More Problems More Money? Does China Lend More to African Countries with Higher Credit Risk Levels?

David Landry and Gailyn Portelance

Abstract

Over the past decade, China has provided billions of dollars in concessional and non-concessional finance to countries around the world. In light of these trends, both researchers and pundits have focused on China's motivations for allocating development finance, particularly in Africa, due to debt sustainability concerns. This paper aims to contribute to the understanding of the ways in which creditworthiness may impact the Chinese government's decision to allocate development finance. In doing so, it examines the impact of African countries' creditworthiness levels on Chinese development finance commitments and whether it impacts the development finance they receive from China and the West differently. It also explores the impact of African country creditworthiness on Chinese loan cancellations and forgiveness.

This paper finds that a disproportionate share of Chinese government loan commitments to African countries are made to governments with high credit risk levels. In that same vein, it finds that China makes more development finance commitments to African countries with lower levels of creditworthiness compared to other Western donors. Finally, this paper finds that African countries' creditworthiness impacts both loan forgiveness and, to a lesser extent, cancellations. As African countries' creditworthiness decreases, their likelihood of having Chinese loan commitments cancelled, or some outstanding debt to Beijing forgiven, increases. These findings highlight the need for a more nuanced characterization of Chinese development finance activities in Africa by researchers, pundits, and policymakers. It also underscores the importance of greater transparency from—and coordination with—China in its approach to debt sustainability and its attitude towards risk on the African continent, as well as the importance of building African debt management and capacity to ensure responsible borrowing.

Keywords: Development finance; Credit risk; Sovereign debt; China; Africa

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Foreword

China's lending to developing countries has come under intense scrutiny in recent years, following a decade of dramatic growth. Lost in the heated political discourse surrounding China's lending is the steady pace of new scholarship that is providing greater evidence and a clearer picture of a lending program that has been defined in part by its lack of transparency. As tensions between China and G7 countries rise, it is all the more critical that evidence-driven research features prominently in the leading policy debates.

One key area of debate amidst the COVID-19 pandemic relates to the debt risks associated with developing countries' external borrowing and the role that China has played as a leading creditor to these countries. In this vein, "More Problems More Money? Does China Lend More to African Countries With Higher Credit Risk Levels" provides a key contribution to extant literature. This paper, commissioned by CGD, seeks to answer a key question: How are China's international lending practices informed by recipient country creditworthiness?

The paper provides new evidence of how China's loan commitments vary according to recipient country credit ratings, and how credit risk considerations influence China's decisions to reevaluate its commitments or reschedule its debts. The authors find that Chinese lenders demonstrate far more willingness to lend to higher-risk countries than other lenders. They also find that a feature of this lending behavior is a higher frequency of loan cancellation between the initial commitment phase and actual loan disbursements.

In the months ahead, low-income countries at high risk of debt distress will feature prominently in multilateral discussions about pandemic relief and recovery. The G20's common framework on debt aims to provide a blueprint for helping these countries avoid default events through coordinated debt relief among their leading creditors. No single government matters more in the success of the G20's efforts, particularly in the most vulnerable countries, than China. For the rest of the G20 governments, a clearer understanding of China's lending behavior will inform a more effective stance toward China; and for the Chinese government itself, a clearer public assessment of the effects of its lending ought to motivate a more constructive stance toward the G20's agenda. I expect that this paper will prove useful on both fronts.

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Introduction

In the past decade, the stock of Chinese development finance has increased dramatically, providing countries around the world with billions of dollars in loans. These flows have launched tense discussions in Western foreign policy circles, as politicians, academics, and media pundits alike are openly debating why, how, and where Beijing allocates its development finance. Central to the Western narratives about Chinese development finance is the idea that China offers "easy credit." China's emergence as a major financier of African infrastructure projects and thus as a contributor to Africa's growing public debt has also sparked renewed concern about sovereign debt sustainability. These concerns are not without merit—as of 2018, China is the continent's largest bilateral creditor, accounting for 22 percent of sub-Saharan Africa's public external debt stock (Huang and Brautigam, 2020). Some accounts of Chinese development finance go as far as labelling it "debt trap diplomacy." The Belt and Road Initiative (BRI), and its reported trillions of dollars in new investments around the world, including in Africa, has stoked this debate. China counters this narrative and emphasizes that its development finance promotes shared growth through collaboration. Furthermore, as an annual infrastructure financing gap of approximately USD 68-108 billion persists on the continent, African leaders have generally embraced Chinese development finance as a way to address a host of unmet needs (NA, 2018). China is funding massive projects in countries that previously received relatively few loans.

Despite the widespread speculation and debates surrounding China's development finance motivations, little research exists on the link between borrower credit risk and Chinese lending, and no empirical research explores the impacts of the former on the latter. This paper aims to contribute to the understanding of the ways in which creditworthiness may impact Chinese government bodies' decision to allocate development finance funds. It also aims to contribute a more nuanced view of Chinese development finance to broader policy discussions. To do so, this paper explores the impact of African countries' creditworthiness levels on the Chinese government's development finance commitments. It also explores whether the creditworthiness of African countries impacts the development finance commitments they receive from China and the West differently. Finally, the paper tests the impact of creditworthiness levels on Chinese loan cancellations and loan forgiveness.

These questions tackled in this paper are explored specifically with regards to Africa primarily because of data considerations. This paper employs the loans data produced by the China Africa Research Initiative at Johns Hopkins University (CARI), which represents the first effort to estimate Chinese loans in Africa from the bottom up, as opposed to relying on media reports to do so (Brautigam and Hwang, 2014). The methodology employed by CARI features rigorous data collection, cross-verification, and cleaning, emphasizing the "official websites of central banks and ministries of finance, Chinese contractors, and personal contacts in China and in African countries" and counting loans of USD 25 million or more only if confirmed by "a representative of the Chinese bank or the Chinese government" or "a reliable source or official website" (Ibid.).

The paper finds that there is a negative relationship between credit risk and Chinese development finance—a disproportionate share of Chinese loan commitments to African countries are made to governments with high credit risk levels. In that same vein, the paper finds that China offers more development finance to African countries with lower levels of creditworthiness compared to Western donors—France, Germany, the United Kingdom, and the United States. The paper also finds that, as African countries' creditworthiness decreases, so does the share of Chinese loan commitments that come to fruition. Finally, the paper finds that African countries' creditworthiness impacts loan forgiveness. As African creditworthiness decreases, the likelihood of loan forgiveness increases. Given these results, the paper concludes by outlining brief policy recommendations for African, Chinese, and Western policymakers.

Determinants of development finance

Determinants of Western development finance

Not surprisingly, a large proportion of the literature on the determinants of bilateral development finance centers on traditional (Western) donors. Furthermore, much of this literature focuses on the pre-Cold War or immediate post-Cold War era. Broadly speaking, that literature demonstrates that the strategic economic, political, and security interests of donor countries consistently represent the most important predictors of development finance allocation. Factors specific to receiving countries that are likely to influence the impact of their bilateral development finance inflows, such as their level of economic need, economic policies, and governance levels, play a weaker role than donor countries' strategic interests in determining development finance allocation.[1] That said, they do play a growing role nevertheless. For instance, following the end of the Cold War, more bilateral development finance was allocated to countries with better institutions and policy environments (Burnside and Dollar, 2004). Finally, bilateral creditors are sensitive to the creditworthiness of their borrowers—the most obvious reason being that they want to be repaid (Eichengreen, 1989; Evrensel, 2004).

Determinants of Chinese development finance

Chinese infrastructure projects have mushroomed around the world—an effect of China's "Go Out" policy (also known as the "Going Global" Strategy). However, little empirical work explores the determinants of Chinese development finance. This is largely due to two key factors. First, China is very opaque about development finance, and does not report outflows in a systematic manner.[2] Second, Chinese development finance flows only ballooned in the past ten years, and thus were the subject of much less debate and scrutiny

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[1] See, for instance, Maizels and Nissanke (1984), McGillivray (1989), Alesina and Dollar (2000), Burnside and Dollar (2000), Dollar and Levine (2004), Berthelemy (2006), and Claessens, Cassimon, and Van Campenhout (2009).

[2] The emergence of databases such as the College of William and Mary's AidData global dataset on China's official development financing and John Hopkins School of Advanced International Studies' China-Africa Research Initiative (CARI) have helped shed light on the mystery of Chinese financing.

before. China's ascendance as a key development finance actor—as well as its policy of non-interference in the domestic affairs of sovereign governments—has fueled concerns that it seeks to undermine Western interests abroad and weaken the good governance, human rights, and environmental protection agendas (Kurlantzick, 2006; Naim, 2009). The evidence on the "rogue aid" narrative is mixed. Some research finds that aid from authoritarian donors has a negative relationship with democratization (Bermeo, 2011). However, other works that specifically explore Chinese development finance concludes that Chinese aid does not have a discernible impact on authoritarian longevity (Bader, 2015). Other works on Chinese aid find that China allocates development finance independently of receiving countries' resource wealth or institutional characteristics (Dreher and Fuchs, 2016). In terms of political and foreign policy interests, the literature does not strongly suggest that China behaves much differently than Western donors (aside from China's emphasis that receiving countries respect the One-China Policy by having no formal diplomatic ties with Taipei). Chinese aid—much like that of the West—is linked to U.N. General Assembly voting patterns (Ibid.). The research also suggests that China's development finance follows economic objectives, such as trade facilitation and the need to secure energy supplies.[3]

Similar themes emerge with regards to the determinants of China's development finance in Africa specifically. While Chinese strategic interests remain the driving force beyond development finance, the evidence is mixed as to what aspects of it have the most predictive power. On the political front, the observance of the One-China Policy unsurprisingly remains a key predictor of Chinese development assistance in Africa (Taylor, 1998; Brautigam, 2009). Furthermore, recent research concludes that Chinese development finance does not systematically flow to more authoritarian regimes in Africa (Brauch, 2017). In comparing Western and Chinese development finance allocations in Africa, Western countries send more development finance than China to African countries with better governance levels but, in absolute terms, China does not send more development finance to African countries with worse governance outcomes (Landry, 2018). With regards to economic considerations, the literature shows that bilateral trade ties and natural resource endowments represent important predictors of Chinese official finance (Dreher et al., 2018; Landry, 2018). On the environmental front, recent research finds that Chinese development finance grows commensurate with environmental performance, up to a certain level of environmental quality, after which it declines (Gellers and Jeffords, 2019).

China, Africa, and credit risk

Over the past decade, China has extended vast amounts of credit to African countries. While estimates vary, the Chinese government, banks, and contractors have lent approximately USD 143 billion USD in loan to African governments and SOEs between 2000 and 2017 (NA, 2020). Angola alone has received USD 42.5 billion from China over the same time period (Ibid.). As of 2018, over 20 percent of African government external debt was owed to China (NA, 2018). Furthermore, African countries make up half of the 50 countries most indebted to China as a percentage of GDP (Ghandi, 2019; Horn, Reinhart, and Trebesch,

[3] See, for instance, Zweig and Jianhai (2005), Burgos and Ear (2010), Brautigam (2011), and Alves (2013).

2019). This shift towards Chinese lending has rapidly changed the balance sheets of many African countries, some of which, including Angola, Djibouti and Kenya, now have massive debt obligations to China (Moore, 2018). For example, Kenya's Chinese debt total nearly USD 5 billion—Japanese debt, which comes in at second, totals USD 909 million (Were, 2018). Finally, China recently built its first overseas military base in Djibouti. The small East African country has a public debt-to-GDP ratio of more than 80 percent, which is mostly owed to China (Green, 2019).

China's emergence as a major financier of African infrastructure has coincided with renewed concerns about the continent's debt sustainability. The implementation of debt relief initiatives, such as the 1996 Heavily Indebted Poor Countries Initiative (HIPC) and the 2005 Multilateral Debt Relief Initiative (MDRI), was followed by nearly a decade of reduced debt burdens and relative debt stability. However, the picture has changed significantly in recent years (NA, 2018). As of 2019, 24 African countries had a debt-to-GDP ratio of more than 55 percent and, in 19 African countries, it exceeded 60 percent (Onyekwena and Ekeruche, 2019). Furthermore, the average cost of servicing debt as a share of government revenue has doubled from 5 percent in 2012 to 10 percent in 2017 (Coulibaly et al., 2019). Today, roughly a third of countries in sub-Saharan Africa are at high risk of debt distress—with total debt and external debt estimated at USD 160 and 90 billion, respectively (Ibid.). In light of these trends, observers have sounded the alarm over an impending debt crisis across Africa (Gill and Karkulah, 2018).

These trends raise questions about whether China takes creditworthiness into account in its development finance allocation. Yet, little is known on whether China actually takes creditworthiness into account when extending development finance to African countries. Interestingly, the literature cited above often does not include credit risk as a variable of interest. Furthermore, anecdotal evidence is often cited to understand China's risk tolerance when it comes to overseas lending, and standalone cases play a key role in informing popular perceptions of Chinese engagement worldwide.

One widely amplified narrative surrounding China's geopolitical motives in Africa and around the world is that China is attempting to ensnare poor countries using "debt trap diplomacy" (for a thorough review of the term, see Brautigam 2019). This view implies that China is using unsustainable loans to push countries into insolvency for geopolitical leverage over them and, often, vis-à-vis the West. Proponents of this narrative often cite the 2017 Hambantota Port case, whereby Sri Lanka signed over the strategically important port in a 99-year lease due to its inability to repay its loan. Given the strategic importance of this case and that of Djibouti (mentioned earlier), and China's general lack of transparency, these loans are often labelled as predatory. This debt-trap diplomacy narrative has fueled a strong reaction from US policymakers and appears to have influenced US foreign policy towards Africa—as evidenced by members of the Trump Administration's comments on China's predatory lending practices (Moore, 2018; Paquette, 2019). However, poring over the initiative's 1,000+ loans database, researchers at CARI have not come across any examples where China deliberately entangled an African country in debt and then used that debt to exact some strategic advantage (Brautigam, 2019).

A number of motivations unrelated to geopolitical interests have been put forth to explain why China may be willing to disregard the creditworthiness of African countries and open itself up to the risk of default. First, Chinese infrastructure loans open up opportunities for Chinese firms and workers, which addresses the problem of domestic overcapacity (Sun, 2014). Additionally, China's financing to Africa may be linked to securing natural resources, as some of it is backed by commodities like oil and copper (Landry, 2018). Finally, it is possible that these loans aim to help secure a market for Chinese goods—which would be supported by the literature that finds a strong positive relationship between bilateral trade and Chinese development finance (Su, 2017).

In analyzing Chinese development finance, a careful distinction must be made between MOUs, commitments, and disbursements. At one end of the spectrum, MOUs represent non-binding agreements, which are frequently cancelled by one of their signatories long before a check is signed, dirt shoveled, or a ribbon cut. At the other, disbursements refer to those instances when money is transferred from Chinese coffers to recipient country accounts. While China's MOUs reflect lofty development finance objectives, they appear to infrequently move beyond that initial phase (Hurley et al., 2018). Recent estimates find that only two to four percent of MOUs actually lead to projects in Africa (Bello, 2016). Commitments fall somewhere between non-binding MOUs and in-the-bank disbursements. While they are not ironclad, they generally involve more certainty than MOUs, as they are reported by official sources. In the words of Brautigam and Hwang (2016): "We are reluctant to assume that a MOU, or even a project contract, with an announced intention to secure Chinese finance, is the same as a commitment."

When loans are actually disbursed, while their interest rates and even payment schedules may be revised, there is evidence that Chinese creditors expect the loans to be repaid. Much qualitative research suggests that the China Export-Import Bank (CEIB) and the China Development Bank (CDB) do indeed prioritize "bankable" projects and assess loans based on commercial criteria.[4] According to one Chinese official with experience at both CEIB and CDB, "cancellation is not possible, even for concessional loans" (Brautigam and Hwang, 2016). According to another Chinese official from the Ministry of Commerce, "China Eximbank is mostly motivated by profit" (Dreher et al., 2018). In cases where a project's risk level is considered high, there is evidence that commercial loans from CEIB require insurance cover from Sinosure—China's official export credit insurance agency. This mechanism requires borrowers using export credits for Chinese imports or construction services to finance 15 percent or more of the value of a contract, thus capping China's exposure at 85 percent (Brautigam and Hwang, 2016). There are also instances where risk aversion manifested itself more directly in the actions of Chinese banks. In the Democratic Republic of Congo's infamous Sicomines deal, CEIB took concrete steps to diminish its risk exposure. When the Congolese government rejected the changes it proposed, CEIB rescinded its funding (albeit temporarily) (Landry, 2018). Similarly, China placed the second phase of the Standard Gauge Railway in Kenya on hold after President Uhuru Kenyatta

[4] See, for instance, Brautigam (2009), Corkin (2011), and Sun (2014).

failed to secure funds for the project until it could establish the project's commercial viability (Guguyu, 2018).

China has also taken steps to address borrower countries' debt sustainability and has demonstrated a willingness to provide additional credit to avoid defaults, though it has taken place in an ad-hoc manner. Developing countries have renegotiated about USD 50 billion in Chinese loans over the past decade (Hancock, 2019). And China has restructured or waved loans in at least 85 instances over the last 15 years (Hurley et al., 2018). For example, in 2015, China wrote off USD 40 million of Zimbabwe's loans and renegotiated the terms of USD 21.3 billion in loans to Angola (Hancock, 2019). Similarly, in 2019, China forgave USD 78 million of Cameroon's debt (Marsh, 2019). And a recent paper found that, between 2000 and 2019, China cancelled at least USD 3.4 billion in African debt, often related to pledges made at the Forum on China-Africa Cooperation. (Acker et al., 2020). Nearly all of these were zero interest loans.

China appears to be moving toward greater discipline with regards to avoiding causing unsustainable debt. For example, in November 2017, the China Banking Regulatory Commission issued its first ever regulations for Chinese policy banks, emphasizing greater risk controls for the overseas activities of CDB, CEIB, and the ADBC (Agricultural Development Bank of China) (Hurley et al., 2018). At the 2019 BRI Forum for International Cooperation, China released a debt sustainability framework (DSF)—one that is very similar to the one jointly produced by the World Bank (WB) and the IMF, which guides lending operations for the multilateral institutions and many bilateral lenders. Yet, one key difference is China's response to countries with high levels of debt distress. According to the Chinese DSF, a high debt distress risk rating may not be a barrier to lending if the Chinese government deems the project economically viable (Olander, 2019). Given the impacts of COVID-19 on African countries' economic and financial stability, China has also recently made two commitments on debt relief, including one under the G-20 Debt Service Suspension Initiative for the Poorest Countries (reached on April 15) (Sun, 2020). Finally, on June 17, China announced it would cancel all its interest-free loans to African countries (Campbell, 2020). While this makes up only five percent of Africa's debt to China, it reveals Beijing's willingness to accept debt cancellations in times of crisis (Ibid.). There are also signs that China might be changing its approach to loan commitments—it appeared more cautious than in the past in making pledges at the 2018 Forum on China-Africa Cooperation Summit (Sun, 2019).

Research questions and hypotheses

Given speculation around China's risk appetite and intentions in Africa, it is surprising that none of the empirical research on the determinants of Chinese development finance includes African countries' creditworthiness as a predictor variable. This is particularly salient given the emerging evidence that Chinese officials appear to carry out risk assessments and take them into account. As such, this paper explores China's risk appetite in Africa by testing whether the creditworthiness of African countries has an impact on Chinese government loan commitments, whether this relationship differs for China and Western countries, and

whether creditworthiness impacts instances of Chinese loan cancellations and forgiveness. It seeks to answer the following questions:

Q1. What impacts do African countries' creditworthiness levels have on Chinese development finance commitments?

H1. African countries' creditworthiness levels are expected to have no relationship with Chinese loan commitments. Chinese government loan commitments are not ironclad—they can be subject to changes or outright cancellations. Thus, there is little reason to believe that assiduous risk assessments are carried out by Chinese financiers before they sign these agreements.

Q2. Does the creditworthiness of African countries impact Chinese and Western lending activities differently?

H2. The relationship between credit risk levels and Chinese loan commitments is expected to differ significantly from those of the Western countries sampled. While, as mentioned, above, no correlation is expected between creditworthiness and loans from China, a positive relationship between the two is expected for Western countries. Western creditors have a long history of issuing—and, more recently, forgiving—sovereign debt. As a result, they are expected to be averse to credit risk in issuing new loans.[5]

Q3. Do African countries' creditworthiness levels have an impact on whether Chinese loan commitments get cancelled?

H3. African countries' levels of creditworthiness are expected to have a negative association with Chinese loan cancelations. This is because, as it is in the interest of Chinese creditors to have their loans repaid on schedule, loan disbursements are expected to follow more rigorous risk assessments than loan commitments, and riskier countries to experience more frequent cancellations.

Q4. Do African countries' creditworthiness levels have an impact on whether disbursed Chinese government loans get forgiven?

H4. Given that China is expected to commit loans without regard for credit risk, and despite the fact that risky countries are expected to see more of their Chinese loan commitments cancelled, the relationship between creditworthiness and Chinese loan forgiveness is expected to be positive. In other words, less creditworthy countries are expected to no longer be able to repay their loans to China—and therefore to see some loans forgiven—more often than more creditworthy countries.

[5] The expected difference in how Chinese and Western lending activities respond to credit risk is also partly due to the difference between the ways in which the two datasets are compiled. The Chinese loans datasets capture commitments, which are sometimes announced to great fanfare but subsequently cancelled, while the Western loans dataset captures disbursements.

Methodology

The testing of the relationship between African countries' credit risk and development finance takes place through four gravity model specifications. Two distinct models are used for each specification. With regards to the models that answer the paper's two first questions, which relate to development finance allocation, the (preferred) Poisson Pseudo-Maximum-Likelihood (PPML) estimation (Santos Silva and Tenreyro, 2006) and the standard Ordinary Least Square (OLS) model are used. In the PPML models, the yearly value of development finance flows is the outcome variable. As part of the OLS models, the log of the yearly value of development finance flows (plus one) is used as the outcome variable. The PPML models naturally deal with the multiple zeros in the dependent variable, essentially combining aspects of the extensive and intensive margin models in a single specification (Mityakov, Tang, and Tsui, 2013). In other words, they capture whether development finance is sent to a country (the extensive margin) and how much (the intensive margin). Another advantage of the PPML estimation is that it is consistent in the presence of heteroskedasticity (Ibid.). Hence, the PPML models' results are preferred and discussed in the body of the paper. Questions 3 and 4, which relate to loan cancellations and forgiveness, are tested using LOGIT and PROBIT models. In these models, the dependent variable takes a value of one if a Chinese loan cancellation took place in the observed country-year and a value of zero otherwise (see Equations 3 and 4 below). The results of the LOGIT models are presented in the paper because of the model's more flexible assumptions regarding the distribution of errors (Abe et al., 2004). All of the paper's models control for various economic, political, and geographic factors and use year and receiving country fixed effects (when applicable). The equations presented below address the research questions presented above, and the associated models are presented in the next section of the paper.

Equation 1: $$y_{jt} = a x_{jt} + \beta z_{jt} + \gamma n_{jt} + \varepsilon_{ij}$$

- y_{jt} is the total development finance commitments from China to African country j in year t.
- x_{jt} is a vector of United Nations (UN) voting pattern alignment, bilateral trade (log), and geographic distance (log) between China and African country j during year t.
- z_{jt} is a vector of variables reflecting the economic and demographic characteristics of African country j—its population (log), GDP (log), GDP per capita (log), and resources wealth (as a percentage of GDP)—in year t.
- n_{ijt} is a vector of variables reflecting the risk factors of the African country j—political risk and credit risk (the variable of interest)—in year t.
- ε_{ij} is the error term.

Equation 2: $y_{ijt} = ax_{ijt} + \beta z_{jt} + \gamma n_{jt} + \delta c_{it} + \zeta c^{*} n_{ijt} + \varepsilon_{ij}$

- y_{ijt} is the total development finance from country i—either China or one of the sampled Western countries—to African country j in year t.
- x_{ijt} is a vector of UN voting pattern alignment, bilateral trade (log), and geographic distance (log) between countries i and j, as well as dummy variables reflecting their colonial and language ties, during year t.
- z_{jt} is a vector of variables reflecting the economic and demographic characteristics of African country j—its GDP (log), GDP per capita (log), population (log) and resources wealth (as a percentage of GDP)—in year t.
- n_{ijt} is a vector of variables reflecting the risk factors of the African country j—political risk and credit risk (the variable of interest)—in year t.
- c_{it} is a vector of dummy variables that capture whether country i in year t is China.
- $c^{*}n_{ijt}$ is an interaction term capturing whether the sending country is China and the receiving country's credit risk (the variable of interest) in year t. In other words, it captures whether the impact of credit risk on development finance changes when China is the sending country.
- ε_{ij} is the error term.

Equation 3: $y_{jt} = ax_{jt} + \beta z_{jt} + \gamma n_{jt} + \varepsilon_{ij}$

- y_{jt} takes a value of one if a Chinese loan commitment to African country j was cancelled in year t and a value of zero otherwise.
- x_{jt} is a vector of United Nations (UN) voting pattern alignment, bilateral trade (log), and geographic distance (log) between China and African country j during year t.
- z_{jt} is a vector of variables reflecting the economic and demographic characteristics of African country j—its population (log), GDP (log), GDP per capita (log), and resources wealth (as a percentage of GDP)—in year t.
- n_{ijt} is a vector of variables reflecting the risk factors of the African country j—political risk and credit risk (the variable of interest)—in year t.
- ε_{ij} is the error term.

Equation 4: $y_{jt} = ax_{jt} + \beta z_{jt} + \gamma n_{jt} + \varepsilon_{ij}$

- y_{jt} takes a value of one if a Chinese loan to African country j was forgiven in year t and a value of zero otherwise.
- x_{jt} is a vector of United Nations (UN) voting pattern alignment, bilateral trade (log), and geographic distance (log) between China and African country j during year t.
- z_{jt} is a vector of variables reflecting the economic and demographic characteristics of African country j—its population (log), GDP (log), GDP per capita (log), and resources wealth (as a percentage of GDP)—in year t.
- n_{ijt} is a vector of variables reflecting the risk factors of the African country j—political risk and credit risk (the variable of interest)—in year t.
- ε_{ij} is the error term.

Data

Data Table 1. Summary statistics of the data

Variables	Mean	SD	Min	Max	Source(s)
1. Loan Commitments (CARI)	7.39e+07	2.21e+08	0	4.02e+09	CARI, OECD
2. Loan Commitments (AD)	8.69e+07	3.27e+08	0	9.65e+09	AD, OECD
3. Loan Cancellations (CARI)	1.27e+07	1.50e+08	0	3.10e+09	CARI
4. Loan Cancellations (AD)	1.20e+07	2.11e+08	0	5.90e+09	AD
5. Loan Forgiveness (CARI)	2160775	1.19e+07	0	2.11e+08	CARI
6. Loan Forgiveness (AD)	2094685	1.32e+07	0	2.11e+08	AD
7. Credit Worthiness (Index)	0	1	-.609819	3.01098	OECD
8. Political Stability (Index)	0	1	-2.150835	1.932351	WB
9. Population	1.83e+07	2.63e+07	81131	1.82e+08	WB
10. GDP per Capita (PPP)	4929.984	6547.368	399.86	48710.7	WB
11. Resources (% of GDP)	15.16461	16.22065	.001161	80.7124	WB
12. Bilateral Trade	1.21e+09	3.70e+09	127000	6.52e+10	UN
13. Political Alignment (Index)	0	1	-2.417782	1.852955	Bailey et al.
14. Geographic Distance	7597.213	2967.809	1340.39	14928.20	CEPII
15. Common Language (Dummy)	.2703704	.4442026	0	1	CEPII
16. Colonial Ties (Dummy)	0.1703704	0.3760014	0	1	CEPII

This paper employs panel data from three sources to compile the outcome variables of interest (for in-depth discussions about variable construction and data limitation, see Appendices A and B). First, it uses data on development finance from four Western countries—France, Germany, the United Kingdom, and the United States—compiled by the Organization for Economic Co-Operation and Development (OECD), which span the years 2000 to 2015. As this dataset reflects figures compiled by governments, it is expected to be both exhaustive and accurate. Second, it uses Chinese government loans to individual African countries for the years 2000 to 2015 drawn from the China Africa Research Initiative (CARI), which represents the first effort to estimate Chinese loans in Africa from the

bottom up (Brautigam and Hwang, 2016).[6] Finally, it employs AidData's Global Chinese Official Finance Dataset (Version 1.0), which reports Chinese development finance around the world based on media sources for the years 2000 to 2014.[7]

As discussed above, loan commitments represent agreements between Chinese state actors and their African counterparts, which are then reported by news outlets or African governments themselves (the CARI database only contains commitments confirmed by personal contacts and/or official sources). Another set of models captures the difference between Chinese and Western development finance. The final sets of models explore the relationship between African countries' levels of creditworthiness and instances of Chinese loan cancellations and forgiveness. The loan cancellations data represents instances where commitments were made by official Chinese lenders and reported by credible sources, but where no disbursements took place. In total, according to the CARI database, USD 10.97 billion in Chinese government loans to African countries were cancelled that way between 2000 and 2015 (AD estimates the figure to be USD 10.37 billion). Loan forgiveness represents instances where lines of credit were established but then written off. China's first wave of debt forgiveness came in 2000, and targeted African countries with a backlog of delinquent or previously restructured zero-interest loans (Acker et al., 2020). Zero-interest loans, which are extended by the Chinese Ministry of Commerce instead of Beijing's policy banks, still make up the vast majority of forgiven debt (Ibid.). In total, CARI estimates that USD 1.87 billion in outstanding Chinese government loans to African governments were forgiven between 2000 and 2015 (compared to USD 1.81 billion, according to AD).

The predictor variable of interest, which captures African countries' creditworthiness, is drawn from the OECD's Country Risk Classification index. The variable reflecting African countries' political stability is generated using the WB's Worldwide Governance Indicators. The other variables reflecting the characteristics of the African countries sampled—their GDP, GDP per capita, population, and the importance of natural resource rents as a share of their economic output—all come from the WB.

The data reflecting factors specific to individual country pairs come from various sources. The variable measuring the voting alignment of country pairs at the UN in a given year uses

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[6] While the CARI dataset contains Chinese loans from (and to) government and non-government sources alike, this paper employs government loans data only. These are defined as loans from China's policy banks, including China Export-Import Bank and China Development Bank, as well as the Chinese Ministry of Commerce, to African governments and state-owned enterprises. The methodology employed by CARI features rigorous data collection, cross-verification, and cleaning, emphasizing the "official websites of central banks and ministries of finance, Chinese contractors, and personal contacts in China and in African countries" and counting loans of USD 25 million or more only if confirmed by "a representative of the Chinese bank or the Chinese government" or "a reliable source or official website" (Ibid., p. 7).

[7] The AD dataset "tracks the known universe of overseas Chinese official finance" for the years 2000 to 2014 and "includes both Chinese aid and non-concessional official financing" (Dreher et al., 2017). It encompasses all reported Chinese government loans (these are coded as "export credit," "loan" and "vague TBD" by AidData) to African governments (including specific government agencies and central banks). Chinese government loans include loans from the Chinese Ministry of Commerce, other government agencies, as well as China's policy banks.

ideal point estimates compiled by Bailey, Strezhnev, and Voeten, which are then standardized. The bilateral trade variable reflecting the total trade flows between two countries is drawn from the UN Comtrade Database. The dummy variables capturing country pairs' colonial and linguistic ties, as well as the data reflecting the distance between country pairs' respective capital cities, are all compiled by the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII).

Results

The models presented in Results Table 2 compare the impact of African countries' creditworthiness levels on China's development finance commitments to those of the four largest Western donors—France, Germany, the United Kingdom and the United States. The models suggest that China commits more loans to African countries with lower levels of creditworthiness than its Western counterparts, even controlling for a host of factors including UN voting pattern alignment and bilateral trade. More specifically, according to Table 2's first model, which employs the (preferred) CARI data, a standard deviation increase in creditworthiness among African countries is associated with a 23 percent decrease in official development finance from the Western countries sampled and a 49 percent decrease in Chinese government loans (the coefficient reflecting the difference between the two being statistically significant at the five percent level).[8] While Table 2's second model shows that this result is robust to the inclusion of receiving country and year fixed effects, the third and fourth model, which employ AD data, do not find the gap in creditworthiness' impact on Western and Chinese government loans to be statistically significant. That said, the coefficients that reflect the gap between Western and Chinese responses to creditworthiness are consistent across all four models.

These results suggest, interestingly, that Chinese creditors are risk-seeking—and not merely risk-neutral—in terms of their loan commitments. This might be explained by demand-side factors. Less creditworthy countries, which have difficulties securing loan commitments from traditional sources, might disproportionately seek them from Chinese lenders. It might also be explained by supply-side factors. China's policy banks can use a range of loan instruments to hedge their exposure to default, including resource collateralization.

While Model 1 paints a relatively clear picture of the relationship between creditworthiness and Chinese loan commitments, it does not indicate whether China's response to credit risk is unique or if other major development finance providers exhibit the same tendencies in distributing their own funds. The models presented in Results Table 2 do just that.

[8] The implied Chinese response to changes in institutional quality is computed as $e(\beta_{Creditworthiness} - \beta_{Creditworthiness} * China) - 1$.

Results Table 1. Creditworthiness and loan commitments (PPML)

	CARI		AD	
	(1)	(2)	(3)	(4)
Creditworthiness (Index)	-0.925***	-0.365	-0.825***	-0.919**
	(0.162)	(0.378)	(0.171)	(0.387)
Political Stability (Index)	0.219	0.0682	0.120	-0.719***
	(0.157)	(0.294)	(0.270)	(0.275)
Population (Log)	0.209*	-13.17	0.421***	5.851
	(0.124)	(8.019)	(0.155)	(6.237)
GDP per Capita, PPP (Log)	-0.0217	-0.183	0.115	-2.378**
	(0.153)	(1.425)	(0.165)	(1.141)
Resources (% of GDP)	-0.0109	0.0154	-0.0173**	0.0247
	(0.00815)	(0.0230)	(0.00838)	(0.0218)
Trade (Log)	0.834***	0.911**	0.669***	-1.254***
	(0.0942)	(0.354)	(0.0908)	(0.479)
UN Voting (Index)	1.505	-0.205	1.269*	2.161***
	(0.976)	(0.827)	(0.668)	(0.707)
Distance (Log)	-2.455*		0.357	
	(1.255)		(1.178)	
Receiving Country FE		YES		YES
Year FE		YES		YES
Observations	633	559	633	560
R-Squared	0.309	0.530	0.170	0.564

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The models presented in Results Table 2 compare the impact of African countries' creditworthiness levels on China's development finance commitments to those of the four largest Western donors—France, Germany, the United Kingdom and the United States. The models suggest that China commits more loans to African countries with lower levels of creditworthiness than its Western counterparts, even controlling for a host of factors including UN voting pattern alignment and bilateral trade. More specifically, according to Table 2's first model, which employs the (preferred) CARI data, a standard deviation increase in creditworthiness among African countries is associated with a 23 percent decrease in official development finance from the Western countries sampled and a 49 percent decrease in Chinese government loans (the coefficient reflecting the difference between the two being statistically significant at the five percent level).[9] While Table 2's second model shows that this result is robust to the inclusion of receiving country and year fixed effects, the third and fourth model, which employ AD data, do not find the gap in

[9] The implied Chinese response to changes in institutional quality is computed as $e(\beta_{Creditworthiness} - \beta_{Creditworthiness} * China) - 1$.

creditworthiness' impact on Western and Chinese government loans to be statistically significant. That said, the coefficients that reflect the gap between Western and Chinese responses to creditworthiness are consistent across all four models.

Results Table 2. Creditworthiness and loan commitments (PPML), China-West comparison

	CARI		AD	
	(1)	(2)	(3)	(4)
Creditworthiness (Index)	-0.204	0.0546	-0.265	-0.308
	(0.254)	(0.292)	(0.249)	(0.392)
China * Creditworthiness (Index)	-0.197**	-0.168*	-0.133	-0.104
	(0.0893)	(0.0937)	(0.0924)	(0.0960)
Political Stability (Index)	0.156**	0.335***	0.141***	-0.0870
	(0.0696)	(0.117)	(0.0470)	(0.207)
Population (Log)	0.532***	-1.255	0.536***	0.644
	(0.136)	(1.974)	(0.104)	(2.611)
GDP per Capita, PPP (Log)	-0.0923	0.119	-0.0591	-0.498
	(0.0761)	(0.543)	(0.0824)	(0.548)
Resources (% of GDP)	0.00231	0.0141**	-0.00283	0.0122
	(0.00394)	(0.00611)	(0.00589)	(0.00923)
Trade (Log)	0.297	0.367**	0.334	0.338***
	(0.224)	(0.149)	(0.203)	(0.109)
UN Voting (Index)	-0.0774	-0.224	-0.00825	-0.218
	(0.177)	(0.192)	(0.215)	(0.134)
Distance (Log)	0.305	0.104	0.378	0.165
	(0.295)	(0.224)	(0.341)	(0.259)
Language (Dummy)	0.659***	0.624***	0.622**	0.565***
	(0.198)	(0.139)	(0.243)	(0.197)
Colony (Dummy)	0.00838	0.103	0.000255	0.136
	(0.246)	(0.186)	(0.253)	(0.230)
Receiving Country FE		YES		YES
Year FE		YES		YES
Observations	3,089	3,089	3,089	3,089
R-Squared	0.136	0.252	0.136	0.263

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

These results provide support for the paper's second hypothesis, which stated: "The relationship between credit risk levels and Chinese loan commitments is expected to differ significantly from those of the Western countries sampled." That said, while the gap in creditworthiness' relationship with Chinese and Western loans conforms to the hypothesis, the individual relationships do not. The paper's second hypothesis stated that a positive relationship between creditworthiness and Western loans was expected and that no such relationship, positive or negative, would exist for Chinese government loans. It turns out that the relationship between the two was *slightly* negative in the case of the sampled Western countries and *very* negative in the case of China.

The difference in the data for Chinese countries on the one hand and the Western countries sampled on the other is worth taking into consideration. The Chinese government loans datasets capture commitments, which can be subject to cancellation. The Western loans dataset, meanwhile, captures disbursements. While, as discussed in Appendix A, the CARI data, by virtue of undergoing additional levels of verification, lends itself to a closer comparison to that of the OECD, the comparison between the two cannot be considered "apples-to-apples."

As discussed earlier, Chinese loan commitments are not ironclad. Chinese creditors can approach them in a relatively cavalier way without exposing themselves to credit risk. Results Table 1 suggests that creditworthiness is negatively associated with Chinese loan commitments. But does creditworthiness—or, more specifically, a lack thereof—impact whether or not Chinese loan commitments that come to fruition? In other words, does it impact Chinese loan cancellations?

Results Table 3 answers the paper's third question by testing whether or not China overpromises when it commits to lending funds to African countries only to reconsider its commitments to potentially insolvent debtor countries when the time comes to sign checks. These models suggest that, as African countries' level of creditworthiness declines, Chinese loan cancellations increase. In other words, African countries with a worse risk profile may be more likely to see their loan commitments from China vanish than their more creditworthy counterparts. More specifically, according to Model 1 of Results Table 3, a standard deviation increase (from the mean) in creditworthiness is associated with a roughly two percentage points decrease in the likelihood that an African country will experience a Chinese loan cancellation during a given year (statistically significant at the one percent level). Given the relative rareness of Chinese loan commitment cancellations—these have only taken place in 23 out of 864 country-years, according to the CARI database—this represents a highly significant result. Model 2 demonstrates that this relationship is robust to the inclusion of borrower country and year fixed effects.

Given the fact that the allocation of development finance is integral to Chinese soft power, it is unsurprising that Beijing might sometimes commit unrealistic sums of money when launching a diplomatic charm offensive. It is also hardly surprising that Chinese creditors, either independently or following guidance from above, would agree to lend vast sums of money to countries that are at risk of default only to course-correct upon weighing the risks of doing so.

Results Table 3. Creditworthiness and loan cancellations (LOGIT), with marginal effects (dx/dy)

	CARI		AD	
	(1)	(2)	(3)	(4)
Creditworthiness (Index)	-1.887**	-2.434**	-0.381	-0.439
	(0.848)	(1.060)	(0.423)	(0.451)
Marginal Effects (dx/dy) at the Means	-0.017***	-0.021**	-0.004	-0.008
	(0.006)	(0.010)	(0.004)	(0.008)
Political Stability (Index)	-0.209	0.123	0.169	0.132
	(0.370)	(0.416)	(0.477)	(0.513)
Marginal Effects (dx/dy) at the Means	-0.002	0.001	0.002	0.003
	(0.004)	(0.004)	(0.004)	(0.010)
Population (Log)	0.416	1.405***	0.663	0.858
	(0.314)	(0.504)	(0.457)	(0.568)
Marginal Effects (dx/dy) at the Means	0.004	0.012	0.006	0.016
	(0.003)	(0.07)	(0.004)	(0.010)
GDP per Capita, PPP (Log)	0.433	1.097**	0.872	1.135*
	(0.383)	(0.474)	(0.612)	(0.627)
Marginal Effects (dx/dy) at the Means	0.004	0.009	0.008	0.022*
	(0.004)	(0.006)	(0.006)	(0.012)
Resources (% of GDP)	0.00723	0.0454*	-0.00872	-0.0119
	(0.0167)	(0.0251)	(0.0228)	(0.0294)
Marginal Effects (dx/dy) at the Means	0.000	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.001)
Trade (Log)	0.219	-0.617*	0.113	-0.119
	(0.220)	(0.357)	(0.289)	(0.428)
Marginal Effects (dx/dy) at the Means	0.002	-0.005	0.001	-0.002
	(0.002)	(0.004)	(0.003)	(0.008)
UN Voting (Index)	-0.00456	0.273	-1.659	-1.423
	(1.259)	(1.395)	(1.272)	(1.282)
Marginal Effects (dx/dy) at the Means	-0.000	0.002	-0.016	-0.027
	(0.011)	(0.012)	(0.013)	(0.025)
Distance (Log)	-0.501	1.771	3.059	3.572
	(2.230)	(2.599)	(2.725)	(3.053)
Marginal Effects (dx/dy) at the Means	-0.005	0.015	0.029	0.068
	(0.020)	(0.024)	(0.026)	(0.057)
Year FE		YES		YES
Observations	633	371	633	322

Robust standard errors in parentheses

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

Results Table 4. Creditworthiness and loan forgiveness (LOGIT), with marginal effects (dx/dy)

	CARI		AD	
	(1)	(2)	(3)	(4)
Creditworthiness (Index)	-1.058***	-1.169***	-1.712***	-1.620**
	(0.380)	(0.379)	(0.659)	(0.633)
Marginal Effects (dx/dy) at the Means	-0.052***	-0.053***	-0.042***	-0.051***
	(0.015)	(0.017)	(0.010)	(0.016)
Political Stability (Index)	0.449**	0.329	0.321	0.130
	(0.219)	(0.254)	(0.248)	(0.277)
Marginal Effects (dx/dy) at the Means	0.022**	0.015	0.008	0.004
	(0.011)	(0.012)	(0.006)	(0.009)
Population (Log)	0.635***	0.370	0.716***	0.377
	(0.199)	(0.256)	(0.222)	(0.282)
Marginal Effects (dx/dy) at the Means	0.031***	0.017	0.018***	0.012
	(0.010)	(0.011)	(0.008)	(0.009)
GDP per Capita, PPP (Log)	0.189	-0.130	0.383	0.0485
	(0.247)	(0.305)	(0.276)	(0.336)
Marginal Effects (dx/dy) at the Means	0.009	-0.006	0.010	0.002
	(0.012)	(0.014)	(0.007)	(0.011)
Resources (% of GDP)	0.0123	-0.00615	0.0257*	0.00928
	(0.0125)	(0.0147)	(0.0138)	(0.0154)
Marginal Effects (dx/dy) at the Means	0.001	-0.000	0.001	0.000
	(0.001)	(0.001)	(0.000)	(0.000)
Trade (Log)	-0.168	0.250	-0.328**	0.0780
	(0.129)	(0.188)	(0.149)	(0.203)
Marginal Effects (dx/dy) at the Means	-0.008	0 .011	-0.008*	0.002
	(0.006)	(0.009)	(0.005)	(0.006)
UN Voting (Index)	1.859*	1.489	1.997*	1.552
	(0.962)	(1.088)	(1.103)	(1.220)
Marginal Effects (dx/dy) at the Means	0.091*	0.067	0.049*	0.049
	(0.047)	(0.051)	(0.030)	(0.041)
Distance (Log)	2.350	1.346	1.987	0.558
	(1.648)	(1.967)	(1.865)	(2.222)
Marginal Effects (dx/dy) at the Means	0.115	0.060	0.049	0.018
	(0.079)	(0.088)	(0.048)	(0.070)
Year FE		YES		YES
Observations	633	559	633	560

Robust standard errors in parentheses

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

Also as discussed in the opening sections of the paper, China has shown willingness to restructure and even forgive loans in recent years. In fact, according to the CARI data explored in this paper, Chinese loan cancellations have taken place in 61 country-years (out of 864). Results Table 4 answers the paper's fourth question. The models presented therein unambiguously demonstrate that creditworthiness is negatively associated with loan forgiveness. In other words, they strongly suggest that China is more likely to forgive loans extended to countries that represent a significant insolvency risk. More specifically, Model 1 of Table 4 demonstrates that a standard deviation increase in creditworthiness (from the mean) is associated with a five percentage points decrease in the likelihood that an African country will see some of their outstanding debt to China cancelled in a given year (statistically significant at the one percent level). Model 2 demonstrates that this result is robust to the inclusion of borrower country and year fixed effects. Finally, Models 3 and 4, which employ the AD data as the outcome variable, are consistent with Models 1 and 2.

These results are consistent with the fourth hypothesis, which states that the relationship between creditworthiness and Chinese loan cancellations is expected to be positive. They are also consistent with the anecdotal evidence on Chinese loan restructuring and forgiveness presented earlier in the paper. Though limited geographically and temporally, these results contradict the popular "debt trap" narrative that portrays China as seeking to ensnare poor countries through easy credit (unless the ruse is so elaborate as to involve debt forgiveness).

Conclusions and policy recommendations

The dynamics of Chinese lending to African countries are complex. On the one hand, the results of this analysis suggest that China may be more willing to make loan commitments to African countries with little regard for their creditworthiness. Furthermore, China is more likely to commit more loans to riskier African countries than the four largest Western donors. This is hardly surprising given the role these commitments play for advancing diplomatic ties between Chinese and African governments. On the other hand, the reality is different when it comes to loan cancelations. African countries' creditworthiness appears to impact the share of Chinese government loans that are ultimately disbursed—leading to loan commitment cancellations. Finally, the result suggests that—counter to what the popular debt trap narrative would imply—China is willing to forgive debt for risky borrowers. Overall, these results suggest that Chinese lenders are willing to make lofty loan commitments to risky African countries—perhaps because their risk calculus or hope for repayment differ from those of Western creditors. However, they appear to undertake some level of risk assessment before actually disbursing loans. Potentially insolvent African countries are more likely to see a greater share of their Chinese loan commitments vanish than their more solvent counterparts. Finally, Chinese lenders may take a more nuanced approach to dealing with debt distressed countries than is often understood, which sometimes involves debt forgiveness for especially risky borrowers.

This research holds a number of policy implications. It highlights the need for a more nuanced characterization of Chinese development finance activities in Africa by researchers, pundits, and policymakers. It also underpins a need for Western actors, and the United States in particular, to craft policy responses to the phenomenon of Chinese development

finance that are fit for a more complex Chinese lending landscape than what popular narratives suggest. Furthermore, these results point to a need for greater coordination with China in responding to debt sustainability issues. If China lends more to countries with lower levels of creditworthiness than Western donors, not only does it risk opening itself up to debt sustainability issues, but it might impact the debt sustainability trajectories of African countries.

At the same time, however, Chinese policymakers should consider greater transparency in their approach to debt sustainability and their attitude towards risk on the continent. As noted in this paper, Chinese policymakers have taken a commendable step in releasing a DSF on BRI lending. However, key questions remain on how this DSF is being used, whether it will compete with Western DSF frameworks, and if it will actually lead to more prudent lending. Chinese policymakers should also consider greater transparency vis-à-vis multilateral institutions and individual African countries on how risk assessments are carried out and should consider utilizing their framework to complement existing risk assessment mechanisms, as opposed to encouraging competition (Morris and Plant, 2019).

Therefore, it is in the interest of China (and Western countries) to move towards a more collective stance to address possible debt sustainability issues. Past research from the Center for Global Development (CGD) has suggested a forum like the Paris Club to achieve such an aim, which could maintain the core principles of the Paris Club but where China could play an important role given its global credit stock (Hurley et al., 2018).

For African governments, the positive link between credit risk and loan commitment cancellations identified in this paper highlights a need for greater planning capacity and adaptability. Unrealized lending can leave African countries in vulnerable positions. This is especially salient in the case of MOUs, which rarely lead to projects (Bello, 2016). Similarly, the lofty commitments made by Chinese officials might crowd out Western donors, only for loans not to come to fruition. As such, African countries should emphasize planning and transparency and make preparations for cancelled loans. Furthermore, caution is warranted for African countries in evaluating Chinese loan rescheduling and forgiveness. Recent research published by CGD found that the Republic of Congo was made worse off by rescheduling debt to Beijing (Gardner, Lin, Morris, and Parks, 2020). This underpins the importance of making agreements transparent and of capacity building among borrowing countries, which could enable them to negotiate on more favorable terms (Ibid). In a similar vein, African countries have the primary responsibility for ensuring the sustainability of their debt situation. Increasing debt management capacity and transparency are critical to ensure responsible borrowing in the long run. For example, as recommended by CGD experts, African countries can improve their negotiating capacity with support from global litigation services like the African Development Bank's African Legal Support Facility (Dahir, 2019). Finally, while full transparency from China on its development finance would be ideal, African loan recipients could also report that information publicly.

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Appendix A. Data construction

Loan Commitments

Loan commitments represent agreements reached between Chinese state actors and their African counterparts. As part of this paper, they are compiled in a panel format and take on either the absolute total value of loans committed to a specific country in a given year (PPML models) or the log of that value plus one (OLS models)

Loan Cancellations

The loan cancellation data captures projects for which a loan commitment was reported but subsequently cancelled. The loan cancellations data is employed as part of LOGIT and PROBIT models and therefore takes on a value of one in instances where a specific country experienced a loan cancellation in a given year and a value of zero otherwise.

Loan Forgiveness

This loan forgiveness data captures instances where pre-existing loans extended by Chinese state actors to their African counterparts were reported as forgiven. The loan forgiveness data is employed as part of LOGIT and PROBIT models and takes on a value of one in instances where a loan Chinese forgiveness announcement was made regarding a specific country in a given year and a value of zero otherwise.

Creditworthiness Index

The "creditworthiness" variable is compiled using the OECD's Country Risk Data, which is published on a monthly basis and ranges between values of 1 (lowest risk) and 7 (highest risk). The first monthly rating issued each year between 2000 and 2015 are used as part of this paper. They are adjusted and standardized, as follows:

$$\textit{standardized creditworthiness} = [(7 - \textit{credit risk}) - \mu]/\sigma$$

Political Risk Index

The political stability variable captures the WB Worldwide Governance Indicator reflecting "perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism," which ranges from -2.5 (highest likelihood) to +2.5 (lowest likelihood). The indicator is converted to a positive value and then standardized, as follows:

$$\textit{standardized political stability} = [(\textit{political stability and absence of violence} + 2.5) - \mu]/\sigma$$

UN Voting Alignment Index

The variable reflecting UN voting alignment estimates the difference between the sending and receiving countries' voting patterns at the UN General Assembly during a given year, in terms of their respective ideal point estimates. The figures are standardized, as follows:

$$\textit{standardized UN voting alignment} = [\textit{UN voting alignment ideal point estimates} - \mu]/\sigma$$

Appendix B. Data limitations

Loan Commitments, Cancellations, and Forgiveness

The comprehensiveness of the Chinese loans data sources used in this paper is almost certainly limited. While OECD countries gather and present their data in a standardized way, China makes little information regarding its development finance outflows publicly available. This paper uses the most comprehensive sources available on Chinese development finance to African countries—the CARI and AD databases. However, neither captures the full slate of Chinese development finance loans to African countries—only full transparency on the part of Beijing could achieve that.

Creditworthiness and Political Risk

The index variables reflecting the creditworthiness and political risk of individual African receiving countries do not exhaustively capture the nuances behind these phenomena that play out in the real world. That said, these variables do offer enough breadth to capture the variance in creditworthiness and political risk in different countries at different points in time. Additionally, these variables are perception based—they are generated from the informed opinions of experts. This means they can suffer from a wide array of biases and therefore may not be completely accurate. However, no better indicators exist for the purpose of this research. Furthermore, the very mechanisms through which these phenomena are expected to affect development finance as part of this paper are perception-driven.

UN Voting Alignment

The variable reflecting UN voting alignment estimates the difference between the sending and receiving countries' voting patterns at the UN General Assembly during a given year, in terms of their respective ideal point estimates. The variable reduces a highly complex phenomenon that takes place over the span of a year into a single digit indicator and should thus be interpreted with caution. This limitation is particularly relevant when analyzing short time periods, though this is not the case in this paper.

Appendix C. Results (excluding Angola)

Results Table 1. Creditworthiness and loan commitments (PPML)

	CARI		AD	
	(1)	(2)	(3)	(4)
Creditworthiness (Index)	-0.866***	0.273	-0.707***	-0.833**
	(0.155)	(0.442)	(0.170)	(0.385)
Political Stability (Index)	0.216	0.483	0.0311	-0.483*
	(0.164)	(0.341)	(0.298)	(0.290)
Population (Log)	0.185	0.864	0.434***	10.98
	(0.123)	(6.309)	(0.157)	(8.088)
GDP per Capita, PPP (Log)	-0.0221	1.780	0.0875	-2.346*
	(0.159)	(1.594)	(0.171)	(1.256)
Resources (% of GDP)	-0.0134	0.0142	-0.0269***	0.00691
	(0.00899)	(0.0335)	(0.00990)	(0.0255)
Trade (Log)	0.845***	0.980**	0.587***	-1.336***
	(0.106)	(0.408)	(0.0969)	(0.516)
UN Voting (Index)	1.784	0.173	1.335*	2.798***
	(1.096)	(0.831)	(0.691)	(0.740)
Distance (Log)	-2.685**		0.343	
	(1.265)		(1.207)	
Receiving Country FE		YES		YES
Year FE		YES		YES
Observations	620	521	620	547
R-Squared	0.237	0.468	0.122	0.565

Robust standard errors in parentheses

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

Results Table 2. Creditworthiness and loan commitments, China and the West (PPML)

	CARI		AD	
	(1)	(2)	(3)	(4)
Creditworthiness (Index)	-0.154	0.0619	-0.214	-0.280
	(0.223)	(0.313)	(0.223)	(0.393)
China * Creditworthiness (Index)	-0.224***	-0.170*	-0.104	-0.0626
	(0.0831)	(0.0965)	(0.0859)	(0.0924)
Political Stability (Index)	0.117**	0.320***	0.0890**	-0.112
	(0.0564)	(0.106)	(0.0454)	(0.202)
Population (Log)	0.563***	-1.790	0.566***	0.233
	(0.130)	(2.149)	(0.105)	(2.537)
GDP per Capita, PPP (Log)	-0.0960	0.190	-0.0757	-0.653
	(0.0745)	(0.615)	(0.0718)	(0.625)
Resources (% of GDP)	0.000314	0.0196***	-0.00738	0.0115
	(0.00591)	(0.00565)	(0.00951)	(0.0131)
Trade (Log)	0.243	0.344**	0.281	0.325***
	(0.189)	(0.136)	(0.177)	(0.0952)
UN Voting (Index)	-0.130	-0.298	-0.0695	-0.286**
	(0.134)	(0.199)	(0.171)	(0.128)
Distance (Log)	0.285	0.0712	0.342	0.156
	(0.279)	(0.225)	(0.315)	(0.246)
Language (Dummy)	0.627***	0.478**	0.590**	0.408
	(0.190)	(0.227)	(0.239)	(0.278)
Colony (Dummy)	0.0350	0.151	0.0204	0.186
	(0.234)	(0.182)	(0.248)	(0.237)
Receiving Country FE		YES		YES
Year FE		YES		YES
Observations	3,024	3,024	3,024	3,024
R-Squared	0.139	0.229	0.118	0.221

Robust standard errors in parentheses

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

Results Table 3. Creditworthiness and loan cancellations (LOGIT)

	CARI		AD	
	(1)	(2)	(3)	(4)
Creditworthiness (Index)	-1.910**	-2.419**	-0.416	-0.487
	(0.839)	(1.044)	(0.426)	(0.455)
Political Stability (Index)	-0.164	0.144	0.183	0.139
	(0.375)	(0.415)	(0.468)	(0.502)
Population (Log)	0.428	1.371***	0.632	0.798
	(0.306)	(0.499)	(0.441)	(0.556)
GDP per Capita, PPP (Log)	0.410	1.057**	0.802	1.077*
	(0.372)	(0.470)	(0.590)	(0.613)
Resources (% of GDP)	0.0103	0.0447*	-0.00455	-0.0103
	(0.0164)	(0.0246)	(0.0225)	(0.0288)
Trade (Log)	0.280	-0.547	0.181	-0.0226
	(0.229)	(0.368)	(0.299)	(0.444)
UN Voting (Index)	-0.0299	0.320	-1.567	-1.279
	(1.249)	(1.389)	(1.277)	(1.298)
Distance (Log)	-0.108	1.840	3.082	3.479
	(2.243)	(2.588)	(2.699)	(3.009)
Year FE		YES		YES
Observations	620	364	620	315

Robust standard errors in parentheses

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

Results Table 3. Creditworthiness and loan forgiveness (LOGIT)

	CARI		AD	
	(1)	(2)	(3)	(4)
Creditworthiness (Index)	-1.033***	-1.176***	-1.624**	-1.590**
	(0.383)	(0.387)	(0.647)	(0.626)
Political Stability (Index)	0.423*	0.292	0.353	0.159
	(0.221)	(0.257)	(0.253)	(0.279)
Population (Log)	0.627***	0.353	0.703***	0.376
	(0.200)	(0.257)	(0.224)	(0.280)
GDP per Capita, PPP (Log)	0.173	-0.158	0.355	0.0450
	(0.249)	(0.306)	(0.281)	(0.334)
Resources (% of GDP)	0.0112	-0.00511	0.0220	0.00747
	(0.0131)	(0.0148)	(0.0144)	(0.0155)
Trade (Log)	-0.184	0.249	-0.321**	0.0730
	(0.131)	(0.191)	(0.152)	(0.207)
UN Voting (Index)	1.791*	1.280	2.192*	1.641
	(0.973)	(1.084)	(1.154)	(1.239)
Distance (Log)	2.290	1.370	1.620	0.402
	(1.653)	(1.989)	(1.866)	(2.209)
Year FE		YES		YES
Observations	620	349	620	346

Robust standard errors in parentheses

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

Appendix D. Results (alternative models)

Results Table 1. Creditworthiness and loan commitments (OLS)

	CARI		AD	
	(1)	(2)	(3)	(4)
Creditworthiness (Index)	-5.107e+07***	5.975e+07	-9.254e+07**	-1.137e+08
	(1.581e+07)	(4.564e+07)	(3.673e+07)	(1.065e+08)
Political Stability (Index)	2.081e+06	1.104e+07	-2.093e+07	-1.362e+08*
	(1.761e+07)	(3.299e+07)	(4.091e+07)	(7.695e+07)
Population (Log)	3.925e+06	7.899e+08**	5.996e+07*	2.255e+09***
	(1.484e+07)	(3.663e+08)	(3.446e+07)	(8.543e+08)
GDP per Capita, PPP (Log)	7.238e+06	4.171e+08***	6.855e+07	8.172e+08**
	(1.982e+07)	(1.406e+08)	(4.603e+07)	(3.281e+08)
Resources (% of GDP)	-990,385	-1.101e+06	-3.275e+06	-832,169
	(923,247)	(2.407e+06)	(2.144e+06)	(5.614e+06)
Trade (Log)	5.035e+07***	-1.733e+06	8.436e+07***	-1.184e+08*
	(9.806e+06)	(2.839e+07)	(2.278e+07)	(6.622e+07)
UN Voting (Index)	1.458e+08**	2.786e+07	3.310e+08**	2.920e+08
	(6.121e+07)	(8.295e+07)	(1.422e+08)	(1.935e+08)
Distance (Log)	-1.791e+08*		1.894e+08	
	(1.041e+08)		(2.419e+08)	
Receiving Country FE		YES		YES
Year FE		YES		YES
Observations	633	632	633	632
R-Squared	0.105	0.275	0.098	0.263

Robust standard errors in parentheses

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

Results Table 2. Creditworthiness and loan commitments, China and the West (OLS)

	CARI		AD	
	(1)	(2)	(3)	(4)
Creditworthiness (Index)	-9.875e+06	2.111e+07	-1.905e+07	-2.092e+07
	(1.322e+07)	(3.087e+07)	(2.137e+07)	(3.632e+07)
China * Creditworthiness (Index)	-1.205e+07	-9.667e+06	-6.612e+06	-2.885e+06
	(7.135e+06)	(8.683e+06)	(7.977e+06)	(9.995e+06)
Political Stability (Index)	-3.016e+06	1.838e+07*	-5.901e+06**	-1.766e+07
	(1.686e+06)	(7.466e+06)	(1.828e+06)	(3.588e+07)
Population (Log)	2.918e+07*	1.354e+08	3.470e+07**	2.569e+08
	(1.215e+07)	(2.697e+08)	(1.131e+07)	(3.799e+08)
GDP per Capita, PPP (Log)	2.172e+06	8.859e+07	4.908e+06	1.006e+08
	(6.446e+06)	(1.186e+08)	(8.210e+06)	(1.332e+08)
Resources (% of GDP)	-29,265	434,025	-522,763	193,425
	(314,633)	(1.468e+06)	(689,460)	(1.697e+06)
Trade (Log)	2.085e+07	2.337e+07	2.992e+07	3.279e+07
	(1.277e+07)	(1.178e+07)	(2.091e+07)	(1.627e+07)
UN Voting (Index)	-544,297	-2.612e+07	8.679e+06	-3.333e+07
	(1.259e+07)	(1.568e+07)	(2.111e+07)	(1.580e+07)
Distance (Log)	3.708e+07*	-8.009e+06	4.879e+07*	-2.988e+07
	(1.591e+07)	(3.691e+07)	(2.146e+07)	(4.228e+07)
Language (Dummy)	6.254e+07***	5.247e+07**	5.707e+07***	4.097e+07*
	(9.099e+06)	(1.545e+07)	(1.230e+07)	(1.915e+07)
Colony (Dummy)	-2.167e+07	-6.671e+06	-2.583e+07	-6.596e+06
	(1.247e+07)	(1.284e+07)	(1.550e+07)	(1.719e+07)
Receiving Country FE		YES		YES
Year FE		YES		YES
Observations	3,089	3,089	3,089	3,089
R-Squared	0.119	0.175	0.090	0.132

Robust standard errors in parentheses

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

Results Table 3. Creditworthiness and loan cancellations (PROBIT)

	CARI		AD	
	(1)	(2)	(3)	(4)
Creditworthiness (Index)	-0.845**	-1.152**	-0.122	-0.156
	(0.376)	(0.510)	(0.174)	(0.201)
Political Stability (Index)	-0.102	0.0463	0.0461	0.0195
	(0.170)	(0.208)	(0.195)	(0.226)
Population (Log)	0.196	0.693***	0.250	0.357
	(0.155)	(0.255)	(0.190)	(0.252)
GDP per Capita, PPP (Log)	0.223	0.576**	0.337	0.472*
	(0.180)	(0.246)	(0.244)	(0.274)
Resources (% of GDP)	0.00441	0.0242*	-0.00147	-0.00181
	(0.00787)	(0.0127)	(0.00968)	(0.0132)
Trade (Log)	0.0998	-0.309*	0.0463	-0.0543
	(0.106)	(0.182)	(0.125)	(0.196)
UN Voting (Index)	0.0549	0.246	-0.710	-0.605
	(0.554)	(0.683)	(0.572)	(0.642)
Distance (Log)	-0.285	0.962	1.509	1.865
	(1.085)	(1.375)	(1.218)	(1.444)
Year FE		YES		YES
Observations	633	371	633	322

Robust standard errors in parentheses

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

Results Table 3. Creditworthiness and loan forgiveness (PROBIT)

	CARI		AD	
	(1)	(2)	(3)	(4)
Creditworthiness (Index)	-0.514***	-0.653***	-0.734**	-0.859***
	(0.182)	(0.203)	(0.288)	(0.312)
Political Stability (Index)	0.214*	0.190	0.130	0.0836
	(0.111)	(0.141)	(0.120)	(0.152)
Population (Log)	0.326***	0.204	0.356***	0.216
	(0.103)	(0.138)	(0.114)	(0.154)
GDP per Capita, PPP (Log)	0.0882	-0.0820	0.180	0.0235
	(0.125)	(0.164)	(0.138)	(0.183)
Resources (% of GDP)	0.00651	-0.00482	0.0122*	0.00228
	(0.00628)	(0.00818)	(0.00669)	(0.00847)
Trade (Log)	-0.0858	0.154	-0.161**	0.0649
	(0.0666)	(0.103)	(0.0747)	(0.114)
UN Voting (Index)	0.806*	0.579	0.755	0.531
	(0.435)	(0.542)	(0.478)	(0.592)
Distance (Log)	1.364	0.979	1.213	0.771
	(0.838)	(1.081)	(0.916)	(1.216)
Year FE		YES		YES
Observations	633	403	633	354

Robust standard errors in parentheses

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