$160 billion as of July 2018)[23] their small volume of supported power plant capacity (7% of total CDI supported capacity) is somewhat surprising and indicates that their investment focus might be outside the power sector. Likewise, the small volumes for China's two newly established multilateral institutions (limited to 5% of the total CDI supported capacity), namely the AIIB and NDB, are somewhat surprising giving China's announcements to "practice true multilateralism"[52] and that it is estimated that the majority of the investments under China's BRI have been directed towards the electricity sector[23,53]. The small identified volumes of the newly established CDIs also imply that the hereto presented aggregated results cannot be generalized to those institutions. This is important to mention for the AIIB and NDB which are not under direct control of the Chinese state council and for which there has been a controversial discussion on its underlying motives (raging from being a vehicle for China's foreign policy interests[54] to an MDB dedicated to common goods[55]).

Implications for public policy

First, a continuation of the observed temporal trends for CDIs (convergence towards MDBs with respect to higher risk aversion, weakening poverty orientation) and no evident consideration of the access to electricity in finance allocation for CDIs and MDBs alike will

likely contribute to an aggravation of the severe power plant infrastructure investment gaps of the developing world. Delivering universal access to electricity in low and middle-income countries (oftentimes in fragile and conflict-affected areas[51]) will require power plant infrastructure investments that are estimated to $3.1 trillion in the period 2016 – 2030[56]. A stronger focus on micro assessments in favor of currently dominating macro debt considerations in finance allocation[47] and a wide securitization of loans across public and private actors that are coordinated via sectoral country development platforms as recently recommended by the G20 Eminent Persons Group on Global Financial Governance[57] are promising actions to mitigate investment risks and support finance flows to reach areas where they are needed most.

Second, there is an urgent need to steer the CDI portfolio that is currently dominated by coal-fired capacity into less carbon-intensive trajectories which will require the consideration of more granular sectoral drivers that are distinct from aggregated finance flows. There is almost no room for any additional coal if we want to limit global warming to 1.5 or 2°C above preindustrial levels[58]. The observation that CDIs are more likely to support projects in countries with low levels of democratization and control of corruption scores might further increase environmental risks. Whereas China's recent announcement at the United Nations General Assembly (UNGA) not to build new coal-fired power projects abroad[52] might change future finance allocation and limiting coal support would be an important contribution, the estimated required sevenfold increase of low-carbon investments into the energy sector of the developing world to meet the net-zero goals[1] will require a significant adaptation of the status quo of capital mobilization and allocation and it should therefore rank high in the agendas of board members of bilateral and multilateral public finance vehicles, the broader climate-policy community and governments.

Third, shortly before the turn of the century the World Bank stated[59]: "The world now accepts that sustainable development is impossible without human rights" (p.2). With China's rise after the turn of the century as major public finance provider in the electricity sector and our finding that alignment on human rights (in UNGA votes where China and the US disagree) is the major determinant in finance allocation from CDIs there might be an increasingly differing understanding of this paradigm. Chinese efforts to shape the global human rights governance system - as recently described in more detail by Zhangand and Buzan[60] as "politics of contestation" (p. 169) within the institutions of global human right governance including the United Nations - are increasingly prominent. Given the importance that this topic seems to have for China and the West alike the need for a more open and transparent dialogue should rank high on the agendas from heads of state as well as on more operational levels. It is for example surprising that the term 'human rights' is not mentioned once in the G-20 backed recommendations for the establishment of development country platforms as one of the priority areas for the reformation of the global financial development finance architecture[57].

CONCLUSION

In a very short period, CDIs have emerged as major public finance providers of the developing world, significantly shaping the contours of the global electricity sector. Despite speculation as to China's underlying motives, empirical evidence on the motivating drivers is sparse. This study empirically analyzes the determinants that drive the expansion of CDIs in the global electricity sector in direct comparison to Western-backed MDBs over a long time period and investigating a range of drivers, unveiling more granular sectoral patterns that are distinct from aggregated studies.

We find that a stereotypical target country of Chinese power plant finance is politically aligned with China on human rights positions and marked by low institutional quality and control of corruption scores. Whereas the importance of political alignment increases over time, the initial orientation of CDI portfolios to poor countries (as measured by GDP per capita) is no longer there, albeit patterns differ by actors and technologies. In contrast, a typical country that receives finance from Western-backed MDBs is (increasingly) marked by poverty and (to a much less decisive degree) low indebtedness. Political alignment (on human rights positions with the US), as well as recipient merit-related factors, does not seem to play a role for MDB finance, thereby illustrating how investment strategies differ considerably. Low access to electricity does not play a role for either of the finance types. Likewise, resource endowments, which have been assumed to be the major determinant in the allocation of Chinese development finance, play a small role with very comparable allocation patterns between

CDIs and MDBs. In sum, CDIs seem to be more self-interested as measured by political alignment and increasingly less considerate of recipient needs as measured by GDP per capita, although their initial focus on institutionally weaker countries with lower electrification rates (in comparison to MDBs) has made important contributions in high-risk environments which have limited alternative finance options.

EXPERIMENTAL PROCEDURES

Resource Availability

Lead Contact

Further information and requests for resources should be directed to and will be fulfilled by the Lead Contact, Jürgen Michael-Thomas Sauer (jmts5@cam.ac.uk).

Materials Availability

This study did not generate new unique materials beyond the data specified below.

Data and Code Availability

Newly generated data for the used dependent variables (number of financial transactions and financed power plant capacity) per country, year and technology for Chinese Developmental Institutions and Western-backed Multilateral Development Banks and used code for the regressions can be provided upon request. The various sources that are used to construct the variables including the methodology description that allows for replication is specified in detail in the supplemental experimental procedures.

Empirical strategy

To account for the censored nature of our outcome variable and following other publications in the aid allocation literature stream[28,61], a two-part model is used to test the influence of our explanatory variables on allocation behavior. In the two-part model, the first stage determines the probability of receiving finance (selection equation). The second stage focuses on strictly positive observations with applying linear models to explain commitments (allocation equation)[15]. The chosen method comes with the assumption of independence between the two modelled investment decisions, which is justifiable in the context of this study for the following reasons: First, it is difficult to think of a variable that influences selection but not allocation. Second, there is empirical evidence that the allocation equation is independent of the selection equation[28]. Third, the two other available parametric frameworks in form of the Heckmann method and Tobit models[28,61] also come with limitations[62] (with respect to lower robustness when certain assumptions are not met) that seem to weigh higher in the context of this study (see Supplemental Note D2). Hence, the Chinese and Western investment decision is modeled in two stages with its respective dependent variables defined as follows:

- *Stage 1 (selection): Where to invest?* Decision in which countries to invest with considering all sample countries and a binary dependent variable $D1$ indicating if a Chinese/Western power plant investment in a country i and year t and technology j is present
- *Stage 2 (allocation): How much to invest?* Decision how much to invest with the dependent variable $D2$ as measured by the CDI/Western-backed MDB funded power plant capacity in MW in country i and year t and technology j

The decision to take the facilitated unit-level capacities as the outcome of interest and therefore the main dependent variable in the second modelled decision stage, as opposed to financial commitments, was motivated by the desire to also also consider financial support in the form of guarantees (which do not represent financial flows), the plausible assumption that the involvement of developmental institutions is critically important in facilitating the full supported unit-level capacity and by the fact that we did not have the financial commitments at the unit-level for the full sample, which can be considered as limitation of this study (see Supplemental Note D4 for more details). A logistic regression is used to model the first stage, an OLS regression to model the second stage. For both stages, the regression Equation 1 is estimated for the considered actors, technologies (fossil-fuel based, renewable) and time periods (1999-2018, 1999-2012, 2013-2018) separately (Estimating separate equations for each donor is the most common estimation technique in the development finance literature stream[22]). Whereas the first period from 1999-2012 represents the period of China's Going-Out policy, the following period represents its successor in form of the Belt and Road Initiative that was introduced in 2013. Despite an unequal distribution of years across the two investigated periods in the temporal breakdown, the sample is approximately equally distributed across the two periods, which reflects the rising trend of Chinese involvement over time. The decision to also split the MDB sample for the period of the BRI is

purely driven by the aim to compare trends during the same time periods. We do not have any hypotheses that the BRI has an effect on the allocation behavior of MDBs.

$$D1,2,3_{it} = \alpha + \beta_1 donor\ interest_{it-1} + \beta_2 recipient\ need_{it-1} + \beta_3 recipient\ merit_{it-1} + \beta_4 control_{it-1} + \alpha_t + \varepsilon_{it} \quad \textbf{(1)}$$

The term β_1 is a vector of the three self-interest related variables, β_2 represents the three recipient need related variables, β_3 the three recipient merit related variables and β_4 the control variables. The term α_t represents year fixed effects (to control for time-invariant omitted variables) and ε_{it} shows the error term. We do not include country-fixed effects in the main models to mitigate incidental parameter problems (arising from our short and largely unbalanced panel dataset) and as we do not expect our independent variables to explain much variance coming from year-to-year changes. We thereby follow Dreher et al.[14] that also highlight the importance of maintaining the between recipient country variation to test their hypotheses (see Supplemental Note D3 for more details). In line with Dreher et al.[14] time-varying explanatory variables are lagged by one year to mitigate endogeneity and reverse causality concerns. A potential endogeneity problem could for example be that CDIs and MDBs do not only reward countries that vote in line with them in the United Nations General Assembly (UNGA) on human rights, but that those countries vote in line with China and the US after receiving aid. To mitigate concerns of other researchers[16] that time lags come with the limitation that past values seem to be decoupled from actual allocation and that deterioration of diplomatic relationships might have an immediate effect on development finance allocation, we limit the time lag to one year. Nevertheless, we are aware that our empirical approach cannot rule out reverse causality and endogeneity concerns completely. Despite the above considerations, we prefer to interpret the regression results as correlation rather than casual effects. Also, because we are mostly interested whether, and to what extent political (as well as the other investigated factors) matter in finance allocation, as opposed to investigating if China instrumentalizes power plant infrastructure finance to obtain political or commercial support.

To increase the robustness of the analysis, a third supporting dependent variable $D3_{itj}$ is introduced, which represents the number of financed power plant projects in country i and year t and technology j. This dependent variable combines both decision stages in the main model and does not have the disadvantage linked to assuming independence between the two decisions in the main model (thereby also overcoming the incidental parameters problem that logistic regressions might have with fixed effects). Furthermore, in comparison to the indicator of the financed capacity in MW it has the advantage of being insensitive to the project size (and potential skewing effects from a few particularly large projects). Econometricians suggest applying Poisson or negative binomial regression models for count data[63]. The negative binomial model is an extension of the Poisson model which takes into account overdispersion problems[48]. As the count data indicators showed a higher variance compared to the means (indicating a positive overdispersion[48]) and the results of a One-Sample Kolmogorov-Smirnov test confirmed that the count data indicator $D3$ is not consistently following a Poisson distribution (for different considered technologies and time periods), a negative binomial regression was chosen in favor of a regression that is based on a Poisson distribution.

Variables and dataset construction

We construct a new global unit-level based dataset capturing transactions for all major CDIs as well as Western-backed MDBs for power plants around the world and the period 1999-2020. The dataset draws on commercial data tracking, publicly available datasets, and more than 1,000 supporting documents to match financial transactions by the covered institutions (see Supplemental Table A3) to power plants around the world with applying the dataset construction process that is specified in more detail in the supplemental procedures. This dataset identifies CDI investments in 69 countries and 623 power plant units (equaling to 166 GW) and Western-backed MDB investments in 124 countries and 1725 power plant units (equaling to 252 GW). The unit-level dataset is used to populate the three dependent variables D1, D2, D3 as defined in the section that specifies the modelling framework. For the aggregated analyses the plant units are coded as CDI/MDB plant when at least one of the considered CDI and MDB institutions (as listed in supplemental Table A3 and A4) is present. In cases when several investments happened across different years the capacity is allocated

equally across the years. For the sparse instances of joint investments between CDIs and MDBs into same plant units (limited to 36 plant units) the full capacity is allocated towards both samples with the underlying assumption that both are critically important in facilitating the full capacity (see Supplemental Note D4).

In parallel, a second dataset was constructed covering the independent variables. A detailed description of the used indicators for the independent variables (operationalizing $\beta_1 - \beta_4$ in Formula 1) including a specification of the various publicly available datasets used for their construction is provided in the supplemental experimental procedures. This dataset with the independent variables, in the first step, covered all countries (>200) and years for which data was available in the time frame 1998-2020. Next, the dependent variables have been included into the dataset with considering the one-year time lag in the matching (by the country-year dyads). This resulted in a four-dimensional (year × actor × recipient × technology) panel dataset containing more than 5000 observations. Due to data unavailability of explanatory variables, the final sample used for the regressions is only covering the years 1999-2018 for financial transactions and 1998-2017 for the explanatory variables (1-year time lag) and the number of covered countries and observations varies by considered models that display the observations and number of countries at each time.

Supporting primary dataset

We collected expert interview data throughout 2020 to enhance our understanding of the underlying mechanisms of the infrastructure investments of CDIs and MDBs, mainly in the power sector in BRI host countries. The 39 semi-structured interviews of 30-60 minutes were conducted remotely via telephone or videochat (skype, zoom) due to COVID-19 travel restrictions the interviewees were based in BRI recipient countries as well as China and held a broad range of subject matter expertise, coming from government organizations, financial institutions, local NGOs, think-tanks, academia, and consultancies (see Supplemental section F for a list of the experts, their country base, and the sector represented by their organizations). The participants have been selected via three methods: (a) an initial judgment sample building on expert knowledge by the authors of this work (13 interviewees), (b) snowball sampling (23 interviewees based on novel referrals) and (c) cold-calling (3 interviewees). Each discussion was guided by the same set of interview questions. The interviews presented in this work are coded with letters that indicate the sector (PS = private sector, PU = public sector, AC = academia, NP = nonprofit) and numbers to count the interview within the sector. The interviews were analyzed to identify the drivers of the Chinese expansion in the investigated dimensions of self-interest, recipient need and recipient merit which made up the coding system.

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AUTHOR CONTRIBUTIONS

L.D.A., J.K., J.P.B. and J.M.T.S conceptualized research. V.S. conducted primary interviews. J.M.T.S performed research, analyzed data, wrote the paper and compiled power plant finance dataset. L.D.A., J.K., J.P.B. and V.S. provided comments. L.D.A. secured funding and is the main supervisor.

DECLARATION OF INTERESTS

The authors declare no competing interests.

TABLES

Table 1. Allocation of CDI and Western-backed MDB funded foreign power plant capacity according to the main two-part regression model broken down by different time periods.

	Selection - Where to invest? (LOGIT)						Allocation - How much to invest? (OLS)					
	Funded power plant infrastructure (0,1)						Foreign funded power plant capacity in MW (log)					
	CDIs			Western-backed MDBs			CDIs			Western-backed MDBs		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	1999-2018	1999-2012	2013-2018	1999-2018	1999-2012	2013-2018	1999-2018	1999-2012	2013-2018	1999-2018	1999-2012	2013-2018
UN Voting with China	1.592**	1.296*	1.862**	.259	.651	-.208	.688*	.577	.643	.644**	.724	.470
	(.007)	(.091)	(.046)	(.492)	(.187)	(.729)	(.062)	(.250)	(.290)	(.002)	(.010)	(.170)
Natural resources rents	-.031**	-.016	-.092**	-.022**	-.018	-.044**	.021*	.029**	.001	.001	.007	-.012
	(.036)	(.313)	(.016)	(.029)	(.133)	(.029)	(.064)	(.028)	(.969)	(.860)	(.342)	(.259)
Ores and Metals	.012*	.014	.013	.016***	.010**	.026**	.001	.004	-.005	.000	-.001	.002
	(.092)	(.117)	(.274)	(.000)	(.084)	(.001)	(.809)	(.438)	(.574)	(.864)	(.803)	(.531)
Political Stability	.244	.145	.432	.118	.234	-.044	.088	.094	.161	-.088	-.106	-.027
	(.165)	(.509)	(.158)	(.357)	(.145)	(.845)	(.402)	(.469)	(.436)	(.148)	(.225)	(.770)
Polity2	-.043**	-.061**	-.027	-.004	.014	-.034	.020	.007	.042	.012	.015	.013
	(.041)	(.029)	(.437)	(.785)	(.526)	(.190)	(.152)	(.660)	(.137)	(.116)	(.226)	(.247)
Control of corruption	-.543**	-.275	-1.006**	-.117	-.267	.051	.071	-.007	.164	-.050	.023	-.200
	(.033)	(.389)	(.020)	(.479)	(.213)	(.847)	(.671)	(.972)	(.660)	(.560)	(.847)	(.134)
Debt-to-GDP ratio	.000	.001	-.004	-.006**	-.007*	-.005	.003	.004	.005	-.002	-.004*	.001
	(.980)	(.784)	(.584)	(.042)	(.078)	(.295)	(.285)	(.292)	(.537)	(.233)	(.092)	(.680)
Access to electricity	.005	.012	-.010	.022***	.019**	.021**	.011**	.015**	.001	0	.002	-.004
	(.479)	(.176)	(.378)	(.000)	(.003)	(.015)	(.025)	(.026)	(.891)	(1.000)	(.683)	(.316)
GDP per capita (log)	-1.336**	-1.706**	-.869	-2.884***	-2.498***	-3.251***	-1.235**	-1.466**	-.798	.169	.133	.251
	(.011)	(.014)	(.311)	(.000)	(.000)	(.000)	(.001)	(.008)	(.224)	(.416)	(.666)	(.401)
Country plant capacity (log)	1.102**	.926**	1.426**	.430*	.431	.632	-.152	-.317	.393	.265*	.334	.231
	(.002)	(.039)	(.024)	(.082)	(.194)	(.118)	(.565)	(.346)	(.430)	(.073)	(.139)	(.261)
GDP (log)	.178	.279	.050	1.022**	1.015**	.836**	.574**	.736**	.120	-.071	-.197	.050
	(.666)	(.585)	(.944)	(.001)	(.009)	(.080)	(.041)	(.035)	(.828)	(.665)	(.431)	(.824)
Country fixed effect	No	No	No	No	No	No	No	No	No	No	No	No
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
(Nagelkerke) R-squared	.30	.29	.33	.36	.36	.36	.45	.58	.36	.22	.24	.22
Number of observations	2014	2014	2014	2014	2014	2014	125	74	51	310	179	131
Number of countries	136	134	129	136	134	129	49	37	31	82	69	65

p values in parentheses. *p < .05. **p < .01. ***p < .001. CDI = Chinese Developmental Institutions. MDB = Multilateral Development Bank. Main test statistics (A = Likelihood-ratio test. B = Hosmer–Lemeshow test. C = F-Test.) for model 1-12 are presented in the following: (1): A: $x^2(27) = 238.626,\ p < 0.001$. B: $x^2(8) = 5.504,\ p = 0.703$ (2): A: $x^2(22) = 146.195,\ p < 0.001$. B: $x^2(8) = 4.716,\ p = 0.787$ (3): A: $x^2(15) = 93.644,\ p < 0.001$. B: $x^2(8) = 8.860,\ p = 0.345$ (4): A: $x^2(27) = 476.997,\ p < 0.001$. B: $x^2(8) = 6.765,\ p = 0.562$ (5): A: $x^2(22) = 301.826,\ p < 0.001$. B: $x^2(8) = 4.437\ p = 0.816$ (6): A: $x^2(15) = 160.910,\ p < 0.001$. B: $x^2(8) = 3.830,\ p = 0.872$. C: (7): $x^2(27, 97) = 2.951,\ p < 0.001$. (8): $x^2(22, 51) = 3.142, p < 0.001$. (9): $x^2(15, 35) = 1.298,\ p = 0.255$. (10): $x^2(25, 284) = 3.225,\ p < 0.001$. (11): $x^2(20, 158) = 2.505 = 0.001$. (12): $x^2(15, 115) = 2.183,\ p = 0.011$. The Variance Inflation Factors (VIFs) for the investigated explanatory variables for CDIs (Supplemental Table D4) and MDBs (Supplemental Table D5) are all below 10 indicating that Multicollinearity is not a concern[71]. Additional supporting statistics including correlations and odds ratios are presented in Supplemental Section D.

Table 2. Allocation of CDI and Western-backed MDB funded foreign power plant capacity according to the main two-part regression model broken down by different technologies.

	Selection - Where to invest? (LOGIT)						Allocation - How much to invest? (OLS)					
	Funded power plant infrastructure (0,1)						Foreign funded power plant capacity in MW (log)					
	CDIs			Western-backed MDBs			CDIs			Western-backed MDBs		
	(1) All	(2) fossil	(3) renewable	(4) All	(5) fossil	(6) renewable	(7) All	(8) fossil	(9) renewable	(10) All	(11) fossil	(12) renewable
UN Voting with China	1.592**	3.779***	.423	.259	.354	.208	.688*	-.616	.327	.644**	.878**	.477**
	(.007)	(.000)	(.523)	(.492)	(.578)	(.612)	(.062)	(.228)	(.527)	(.002)	(.010)	(.039)
Natural resources rents	-.031**	-.040	-.028*	-.022**	.004	-.041**	.021*	.012	.017	.001	-.001	.000
	(.036)	(.121)	(.091)	(.029)	(.783)	(.001)	(.064)	(.480)	(.354)	(.860)	(.861)	(.988)
Ores and Metals	.012*	-.010	.015**	.016***	-.010	.024***	.001	.028**	.002	.000	.010**	.003
	(.092)	(.565)	(.038)	(.000)	(.256)	(.000)	(.809)	(.018)	(.644)	(.864)	(.025)	(.346)
Political Stability	.244	.370	.061	.118	.037	.110	.088	.167	.027	-.088	-.181*	-.073
	(.165)	(.177)	(.767)	(.357)	(.847)	(.429)	(.402)	(.292)	(.850)	(.148)	(.056)	(.273)
Polity2	-.043**	-.039	-.026	-.004	.004	-.010	.020	-.008	.044**	.012	.013	.014*
	(.041)	(.219)	(.315)	(.785)	(.886)	(.562)	(.152)	(.639)	(.029)	(.116)	(.328)	(.096)
Control of corruption	-.543**	-.450	-.848**	-.117	-.068	-.076	.071	-.063	-.210	-.050	.160	-.160*
	(.033)	(.304)	(.004)	(.479)	(.805)	(.671)	(.671)	(.868)	(.343)	(.560)	(.279)	(.094)
Debt-to-GDP ratio	.000	.006	-.005	-.006**	-.005	-.006**	.003	.007	.001	-.002	-.005**	0
	(.980)	(.324)	(.377)	(.042)	(.341)	(.045)	(.285)	(.289)	(.854)	(.233)	(.039)	(.964)
Access to electricity	.005	.023**	-.009	.022***	.002	.026***	.011**	.008	.005	0	.008*	.001
	(.479)	(.046)	(.260)	(.000)	(.837)	(.000)	(.025)	(.227)	(.543)	(1.000)	(.072)	(.750)
GDP per capita (log)	-1.336**	-2.194**	-.138	-2.884***	-1.747**	-2.999***	-1.235**	-1.392**	-.575	.169	.174	.143
	(.011)	(.014)	(.819)	(.000)	(.003)	(.000)	(.001)	(.006)	(.394)	(.416)	(.578)	(.546)
Country plant capacity (log)	1.102**	.381	1.289**	.430*	.401	.252	-.152	-.410	-.006	.265*	.278	.270
	(.002)	(.573)	(.002)	(.082)	(.295)	(.358)	(.565)	(.265)	(.987)	(.073)	(.210)	(.114)
GDP (log)	.178	1.084	-.360	1.022**	.584	1.191***	.574**	.928**	.078	-.071	-.178	-.090
	(.666)	(.164)	(.437)	(.001)	(.203)	(.000)	(.041)	(.018)	(.853)	(.665)	(.522)	(.631)
Country fixed effect	No	No	No	No	No	No	No	No	No	No	No	No
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
(Nagelkerke) R-squared	.30	.36	.26	.36	.18	.35	.45	.71	.37	.22	.64	.21
Number of observations	2014	2014	2014	2014	2014	2014	125	51	82	310	88	248
Number of countries	136	136	136	136	136	136	49	24	39	82	45	74

p values in parentheses. *p < .05. **p < .01. ***p < .001. CDI = Chinese Developmental Institutions. MDB = Multilateral Development Bank. Main test statistics (A = Likelihood-ratio test. B = Hosmer–Lemeshow test. C = F-Test.) for model 1-12 are presented in the following: (1): A: $x^2(27) = 238.626,\ p < 0.001$. B: $x^2(8) = 5.504,\ p = 0.703$ (2): A: $x^2(27) = 159.453,\ p < 0.001$. B: $x^2(8) = 5.930,\ p =$ 0.655 (3): A: $x^2(27) = 154.329,\ p < 0.001$. B: $x^2(8) = 10.210,\ p =$ 0.251 (4): A: $x^2(27) = 476.997,\ p < 0.001$. B: $x^2(8) = 6.765,\ p =$ 0.562 (5): A: $x^2(27) = 116.139,\ p < 0.001$. B: $x^2(8) = 2.589,\ p =$ 0.957 (6): A: $x^2(27) = 417.631,\ p < 0.001$. B: $x^2(8) = 5.969,\ p =$ 0651. C: (7): $x^2(27, 97) = 2.951,\ p < 0.001$. (8): $x^2(25, 25) = 2.496,\ p = 0.013$. (9): $x^2(25, 56) = 1.304,\ p = 0.203$. (10): $x^2(25, 284) = 3.225,\ p < 0.001$. (11): $x^2(25, 62) = 4.473,\ p < 0.001$. (12): $x^2(25, 222) = 2.352,\ p = 0.001$.The Variance Inflation Factors (VIFs) for the investigated explanatory variables for CDIs (Supplemental Table D4) and MDBs (Supplemental Table D5) are all below 10 indicating that Multicollinearity is not a concern[71]. Additional supporting statistics including correlations and odds ratios are presented in Supplemental Section D.

REFERENCES

1. IEA. (2021). Financing clean energy transitions in emerging and developing economies (International Energy Agency). https://www.iea.org/reports/financing-clean-energy-transitions-in-emerging-and-developing-economies
2. Granoff, I., Hogarth, J. R., and Miller, A. (2016). Nested barriers to low-carbon infrastructure investment. Nature Climate Change, 6(12), 1065-1071.
3. Steffen, B., and Schmidt, T. S. (2019). A quantitative analysis of 10 multilateral development banks' investment in conventional and renewable power-generation technologies from 2006 to 2015. Nature Energy, 4(1), 75-82.
4. IEA (2019). World Energy Investment 2019 (International Energy Association). https://iea.blob.core.windows.net/assets/c299fa1e-f2f4-4b81-bfb2-672d3a50ccab/WEI2019.pdf
5. Miyamoto, K., and Chiofalo, E. (2016). Official development finance for infrastructure: with a special focus on multilateral development banks (OECD Publishing).
6. Tirpak, D., and Adams, H. (2008). Bilateral and multilateral financial assistance for the energy sector of developing countries. Climate Policy, 8(2), 135-151.
7. Chen, X., Gallagher, K. P., and Mauzerall, D. L. (2020). Chinese overseas development financing of electric power generation: A comparative analysis. One Earth, 3(4), 491-503.
8. Kong, B., and Gallagher, K. P. (2017). Globalizing Chinese energy finance: the role of policy banks. Journal of Contemporary China, 26(108), 834-851.
9. Kong, B., and Gallagher, K. P. (2021). Inadequate demand and reluctant supply: The limits of Chinese official development finance for foreign renewable power. Energy Research & Social Science, 71, 101838.
10. Dolan, C. B., and McDade, K. K. (2020). Pulling the purse strings: Are there sectoral differences in political preferencing of Chinese aid to Africa? PloS one, 15(4), e0232126.
11. Niczyporuk, H., and Urpelainen, J. (2021). Taking a gamble: Chinese overseas energy finance and country risk. Journal of Cleaner Production, 281, 124993.
12. Li, Z., Gallagher, K., Chen, X., Yuan, J. and Mauzerall, D.L. (2022). Pushing out or pulling in? The determinants of Chinese energy finance in developing countries. Energy Research & Social Science, 86, p.102441.
13. Kong, B., and Gallagher, K. P. (2021). The new coal champion of the world: The political economy of Chinese overseas development finance for coal-fired power plants. Energy Policy, 155, 112334.
14. Dreher, A., Fuchs, A., Parks, B., Strange, A. M., and Tierney, M. J. (2018). Apples and dragon fruits: the determinants of aid and other forms of state financing from China to Africa. International Studies Quarterly, 62(1), 182-194.
15. Berthélemy, J. C. (2006). Bilateral donors' interest vs. recipients' development motives in aid allocation: do all donors behave the same? Review of Development Economics, 10(2), 179-194.
16. Dreher, A., and Fuchs, A. (2015). Rogue aid? An empirical analysis of China's aid allocation. Canadian Journal of Economics/Revue canadienne d'économique, 48(3), 988-1023.
17. Maizels, A., and Nissanke, M. K. (1984). Motivations for aid to developing countries. World development, 12(9), 879-900.
18. McKinlay, R. D., and Little, R. (1977). A foreign policy model of US bilateral aid allocation. World Politics: A Quarterly Journal of International Relations, 58-86.
19. Frank, A.G. (1969). Latin American, underdevelopment or revolution (Monthly Review Press).
20. Hensman, C.R. (1971). Rich against poor: the reality of aid (Allen Lane).
21. Dreher, A., Nunnenkamp, P., and Thiele, R. (2011). Are 'new' donors different? Comparing the allocation of bilateral aid between nonDAC and DAC donor countries. World Development, 39(11), 1950-1968.
22. Alesina, A., and Dollar, D. (2000). Who gives foreign aid to whom and why? Journal of economic growth, 5(1), 33-63.
23. Gallagher, K. P., Kamal, R., Jin, J., Chen, Y., and Ma, X. (2018). Energizing development finance? The benefits and risks of China's development finance in the global energy sector. Energy policy, 122, 313-321
24. Bräutigam, D. (2011). Aid 'with Chinese characteristics': Chinese foreign aid and development finance meet the OECD-DAC aid regime. Journal of international development, 23(5), 752-764.
25. Mazzucato, M., and Semieniuk, G. (2018). Financing renewable energy: Who is financing what and why it matters. Technological Forecasting and Social Change, 127, 8-22.
26. Prag, A., Röttgers, D., and Scherrer, I. (2018). State-Owned Enterprises and the Low-Carbon Transition (OECD), Environ. Work. Pap. No. 129.
27. Amusa, K., Monkam, N., and Viegi, N. (2016). The political and economic dynamics of foreign aid: A case study of United States and Chinese aid to Sub-Sahara Africa. ERSA-Economic Research Southern Africa, 21(5), 363-373.
28. Hoeffler, A., and Outram, V. (2011). Need, merit, or self-interest—what determines the allocation of aid? Review of Development Economics, 15(2), 237-250.
29. Gallagher, K. S., Bhandary, R., Narassimhan, E., and Nguyen, Q. T. (2021). Banking on coal? Drivers of demand for Chinese overseas investments in coal in Bangladesh, India, Indonesia and Vietnam. Energy Research & Social Science, 71, 101827.
30. GlobalData (2020). GlobalData Power Project Database (GlobalData). https://www.globaldata.com/industries-we-cover/power/ (Last download April 14, 2020)
31. Nature Energy. (2017). Renewables get mature. Nat. Energy 2, 17017
32. Mohan, G., and Power, M. (2008). New African choices? The politics of Chinese engagement. Review of African Political Economy, 35(115), 23-42.
33. Alden, C. (2005). Red star, black gold. Review of African Political Economy, 32(104/105), 415-419.

34. Lum, T., Fischer, H., Gomez-Granger, J., & Leland, A. (2009). China's foreign aid activities in Africa, Latin America and Southeast Asia (Congressional Research Service), CRS report for congress.
35. Tull, D. M. (2006). China's engagement in Africa: scope, significance and consequences. Journal of modern African studies, 459-479.
36. Naim, M. (2007). Rogue aid. Foreign policy, (159), 96.
37. Ibrachim, A. (2020). China's Debt Diplomacy Will Get a Coronavirus Boost (Foreign Policy). https://foreignpolicy.com/2020/03/23/china-coronavirus-belt-and-road-bri-boost-debt-diplomacy/
38. White House. (2018). Remarks by Vice President Pence on the Administration's Policy Toward China (Archives White House). https://trumpwhitehouse.archives.gov/briefings-statements/remarks-vice-president-pence-administrations-policy-toward-china/ (accessed: 30 April 2022)
39. Russel, D. R., & Berger, B. H. (2020). Weaponizing the Belt and Road Initiative (Asia Policy Society Institute). https://asiasociety.org/sites/default/files/2020-09/Weaponizing%20the%20Belt%20and%20Road%20Initiative_0.pdf
40. Hilsum, L. (2005). Re-enter the Dragon: China's new Mission in Africa. Review of African Political Economy, 419-425.
41. Ang, G., Roettgers, D., Burli, P. (2017). The empirics of enabling investment and innovation in renewable energy (OECD), Environment Working Papers, No. 123.
42. Ragosa, G., and Warren, P. (2019). Unpacking the determinants of cross-border private investment in renewable energy in developing countries. Journal of Cleaner Production, 235, 854-865.
43. Dubash, N.K. (2009). Climate change and development: a bottom-up approach to mitigation for developing countries? In: Climate Finance: Regulatory and Funding Strategies for Climate Change and Global Development (New York University Press), pp.172-178.
44. Bhamidipati, P. L., Hansen, U. E., and Haselip, J. (2019). Agency in transition: The role of transnational actors in the development of the off-grid solar PV regime in Uganda. Environmental Innovation and Societal Transitions, 33, 30-44.
45. Probst, B., Westermann, L., Anadón, L. D., and Kontoleon, A. (2021). Leveraging private investment to expand renewable power generation: Evidence on financial additionality and productivity gains from Uganda. World Development, 140, 105347.
46. Dreher, A., Fuchs, A., Parks, B.C., Strange, A.M. and Tierney, M.J., (2017). Aid, China, and growth: evidence from a new global development finance dataset (AidData), working paper# 46. Williamsburg: College of William and Mary.
47. Kharas, H., Chaturvedi, S., Rahman, M. and Scholz, I. (2019). Sustainable Financing for Development (G20 Think 20). https://t20japan.org/wp-content/uploads/2019/03/t20-japan-tf1-7-sustainable-financing-for-development.pdf
48. Ramasamy, B., Yeung, M., and Laforet, S. (2012). China's outward foreign direct investment: Location choice and firm ownership. Journal of world business, 47(1), 17-25.
49. Bräutigam, D., and Gallagher, K. P. (2014). Bartering globalization: China's commodity-backed finance in Africa and Latin America. Global Policy, 5(3), 346-352.
50. Landry, D. G. (2018). Comparing the determinants of western and Chinese development finance flows to Africa (CARI), Working Paper and Policy Brief 2018/21.
51. IEA, IRENA, UNSD, WB, and WHO. (2021). Tracking SDG7: The Energy Progress Report 2021. (IEA, IRENA, UNSD, WB, WHO). https://trackingsdg7.esmap.org/data/files/download-documents/2021_tracking_sdg7_report.pdf
52. Xi J., (2021). Bolstering Confidence and Jointly Overcoming Difficulties to Build a Better World (China, President of the People's Republic of China). At the General Debate of the 76th Session of: United Nations General Assembly. https://www.fmprc.gov.cn/mfa_eng/wjdt_665385/zyjh_665391/202109/t20210922_9580293.html
53. Eder, T.S. and Mardell, J. (2019). Powering the belt and road. Mercator Institute for China Studies (MERICS). https://www. merics. org/de/bri-tracker/powering-the-beltand-road
54. Heilmann, S., Rudolf, M., Huotari, M. and Buckow, J., 2014. China's shadow foreign policy: parallel structures challenge the established international order. China Monitor, 18(10), pp.1-9.
55. Callaghan, M. and Hubbard, P., (2016). The Asian infrastructure investment bank: Multilateralism on the silk road. China Economic Journal, 9(2), pp.116-139.
56. Global Infrastructure Hub (2017). Global Infrastructure Outlook (Global Infrastructure Hub, Oxford Economics). https://outlook.gihub.org/
57. G20 Eminent Persons Group (2018). Making the Global Financial System Work for All (G20 Eminent Persons Group on Financial Governance). https://www.globalfinancialgovernance.org/report-of-the-g20-epg-on-gfg/
58. IPCC (2018). Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. In Press.
59. Gaeta, A., and Vasilara, M. (1998). Development and human rights: the role of the World Bank (The World Bank).
60. Zhang, Y., & Buzan, B. (2020). China and the global reach of human rights. The China Quarterly, 241, 169-190.
61. Fleck, R. K., and Kilby, C. (2010). Changing aid regimes? US foreign aid from the Cold War to the War on Terror. Journal of Development Economics, 91(2), 185-197.
62. Harrigan, J., and Wang, C. (2011). A new approach to the allocation of aid among developing countries: is the USA different from the rest? World Development, 39(8), 1281-1293.
63. Maddala, G. S. (1993). Estimation of limited-dependent variable models under rational expectations. Handbook of statistics, 11, 175-194.

64. Evrensel, A. Y. (2004). Lending to developing countries revisited: changing nature of lenders and payment problems. Economic Systems, 28(3), 235-256.
65. Roth, K (2020). China's Global Threat to Human Rights (Human Rights Watch). https://www.hrw.org/world-report/2020/country-chapters/global
66. European Chamber of Commerce in China. (2020). The Road Less Travelled: European Involvement in China's Belt and Road Initiative (European Chamber of Commerce in China). https://www.europeanchamber.com.cn/en/publications-archive/762/The_Road_Less_Travelled_European_Involvement_in_China_s_Belt_and_Road_Initiative
67. Halper, S. (2010). Beijing's Coalition of the Willing (Foreign Policy). https://foreignpolicy.com/2010/06/15/beijings-coalition-of-the-willing/
68. OECD (2009). DAC List of ODA Recipients. Effective for reporting on 2009 and 2010 flows (OECD). https://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/43540882.pdf
69. Abbas, S. A., Belhocine, N., El Ganainy, A., and Horton, M. (2010). A historical public debt database (International Monetary Fund), Working Paper WP10245. https://data.imf.org/?sk=806ED027-520D-497F-9052-63EC199F5E63 (accessed: 15 March 2021)
70. Hurley, J., Morris, S., and Portelance, G. (2019). Examining the debt implications of the Belt and Road Initiative from a policy perspective. Journal of Infrastructure, Policy and Development, 3(1), 139-175.
71. Marquaridt, D. W. (1970). Generalized inverses, ridge regression, biased linear estimation, and nonlinear estimation. Technometrics, 12(3), 591-612.
72. IEA, 2018. World Energy Outlook 2018 (International Energy Association). https://www.iea.org/reports/world-energy-outlook-2018

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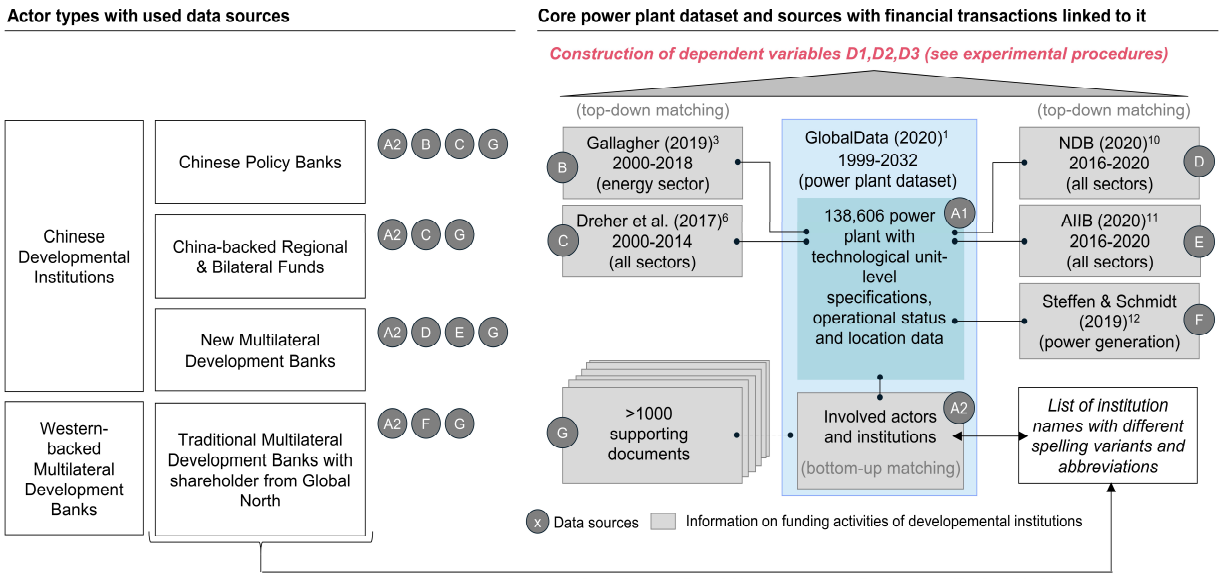
Supplemental experimental procedures



Data source description

A **GlobalData (2020)[1]:** Unit-level power plant database from the data analytics company GlobalData, contains nearly all power plants in the world (138,606 power plants, 247,418 plant subunits) including technical plant details (A1) and information on involved actors along the power plant value chain, including finance providers (A2). According to GlobalData[1], the data analytics company mines several hundred sources including but not limited to company reports and accounts, publications of national bodies and news sources which are enhanced by more than 5000 primary interviews in the power industry per year and further secures data quality through triangulation. Whereas Farfan and Breyer[2] identified GlobalData as a promising database to analyze the sustainability of power plants in a global context we introduce the database as possibility to track funding activities of developmental institutions (and beyond) bottom-up with considering nearly all power plants in the world. Furthermore, it serves as a foundation to link other available "top-down" financing datasets that are at more aggregate level (see below) to the financed power plants with its technological specifications (e.g., unit-level capacities, technology type, operational status, (planned) grid connection year, location).

B **Gallagher (2019)[3]:** China's Global Energy Finance Database is a media-based data collection effort between the Global Economic Governance Initiative (GEGI) from the Boston University and the China-Africa Research Initiative of the Johns Hopkins University. It provides the first (comprehensive) estimate for the development finance volume of China's two major policy banks (China Export-Import Bank, China Development Bank) in the energy sector for the period 2000-2017 (Gallagher et al. 2018)[4]. Jin, Ma, and Gallagher[5] provide a detailed description of the applied data collection methodology which uses a wide range of sources (e.g., official bank websites, host country ministries, news reports) which have been verified through interview contacts whenever possible.

C **Dreher et al. (2017)[6]:** AidData is a data tracking effort of the William & Mary's Global Research Institute. The obtained dataset refers to version 1.3 as specified by Strange et al[7]. It captures Chinese development finance flows across all sectors (including the energy sector). It considers a broad range of Chinese actors, covers financing activities from 2000-2014 with a focus on Africa and has been widely used in academia[e.g., 8,9]. Strange et al.[7] provides a detailed description of the methodology that is based on desk research-based screening of official sources and media reports.

D E **AIIB (2020)[10], NDB (2020)[11]:** In contrast to the fully Chinese Policy Banks the two newly established Multilateral Development Banks with China as major shareholder, namely the Asian Infrastructure Investment Bank and the New Development Bank, provide a list of financed projects for which some descriptions provide enough information to identify the financed power plants.

F **Steffen & Schmidt (2019)[12]:** Albeit investments from Multilateral Development Banks (MDB) into the electricity sector are publicly available they are distributed across multiple sources and lack comparability. Steffen and Schmidt[12] have recently filled the gap of a missing comprehensive compilation for all relevant MDBs for the period 2006-2015 by constructing a bottom-up dataset out of 1,751 documents obtained from banks and additional secondary data and expert interviews[12]

G **Other sources:** Other publicly available sources (mainly project reports of multilateral development banks and media articles) are used to 1) further triangulate and enrich the financial transactions identified in GlobalData (2020) and to 2) support the matching process (see below))

Matching and linking procedure

Identification of developmental institutions in GlobalData (2020): In addition to technological power plant details, GlobalData (2020) captures finance providers in structured and unstructured (e.g., asset notes) data fields. A list of the names of the relevant developmental institutions (as displayed in Table A.2) with different spelling variants have been created. This enabled tracking the presence of those actors through the application of simple matching algorithms between the institution name lists and data fields in the GlobalData database. The matched cases have been reviewed manually to understand the context and to verify if they have been mentioned as providers. For each identified transaction in GlobalData a web research was conducted to validate the supporting activity and to capture the year and type of transaction (new construction, extension, modernization, rehabilitation) wherever traceable, as this information is not provided by GlobalData (2020) in most cases.

Linking the core dataset A1 to datasets B-F: Datasets have been matched at the unit-level. Due to varying spellings for power plant projects, locations and other variables that have been used to match Chinese and Western involvement to power plants, it was not possible to automatize the matching, which is why it resulted in a highly time-consuming manual process. Major matching variables included country, location, power plant (unit) name, plant capacity, the year of transaction and the (expected) first year of plant-unit operation. In cases where the dataset B-F did not provide sufficient information to identify the supported power plant (unit), publicly available information has been used to further investigate if it is possible to specify the power plants supported by the indicated transaction. This included, in particular, project documentation of Multilateral Development Banks for dataset F

Simplified illustration of the underlying unit-level power plant dataset design that has been used to construct the aggregated dependent variables D1-D3. The unit-level data collection effort was part of a broader research project that is also used in a related manuscript submitted for publication by the authors of this work[13], however, to answer different research questions.

Explanatory variables with datasets

Political interests - Recipient country voting similarity in the UNGA is an established indicator to measure political alignment between countries[14,15,16-18] and it is seen as a valuable proxy for the strategic motives of China´s foreign development finance allocation[19,20]. Following Dreher et al[8] who again build their indicator on previous work[21,22], the calculation of the similarity indicator that ranges between 0 and 1 was restricted to i) "key votes" (= votes which are considered as important by the US Department), ii) votes where China and the US disagree and iii) human rights voting:

i) The restriction to key votes was done as most UN votes will have low relevance in the context of the Chinese foreign policy. There is "good reason to believe that China will lobby extensively in [the] UNGA on certain issues it deem[s] important."[21] (p. 4) and votes that are important to the US are likely to also be important to other countries including China[8].

ii) The focus on votes where China and the US disagree was chosen for two reasons. First, because it creates a setting where development finance might be most effective[8]. Second, because it is useful to account for the comparative nature of the present study (1 – Voting alignment with China index = Voting alignment with the US index).

iii) The restriction on human rights was mainly chosen as recent non-empirical claims, point in the direction that this is an area of particular and increasing interest for the Chinese state[23] and that infrastructure finance might play a role in increasingly prominent efforts of the Chinese state to shape the global human rights governance system[24] (see Supplemental Section B for more details).

Raw data for UNGA voting was obtained from Harvard Dataverse[25]. For each of those votes the indicator value was calculated as follows: Yes (China) -Yes (Recipient country) & No (China) – No (Recipient country) → 1; Yes (China) or No (China) – Abstain (Recipient country) or Absence (Recipient country) → 0,5; else → 0. The average for of all votes for each recipient country for those calculated values was used as country-year dyad indicator (independent variable) in the regressions.

Commercial interests – The resource-seeking motivation is tested with two indicators. First, we use the recipient countries' exports of ore and minerals which is the most commonly used proxy[26] to operationalize China's resource-seeking motivation. Following other publications[27,28] we use the World Banks's ores and metals exports indicator from the World Development Indicator database that is expressed as percentage of a countries merchandise exports (data sources with accession links are provided on the next page). Second, following other authors[18,27] we also include the total natural resource rents expressed as share of a countries GDP from the same dataset. The motivation to include the second indicator was twofold. On the one hand, it is mainly composed of coal, gas and oil rents that directly relate to fuel types that are used in fossil-based power plant infrastructure. On the other hand, a second indicator seemed advisable given the mixed results in the literature concerning the most commonly used ores and metal indicator.

Recipient merit – Following other publications[8,29] levels of institutional quality are operationalized with the Polity2 variable from the Polity IV project. It is a 21-point scale ranging from -10 (hereditary monarchy) to +10 (consolidated democracy). Recipient country corruption levels are operationalized by the WB's Governance Indicators. The control of corruption index is a commonly used[e.g.,8] survey-based measure for the extent to which public power is used for personal gain including the "capture" of the state and private interests (ranges from -2,5 to +2,5). In line with other work[18,30], levels of political stability have been operationalized with the Political Stability measure from the WB's Governance Indicators (which ranges from weak -2,5 to strong +2,5). All indicators are perception based (i.e. aggregated from informed perceptions of experts) which might be considered as limitation. However, the absence of alternatives[30] seems to justify the selection.

Recipient need – The per capita GDP from in constant 2010 US$ from the WB-WDI is used as first proxy for the recipient need (based on market exchange rates, downloaded March 31 2020). Albeit per capita GDP is used as the most common proxy for recipient country needs it should be interpreted with caution due to its limited ability to explain distributional issues[31]. A major hurdle in the consideration of additional need-related variables is a limited data availability across countries and years[32,33]. As pointed out by Fleck and Kilby[32] "Some studies consider additional humanitarian factors, but data availability places sharp

limits on what is feasible" (p.186). We identify and include the share of the population with access to electricity from the WB-WDI database as proxy for recipient country needs in the context of the electricity sector as a variable with sufficient data coverage. Whereas it seems to be a good proxy for developmental needs (see Supplemental Section B) it should also be interpreted with caution as we are unable to control for all potential confounding factors, such as utility behaviour or power market structure. The additional inclusion of the projected demand for electricity and/or the electricity infrastructure generation investment gaps as a proxy for the need for electricity that is not only resulting from the household level but also from industry demand (oftentimes addressed by public support for generation infrastructure in major load areas) was inhibited by data limitations. Finally, the Debt-to-GDP ratio is included as it is increasingly difficult to get alternative financial sources for countries with higher indebtedness (as well as because it is considered as key determinant in investment decisions of MDBs[34]). Following other publications[8], the ratio was obtained from the International Monetary Fund Historical Public Debt Database (HPDD).

Control and supporting variables – To account for (inter alia) the expected higher commercial orientation of CDIs in comparison the Western-backed MDBs we use the GDP (Log of constant 2010 US$) from the WB-WDI database as control variable. In addition, we add a countries electricity market potential as measured by the sum of the total active and pipeline capacity in MW as reported in the power plant database GlobalData[1] for the year 2020, which is the only time-invariant variable in the main model of the study. Furthermore, we construct two proxies for a countries hydropower potential which is elaborated in more detail in Supplemental Note D1.

Independent variables	Data source with link
UN voting rawdata	Voeten, E., Strezhnev, A. and Bailey, M. (2009). United Nations General Assembly Voting Data. Harvard Dataverse. *Available at:* https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/LEJUQZ
Data on institutional quality	Monty, M., Gurr, T. R., and Jaggers, K. (2013). Polity IV Project: Political Regime Characteristics and Transitions, 1800-2012. Center for Systemic Peace. *Available at:* https://www.systemicpeace.org/polityproject.html
Control of corruption index, political stability index	Kaufmann, D., Kraay, A., Mastruzzi, M. (2011). The Worldwide Governance Indicators: Methodology and Analytical Issues. Hague journal on the rule of law 3, 220-246 (2011). *Available at:* http://info.worldbank.org/governance/wgi/
Debt to GDP ratios	Abbas, S. M., Nazim, B., ElGanainy, A. A., and Horton M. (2010). A historical public debt database. International Monetary Fund. *Available at:* https://data.imf.org/?sk=806ED027-520D-497F-9052-63EC199F5E63
Access to electricity, ores and metals, natural ressource rents, GDP, GDP per capita	World Bank (2016). World Development Indicators. The World Bank, 2016) *Available at*: https://databank.worldbank.org/source/world-development-indicators

A. Literature review and covered actors

Table A1. Tabular summary of identified empirical literature that analysed the determinants of aggregated (non-energy sector focused) foreign Chinese official finance flows. Variables are categorized along three dimensions: Donor interest, recipient merit, recipient need. Colours reflect statistical significance: green = significant results in main model(s) ($p<0.10$); yellow = mixed results (significant and insignificant results in different models or time-periods); red = no significant results. C = Comparative study. D = Disaggregated finance flow type analysis. Author's own depiction.

								Donor interest				
#	Publication	Data	D	C	Time period	Sector	Geographical coverage	Foreign policy interests	Resource endowments	Other	Recipient merit	Recipient need
1	Dreher & Fuchs 2015[14]	Own dataset including AidData		x	1956-2006	All	123 countries	Un voting with China, Taiwan recognition	Oil production	Exports	Binary democracy indicator	GDP per capita, Population Natural Disaster
2	Hendrix & Noland, 2014[29] (Book chapter)	AidData			2000-2011	All	44 African countries	Taiwan recognition	Oil, natural gas, mineral wealth		Polity score	Population GDP per capita
3	Amusa, Monkam & Viegi 2016[31]	AidData		x	2000-2012	All	44 African countries		Oil production	Exports	Political repression Conflict	GDP per capita, Population Mortality rate, Learning enrolment rate
4	Dreher et al., 2018[8]	AidData	x		2000-2012	All	50 African countries	Un voting with China, UNSC Membership Taiwan recognition	Oil dummy	Trade with China, Debt/GDP	Control of corruption Polity score	GDP per capita Affected from disasters, population
5	Zhao, Kennedy & Tang, 2018[27]	AidData			2006-2014	Health sector		UN voting with China	Natural resource rents	Trade level	Governance effectiveness Human rights violation	GDP per capita Health workforce, Disease burden hospital beds

6	Yang, Liu & Guo, 2018[35]	Own dataset, including AidData	2006-2015	Health sector	50 African countries	Birthplace of national leader				Population, Population density
						Capital city of the country				Health and social-related factors
7	Guillon & Mathonnat, 2019[36]	AidData	2006-2013	Health sector	Africa	UN voting with China	Natural resources rent	Health ODA commitments from DAC countries	Control of corruption	GDP per capita, Public health expenditures
						Taiwan recognition	Openness rate to China			Life expectancy at birth, Population
8	Dollar, 2018[18]	AidData, CARI	2012-2014	All	131 developing countries	Un voting with China, BRI countries	Natural resource rents		Political stability, rule of law	GDP per capita
										Population
9	Wang, Bar & Hong, 2020[37]	AidData	2000-2014	ICT Sector	44 African countries		Oil rents	FDI per capita		GDP per capita, Population,
										Fixed phone, mobile, Internet users
10	Dolan & McDade, 2020[10]	AidData		Cross-sector analy-sis	44 African countries	Analysis of political preferencing (aid allocation to birth regions of political leaders) showed mixed results across sectors with significant observed preferencing for energy sector aid.				

= significant results in main model(s) ($p<0.10$); = mixed results (significant and insignificant results in different models or time-periods); = no significant results; ICT = Information and Communications Technology. C = Comparative study. D = Disaggregated finance flow type analysis.

Due to the unavailability of reliable datasets[18,37], the number of empirical studies that analyse the determinants of Chinese development finance is very limited. Furthermore, the existing studies show ambiguous results which might be caused by insufficient consideration of sectoral differences[9]. The latter shortcoming results in very limited knowledge about the determinants of development finance flows at the sector level[9]

Data sources: *AidData* (https://www.aiddata.org/) is considered to be the only publicly available dataset that systematically captures Chinese aid finance flows together with non-concessional official financing. The latest version captures 3,485 projects. *CARI* is a database from the Johns Hopkins School of Advanced International Studies (http://www.sais-cari.org/data) that captures loan commitments from Chinese governments, banks and contractors to African governments (the database only provides annual aggregated data and no project-level information).

Note: Displayed results for investigated determinants of paper #7 are based on the reported regression analyses with Heckman selection models, p.643

Table A2. Tabular summary of identified quantitative empirical literature that analysed the determinants of foreign Chinese official finance flows in the energy/electricity sector

		Covered developmental institutions						Scope of empirical analysis							
		CDIs													
#	Study	Exim	CDB	Funds	AIIB	NDB	MDBs	Allocation	Selection	Comparative study	Geographical scope	Covered time period	Covered technologies	Used data sources with information on development finance flows	Study aims and design
A	Kong & Gallagher, 2021[38]	X	X				N/A		(X)[b]		17 countries	2006-2019	Coal-fired power plants	GEGI-CARI Chinese development finance database[a]	Investigation of the political economy of China's foreign coal expansion with qualitative methods and supporting corelations/regressions
B	Li, Gallagher, Chen, Yuan & Mauzerall, 2022[39]	X	X				N/A		X		35 countries	2005-2018	All supported generation technologies	Database that linked the GEGI-CARI Chinese development finance database[a] to power plants in a power plant dataset	Determinants related to push (e.g., domestic overcapacity) and pull factors (e.g. demand for power projects) are investigated with applying OLS regressions
C	Niczyporuk & Urpelainen, 2021[40]	X	X				ADB, AFDB, EBRD, EIB, IADB, WB	X	X	X	Global	2005-2017	All supported generation technologies	GEGI-CARI Chinese development finance database[a]; Annual reports for Multilateral development banks	Tolerance of country risk (credit risk, governance risk, political risk) in finance allocation is investigated with applying hurdle and simultaneous probit models
D	This Study	X	X	X	X	X	ADB, AFDB, EBRD, EIB (activities outside EU), IADB, WB, IFC, MIGA	X	X	X	Global	1999-2018	All supported generation technologies	Newly constructed unit-level dataset that links Chinese and Western investments to power plants around the world using the same methodology (see supplemental experimental procedures)	Borrowing a framework from the aid literature stream the influence from variables related to self-interest, recipient need and recipient merit are investigated with applying a two-part model (LOGIT, OLS)

Abbreviations: CDI = Chinese Developmental Institutions. MDB = Traditional Multilateral Development Banks. World Bank Group (WB), International Finance Corporation (IFC), Multilateral Investment Guarantee Agency (MIGA), European Investment Bank (EIB) for activities outside the European Union, Asian Development Bank (AsDB), Inter-American Development Bank (IADB), European Bank for Reconstruction and Development (EBRD), African Development Bank (AfDB)

1) GEGI-CARI Chinese development finance database[3]:China's Global Energy Finance Database is a media-based data collection effort between the Global Economic Governance Initiative (GEGI) from the Boston University and the China-Africa Research Initiative of the Johns Hopkins University. It provides the first (comprehensive) estimate for the development finance volume of China's two major policy banks (China Export-Import Bank, China Development Bank) in the energy sector[4]

2) Kong & Gallagher[38] do not use empirical models that have the commitments of Chinese development finance as dependent variable. The two correlations/regressions they use are concerned with the two following relationships: Global coal reserves and newly installed coal power projects (not restricted to Chinese supported projects); GDP growth rate and total electricity consumption growth rate.

Table A3. Definition of Chinese Developmental Institutions and Western-backed Multilateral Development Banks for the purpose of this study with supporting details on financial magnitude, degree China can influence decisions and covered (simplified) financial instruments. Author's own depiction based on various sources [4,38,41-48]. Same actor categorization is used by the authors of this work in a related manuscript[13]. (x): Although the AIIB and NDB intend to issue guarantees they have not yet issued them; Lending to the private sector from the NDB[44] and equity investments from the ExIm and CDB are very limited[38].

Finance Type	Institution Type	Institutions[A]	Key-facts and BRI relevance	Financial magnitude (estimates)	Degree China can influence decisions	Finance types and sectors: Loans with varying concessionality	Credit guarantees	Export credits	Equity investments	Public Sector	Private Sector
Chinese Develop-mental Institutions	Policy Banks	China Development Bank (CDB)	Major finance vehicles behind China's Going Out policy and Belt and Road Initiative with loans being issued in close collaboration with China's principal development planner (NDRC). Founded in 1994, they have been tasked to finance public sector investment at home as well as to support the international expansion of domestic companies. Both banks have been supported through capital injections from China's foreign exchange reserves in support of the Going out strategy and the BRI[48]. Considered as the world's largest financial institution for oversee loans[48]. Focus on financing development-related infrastructure projects[49].	USB$278 of international loans by 2016[ref 49]; > USB$170 in loans to BRI countries by 2017[ref 46]. Project pipeline worth USB$170 billion[49]	Fully state-owned and under the direct jurisdiction of the state council[48,49]. Strong ties to the Chinese government concerning top-tier executive appointment and evaluation mechanisms as described in detail by Kong and Gallagher[48] (Chapter 4) further increase the influence of the Communist Party on decisions fallen within its two major policy banks	x	x	x	(x)	x	
		China Export-Import Bank (ExIm)	In contrast to CDB, more inclined to support projects that involve Chinese exports. China's only bank that is designated to provide concessional loans based on the country's foreign aid budget[48,49]	> RMB 670 billion to BRI projects by 2017[ref 49]		x	x	x	(x)	x	
	Regional and bilateral funds	20 regional & bilateral development funds	Regional and bilateral development funds are an important element for the distribution of Chinese development finance flows. Gallagher et al.[4] provided the first comprehensive compilation of Chinese-backed funds with a focus on energy and infrastructure investments[A]. The majority of the funds have a regional focus on Asia and are established as part of China's Belt and Road Initiative. The Silk Road Fund represents the largest fund (US$54.4 billion), followed by the China-Brazil Investment Fund (US$20 billion) and the China-Central and Eastern Europe Investment Fund (US$11.5 billion)[4]	Identified energy-related funds comprise an estimated Chinese development finance volume of more than US$160 billion[4]	The ExIm and CDB serve as finance provider for development funds amongst other providers as funds are also open for finance providers from other countries[4]	x			x	x	x
	New Multilateral Development Banks	Asian Infrastructure Investment Bank (AIIB)	The AIIB was proposed by the Chinese president Xi Jinping one month after his announcement of the BRI[46] with explicitly mentioning that the primary task of the AIIB is to provide capital for BRI initiatives[47]. After the start of operations in 2015 with 17 member states, it has grown to more than 84 members[4]. The official purpose of the bank is to "improve social and economic outcomes in Asia" with a focus on investing in sustainable infrastructure[50]. In the first years after its initiation, the AIIB cooperated with the western-backed World Bank form of joint-project financing[4]	USB$ 100 in subscribed capital[43]. Estimated capital stock around US$250 billion by the end of 2020[4].	China is by far the largest shareholder with 26,6 % of voting rights, followed by India (7.6%) and Russia (6.0%)[41]. This gives China a veto right over important decisions (e.g., recapitalization, membership admission, the composition of board of directors) that require a 75 percent majority.[45,46]	x	(x)		x	x	x
		New Development Bank (NDB)	Although headquartered in Shanghai the NDB is a joint initiative from China, India, Russia, Brazil and South Africa (BRICS countries) with equally distributed initial capital stock subscriptions and voting power. After the initial proposal by India in 2012 the bank was launched in 2015[ref 43]. Its official mission statement is "to support infrastructure and sustainable development efforts in BRICS and other underserved, emerging economies for faster development through innovation and cutting-edge technology"[42]	Initial capital contribution equaled US$ 50 billion per country which is half of the amount that was used for the AIIB[43]	Maximum share of a founding member limited to 20% and the aggregated share of all non-founding members to 45%. This limits the influence a single country (e.g., China) or a group of countries can obtain at the cost of the potential to expand its capital base[43]	x	(x)		x	x	(x)
Multilateral Develop-ment Banks	MDBs as defined by Steffen and Schmidt[12] with a country from the global north among their shareholders and boards		World Bank Group (operating formally through the International Bank for Reconstruction and Development, International Development Association), International Finance Corporation (IFC), Multilateral Investment Guarantee Agency (MIGA), European Investment Bank (EIB) for activities outside the European Union, Asian Development Bank (AsDB), Inter-American Development Bank (IADB), European Bank for Reconstruction and Development (EBRD), African Development Bank (AfDB)			x	x		x	x	x

A) Chinese Developmental Institutions with energy-related investments as defined and for the first time compiled by Gallagher et al.[4]

Table A4. List of considered China-backed energy-related development funds with their total size as of early July as compiled by Gallagher et al.[4].

	$USB
Asia	
Silk Road Fund	54.5
The Green Silk Road Fund	4.8
China-ASEAN Fund	11
Eurasia	
China-Central and Eastern Europe Investment Fund	11.15
Russia-China Investment Fund	2
China-Russia Regional Cooperation Development Investment Fund	1.49
China-VEB Innovation Fund	1
The China-Kazakhstan Production Capacity Cooperation Fund	2
China-Mexico Energy Fund	1
Latin America and Caribbean	
CELAC-China Investment Fund	5
China-LAC Industrial Cooperation Fund	10
China-LAC Cooperation Fund	10
China-Mexico Investment Fund	2.4
China-Portuguese Speaking Countries Cooperation Fund	1
China-Brazil Investment Fund	20
Africa	
China -Africa Development Fund	10
Africa Growing Together Fund(with AfD)	2
China-Africa Production Capacity/Industrial Cooperation Fund	10
Global South	
South-South Climate Fund	3.2
South-South Cooperation Fund	2
Total	**164.54**

Note: We checked for the presence of those funds (with different spelling variants) in power plants around the world applying the methodology specified in the supplemental experimental procedures.

Table A5. Details for discussed studies that analysed political alignment in the allocation of Chinese foreign development-related finance flows

Study	Dreher and Fuchs 2015[14]	Dreher et al. 2018[8]	This Study
Data	Own compilation from various sources including AidData	AidData	see method section
Covered time period	1996-2005	2000-2013	1999-2018
Geographical coverage	Global (123 countries)	Africa (50 countries)	Global (136 countries)
Disaggregation	Aggregated (multi-sector)	Disaggregation by finance types (multi-sector)	Unit-level disaggregation in the electricity sector
Covered finance types	Official Development Assistance (Without policy finance)	Official development assistance and other official finance flows	Official development assistance and other official finance flows
Comparative study	Yes (Western donor countries as comparison)	No	Yes (Western-backed MDBs as comparison)
Econometric method	Nested regressions on share of aid projects funded by a given donor	OLS regressions with financial value as dependent variable	Two-part model with LOGIT and OLS (see method section)
Indicator for political alignment	UNGA voting alignment	UNGA voting alignment on human rights	UNGA voting alignment on human rights
Finding related to political alignment	"China does not pay substantially more attention to politics compared to Western donors" (p. 988)	Highly concessional grants are the only finance flow category that is significantly associated with UNGA voting alignment	China does pay substantially more attention to politics compared to Western-backed MDBs

Note: A replication of the main statistical analysis with a UNGA voting proxy that is not restricted to human rights has not changed the significance of the indicator indicating that the slightly different operationalization of the study from Dreher and Fuchs[14] does not explain the difference in the observed findings.

B. Conceptual model and hypotheses

The hypothesis derivation builds on currently dominating "hybrid" models of aid allocation that combine the self-interest (B1) and donor-need (B2) model of aid allocation[51]. In addition to self-interest and recipient need-related factors recipient merit-related factors (B3) are considered. The consideration of all three categories (donor self-interest, recipient need, recipient merit) is considered as status quo[13,31,52] in the aid allocation literature as this enables avoidance of omitted variable biases[53,31]. Whereas our study is concerned with allocation behaviour of developmental institutions it is important to note that decisions on investments in recipient countries are influenced and ultimately made by actors in recipient countries which are not the focus of this study.

B1. Self-Interest model and hypotheses. The donor interest model assumes that the primary rationale of aid allocation is the donor's interest to promote foreign policy and commercial interests by exercising political power[54-56]. It comes with the assumption of potential for control over the recipient in the context of excess aid demand, future project-related reliance and repayment responsibilities[57] and is assumed to be better suited for bilateral aid than for multilateral aid[55]. Proponents of the donor interest model differentiate between political/foreign policy and commercial interests[51].

Political interests: China's official foreign finance flows are oftentimes criticized to be more politically motivated than its Western counterparts[14]. In the electricity sector, strong ties of state-owned financial institutions to the Chinese government with respect to top-tier executive appointment and governance structures, as described in detail by Kong & Gallagher[48] (Chapter 4) illustrate the proximity between political decision-makers and investment decisions. The China Development Bank and Export-Import Bank of China, for example, are under the direct jurisdiction of the state council[48] and infrastructure agreements are often signed on a governmental level without disclosure of agreements (Interview ID PS17).

A potential area of political support that seems to become increasingly important for China, but is also at the core of the mission statement of Western backed-MDBe[58] are human rights. Chinese efforts to shape the global human rights governance system as recently described in more detail by Zhangand and Buzan[23] as "politics of contestation" (p.169) within the institutions of global human rights governance including the United Nations are increasingly prominent. A recent human rights watch[24] established the link between infrastructure finance and political support in China's human rights related positions claiming that "BRI loans effectively impose a separate set of political conditions requiring support for China's anti-rights agenda" (p.1). Given the importance, this area seems to have for CDIs and Western-backed MDBs alike and earlier empirical findings that political interests of Western donors[59,122] and respect for human rights[69] are influencing their aid allocation we hypothesize that finance flows from CDIs, as well as Western-backed MDBs, are positively related to political alignment on human rights.

Hypothesis 1a,b: *CDI (a) as well as Western-backed MDB (b) power plant finance is positively associated with political alignment on human rights*

Commercial interests: Satisfying China's rising resource needs (e.g., oil, minerals) is the most frequently mentioned commercial motivation behind the Chinese expansion[14]. Numerous researchers[61-65], as well as some of our primary data respondents (Interview ID PU1, PS6, PS2, PU5, PS5), share this view, albeit empirical evidence that goes beyond the case study approach is very sparse and marked by mixed findings (see literature review in Supplemental Table A1). In the energy sector, a high estimated prevalence of resource-backed infrastructure loans that some researchers estimate to 50 % of all loans[40,66] indicates that this sector might be particularly suitable to facilitate exports of natural resources to domestic China. In resource-backed loans part of the loan is repaid with transactions on the underlying collateral (e.g., coal, gas, oil for plant of same type) (see Niczyporuk & Urpelainen[40] for more details). Hence, we expect the effect to be stronger for coal, gas and oil endowments in comparison to resources that are not used as fossil fuels for power plants (e.g., minerals, timber).

Hypothesis 2a,b,c: *CDI power plant finance is positively associated with resource endowments in recipient countries (a) whereas the association is unrelated for Western-backed MDBs (b).*

B2. Recipient need model and hypotheses. The recipient need model assumes that the primary rationale of aid allocation is a shortfall of domestic resources in recipient countries and the possibility to reduce inequality with external support (i.e. capital) according to standard models of economic growth[e.g., 55,57]. The recipient need model is assumed to be better suited for multilateral aid than for bilateral aid[55]. Critics argue that Chinese development finance is less need-oriented than Western aid[e.g., 67,68]. In the only traceable global comparative study (with finance flows at aggregated level), however, Dreher and Fuchs[14] found that Chinese aid is marked by a higher poverty orientation (as measure by GDP per capita) in comparison to Western donors.

Large infrastructure investment gaps in the electricity sector of the developing world illustrate a particularly serious shortfall of domestic resources. Infrastructure investment gaps resulting from electricity needs from all sectors of the economy are estimated to US$1 trillion in the period 2016-2030. Delivering universal access to electricity at the household level would require another additional 2,5 Trillion in the same time period according to a G-20 backed infrastructure outlook estimate[69]. In Sub-Saharan Africa, where a big part of the CDI, as well as MDB power plant support cumulate, close to 600 million people, are still without access to electricity with more than 500,000 premature annual deaths, due to air pollution from indoor biomass burning[70]. In addition, access to electricity (as reflected in the SDG7.1) is critically important to achieving the 2030 Agenda for Sustainable Development as it is linked to various other development goals (e.g., poverty reduction, education, employment, food security)[71]. Whereas the commitments of MDBs and CDIs are oftentimes directed towards power plants in major load areas with satisfying industry (and household) electricity demands developmental institutions also state that they are committed to increase the access to electricity on a household level. Beyond the commitment of the covered institutions towards the SDG in general (and the underlying principle to leave no one behind and the SDG7.1)[e.g.72,73] the goal to increase the access to electricity is also states in a more direct way.

On the side of the MDBs, this is reflected in their energy sector support strategies and various publicly available loans with the stated purpose to increase the access to electricity in remote areas[e.g.,74-77]. On the side of the covered CDIs in our sample the China-backed the AIIB's energy sector strategy[78] likewise "sets out a clear framework for AIIB to invest in energy projects that will increase access to clean, safe and reliable electricity for millions of people in Asia" (p.1). A joint report[72] between the China Development Bank (CDB) and United Nations Development Programme is emphasizing that the CDB and the Belt and Road Initiative in more general is working towards the Sustainable Development Goals. This report also mentions the potential to increase the access to electricity for households in country case studies several times (e.g., "and bring electricity to some of Lao PDR's poorest households" (p.73))[72]. The Belt and Road Energy Cooperation portal (in which the majority of our CDIs are mentioned) and which is sponsored by the China's National Energy Administration also states increasing access to electricity as a priority[79]. We hypothesize:

Hypothesis 3a,b: *CDI (a) as well as Western-backed MDB (b) power plant finance is positively associated to poverty and the need for electricity.*

B3. Recipient merit and hypotheses. China and Western donors pursue a fundamentally different approach in the consideration of factors that are related to the quality of institutions and policies (i.e. recipient merit) in recipient countries: China's aid policy and foreign policy in more general is guided by the principle of non-interference in a country's internal affairs including non-conditionality[80]. Thus, following other authors[e.g.,14] we expect the allocation of CDI finance in the electricity sector to be unrelated to the regime type and governance. In contrast, financial flows from Western donors are tied to conditions that aim to improve governance in recipient countries, thereby constituting an incentive mechanism to reward countries with "good" institutions[80]. In addition, higher reliance on credit ratings of MDBs[81] together with high investment risk in the electricity sector[34] might hinder investments in countries with high (institutional) investment risks. Thus, we expect Western-backed MDB finance in the electricity sector to be positively related to levels of democratization and good governance. Furthermore, in line with recent findings from Niczyporuk & Urpelainen[40], we expect both finance types to be positively related to levels of political stability.

Hypothesis 4a,b,c: *CDI power plant finance is unrelated to the recipient regime type and corruption levels (a) whereas MDB finance is positively associated to more democratic countries with lower corruption levels (b). Both finance types are positively associated to political stability (c).*

Controls. It is assumed that a large part of Chinese development-related foreign public finance flows are "tied" to project implementation of Chinese firms[80,66]. This seems to be particularly the case in the infrastructure (Interview ID NP3) and electricity sector where major developmental institutions (CDB, ExIm) have the mandate to support the foreign expansion of Chinese (mostly state-owned) energy companies and have been encouraged by the Chinese government to do so[38]. In consequence, we expect Chinese development finance flows to be influenced to a greater extent by the electricity market size than for Western-backed MDBs.

C. Additional descriptive statistics

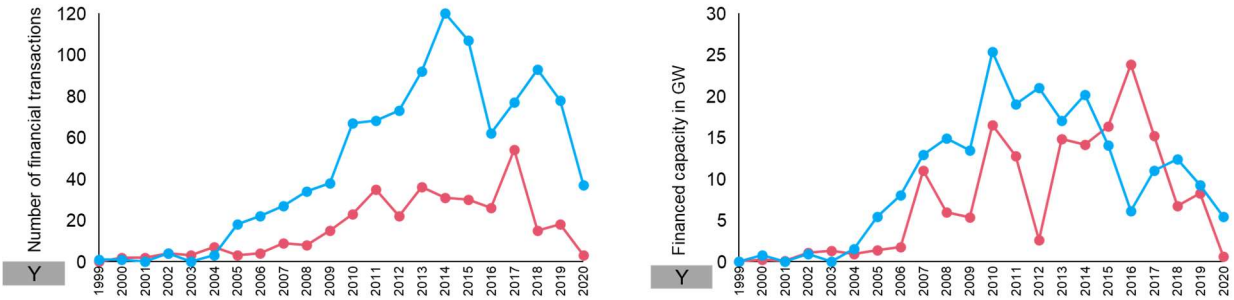


Figure C1. Annual distribution of financed power plant projects and power plant capacity for Chinese Developmental Institutions and Western-backed Multilateral Development Bank in comparative perspective. CDI = red, MDB = blue. The year 2020 only covers values from the period January-April.

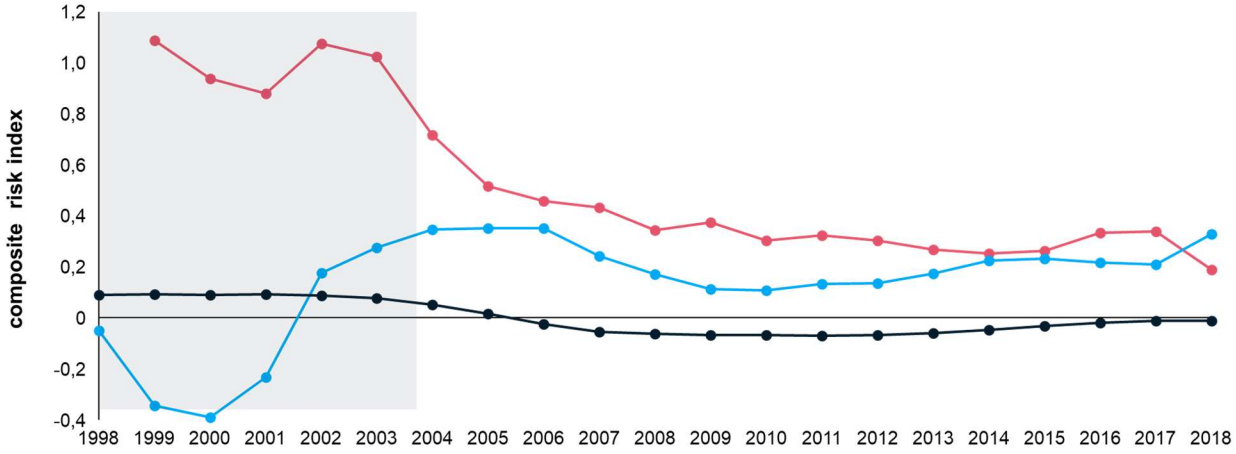


Figure C2. Temporal distribution of equally-weighted composite risk index for the investigated risk-related determinants (control of corruption, political stability, institutional quality, debt-to-GDP-ratio). Research has found that corruption, low regulatory quality and political instability usually discourage private cross-border investments into the electricity sector and are linked to higher investment risks[40,82-84]. Furthermore, investment decisions are dominated by macro debt level considerations[34] and the linked credit default risk. Values display standard deviations from the population mean that covers all available country-year dyads in the period 1998-2018. The composite risk index is composed of the equally weighted standardized negation (×-1) of the control of corruption (i.e. corruption), political stability (i.e. political instability) and level of institutional quality (i.e. autocracy) proxies as well as from debt to GDP ratio levels.

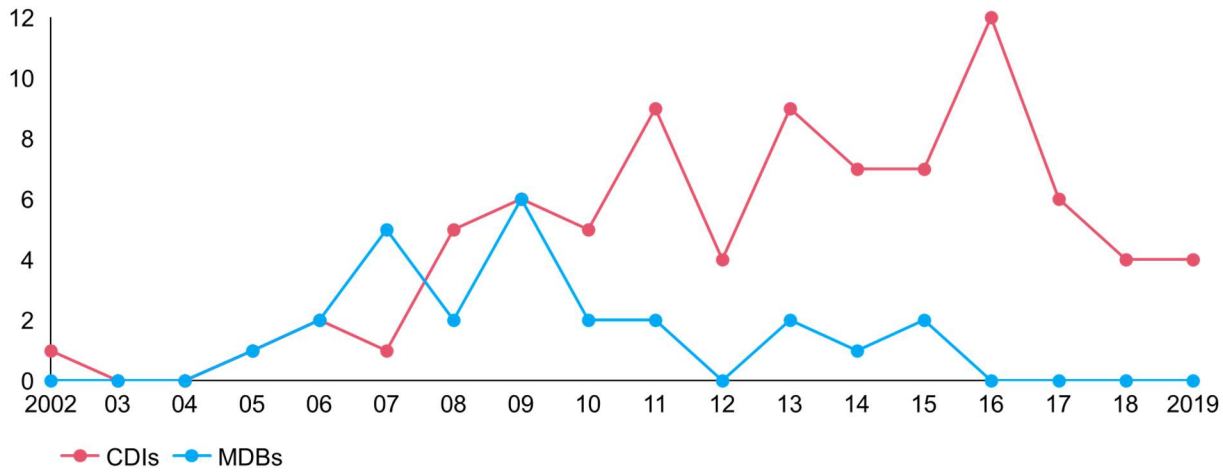


Figure C3. Annual distribution of supported coal-fired power plant projects for Chinese Developmental Institutions and Western-backed Multilateral Development Bank in comparative perspective. For the CDI-supported projects more than half of the capacity (46.5 GW) is still in the pipeline as of April 2020. Whereas 42% of this pipeline capacity is reported to be already in construction 37% are still in permitting stage as of April 2020 and as reported in the power plant dataset GlobalData (2020).

Table C1. Comparison of involvement levels (number of countries, supported projects, supported capacities) for CDIs and MDBs broken down by technologies (1999-2020)

	Number of countries	Supported projects	Supported capacities in GW
CDIs	69	352	165.8
Fossil	34	110	100.1
Hydro	49	138	48.9
Non-hydro renewable	25	97	10.2
Nuclear	2	7	6.6
MDBs	124	1065	251.7
Fossil	58	152	100.3
Hydro	74	315	106.5
Non-hydro renewable	93	598	45.0
Nuclear	N/A	N/A	N/A

Note: The time period refers to identified funding activities from 1999 till April 2020

Table C2. Involvement levels (number of countries, supported projects, supported capacities) for CDIs by different time periods, institutions and technologies (1998-2020)

	Number of countries	Supported projects	Supported capacities in GW
Disaggregation by time			
1999-2005	12	21	5.1
1999-2010	29	77	45.7
1999-2015	58	218	106.3
1999-2020	69	330	161.1
Disaggregation by institutions and technologies			
ExIm	53	195	85.0
Fossil	24	58	45.3
Hydro	36	98	32.7
Non-hydro renewable	10	34	3.7
Nuclear	1	5	3.2
CDB	33	106	68.5
Fossil	16	44	54.8
Hydro	14	28	6.5
Non-hydro renewable	13	32	3.8
Nuclear	1	2	3.5
Funds	9	15	10.6
Fossil	5	7	7.9
Hydro	2	2	1.5
Non-hydro renewable	4	6	1.3
Nuclear	N/A	N/A	N/A
AIIB & NDB	12	28	9.5
Fossil	3	3	2.0
Hydro	4	7	5.5
Non-hydro renewable	5	18	1.9
Nuclear	N/A	N/A	N/A

Note: The supported capacities of 161.1 GW in the period 1999-2020 are below the total identified capacities of 165.8 as the year of contract signature was not clearly identifiable for power plants amounting to 4.7 GW.

Table C3. Standardized unweighted and weighted mean deviation from world average for independent variables in comparative perspective for CDIs, MDBs and ODA recipient countries

	CDIs			MDBs				
		Weighted			Weighted			
	Unweighted	by projects	by capacities	Unweighted	by projects	by capacities	ODA recipients	World
UN Voting	0.637	0.655	0.792	0.286	0.358	0.681	0.323	0
Natural resource rents	0.126	0.067	-0.011	0.059	-0.084	0.120	0.143	0
Ores and metals	0.230	0.294	0.010	0.275	0.175	0.072	0.165	0
Polity2	-0.348	-0.509	-0.191	0.000	0.026	0.080	-0.188	0
Control of corruption	-0.631	-0.640	-0.640	-0.475	-0.460	-0.621	-0.460	0
Political stability	-0.652	-0.742	-0.841	-0.560	-0.663	-0.972	-0.329	0
Debt to GDP ratio	-0.154	-0.128	-0.108	-0.229	-0.203	-0.252	-0.042	0
GDP per capita	-0.476	-0.469	-0.467	-0.451	-0.464	-0.459	-0.475	0
Access to electricity	-0.282	-0.233	-0.045	-0.085	0.019	0.050	-0.339	0

Note: Means for recipient countries of CDI and Western-backed MDB power plant finance expressed as standard deviation from the world population mean and available data in the period 1998-2019. Note: Population (world) values for available countries and years are z-transformed for each variable. Only those country-year dyads where finance was received in the subsequent years are considered for recipient country mean calculation. The Official Development Assistance (ODA) recipient countries refer to 146 countries that received ODA (all types, not only energy related) as reported by the Development Assistance Committee[85]. All years in the covered time periods with available data are considered for the DAC country mean calculation (not only the year when DAC support was received).

Table C4. Indication for prevalence of more granular finance types (ODA-like, OOF-like, Vague) for a subsample 86 transactions directed towards 80 plants in the CDI sample (23%) where this information was provided systematically by the Dataset from Dreher et al.[6]

Finance type	Number of transactions	Share of transactions
ODA-like	20	23%
OOF-like	45	52%
Vague (Official Finance)	21	24%
Total number of transactions	86	100%

Supplemental Note C1. Migration effect in observed debt-to-GDP ratio reduction for CDIs.
A migration towards countries with lower debt-to-GDP ratios is more prevalent than a reduction of ratios in supported countries over time. Data was available for 57 countries with CDI investments in the period 1999-2019. For 24 countries (42%) investments happened in one year only, hence in those countries a lowering of the debt-to-GDP ratio over time is not explaining the observed effect of decreasing debt-to-GDP ratios (i.e. at least 42% of the sample is part of the "migration effect"). In the remaining 33 countries the average number of years in which investments took place was 4.27 years and the standard deviation for the debt-to-GDP ratio was relatively stable for most of those 33 countries (investments often clustered in neighbouring years). The standard deviation of the Debt-to-GDP ratios lies below 10 for 24 of the 33 countries (73%) and below 5 for 15 of the 33 countries (46%). This speaks for a prevalent migration effect (i.e. switch to a country with lower debt-to-GDP ratio after several investments). An example is Sudan where we identified four investments with an average Debt-to-GDP ratio of 116% in the period of the Going-Out Strategy (1999-2012) and no more investments in the country in the covered BRI period (2013-2019) (In the period up to 2020 debt-to-GDP ratios skyrocketed in Sudan to above 250% in 2020). In only two cases (Zambia, Myanmar) the standard deviation was above 50%. In those two cases there was a clear decrease of the Debt-to-GDP ratio over time. However, overall the migration effect was more prevalent.

D. Regression models and supporting statistics/explanations

Table D1. Summary of intercorrelations, means and standard deviations for main investigated determinants and outcome variables for full available sample per variable.

#	Years	*N*	*M*	*SD*	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**
1	1998-2017	3891	0.57	0.30	-																
2	1998-2017	4605	7.49	11.30	.334**	-															
3	1998-2018	3972	7.47	12.68	.044*	.114**	-														
4	1998-2019	4134	0.00	1.00	-.418**	-.306**	-.073**	-													
5	1998-2018	3410	3.66	6.30	-.585**	-.496**	-.009	.328**	-												
6	1998-2019	4134	0.00	1.00	-.482**	-.387**	-.103**	.743**	.446**	-											
7	1998-2019	3632	53.48	46.63	.056**	-.090**	-.013	-.104**	-.057**	-.032	-										
8	1999-2017	4619	80.00	28.88	-.282**	-.265**	-.268**	.440**	.214**	.487**	-.103**	-									
9	1999-2018	4796	14125.69	21008.18	-.392**	-.166**	-.136**	.510**	.257**	.761**	-.073**	.415**	-								
10	constant	4618	67115.83	256173.13	.004	-.054**	-.069**	-.050**	.030	.076**	.001	.112**	.078**	-							
11	1998-2018	4796	2140231.13	7392664.89	-.184**	-.099**	-.082**	.060**	.133**	.215**	.070**	.135**	.100**	.786**	-						
12	1999-2020	5850	0.04	0.185	.143**	.026	.047**	-.148**	-.087**	-.143**	-.034*	-.058**	-.100**	.044**	-.052**	-					
13	1999-2020	5850	0.06	0.47	.097**	.009	.040*	-.112**	-.050**	-.097**	-.019	-0,019	-.066**	.045**	-.033*	.671**	-				
14	1999-2020	5850	27.53	277.28	.092**	-.001	0.001	-.099**	-0.025	-.071**	-.012	-.005	-.051**	.075**	-.0252	.518**	.535**	-			
15	1999-2020	5850	0.09	0.28	.102**	.019	.092**	-.208**	.000	-.177**	-.084**	-0.027	-.149**	.111**	-.080**	.239**	.199**	.151**	-		
16	1999-2020	5850	0.17	0.81	.087**	-.019	.040*	-.170**	.007	-.119**	-.052**	.004	-.107**	.186**	-.051**	.205**	.227**	.142**	.702**	-	
17	1999-2020	5850	37.42	302.83	.097**	.016	.010	-.143**	-.013	-.091**	-.035*	.006	-.061**	.104**	-.030*	.132**	.134**	.082**	.404**	.412**	-

Independent variables (1-11): 1. UN Voting with China - [0-1] 1 = 100% alignment. **2.** Natural resources rents - [% of GDP]. **3.** Ores and Metals - [% of merchandise exports]. **4.** Political Stability - weak [-2,5 to +2,5] strong. **5.** Institutional quality (Polity2) - autocracy [-10 to +10] democracy. **6.** Control of corruption - weak [-2,5 to +2,5] strong. **7.** Debt-to-GDP ratio - [%]. **8.** Access to electricity - [%]. **9.** GDP per capita - Constant 2010 US$. **10.** Country plant capacity – MW

Dependent Variables (12-17): 12. CDI investment - [0,1]. **13.** Number of CDI funded projects - ϵ N. **14.** CDI funded capacity - in MW. **15.** MDB investment - [0,1]. **16.** Number of MDB funded projects - ϵ N. **17.** MDB funded capacity - in MW.

*p < .05. **p < .01. ***p < .001.

Table D2. Full logistic regression results for first modelled decision stage (In which country to invest?) with binary CDI presence indicator as dependent variable including odd ratios (1999-2018).

	B	SE	χ^2 Wald	df	*p*	*OR*	95% CI	
							Lower	Upper
UN Voting with China	1.592	.588	7.342	1	.007	4.915	1.554	15.549
Natural resources rents	-.031	.015	4.416	1	.036	.970	.943	.998
Ores and Metals	.012	.007	2.848	1	.092	1.012	.998	1.026
Political Stability	.244	.176	1.924	1	.165	1.277	.904	1.803
Polity2	-.043	.021	4.164	1	.041	.958	.919	.998
Control of corruption	-.543	.254	4.571	1	.033	.581	.353	.956
Debt-to-GDP ratio	.000	.004	.001	1	.980	1.000	.992	1.008
Access to electricity	.005	.007	.501	1	.479	1.005	.992	1.018
GDP per capita (log)	-1.336	.528	6.402	1	.011	.263	.093	.740
Country plant capacity (log)	1.102	.362	9.293	1	.002	3.011	1.482	6.116
GDP (log)	.178	.411	.187	1	.666	1.195	.533	2.675
Constant	-5.809	2.511	5.353	1	.021	.003		
Country fixed effect					No			
Year fixed effects					Yes			

Note. OR = Odds Ratio. CI = Confidence Interval of Odds Ratio. Number of countries = 136. Number of observations = 2014. Likelihood-ratio test: $x^2(27) = 238.626,\ p < 0.001$. Hosmer–Lemeshow test: $x^2(8) = 5.504,\ p = 0.703$. (Nagelkerke) R-squared = .30

Table D3. Full logistic regression results for first modelled investment stage (In which country to invest?) with binary Western-backed MDB presence indicator as dependent variable including odd ratios (1999-2018)

	B	SE	χ^2 Wald	df	*p*	*OR*	95% CI	
							Lower	Upper
UN Voting with China	.259	.377	.473	1	.492	1.296	.619	2.712
Natural resources rents	-.022	.010	4.789	1	.029	.978	.959	.998
Ores and Metals	.016	.005	12.419	1	.000	1.016	1.007	1.026
Political Stability	.118	.128	.847	1	.357	1.125	.875	1.447
Polity2	-.004	.016	.074	1	.785	.996	.964	1.028
Control of corruption	-.117	.165	.502	1	.479	.890	.644	1.230
Debt-to-GDP ratio	-.006	.003	4.118	1	.042	.994	.989	1.000
Access to electricity	.022	.005	18.219	1	.000	1.022	1.012	1.032
GDP per capita (log)	-2.884	.417	47.797	1	.000	.056	.025	.127
Country plant capacity (log)	.430	.247	3.020	1	.082	1.537	.947	2.496
GDP (log)	1.022	.294	12.061	1	.001	2.780	1.561	4.951
Constant	-4.982	1.810	7.577	1	.006	.007		
Country fixed effect					No			
Year fixed effects					Yes			

Note. OR = Odds Ratio. CI = Confidence Interval of Odds Ratio. Number of countries = 136. Number of observations = 2014. Likelihood-ratio test: $x^2(22) = 146.195,\ p < 0.001$. Hosmer–Lemeshow test: $x^2(8) = 4.716,\ p = 0.787$. (Nagelkerke) R-squared = .36

Table D4. Full OLS regression results for second modelled investment stage (How much to invest?) with CDI financed power plant capacity in MW as dependent variable (1999-2018).

	B	SE B	β	t	p	VIF
UN Voting with China	.688	.365	.207	1.885	.062	2.122
Natural resources rents	.021	.011	.215	1.874	.064	2.327
Ores and Metals	.001	.004	.027	.242	.809	2.213
Political Stability	.088	.104	.103	.841	.402	2.641
Polity2	.020	.014	.162	1.445	.152	2.230
Control of corruption	.071	.167	.054	.427	.671	2.804
Debt-to-GDP ratio	.003	.003	.118	1.075	.285	2.132
Access to electricity	.011	.005	.385	2.282	.025	5.037
GDP per capita (log)	-1.235	.368	-.756	-3.359	.001	8.948
Country plant capacity (log)	-.152	.263	-.136	-.578	.565	9.735
GDP (log)	.574	.276	.594	2.075	.041	14.478
Constant	-.532	1.449		-.367	.714	
Country fixed effect			No			
Year fixed effects			Yes			

Note. N = 125. R-squared = .45 F-test: $x^2(27,\ 97) = 2.951,\ p < 0.001$.The Variance Inflation Factors (VIFs) for the investigated explanatory variables are all below 10 indicating that multicollinearity is not a concern[86].

Table D5. Full OLS regression results for second modelled investment stage (How much to invest?) with MDB financed power plant capacity in MW as dependent variable (1999-2018).

	B	SE B	β	t	p	VIF
UN Voting with China	.644	.206	.216	3.129	.002	1.749
Natural resources rents	.001	.005	.012	.176	.860	1.689
Ores and Metals	.000	.002	.011	.172	.864	1.578
Political Stability	-.088	.061	-.110	-1.452	.148	2.115
Polity2	.012	.008	.099	1.576	.116	1.431
Control of corruption	-.050	.086	-.048	-.583	.560	2.530
Debt-to-GDP ratio	-.002	.002	-.068	-1.195	.233	1.184
Access to electricity	1,26E-03	.003	.000	.000	1.000	4.523
GDP per capita (log)	.169	.207	.118	.814	.416	7.653
Country plant capacity (log)	.265	.147	.303	1.798	.073	10.382
GDP (log)	-.071	.164	-.081	-.433	.665	12.796
Constant	.750	.956		.785	.433	
Country fixed effect			No			
Year fixed effects			Yes			

Note. N = 310. R-squared = .22. F-test: $x^2(25,\ 284) = 3.225,\ p < 0.001$. The Variance Inflation Factors (VIFs) for the investigated explanatory variables are all below 10 indicating that multicollinearity is not a concern[86].

Table D6. Supporting negative binomial regression results with number of financed projects from Chinese Developmental Institutions in the period 1999-2018 as the dependent variable.

			95% Wald CI				
	B	SE	Lower	Upper	Wald Chi-Square	df	*p*
UN Voting with China	1.673	.5124	.668	2.677	10.655	1	.001
Natural resources rents	-.028	.0135	-.055	-.002	4.383	1	.036
Ores and Metals	.020	.0058	.008	.031	11.285	1	.001
Political Stability	.182	.1426	-.098	.461	1.627	1	.202
Polity2	-.025	.0185	-.061	.011	1.795	1	.180
Control of corruption	-.694	.2253	-1.135	-.252	9.485	1	.002
Debt-to-GDP ratio	.002	.0035	-.005	.008	.192	1	.661
Access to electricity	.011	.0061	-.001	.023	3.488	1	.062
GDP per capita (log)	-1.471	.4755	-2.403	-.539	9.574	1	.002
Country plant capacity (log)	.915	.3257	.276	1.553	7.884	1	.005
GDP (log)	.580	.3676	-.140	1.301	2.490	1	.115
Constant	-8.640	21.572	-12.868	-4.412	16.043	1	.000
Country fixed effect				No			
Year fixed effects				Yes			

Note. CI = Confidence Interval. Likelihood-Ratio test: $x^2(26) = 461.827,\ p < 0.001$. Number of observations = 1895.

Table D7. Supporting negative binomial regression results with the number of financed projects from Western-backed MDBs in the period 1999-2018 as the dependent variable.

			95% Wald CI				
	B	SE	Lower	Upper	Wald Chi-Square	df	*p*
UN Voting with China	.260	.3091	-.346	.866	.708	1	.400
Natural resources rents	-.032	.0093	-.050	-.014	12.105	1	.001
Ores and Metals	.012	.0038	.005	.020	9.947	1	.002
Political Stability	.054	.0979	-.138	.246	.303	1	.582
Polity2	-.009	.0121	-.033	.014	.610	1	.435
Control of corruption	.028	.1285	-.224	.279	.046	1	.830
Debt-to-GDP ratio	-.006	.0024	-.010	-.001	5.315	1	.021
Access to electricity	.020	.0041	.012	.028	24.078	1	.000
GDP per capita (log)	-2.698	.3199	-3.325	-2.071	71.114	1	.000
Country plant capacity (log)	.187	.2060	-.217	.591	.825	1	.364
GDP (log)	1.054	.2421	.580	1.529	18.971	1	.000
Constant	-5.212	14.850	-8.123	-2.302	12.320	1	.000
Country fixed effect				No			
Year fixed effects				Yes			

Note. CI = Confidence Interval. Likelihood-Ratio test: $x^2(26) = 803.498,\ p < 0.001$. Number of observations = 1895.

Table D8. Replication of main logistic regression with investments of Chinese Developmental Institutions as binary dependent variable and with additionally controlling for the hydropower potential

	B	SE	χ2 Wald	df	*p*	OR
UN Voting with China	1.847	.601	9.444	1	.002	6.344
Natural resources rents	-.026	.016	2.754	1	.097	.974
Ores and Metals	.009	.007	1.662	1	.197	1.009
Political Stability	.188	.179	1.104	1	.293	1.207
Polity2	-.056	.022	6.626	1	.010	.945
Control of corruption	-.326	.259	1.582	1	.208	.722
Debt-to-GDP ratio	.001	.004	.019	1	.889	1.001
Access to electricity	.006	.007	.733	1	.392	1.006
GDP per capita (log)	-1.304	.547	5.674	1	.017	.271
Country plant capacity (log)	.349	.444	.620	1	.431	1.418
GDP (log)	.317	.414	.587	1	.444	1.373
Hydropower potential (log)	.615	.222	7647	1	.006	1.849
Constant	-6.524	2.463	7.013	1	.008	.001
Country fixed effect			No			
Year fixed effects			Yes			
Number of observations			2014			
Number of countries			136			

Note. Likelihood-ratio test: $x^2(28) = 228.446,\ p < 0.001$. Hosmer–Lemeshow test: $x^2(8) = 7.120,\ p = 0.524$. From the two constructed proxies for the hydropower potential (see Supplemental Note D1) the second proxy as measured by the sum of active, pipeline and discontinued hydropower capacity in a given country has been used. The reason has been the higher data availability in comparison to the first proxy that would have result in excessively limiting the sample. As hypothesized, the ores and metals indicator (% of merchandise exports) loses its significance when controlling for the hydropower potential.

Table D9. Allocation of CDI-funded foreign power plant capacity according to the main two-part regression model broken down by different financial institutions.

	Model 1 - Where to invest? (LOGIT)				Model 2 - How much to invest? (OLS)			
	Funded power plant infrastructure (0,1)				Foreign funded power plant capacity in MW (log)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ExIm	CDB	Funds	Other	ExIm	CDB	Funds	Other
UN Voting with China	1909**	1655*	5.370		.664	1068*		
	(.014)	(.061)	(.164)		(.267)	(.082)		
Natural resources rents	-.020	-.053*	-.205		.011	.035		
	(.228)	(.064)	(.307)		(.487)	(.266)		
Ores and Metals	.004	.049***	.099*		-.002	-.006		
	(.605)	(.000)	(.087)		(.770)	(.565)		
Political Stability	.287	.167	-1.155		.139	.170		
	(.174)	(.545)	(.346)		(.384)	(.403)		
Polity2	-.051*	-.042	.533		.019	.048		
	(.041)	(.222)	(.215)		(.283)	(.125)		
Control of corruption	-.829*	-.581	-3.460		-.072	.168		
	(.019)	(.102)	(.110)		(.815)	(.479)		
Debt-to-GDP ratio	-.002	-.002	-.023		.004	.002		
	(.726)	(.799)	(.361)		(.405)	(.720)		
Access to electricity	.004	.040**	-.067		.002	.001		
	(.641)	(.003)	(.173)		(.740)	(.971)		
GDP per capita (log)	-1798**	-1.458	7442*		-.666	-.863		
	(.004)	(.107)	(.098)		(.207)	(.252)		
Country plant capacity (log)	1156**	.556	3.641		.091	.398		
	(.005)	(.440)	(.289)		(.802)	(.540)		
GDP (log)	-.030	1.173	-1.617		.369	-.187		
	(.952)	(.135)	(.642)		(.322)	(.797)		
Country fixed effect	No	No	No		No	No		
Year fixed effects	Yes	Yes	Yes		Yes	Yes		
[Nagelkerke] R-squared	[.33]	[.23]	[.52]		.39	.68		
Number of observations	2014	2014	2014		85	51		
Number of countries	136	136	136		35	24		

Notes. p values in parentheses. *p < .05. **p < .01. ***p < .001. Main test statistics (A = Likelihood-ratio test. B = Hosmer–Lemeshow test. C = F-Test.) are presented in the following: **(1)**: A: $x^2(27) = 204.830,\ p < 0.001$. B: $x^2(8) = 3.599,\ p = 0.891$ **(2)**: A: $x^2(27) = 146.681,\ p < 0.001$. B: $x^2(8) = 5.584,\ p = 0.694$ **(3)**: A: $x^2(27) = 36.179,\ = 0.11$. B: $x^2(8) = 0.008,\ p = 1$ **(5)**: A: $x^2(27) = 1365,\ p = 0.161$ **(6)**: A: $x^2(23) = 2561,\ p = 0.010$.

Table D10. Results for coefficient comparison strategy for main LOGIT models for CDIs and MDBs (Table 1) following Paternoster et al.[87].

	Stage 1 - LOGIT					
	CDIs		MDBs			
	b	SE	b	SE	z-statistic[1]	
UN Voting with China	1.592	0.588	0.259	0.377	1.908	*
Natural resources rents	-0.031	0.015	-0.022	0.01	-0.499	
Ores and Metals	0.012	0.007	0.016	0.005	-0.465	
Political Stability	0.244	0.176	0.118	0.128	0.579	
Polity2	-0.043	0.021	-0.004	0.016	-1.477	
Control of corruption	-0.543	0.254	-0.117	0.165	-1.406	
Debt-to-GDP ratio	0.000	0.004	-0.006	0.003	1.200	
Access to electricity	0,005	0.007	0.022	0.005	-1.98	**
GDP per capita (log)	-1.336	0.528	-2.884	0.417	2.301	**
Country plant capacity (log)	1.102	0.362	0.430	0.247	1.533	
GDP (log)	0.178	0.411	1.022	0.294	-1.670	*
Constant	-5.809	2.511	-4.982	1.180	-0.267	

*p<0.10, **p<0.05, ***p<0.001
1) z-statistics refers to the coefficient-comparison strategy suggested by Paternoster et al.[87]– Formula 4, p.862 that again builds on Clogg et al.[88] – to test whether the observed differences between the regression coefficients between the CDI and MDB regressions differ significantly.

Table D11. Results for coefficient comparison strategy for main OLS models for CDIs and MDBs (Table 1) following Paternoster et al.[87].

	Stage 2 - OLS					
	CDIs		MDBs			
	b	SE	b	SE	z-statistic[1]	
UN Voting with China	0.688	0.365	0.644	0.206	0.105	
Natural resources rents	0.021	0.011	0.001	0.005	1.655	*
Ores and Metals	0.001	0.004	0.00	0.002	0.224	
Political Stability	0.088	0.104	-0.088	0.061	1.460	
Polity2	0.020	0.014	0.012	0.008	0.496	
Control of corruption	0.071	0.167	-0.050	0.086	0.644	
Debt-to-GDP ratio	0.003	0.003	-0.002	0.002	1.387	
Access to electricity	0.011	0.005	0.001	0.003	1.670	*
GDP per capita (log)	-1.235	0.368	0.169	0.207	-3.325	***
Country plant capacity (log)	-0.152	0.263	0.265	0.147	-1.384	
GDP (log)	0.574	0.276	-0.071	0.164	2.009	**
Constant	-0.532	1.449	0.750	0.956	-0.738	

*p<0.10, **p<0.05, ***p<0.001
1) z-statistics refers to the coefficient-comparison strategy suggested by Paternoster et al.[87] – Formula 4, p.862 that again builds on Clogg et al.[88] – to test whether the observed differences between the regression coefficients between the CDI and MDB regressions differ significantly

Supplemental Note D1. Correlation hydropower potential and ores and metals.
The observation that the ores and metals indicator shows a statistical significance only for renewable technologies (mostly being comprised by hydropower) for CDIs as well as Western-backed MDBs (see Table 2) lead to the hypothesis that this might be caused by a correlation between the wealth of a country's ores and metals endowments and its available hydropower potential. (The initial idea came from the assumption that the occurrence of rivers in mountains is high and ores and metals are also oftentimes located in hilly regions). To test the hypothesis, we constructed two proxies for the hydropower potential with drawing on different data sources. The first proxy was based on the economically feasible hydropower potential as reported by the Hydropower and Dams World Atlas 2020 published by Aquamedia in GWh/year (The six values that are reported in MW as opposed to GWh/year have been excluded. Values that have been displayed in the form of ">" or "<" have been used as reported). Due to the data availability for a considerably greater number of countries a second proxy was constructed in form of the sum of the active, pipeline and discontinued hydropower capacity in MW for each country as reported in the hydropower database GlobalData[1] for the year 2020. In line with the used ores and metals indicator that is displayed as proportion of a country's merchandise exports both hydropower potential proxies have been set in relation to the country GDP (as reported in the WB-WDI database). As result, we found a significantly positive correlation between the two constructed hydropower potential proxies and the ores and wealth indicator, $r(96)=.25$, $p < 0.05$ (Proxy 1), $r(145)=.24$, $p < 0.001$ (Proxy 2).

Supplemental Note D2. Justification of two-part model over Tobit and Heckmann models.
The higher robustness (with respect to the violation of certain assumptions) of the chosen regression techniques (two-part model in form of the Logistic and OLS regression) in comparison to the alternative Tobit and Heckmann's method was the main reason for the chosen modelling strategy: The Tobit model relies crucially on the assumption of normality and homoskedasticity. The Heckmann's method has shown to produce much greater variability across studies in comparison to simpler techniques which might be explained by a higher sensitivity for the presence of heteroskedasticity or non-normality[51]. Furthermore, Kennedy[89] argues the Heckmann model does not perform well when the independence assumption is met, which is a reasonable assumption in the current study (see experimental procedures).

Supplemental Note D3. Justification not to include country fixed effects.
As pointed out by Kilby[33] "a number of difficult specification issues arise in almost every aid allocation estimation" (p.177). Following Dreher et al.[8] who also analysed allocation determinants of Chinese development finance without country fixed-effects (and with time-fixed effects in a linear regression) an important reason not to include country fixed-effects is that we also "do not expect our explanatory variables to hold much power in explaining year-to-year changes (…); rather, we stress the importance of retaining the between-recipient country variation for testing the observable implications of our theory" (p.187). In addition, our dataset is short and strongly unbalanced (i.e. large number of countries in relation to the number of years (=short panel dataset) and strongly limited number of years (where investments took place) per country (=unbalanced dataset)). An example: In 36 % of the CDI-supported countries investments took only place in one year. The inclusion of country fixed effects (via the least square dummy variable approach (LSDV)) would be highly problematic in such a situation as there is a risk that the coefficients of the individual effects become inconsistent and the incidental parameter problem arises[90]. In other words "Under this circumstances, LSDV is useless"[91] (p.9). The incidental parameter problem is thereby particularly serious for non-linear models such as the covered LOGIT model in our first modelled decision stage resulting in "consistency issues that cannot be easily resolved, as long as the dataset has a limited number of time observations"[53, p.182, 92]. As the incidental parameter problem gets worse the higher the number of dummy variables is[91] the inclusion of country fixed effects did not seem a good choice, also from a methodological point of view.

Supplemental Note D4. Justification for dependent variable measuring commitments
As pointed out by Kilbily[33] there is no consensus on what dependent variable to use and operationalizations vary by the focus of the study. The decision to operationalize commitments with the facilitated incremental unit-level capacities was driven by the plausible assumption that the pure involvement of developmental institutions is usually critically important in facilitating the full supported unit-level capacity. Finance from Chinese Developmental Institutions usually covers a substantial part of the overall plant costs. Chen et al.[93] estimated that for the ExIm and the CDB the share of financed costs usually lies above 50% across all

technologies (Chen et al.[93], Figure S.3). Beyond the covered costs of the developmental institutions the pure involvement of a developmental institution usually catalyses additional finance from other actors, in particular on the side of MDBs (as their presence signals risk mitigation for private actors)[94-96]. Furthermore, taking the facilitated capacity as dependent variable allows us to also consider guarantees (which we occasionally cover) which would not be possible with financial flows as dependent variable. As pointed out in a recent OECD report by Miyamoto and Chiofalo[97] "there is an on-going discussion in the DAC on how to better capture the coverage of guarantees". Not introducing commitments in US$ as second supporting dependent variable was purely driven by limited data availability and can be considered as a limitation of our study. In addition, it is worthwhile to point out that CDIs – in contrast to MDBs whose finance is mostly subject to public bidding procedures – are also supporting their domestic Chinese companies in a more direct way (e.g., by tying project implementation to public loans or supporting them directly with loans which are then used by the companies to invest in foreign power plant infrastructure). Whereas this link between CDIs and their domestic Chinese companies is not in the focus of this study it seems to be a promising area for future research as this seems to be an important channel of statecraft that is distinct from the Western approach with little existing empirical research. This also indicates that the (indirect) CDI involvement in power plant infrastructure might be bigger than reflected in our data.

E. Density distribution of explanatory variables

Table E1. Summary of Observed trends temporal trends for main investigated determinants in comparative perspective.

	Chinese Developmental Institutions		Western-backed Multilateral Development Banks	
A) UN Voting with China (see Fig. D1)	↓↓	Decreasing focus on countries that vote highly in line with China/against the US. However, decrease still below the decrease of the global distribution.	↓↓	Shift towards countries that vote in line with the US/against China reflecting the observed global trend.
A) Natural resource rents (See Fig. D2)	↓↓↓	Shift towards countries with a lower share of natural resource rents with approximating MDB distribution.	↓↓↓	Distribution of the share of natural resource rents of recipient countries remains fairly constant.
A) Ores and metals (see Fig. D3)	↑↑	Shift towards countries with higher occurrences of ores and metals as measured by export amounts.	↑↑↑	Distribution of ores as metal occurrences of recipient countries seem to follow the same trend as CDI distribution.
B) Debt-to-GDP ratio (see Fig. D4)	↓↓	Initial presence of highly indebted countries with a debt-to-GDP ratio above 100% completely disappears in the period after 2013. Higher concentration of moderate ratios around 50%.	↑↑	Whereas the occurrence of highly indebted countries (ratio > 100%) in the MDB portfolio has been lower than the one of CDIs for the period 1998-2012 it is higher for the period 2013-2018, but still very limited and below world distribution.
B) Corruption (see Fig. D5)	↓↓	Dual focus on corrupt and less corrupt countries is replaced by one main concentration that lies in between, but leads to an overall lower corruption index (mean ratio = -20%)	↑	Slight shift towards more corrupt countries (mean ratio = +4%)
B) Institutional Quality (see Fig. 6)	↑↑↑	Strong shift from an initial dual focus on highly autocratic as well more democratic countries towards an overall focus on higher levels of institutional quality resembling the distribution of MDBs (mean ratio = +217%)	↑↑	Distribution of institutional quality of recipient countries remains fairly constant with an observable reduction of recipient countries with very low democratization levels which is partly reflected by the global data showing the same pattern
B) Political Stability (see Fig. 7)	↓↓	Overall, shift from a broad range of levels of political stability towards a more concentrated distribution around countries with moderate political stability. Next to overall concentration around moderate levels also rising spike for very unstable countries	↑	Concentration around moderate political stability levels as also observed for CDIs, distinct from patterns in world distribution that shows a trend towards a more dual distribution around moderate and high political stability levels
C) GDP per capita (see Fig. 8)	↑↑↑	Increasing focus on richer countries	↓↓↓	Increasing focus on poorer countries
C) Access to electricity (see Fig. 9)	↑↑	Increasing focus on countries with higher access to electricity, however still lower than the one of MDBs and remaining visible spike for countries with very low access (≈30-45%) to electricity	↑	Country profile distribution remains fairly constant

Note: Changes in the comparison of the means and kernel density functions for investigated determinants in the period before (1998-2012) and after the initiation of China's Belt and Road Initiative (2012-2013) are displayed. The kernel density estimations which have been used for the synthesis presented in the table are displayed below. The arrows display the mean ratios between the variable mean before and after the initiation of the BRI: ↑/↓: ratio increase/decrease less than 5%. ↑↑/↓↓: ratio increase/decrease less than 15%. ↑↑↑/↓↓↓ ratio differs more than 25.

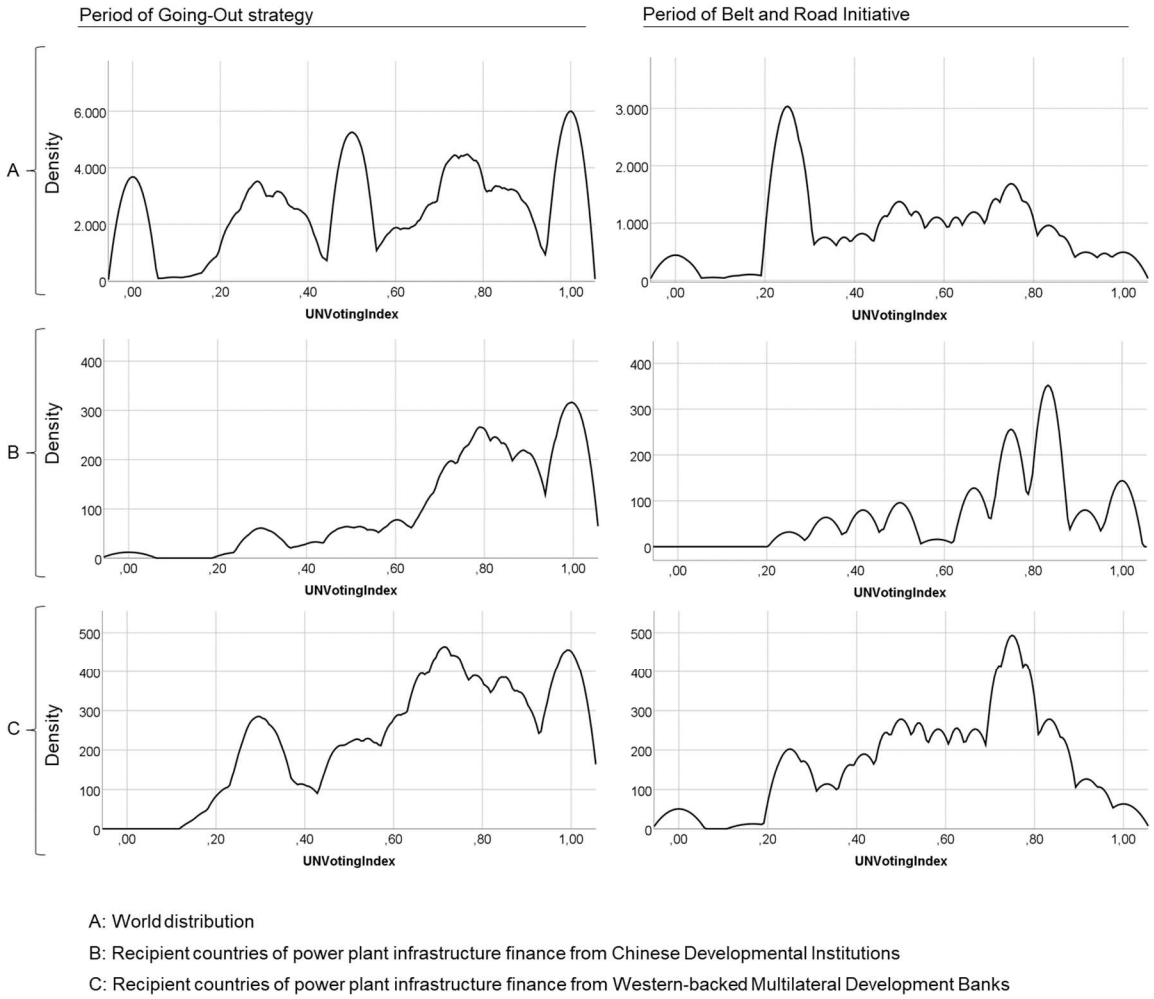


Figure E1. Kernel density functions for the UN voting with China alignment index for countries that received power plant finance from CDIs and MDBs for the time period before (1998-2012) and after the initiation of China's Belt and Road initiative (2013-2017) in comparative perspective to the world distribution. For CDIs there is a decreasing focus on countries that vote highly in line with China/against the US. However, the decrease is still below what can be observed for the global distribution. For MDBs, there is a shift towards countries that vote in line with the US/against China reflecting the observed global shift. Only those years where finance was received in the subsequent year are considered. The world distribution represents the density functions for all countries in the world for which data was available in the period under consideration (the selection of countries in the world distribution is unrelated to power plant finance that those countries receive).

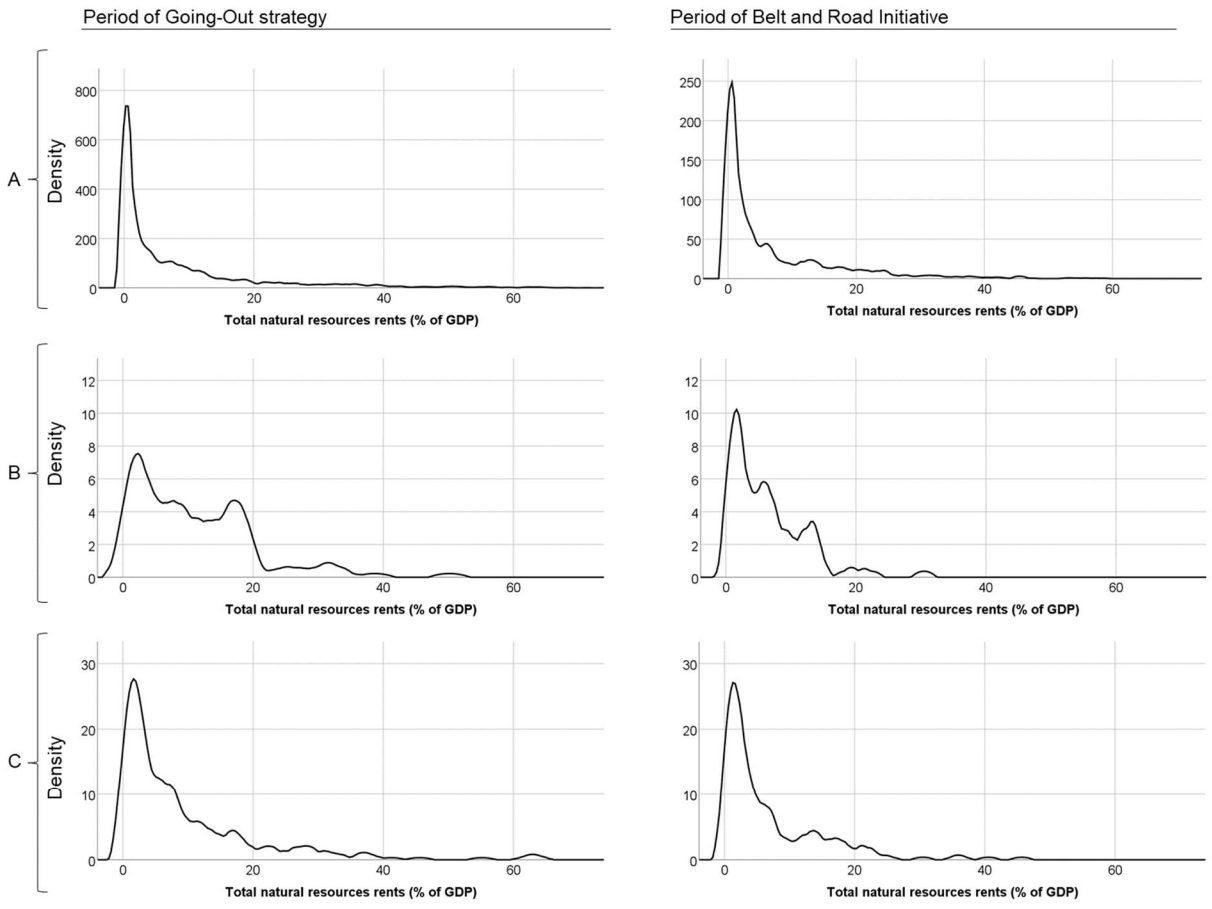


Figure E2. Kernel density functions for total natural resource rents as share of the GDP for countries that received power plant finance from CDIs and MDBs for the time period before (1998-2012) and after the initiation of China's Belt and Road initiative (2013-2017) in comparative perspective to the world distribution. For CDIs there seems to be a shift towards countries with a lower share of natural resource rents with approximating the MDB distribution that remains fairly constant between the two observed time periods. Only those years where finance was received in the subsequent year are considered. The world distribution represents the density functions for all countries in the world for which data was available in the period under consideration (the selection of countries in the world distribution is unrelated to power plant finance that those countries receive).

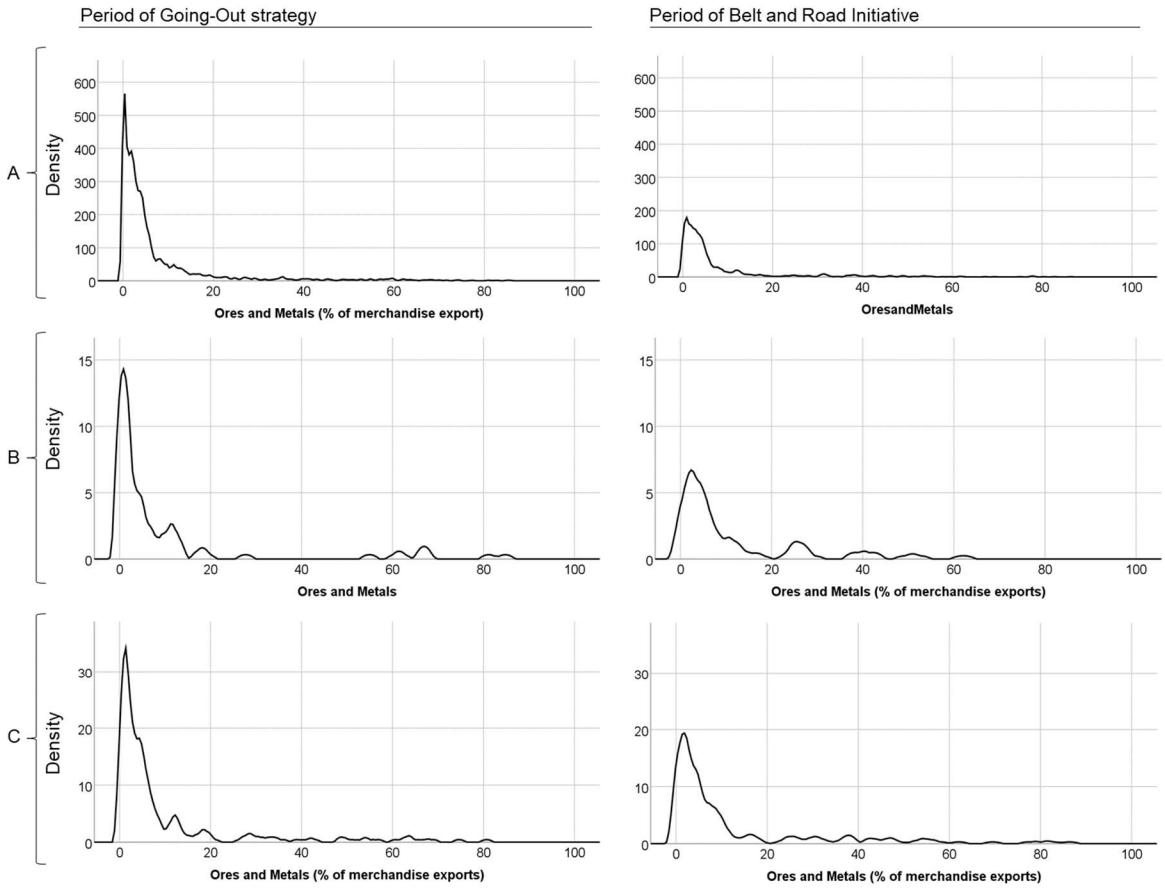


Figure E3. Kernel density functions for the ores and metals exports indicator for countries that received power plant finance from CDIs and MDBs for the time period before (1998-2012) and after the initiation of China's Belt and Road initiative (2013-2018) in comparative perspective to the world distribution. For CDIs, there is a shift towards countries with higher occurrences of ores and metals which seems to be very comparable to what can be observed for MDBs and the world distribution. Only those years where finance was received in the subsequent year are considered. The world distribution represents the density functions for all countries in the world for which data was available in the period under consideration (the selection of countries in the world distribution is unrelated to power plant finance that those countries receive).

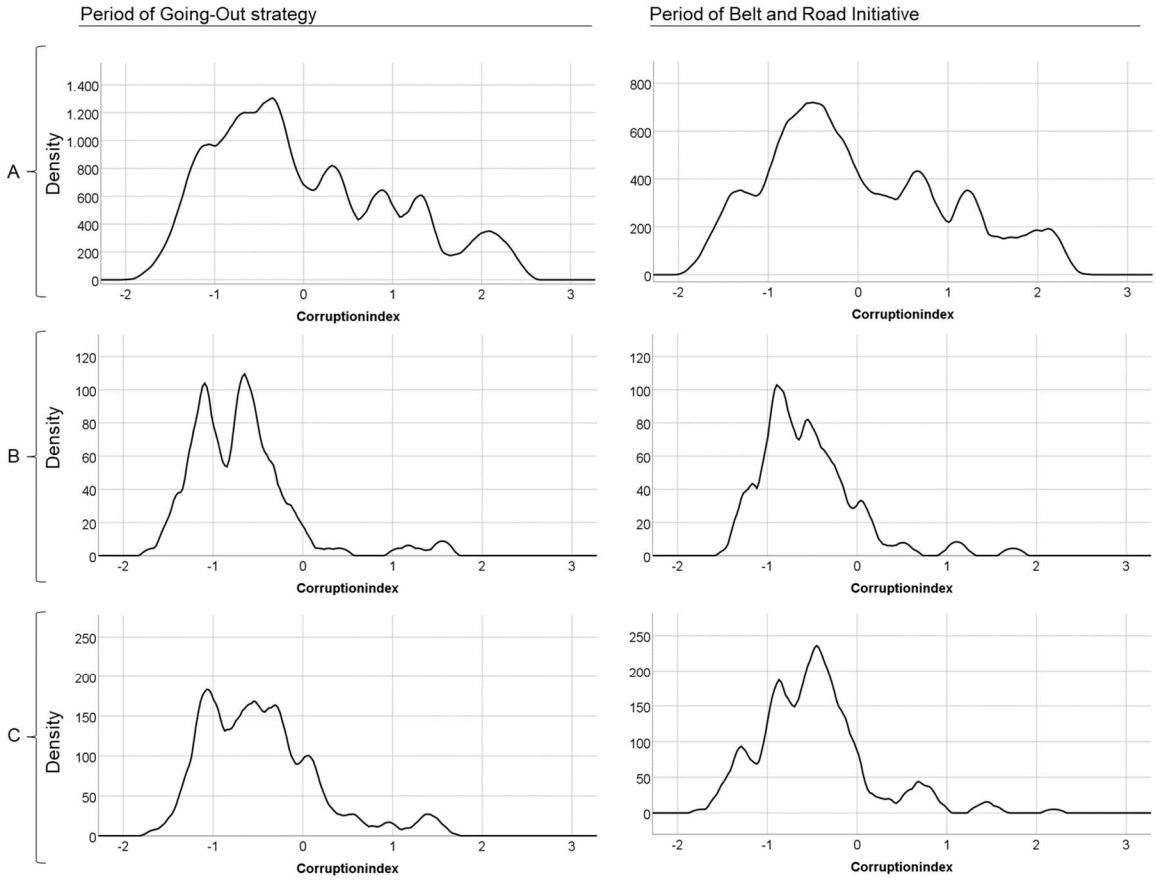


Figure E5. Kernel density functions for the control of corruption index for countries that received power plant finance from CDIs and MDBs for the time period before (1998-2012) and after the initiation of China's Belt and Road initiative (2013-2019) in comparative perspective to the world distribution. Dual focus on corrupt and less corrupt countries for CDIs is replaced by one main concentration that lies in between, but leads to an overall lower corruption index (mean difference between the two observed periods = -20%). For MDB there is a slight shift towards more corrupt countries (mean difference between the two observed periods = +4%). Only those years where finance was received in the subsequent year are considered. The world distribution represents the density functions for all countries in the world for which data was available in the period under consideration (the selection of countries in the world distribution is unrelated to power plant finance that those countries receive).

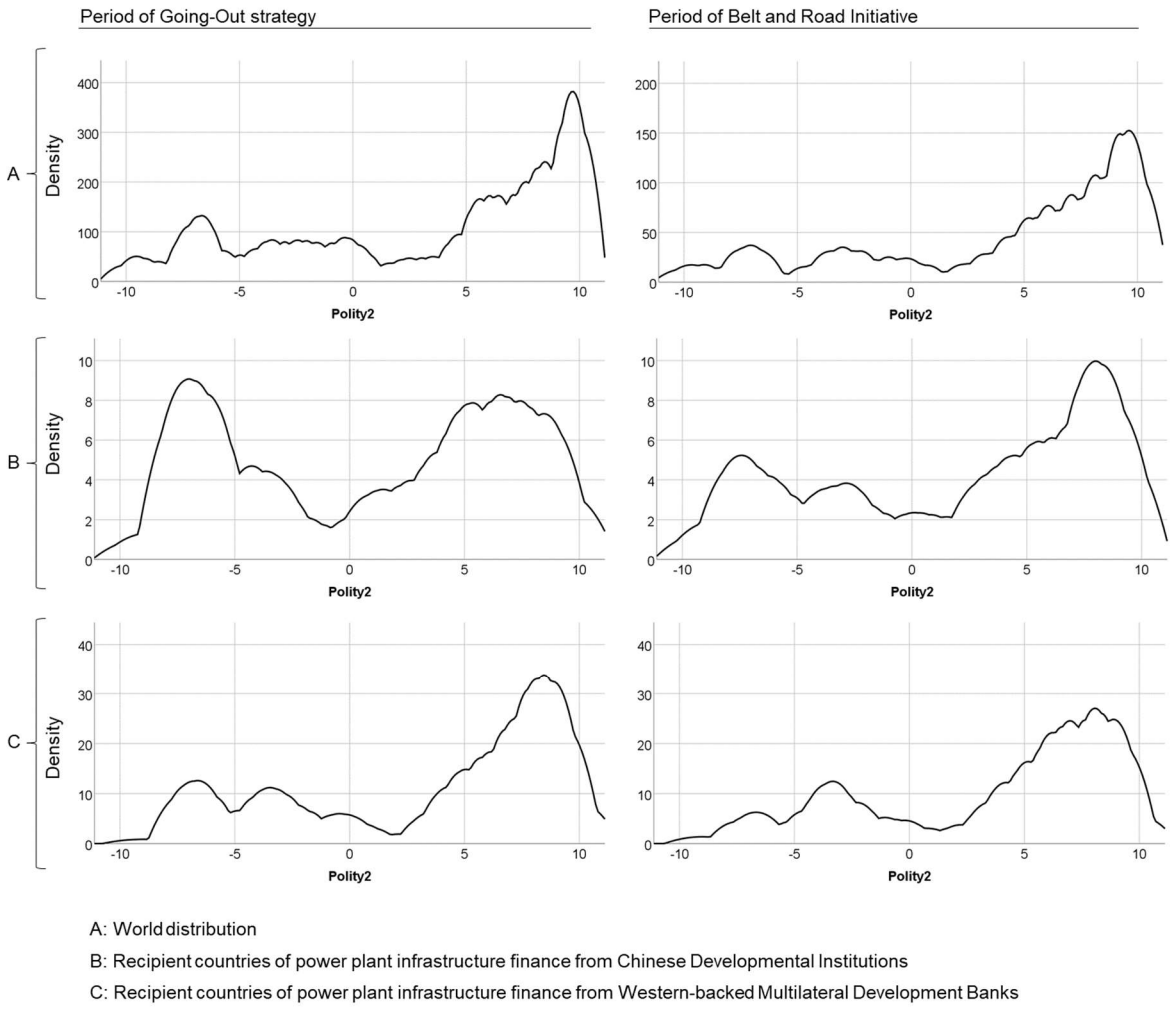


Figure E6. Kernel density functions for the level of democratization as measured by the Polity2 index for countries that received power plant finance from CDIs and MDBs for the time period before (1998-2012) and after the initiation of China's Belt and Road initiative (2013-2018) in comparative perspective to the world distribution. Strong shift from an initial dual focus on highly autocratic as well more democratic countries towards an overall focus on higher levels of institutional quality for CDIs resembling the distribution of MDBs (mean ratio = +217%). In contrast, for MDBs the distribution of institutional quality of recipient countries remains fairly constant with an observable reduction of recipient countries with very low democratization levels which is partly reflected by the global data showing the same pattern. Only those years where finance was received in the subsequent year are considered. The world distribution represents the density functions for all countries in the world for which data was available in the period under consideration (the selection of countries in the world distribution is unrelated to power plant finance that those countries receive).

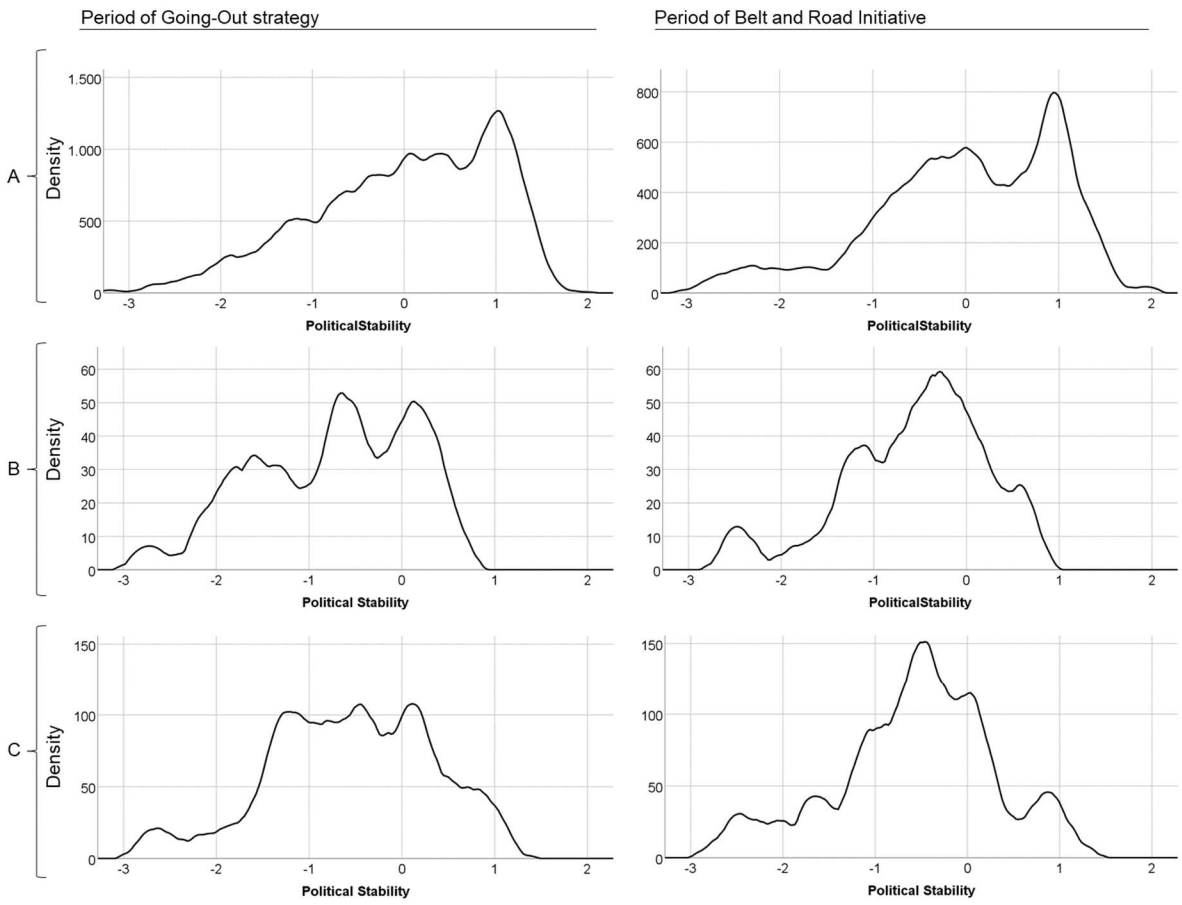


Figure E7. Kernel density functions for levels of political stability for countries that received power plant finance from CDIs and MDBs for the time period before (1998-2012) and after the initiation of China's Belt and Road initiative (2013-2019) in comparative perspective to the world distribution. Overall, is an observable shift for CDIs from a broad range of levels of political stability towards a more concentrated distribution around countries with moderate political stability. However, next to an overall concentration around moderate levels there is also a rising spike for very unstable countries. For MDBs, there is a Concentration around moderate political stability levels as also observed for CDIs, distinct from patterns in world distribution that shows a trend towards a more dual distribution around moderate and high political stability levels. Only those years where finance was received in the subsequent year are considered. The world distribution represents the density functions for all countries in the world for which data was available in the period under consideration (the selection of countries in the world distribution is unrelated to power plant finance that those countries receive).

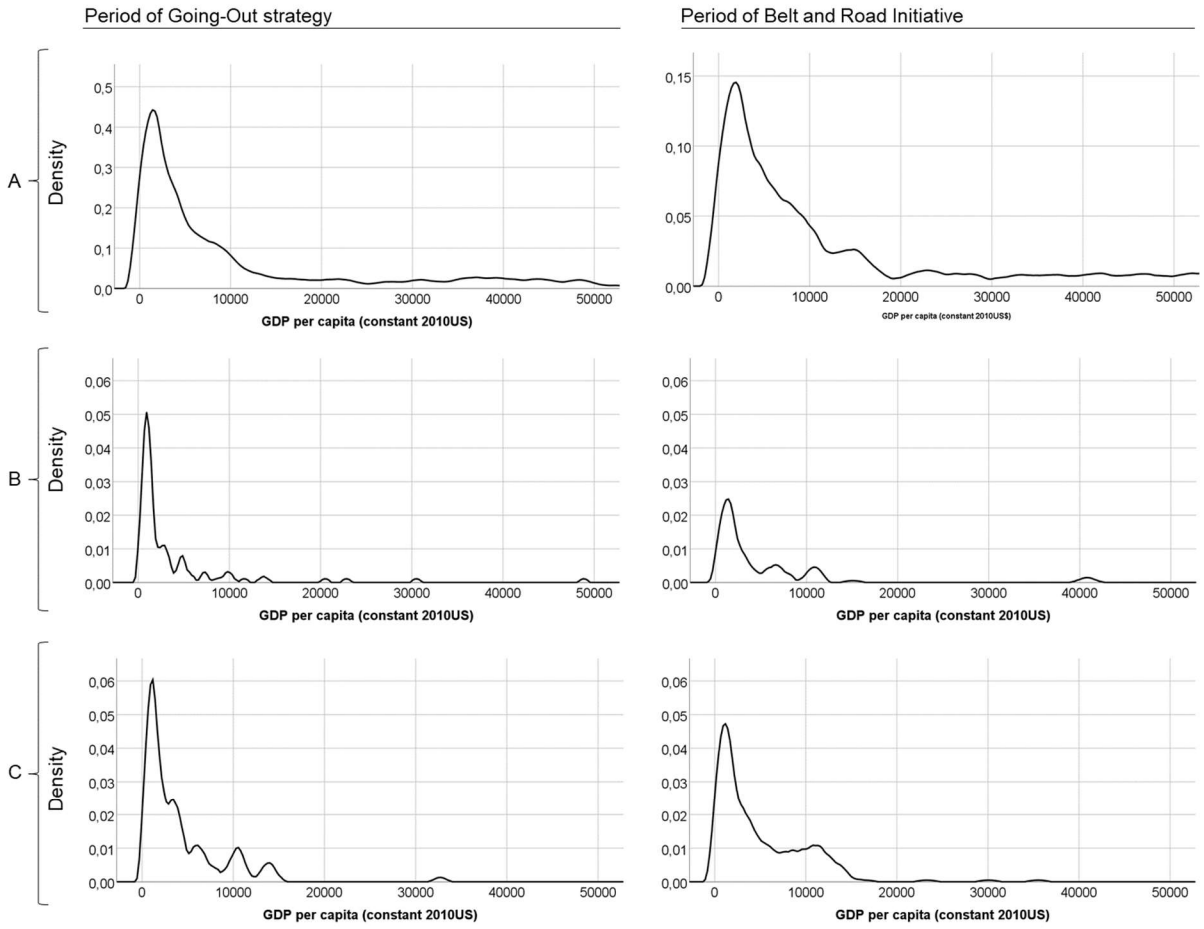


Figure E8. Kernel density functions for GDP per capita levels for countries that received power plant finance from CDIs and MDBs for the time period before (1999-2012) and after the initiation of China's Belt and Road initiative (2013-2018) in comparative perspective to the world distribution. Only those years where finance was received in the subsequent year are considered. The world distribution represents the density functions for all countries in the world for which data was available in the period under consideration (the selection of countries in the world distribution is unrelated to power plant finance that those countries receive).

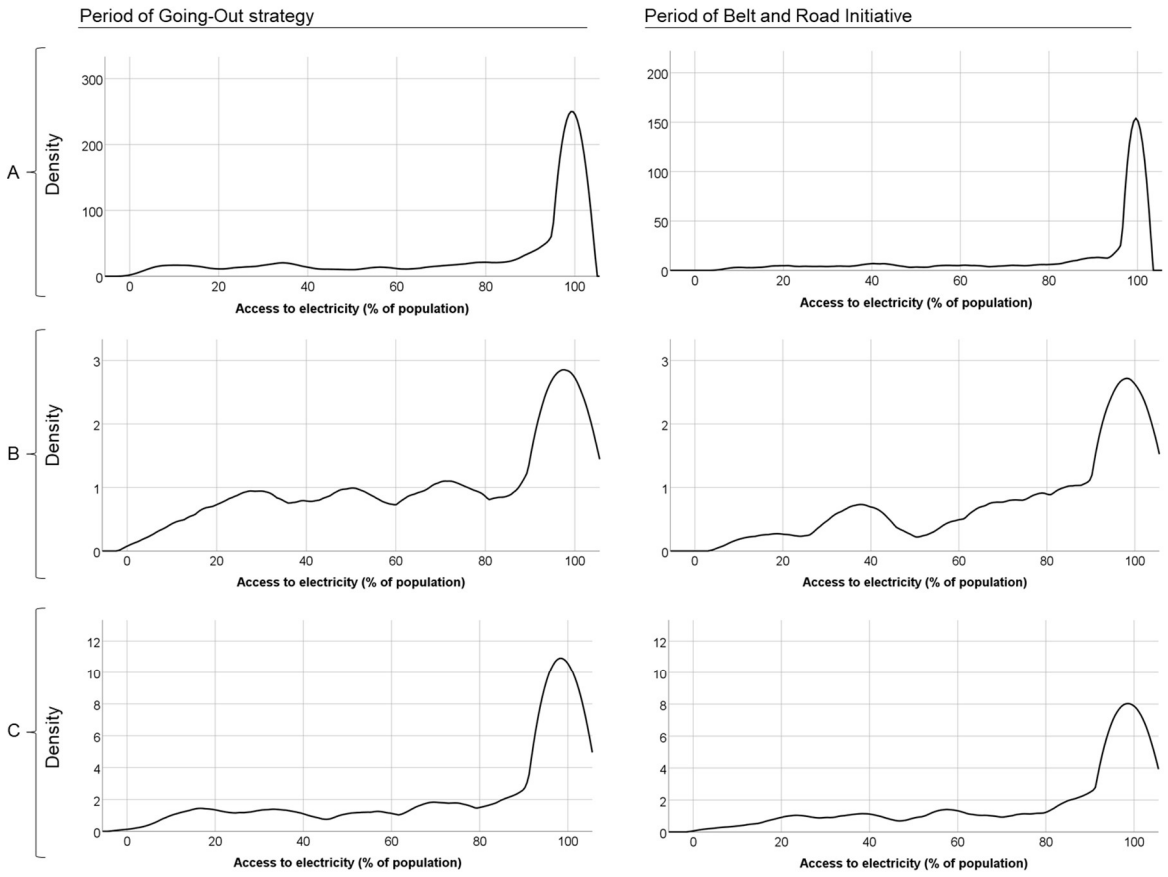


Figure E9. Kernel density functions for access to electricity levels for countries that received power plant finance from CDIs and MDBs for the time period before (1998-2012) and after the initiation of China's Belt and Road initiative (2013-2017) in comparative perspective to the world distribution. For CDIs there is an observable increasing focus on countries with higher access to electricity. However, the increase is still lower than the one of MDBs and there is a remaining visible spike for countries with very low access (≈30-45%) to electricity. Only those years where finance was received in the subsequent year are considered. The world distribution represents the density functions for all countries in the world for which data was available in the period under consideration (the selection of countries in the world distribution is unrelated to power plant finance that those countries receive).

F. Underlying power plant dataset

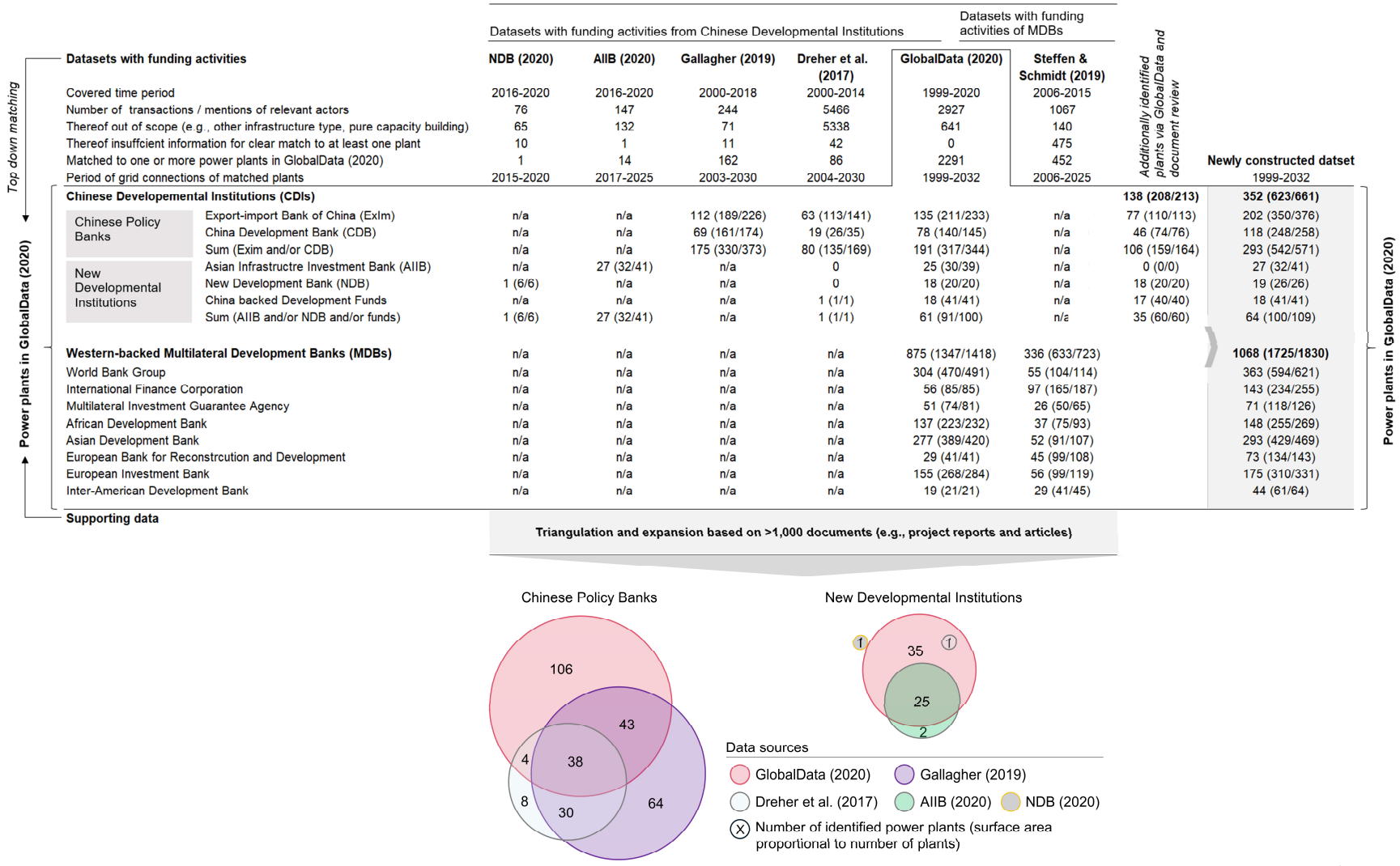


Figure F1. Composition of the constructed unit-level power plant dataset with financial transactions of CDIs and Western-backed MDBs. The number of power plants and subunits thereof (in brackets) with identified financial transactions by institutions and used data sources is displayed (in brackets: financed sub-units/total number of sub-units as reported by GlobalData[1]). Although substantial effort has been invested to validate and triangulate the existing findings, they should be seen as estimates and not as precise figures for total involvement. The dataset from Dreher et al.[6] refers to the dataset version 1.3 as specified by Strange et al.[7]. Although we consider all potentially relevant financial transactions (grants, loans, equity investments, quarantees), the majority of the sample of transactions from MDBs and CDIs is made up of loans. The CDI sample consists entirely of loans with different degrees of concessionality (including export credit loans), with the exception of 10 equity investment transactions from China-backed development funds. Authors' own depiction as displayed in a parallel manuscript by the authors of this work that is submitted for publication[13]

G. Supporting interview dataset

Table G1. Overview of Interviews

Code	No	Position	Type of organisation	Sector	Country of organisation
NP1	1	Social Impact Consultant*	Self-employed / Development organisation	Non-profit sector	Laos
PS1	2	ESG Advisory Lead Asia-Pacific*	International finance Institution	Private sector	Myanmar
PU1	3	Advisor Infrastructure	Government development cooperation	Public sector	Germany / China
PS2	4	Export Sales Manager*	Multinational corporation	Private sector	China
NP2	5	Senior Advisor*	Sustainable infrastructure foundation	Non-profit sector	Switzerland / China
NP3	6	Social Impact Consultant*	Self-employed / Development organisation	Non-profit sector	Thailand, Laos
NP4	7	Chief Advisor	Chinese policy advisory board	Non-profit sector	Canada
PU2	8	Foreign Trade Lead*	Basel Chamber of Commerce	Public sector	Switzerland
PU3	9	Manager*	Ministry of Finance	Public sector	Nepal
PU4	10	Chief Advisor	Chinese policy advisory board	Public sector	Norway
AC1	11	Researcher	Tribhuvan University	Academia	Nepal
NP5	12	Project development China*	Sustainable development consultancy	Non-profit sector	Switzerland
PS3	13	Secretary General Low Carbon Committee	Association of Plant Engineering Companies	Private sector	China
PU5	14	Project Director	Government development cooperation	Public sector	China
AC2	15	Post-doc researcher	Development and reform commission	Academia	China
AC3	16	Research and Project Lead China	Global development policy centre	Academia	USA
AC4	17	Researcher ESG standards	Law association Asia-Pacific	Academia	Thailand
NP6	18	Board president*	River conservation Organization	Non-profit sector	Thailand
PU6	19	Policy Lead Infrastructure Investment	G20 forum	Public sector	Saudi Arabia
NP7	20	CEO	Infrastructure foundation	Non-profit sector	Switzerland
PS4	21	China representative	Forestry/wood products consultancy	Private sector	China
AC5	22	Researcher*	University	Academia	UK
PS5	23	Director Business Development	Hydropower company	Private sector	Thailand
PS6	24	Associate	Business / Infrastructure consultancy	Private sector	China
PS7	25	Senior Advisor	Private sector development	Private sector	Myanmar
PS8	26	Director Client Development*	Business Consultancy	Private sector	Malaysia
AC6	27	Senior Project Manager	Centre Asia Business/University	Academia	Switzerland
AC7	28	Professor	University	Academia	China
PS9	29	Project Manager	Business Consultancy	Private sector	Saudi Arabia
PS10	30	Senior Partner*	Business Consultancy	Private sector	Vietnam
PS11	31	Director/Senior Partner*	Business Consultancy	Private sector	China
PS12	32	Senior Partner	Business Consultancy	Private sector	China
PS13	33	Partner	Business Consultancy	Private sector	China
PS14	34	Partner	Business Consultancy	Private sector	China
PU7	35	Director Sustainable Infrastructure Policy	International Financial Institution	Public sector	UK
PS15	36	Senior Partner	Business Consultancy	Private sector	Hongkong
PS16	37	Associate Partner	Business Consultancy	Private sector	Southeast Asia
PS17	38	Cities and Planning Leader	Engineering firm	Private sector	Singapore
PU8	39	Director Infrastructure	Development bank	Public sector	China

* Interviewees part of the initial judgment sample. The dataset is also used in two other manuscripts[13,108], but we refer to a different section of the data in this work

Supplemental Note G1. Interview Questions.

The interviews were semi-structured interviews and, therefore, interviewees covered topics that often went beyond the initial interview questions. Below we provide a selection of the initial questions from our interview guide that have been asked for the purpose of this study. We should also note that one question was particularly helpful in the context of this paper, which was: “why are there many Chinese-supported projects in one country, but not in others?” We coded the responses along the dimensions of the conceptual framework (self-interest, need, merit, other).

What do you think is the Belt and Road Initiative?

What do you think is the overall goal / vision of the BRI?

Do you see Chinese-supported project “hotspots”?

If so, what are drivers for “hotspots”, i.e. why there are many Chinese-supported projects in one country, but not in others?

Are there project(s) that you know better/in more detail? If so, which ones?

What can you tell me about the stakeholder set-up in this project(s)?

H. Selection of comparison group

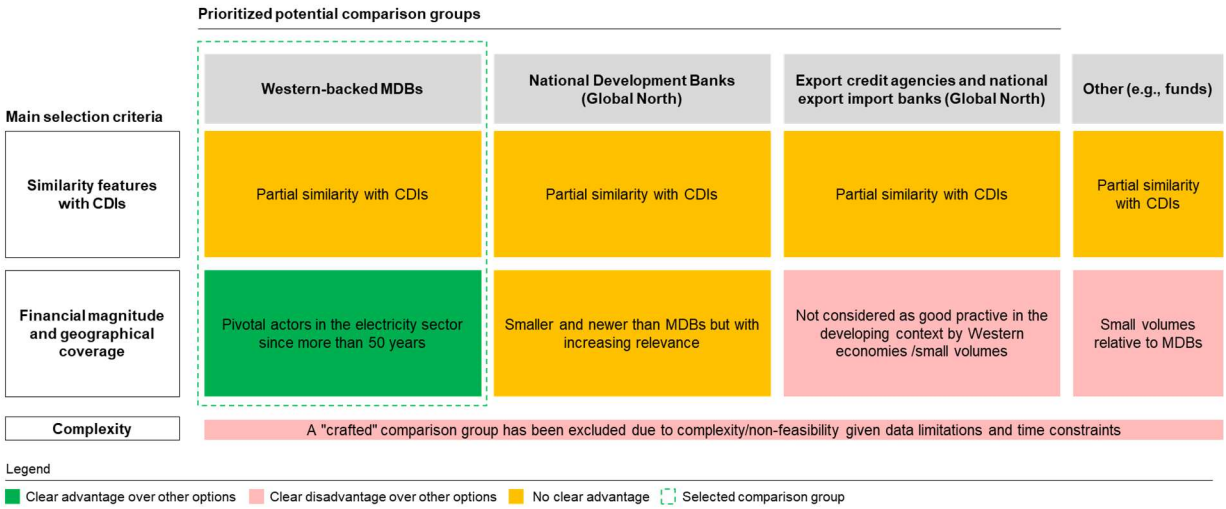


Figure H1. Simplified illustration of potential comparison groups, decision criteria and high-level evaluation for comparison group attractiveness

Supplemental Note H1. Comparison group selection process.
Given the distinct characteristics of Chinese development finance that is not aligned with OECD criteria[66,80] there is no "natural" comparison group. Next to National Development Banks we also considered Export Credit Agencies/National Export-Import Banks as potential comparison group due to the fact that one can assume that a big part of the bilateral Chinese development finance is tied to project implementation by Chinese companies[80]. After careful consideration Western-backed MBDs provided the best compromise between the relevance of the comparison group as measured by financial/geographical scale in the global electricity sector, potential "similarity" and research design complexity. Figure H1 presents a simplified illustration of the decision process that will be elaborated in more detail in the following.

First, one of the main motivations to choose Western-backed MDBs as comparison group was that they are considered as the pivotal institutions in providing public finance for electricity generation infrastructure with significant international coverage in the developing world, for now more than 50 years[97-100]

- Whereas some national Development Banks (e.g., Agence Francaise de Developpement (AFD), Kreditanstalt für Wideraufbau (KfW)) are also large relative to single MDBs as measured by their total commitments/assets, the share of their investments that is directed towards the energy and power generation infrastructure is often considerably smaller. According to one of the few studies that analysed bilateral development finance for energy infrastructure globally only 2% of the total bilateral spending went into this sector in the period 1997-2005[Ref 98]. This might be explained by the fact that MDBs historically focused on very expensive high-risk power generation infrastructure projects (e.g., large dams, gas and coal projects) whereas national development banks focused on less capital intensive and risky support.
- In addition, the commitments towards the energy sector (we have not been able to identify comprehensive data/studies for the electricity sector) seems to be cumulated in a small set of countries/national development. According to Tirpak & Adams[98] two-thirds of the total bilateral assistance for energy came from Japan followed by Germany (12%) and France (3.4%).
- Likewise, the total identified volume for bilateral energy development finance is considerably smaller in comparison to MDBs. The total global bilateral energy support in the period 1997-2005 (US$ 20 billion) was below the commitments of the World Bank Group (US$ 24 billion) alone. A more recent study from Miyamoto and Chiofalo[97] that was focused on infrastructure spending in

general for the year 2014 likewise found that bilateral support from DAC countries lies below the support of MDBs which covered more than half of the total official support for development co-operation for infrastructure.

- However, whereas commitments of national development banks have remained static over a long time[98] more recently there seems to be increasing activity in the renewable energy sector[101] which will make them more attractive as a comparison group as measured by commitments in future empirical investigations. (In general, the available data and studies that put multilateral and bilateral energy infrastructure finance in perspective is very sparse, we only identified[98] for a comprehensive comparative analysis which is why we do not use more up to date studies to support our arguments.)

- Export credit agencies and national export-import banks, as alternative comparison group, have been excluded as "tied" financing in the development context has been scaled back by Western economies because it is not considered to be a "good practice". This is reflected in the 2005 Paris Declaration on Aid Effectiveness asking donor countries to refrain from tying development finance to the purchase of good and services from national firms (see Ghossein et al.[102] for more details). Likewise, the volume of Western-backed development funds (e.g., EU-Africa Infrastructure Trust Fund) in the period 1999-2020 seems to be very limited in comparison to MDB investments, albeit a comprehensive compilation is missing and evidence is limited to selective case studies[e.g 103]. A recent report published by the World Bank and the Inter-American Development Bank[103] also illustrates the underlying complexity of various public development-related funds that would inhibit a clear delineation and data collection for a comparison group.

Second, whereas having MDBs as a comparison group comes with asymmetries, a comparison with national development banks from the Global North would likewise come with asymmetries in comparison to MDBs as an alternative.

- As illustrated in more detail in Kong and Gallagher[104] "Chinese National Development Banks" in form of China's two major policy banks have distinct Characteristics relative to Western industrialized country national development banks. This includes but is not limited to the fact that loans are oftentimes tied to project implementation of Chinese companies, the absence of policy conditions, coupling of loans with commodity agreements and the degree to which the state can influence decisions.
- Furthermore, China's policy banks have several characteristics that they share with Western-backed MDBs. Next to the already mentioned scale in terms of magnitude and geographical coverage this also includes that their interest rates or costs "are fairly analogous to the terms offered by other MDBs"[104] (p.840) and that MDBs are increasingly allocating commitments in form of so called " 'policy loans' which support broad priorities agreed upon with recipient governments as form of budget support"[105] (p.121)
- In addition, the underlying sample of CDIs also covers the newly established China-backed Multilateral Development Banks (AIIB, NDB) that by its nature are more similar to Western-backed MDBs relative to national development banks, albeit there is still a controversial discussion on their role in the development finance regime and their underlying motives (raging from being a vehicle for China's foreign policy interests[106] to an MDB dedicated to common goods[107]).

Third, another important consideration on choosing MDBs as comparison group was that it addresses a knowledge gap. As pointed out by Steffen and Schmidt[12], information on MDB investments is publicly available but it is dispersed and hard to compare. We expand on recent research from Steffen and Schmidt[12] that compiled data for 10 MDBs for the period 2006-2015. As described in more detail in the methods and supplemental procedures we use the dataset from Steffen and Schmidt[12] as inflow into our dataset that links MDB involvement to power plants at the unit level for the period 1999-2020. In contrast, the Agence Francaise de Developpement (AFD) - as an example for one of the most prominent national development banks - provides full and intuitive transparency on the supported projects in an interactive online visualization.

In sum, given the distinct characteristics of Chinese development finance there is no “natural” comparison group, and we concluded that Western-backed MDBs provide a good compromise between financial magnitude/geographical coverage, similarity features and complexity. We are still having a siloed/fragmented and incomplete understanding of public finance in the global electricity sector, once the picture becomes more complete a more “crafted” comparison group might become more feasible.

References

1. GlobalData (2020). GlobalData Power Project Database (GlobalData). https://www.globaldata.com/industries-we-cover/power/ (Last download April 14, 2020)
2. Farfan, J., and Breyer, C. (2017). Structural changes of global power generation capacity towards sustainability and the risk of stranded investments supported by a sustainability indicator. Journal of Cleaner Production, 141, 370-384.
3. Gallagher, K. P. (2019), China’s Global Energy Finance. (Global Development Policy Center). http://www.bu.edu/cgef/#/intro
4. Gallagher, K. P., Kamal, R., Jin, J., Chen, Y., and Ma, X. (2018). Energizing development finance? The benefits and risks of China's development finance in the global energy sector. Energy policy, 122, 313-321
5. Jin, J., Ma, X., and Gallagher, K., 2018. China’s Global Development Finance: A Guidance Note for Global Development Policy Center Databases. (Global Development Policy Center). https://www.bu.edu/gdp/files/2018/08/Coding-Manual-.pdf
6. Dreher, A., Fuchs, A., Parks, B.C., Strange, A.M. and Tierney, M.J., (2017). Aid, China, and growth: evidence from a new global development finance dataset (AidData), working paper# 46. Williamsburg: College of William and Mary.
7. Strange, A., Cheng M., Brooke R., Ghose S., and Parks, B. (2017). AidData's Tracking Underreported Financial Flows (TUFF) Methodology, Version 1.3. (AidData) at William & Mary.
8. Dreher, A., Fuchs, A., Parks, B., Strange, A. M., and Tierney, M. J. (2018). Apples and dragon fruits: the determinants of aid and other forms of state financing from China to Africa. International Studies Quarterly, 62(1), 182-194.
9. Dolan, C. B., and McDade, K. K. (2020). Pulling the purse strings: Are there sectoral differences in political preferencing of Chinese aid to Africa? PloS one, 15(4), e0232126.
10. AIIB (2019, December 10). Introduction (Asia Infrastructure Investment Bank). https://www.aiib.org/en/about-aiib/index.html (accessed: 10 July 2020)
11. NDB (2021, January 15). Mission (New Development Bank). https://www.ndb.int/about-us/essence/mission-values/#:~:text=Our%20mission%20is%20to%20bridge,infrastructure%20and%20sustainability%2Ddriven%20projects. (accessed: 18 March 2022)
12. Steffen, B., and Schmidt, T. S. (2019). A quantitative analysis of 10 multilateral development banks’ investment in conventional and renewable power-generation technologies from 2006 to 2015. Nature Energy, 4(1), 75-82.
13. Sauer, M. T., Anadón, L. D., Kircherr, J., Plummer Braeckman J., Schulhof, V. (forthcoming). Electrified Belt and Road Initiative. [Manuscript submitted for publication]. Centre for Environment, Energy and Natural Resource Governance (C-EENRG) and Centre for Sustainable Finance, University of Cambridge. Copernicus Institute of Sustainable Development. Utrecht University.
14. Dreher, A., and Fuchs, A. (2015). Rogue aid? An empirical analysis of China's aid allocation. Canadian Journal of Economics/Revue canadienne d'économique, 48(3), 988-1023.
15. Dreher, A., Nunnenkamp, P., and Thiele, R. (2011). Are ‘new’ donors different? Comparing the allocation of bilateral aid between nonDAC and DAC donor countries. World Development, 39(11), 1950-1968.
16. Vreeland, J. R., & Dreher, A. (2014). The political economy of the United Nations Security Council: money and influence (Cambridge University Press).
17. Kilby, C. (2011). Informal influence in the Asian development bank. The Review of International Organizations, 6(3), 223-257.

18. Dollar, D. (2018). Is China's development finance a challenge to the international order? Asian Economic Policy Review, 13(2), 283-298.
19. Strüver, G. (2016). What friends are made of: Bilateral linkages and domestic drivers of foreign policy alignment with China. Foreign Policy Analysis, 12(2), 170-191.
20. Foot, R. (2014). 'Doing some things' in the Xi Jinping era: the United Nations as China's venue of choice. International Affairs, 90(5), 1085-1100.
21. Wu, W. C., Fu, R. T. M., and Pan, H. H. (2016). China's economic weight on the scale of Sino-US confrontation—Evidence from the United Nations general assembly voting data. In Political Economy of International Organizations Conference (pp. 1-17).
22. Flores-Macías, G. A., and Kreps, S. E. (2013). The foreign policy consequences of trade: China's commercial relations with Africa and Latin America, 1992–2006. The Journal of Politics, 75(2), 357-371.
23. Zhang, Y., and Buzan, B. (2020). China and the global reach of human rights. The China Quarterly, 241, 169-190.
24. Roth, K (2020). China's Global Threat to Human Rights (Human Rights Watch). https://www.hrw.org/world-report/2020/country-chapters/global
25. Voeten, E., Strezhnev, A., and Bailey, M. (2009). United Nations General Assembly Voting Data. (Havard University), Harvard Dataverse. Cambridge, MA.
26. Ramasamy, B., Yeung, M., and Laforet, S. (2012). China's outward foreign direct investment: Location choice and firm ownership. Journal of world business, 47(1), 17-25.
27. Zhao, Y., Kennedy, K., and Tang, K. (2018). Factors influencing the allocation of China's development assistance for health. Journal of global health, 8(2).
28. Yang, J. H., Wang, W., Wang, K. L., and Yeh, C. Y. (2018). Capital intensity, natural resources, and institutional risk preferences in Chinese Outward Foreign Direct Investment. International Review of Economics & Finance, 55, 259-272.
29. Hendrix, C., and Noland, M. (2014). Confronting the curse: The economics and geopolitics of natural resource governance (Columbia University Press).
30. Landry, D. G. (2018). Comparing the determinants of western and Chinese development finance flows to Africa (CARI), Working Paper and Policy Brief 2018/21.
31. Amusa, K., Monkam, N., and Viegi, N. (2016). The political and economic dynamics of foreign aid: A case study of United States and Chinese aid to Sub-Sahara Africa. ERSA-Economic Research Southern Africa, 21(5), 363-373.
32. Fleck, R. K., and Kilby, C. (2010). Changing aid regimes? US foreign aid from the Cold War to the War on Terror. Journal of Development Economics, 91(2), 185-197.
33. Kilby, C. (2006). Donor influence in multilateral development banks: The case of the Asian Development Bank. The Review of International Organizations, 1(2), 173-195.
34. Kharas, H., Chaturvedi, S., Rahman, M. and Scholz, I. (2019). Sustainable Financing for Development (G20 Think 20). https://t20japan.org/wp-content/uploads/2019/03/t20-japan-tf1-7-sustainable-financing-for-development.pdf
35. Yang, H. M., Liu, P. L., and Guo, Y. (2018). Determinants of China's development assistance for health at the sub-national level of African countries (2006–2015). Infectious diseases of poverty, 7(1), 1-9.
36. Guillon, M., and Mathonnat, J. (2019). Is there a strategy in China's health official development assistance to African countries? Revue d'economie politique, 129(4), 619-660.
37. Wang, R., Bar, F., and Hong, Y. (2020). ICT aid flows from China to African countries: A communication network perspective. International Journal of Communication, 14, 1498.
38. Kong, B., and Gallagher, K. P. (2021). The new coal champion of the world: The political economy of Chinese overseas development finance for coal-fired power plants. Energy Policy, 155, 112334.
39. Li, Z., Gallagher, K., Chen, X., Yuan, J. and Mauzerall, D.L. (2022). Pushing out or pulling in? The determinants of Chinese energy finance in developing countries. Energy Research & Social Science, 86, p.102441.
40. Niczyporuk, H., and Urpelainen, J. (2021). Taking a gamble: Chinese overseas energy finance and country risk. Journal of Cleaner Production, 281, 124993.
41. AIIB (2021). Members and Prospective Members of the Bank (Asian Infrastructure Investment Bank). https://www.aiib.org/en/about-aiib/governance/members-of-bank/index.html (accessed: 18 March 2022)

42. NDB (2021, January 15). Mission (New Development Bank). https://www.ndb.int/about-us/essence/mission-values/#:~:text=Our%20mission%20is%20to%20bridge,infrastructure%20and%20sustainability%2Ddriven%20projects. (accessed 18 March 2022)
43. Wang, H. (2019). The New Development Bank and the Asian Infrastructure Investment Bank: China's Ambiguous Approach to Global Financial Governance. Development and Change, 50(1), 221-244
44. Humphrey, C. (2020). From drawing board to reality: the first four years of operations at the Asian Infrastructure Investment Bank and New Development Bank. Working Paper of the G-24 & Global Development Policy Center of Boston University.
45. Leksyutina Y. (2018) Functional Changes in China's Participation in the Multilateral Development Banks: from Borrower to Creditor Status. International Organisations Research Journal, 13 (1), 80–98
46. Mishra, R. (2016). Asian Infrastructure Investment Bank: An Assessment. India Quarterly, 72(2), 163-176.
47. Papagianneas, S. (2019). The AIIB: A New Shift to Chinese Multilateralism? (Mapping China), Working Paper. https://mappingchina.org/2019/03/the-asian-infrastructure-investment-bank/
48. Kong, B., and Gallagher, K. P. (2016). The globalization of Chinese energy companies: The role of state finance (Global Economic Governance Initiative), Working Paper. https://www.bu.edu/pardeeschool/files/2016/06/Globalization.Final_.pdf
49. Gallagher, K. S., & Qi, Q. (2018). Policies governing China's overseas development finance implications for climate change (Center for International Environment and Resource Policy), The Fletcher School, Tufts University, March, (016).
50. AIIB (2019, December 10). Introduction (Asian Infrastructure Investment Bank). https://www.aiib.org/en/about-aiib/index.html (accessed 10 July 2020)
51. Harrigan, J., and Wang, C. (2011). A new approach to the allocation of aid among developing countries: is the USA different from the rest? World Development, 39(8), 1281-1293.
52. Hoeffler, A., and Outram, V. (2011). Need, merit, or self-interest—what determines the allocation of aid? Review of Development Economics, 15(2), 237-250.
53. Berthélemy, J. C. (2006). Bilateral donors' interest vs. recipients' development motives in aid allocation: do all donors behave the same? Review of Development Economics, 10(2), 179-194.
54. Frank, A.G. (1969). Latin American, underdevelopment or revolution (Monthly Review Press).
55. Maizels, A., and Nissanke, M. K. (1984). Motivations for aid to developing countries. World development, 12(9), 879-900.
56. Hensman, C.R. (1971). Rich against poor: the reality of aid (Allen Lane).
57. McKinlay, R. D., and Little, R. (1977). A foreign policy model of US bilateral aid allocation. World Politics: A Quarterly Journal of International Relations, 58-86.
58. Gaeta, A., and Vasilara, M. (1998). Development and human rights: the role of the World Bank (The World Bank).
59. Kuziemko, I., & Werker, E. (2006). How much is a seat on the Security Council worth? Foreign aid and bribery at the United Nations. Journal of political economy, 114(5), 905-930.
60. Demirel-Pegg, T., and Moskowitz, J. (2009). US aid allocation: The nexus of human rights, democracy, and development. Journal of Peace Research, 46(2), 181-198.
61. Mohan, G., and Power, M. (2008). New African choices? The politics of Chinese engagement. Review of African Political Economy, 35(115), 23-42.
62. Alden, C. (2005). Red star, black gold. Review of African Political Economy.
63. Lum, T., Fischer, H., Gomez-Granger, J., & Leland, A. (2009). China's foreign aid activities in Africa, Latin America and Southeast Asia (Congressional Research Service), CRS report for congress. https://sgp.fas.org/crs/row/R40361.pdf
64. Tull, D. M. (2006). China's engagement in Africa: scope, significance and consequences. Journal of modern African studies, 459-479.
65. Berthélemy, J. C. (2011). China's engagement and aid effectiveness in Africa. China and Africa: An emerging partnership for development, 71-90.
66. Bräutigam, D., and Gallagher, K. P. (2014). Bartering globalization: China's commodity-backed finance in Africa and Latin America. Global Policy, 5(3), 346-352.
67. Naim, M. (2007). Rogue aid. Foreign policy, (159), 96.

68. White House. (2018, October 4). Remarks by Vice President Pence on the Administration's Policy Toward China (Archive White House). https://trumpwhitehouse.archives.gov/briefings-statements/remarks-vice-president-pence-administrations-policy-toward-china/ (accessed 18 March 2022)
69. Global Infrastructure Hub (2017). Global Infrastructure Outlook (Global Infrastructure Hub, Oxford Economics). https://outlook.gihub.org/
70. IEA (2019b). Africa Energy Outlook 2019: World Energy Outlook Special Report (International Energy Association). https://webstore.iea.org/download/direct/2892
71. World Bank. (2017). State of electricity access report 2017 (World Bank). https://www.worldbank.org/en/topic/energy/publication/sear
72. CDB and UNDP (2019). Harmonizing Investment and Financing Standards towards Sustainable Development along the Belt and Road. Joint report between the China Development Bank (CDB) and the United Nations Development Programme (UNDP) (CDB, UNDP). https://www.cn.undp.org/content/china/en/home/library/south-south-cooperation/harmonizing-investment-and-financing-standards-.html
73. NBD (2022). Annual Report 2020 (New Development Bank). https://www.ndb.int/annual-report-2020/enhancing-development.html
74. World Bank (2007). Clean Energy for Development Investment Framework: Progress Report on the World Bank Group Action Plan (World Bank). https://openknowledge.worldbank.org/handle/10986/12559
75. AfDB (2021, May 31). African Development Bank extends $84 million in financing to boost electricity access (African Development Bank). https://www.afdb.org/en/news-and-events/press-releases/rwanda-african-development-bank-extends-84-million-financing-boost-electricity-access-43949#:~:text=boost%20electricity%20access-,Rwanda%3A%20African%20Development%20Bank%20extends%20%2484%20million,financing%20to%20boost%20electricity%20access&text=The%20Board%20of%20Directors%20of,rural%20households%20in%20south%20Rwanda (accessed 5 March 2022).
76. World Bank (2021, June 3). Zanzibar: New World Bank Financing to Increase Access to Electricity (World Bank Group). https://www.worldbank.org/en/news/press-release/2021/06/03/zanzibar-new-world-bank-financing-to-increase-access-to-electricity (accessed 18 March 2022)
77. ADB (2020, November 24). $600 Million ADB Loan to Expand Energy Access in Eastern Indonesia. (Asian Development Bank). https://www.adb.org/news/600-million-adb-loan-expand-energy-access-eastern-indonesia (accessed 5 March 2022)
78. AIIB (2022). Energy Sector Strategy: Sustainable Energy for Asia (Asian Infrastructure Investment Bank). https://www.aiib.org/en/policies-strategies/strategies/sustainable-energy-asia/index.html
79. BREC (2019). Multilateral cooperation - Energy Access (Belt and Road Energy Cooperation Portal). http://obor.nea.gov.cn/pictureDetails.html?id=2583 (accessed 5 March 2022)
80. Bräutigam, D. (2011). Aid 'with Chinese characteristics': Chinese foreign aid and development finance meet the OECD-DAC aid regime. Journal of international development, 23(5), 752-764.
81. Humphrey, C. (2015). Are credit rating agencies limiting the operational capacity of multilateral development banks? (G-24), working paper: https://www.g24.org/wp-content/uploads/2016/01/Are-Credit-Rating-Agencies-Limiting-the-Operational.pdf
82. Ang, G., Roettgers, D., Burli, P. (2017). The empirics of enabling investment and innovation in renewable energy (OECD), Environment Working Papers, No. 123.
83. Ragosa, G., and Warren, P. (2019). Unpacking the determinants of cross-border private investment in renewable energy in developing countries. Journal of Cleaner Production, 235, 854-865.
84. Dubash, N.K. (2009). Climate change and development: a bottom-up approach to mitigation for developing countries? In: Climate Finance: Regulatory and Funding Strategies for Climate Change and Global Development (New York University Press).
85. OECD (2009). DAC List of ODA Recipients. Effective for reporting on 2009 and 2010 flows (OECD). https://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/43540882.pdf
86. Marquaridt, D. W. (1970). Generalized inverses, ridge regression, biased linear estimation, and nonlinear estimation. Technometrics, 12(3), 591-612.
87. Paternoster, R., Brame, R., Mazerolle, P., and Piquero, A. (1998). Using the correct statistical test for the equality of regression coefficients. Criminology, 36(4), 859-866.

88. Clogg, C. C., Petkova, E., and Haritou, A. (1995). Statistical methods for comparing regression coefficients between models. American journal of sociology, 100(5), 1261-1293.
89. Kennedy, P. (2003). A guide to econometrics. 5th Edition (MIT Press).
90. Baltagi, B. H. (2001). Econometric Analysis of Panel Data (Wiley, John & Sons).
91. Park, H. M. (2011). Practical guides to panel data modeling: a step-by-step analysis using stata. Public Management and Policy Analysis Program, Graduate School of International Relations, International University of Japan, 12, 1-52.
92. Berthélemy, J. C., and Tichit, A. (2004). Bilateral donors' aid allocation decisions—a three-dimensional panel analysis. International Review of Economics & Finance, 13(3), 253-274.
93. Chen, X., Gallagher, K. P., and Mauzerall, D. L. (2020). Chinese overseas development financing of electric power generation: A comparative analysis. One Earth, 3(4), 491-503.
94. Hainz, C., and Kleimeier, S. (2012). Political risk, project finance, and the participation of development banks in syndicated lending. Journal of Financial Intermediation, 21(2), 287-314.
95. Geddes, A., Schmidt, T. S., and Steffen, B. (2018). The multiple roles of state investment banks in low-carbon energy finance: An analysis of Australia, the UK and Germany. Energy policy, 115, 158-170.
96. Bolton, R., Foxon, T. J., and Hall, S. (2016). Energy transitions and uncertainty: Creating low carbon investment opportunities in the UK electricity sector. Environment and Planning C: Government and Policy, 34(8), 1387-1403.
97. Miyamoto, K., and Chiofalo, E. (2016). Official development finance for infrastructure: with a special focus on multilateral development banks (OECD Publishing).
98. Tirpak, D., and Adams, H. (2008). Bilateral and multilateral financial assistance for the energy sector of developing countries. Climate Policy, 8(2), 135-151.
99. Wright, H., Hawkins, J., Orozco, D., Mabey, N., (2018). Banking on Reform: Aligning Development Banks with the Paris Climate Agreement (E3G). https://www.e3g.org/publications/banking-on-reform-aligning-development-banks-with-paris-climate-agreement/
100. Delina, L. L. (2011). Asian Development Bank's support for clean energy. Climate Policy, 11(6), 1350-1366.
101. Mazzucato, M., and Semieniuk, G. (2018). Financing renewable energy: Who is financing what and why it matters. Technological Forecasting and Social Change, 127, 8-22.
102. Ghossein, T., Hoekman, B., and Shingal, A. (2021). Public Procurement, Regional Integration, and the Belt and Road Initiative. The World Bank Research Observer, 36(2), 131-163.
103. WBG, IDB & PPIAF. (2020). Global Review of Public Infrastructure Funds: Global Review of Public Infrastructure Funds. (WBG, IDB, PPIAF). https://ppiaf.org/documents/5982/download
104. Kong, B., and Gallagher, K. P. (2017). Globalizing Chinese energy finance: the role of policy banks. Journal of Contemporary China, 26(108), 834-851.
105. Nakhooda, S. (2011). Asia, the Multilateral Development Banks and energy governance. Global Policy, 2, 120-132.
106. Heilmann, S., Rudolf, M., Huotari, M. and Buckow, J., 2014. China’s shadow foreign policy: parallel structures challenge the established international order. China Monitor, 18(10), pp.1-9.
107. Callaghan, M. and Hubbard, P., (2016). The Asian infrastructure investment bank: Multilateralism on the silk road. China Economic Journal, 9(2), pp.116-139.
108. Schulhof, V., van Vuuren, D., & Kirchherr, J. (2022). The Belt and Road Initiative (BRI): What Will it Look Like in the Future?. Technological Forecasting and Social Change, 175, 121306.