China's Calculated Capital:

The Business Logic Behind Chinese Lending in the Global South

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Abstract

Overseas development finance plays a pivotal role in China's expanding global engagement. Prior scholarship often underestimates the commercial astuteness of Chinese capital, portraying it as exceptionally "patient" due to its higher tolerance of risk compared to Western capital, which prioritizes short-term gains. However, we demonstrate that this narrative overlooks the calculated business decisions behind much Chinese overseas lending. Specifically, we find that in risky countries, China demands collateral in the form of natural resources and charges higher interest rates on its loans. This commercially motivated finance, combined with the moral hazard posed by Chinese state-owned enterprises, heightens the risk of sovereign default in the Global South. Our empirical analysis of the terms of Chinese overseas loans committed between 2000 and 2021 and Western sovereign bond spreads shows that far from being patient, Chinese capital employs hard-nosed business tactics akin to Western capital. Additionally, we draw on qualitative case studies based on field interviews in the Congo, Ecuador, and Ghana. We propose three mechanisms—two that play out in borrowing countries themselves and one that relates to China's appetite for natural resources—to explain this finding: corruption, political business cycles, and the importance of the debtor country's production of the resource used as loan collateral to China. These findings complicate narratives of Chinese altruism, showing that much state lending remains motivated by returns, even while accomplishing broader geopolitical aims. Recognizing the business pragmatism underlying Chinese global finance is critical for understanding the market-driven logic, incentives, and risks for recipients of its capital.

Keywords

Finance; China; Natural resources; Political risk, Credit risk

Introduction

Overseas development finance is a significant component of China's rising global engagement, as it has become the world's largest creditor to low- and middle-income countries (Horn et al., 2019; Moses et al., 2023). Examining the determinants of China's overseas development finance is essential to gain insights into the characteristics of China's state capitalism and its foreign policy goals, as well as its impacts on the economic landscapes and political dynamics of recipient countries and global economic governance more broadly. Building upon existing theory, this paper examines the factors that impact the structure of Chinese lending. More specifically, it contributes to the scholarship on China's perception of risk and economic statecraft by investigating the terms of Chinese loans, focusing on resource collateral and interest rates, which are two important indicators of Chinese state capital's risk evaluation.

The literature suggests that sovereign creditors can strategically extend loans—with interest rates higher than those of international financial institutions (IFIs) but lower than those of private creditors—to debtors who lack creditworthiness to gain political influence and soft power (Bunte, 2018), lock up important natural resources (Meidan, 2016), and secure export markets for their firms (Gallagher and Irwin, 2015). But how do these creditors evaluate the risks while lending to risky frontier markets that lack traditional credit risk ratings and have few alternative creditors to borrow from? How does their risk assessment differ from those of traditional sovereign creditors or private lenders?

Previous literature has suggested that emerging creditors, such as China, try to reduce risk exposure by tying their loans to resource deals and using Chinese firms for construction and equipment procurement (Brautigam and Gallagher, 2014; Gallagher and Irwin, 2015; Landry, 2018). This bears resemblance to the approach taken by Japan in the 1980s when it delivered its first development finance packages to China. These loans were largely used to build railroads and ports to facilitate the export of Chinese oil and coal—to Japan—at a time when China had little access to credit (Brautigam, 2011). But what determines whether these countries put up their resources as collateral to borrow from China? And are Chinese resource-backed loans advantageous for borrowers, in terms of borrowing costs?

Our primary focus is on the risk calculations of Chinese state capital, which we explore through the phenomenon of resource-backed loans (RBLs), a prime example of how China mitigates political and financial risks in its sovereign lending practices. RBLs play a pivotal role in Chinese overseas lending to developing countries, accounting for nearly a third of these loans and significantly contributing to China's foreign policy toolkit.[1] RBLs also serve as an important resource acquisition mechanism for China. For instance, RBLs issued by the China Development Bank (CDB) alone accounted for 17-18% of China's oil import contracts for 2012 (Downs, 2011). Furthermore, for governments heavily reliant on Chinese RBLs for financing,

[1] In terms of loan counts, RBLs represent a relatively small share of the number of loans made by Chinese policy banks. For instance, according to AidData, only about 4 percent of Chinese loans (517 out of 13,427 included in the dataset) are collateralized/securitized. However, as these loans are often huge, they make up a substantial share of China's state finance portfolio. Per AidData, in nominal terms, more than 28 percent of Chinese loans are backed by some kind of collateral.

such as Angola, the Democratic Republic of Congo, and Ecuador, these loans can limit the options of governments in terms of how they manage future resource rents. For example, largely as a result of the RBLs its government signed with the China Development Bank (CDB), over 90% of Ecuador's oil exports in 2013 were controlled by Chinese firms.

In this paper, we demonstrate that in engaging with high-risk borrowers, China's response to risk is not as different from that of private capital as previously thought, and Chinese state financiers often resort to what we call double risk mitigation measures, resource-backing, and high interest rates. In other words, Chinese capital may be less patient than has been described in the previous literature (Lee, 2017; Kaplan, 2021). These risk-mitigation efforts, ironically, can increase the debt-service pressure of debtors and exacerbate their default risk, particularly for countries whose economies are highly resource-dependent.

Some countries face such elevated risk levels that it becomes exceedingly challenging for their governments to secure credit, regardless of the interest rates offered. The private sector's unwillingness to finance certain countries—such as Angola, the Democratic Republic of Congo, Guinea, Sudan, and Zimbabwe—is such that the major credit rating agencies, Standard & Poor; Fitch; and Moody's, do not produce credit ratings for them. RBLs have evolved as a response to this very constraint. When discussing Chinese RBLs in Africa, Brautigam and Hwang (2016) argue that the primary purpose of this collateralization is not merely to secure natural resources but rather to reduce the risks associated with lending to financially disadvantaged and politically unstable nations. In their view, resource backing enables these projects to be financed at a reasonable interest rate.

Surprisingly, despite the added resource security and the hypothesis that Chinese RBLs should logically be cheaper due to this security (Naim, 2009; Alden & Large, 2015), our findings reveal that Chinese RBLs are more expensive than non-RBL loans. Even when controlling for factors like loan size, type, and timing, the risk factors associated with debtor countries, and their bilateral ties with China, our models indicate that the interest rates on Chinese RBLs are more than 1% higher than those of other Chinese loans. This finding challenges the traditional perception of Chinese capital displaying long-term risk tolerance. Instead, it suggests that Chinese resource-backed state capital operates with a market-oriented logic and may be impatient, requiring both resource collateral and higher interest rates to secure its lending.

More broadly, our findings contribute to the study of Chinese foreign policy, the literature on the political risks of sovereign lending, and the broader literature on international political economy by demonstrating that Chinese state capital is not as different from global private capital in terms of risk tolerance as has been argued in the existing literature.

The rest of the paper is structured as follows: we review the relevant literature before generating our hypothesis based on existing theory. Then we discuss our methodology and empirical results. Last, we discuss the mechanisms that might drive these results.

Literature Review and Theory

China’s State Capital and Risk

In recent years, our understanding of what factors impact the distribution of Chinese state capital has grown dramatically. China's state finance goes beyond economic statecraft and export-led growth (Chen, 2020). It internationalizes a model that has facilitated China’s economic progress. This "state-supported, market-based" Chinese approach has reshaped development finance by offering an alternative for developing nations. Overall, however, the literature does not strongly suggest that China lends to fundamentally different countries than its Western counterparts. Kern and Reinsberg (2022), in analyzing when and how countries indebted to China who faces debt distress turn to the International Monetary Fund (IMF), establish that “China loan defaulters are not different from defaulters of non-Chinese creditors”. Furthermore, in line with Western aid flows, which are largely driven by political and economic considerations,[2] Chinese finance is linked to U.N. General Assembly voting patterns (Taylor, 1998; Brautigam, 2009; Landry, 2021; Hoeffler and Sterck, 2022) and to economic objectives, such as trade facilitation and the need to secure energy supplies (Zweig and Jianhai, 2005; Burgos and Ear, 2010; Brautigam, 2011; Alves, 2013; Dreher et al., 2018; Landry, 2021).

Only three of the papers that address the determinants of Chinese development finance quantitatively include credit risk (debt-to-GDP ratio) as a predictor variable (Dreher et al., 2018; Landry and Portelance, 2021; Hoeffler and Sterck, 2022). Dreher et al. (2018) find that debt-to-GDP ratio is negatively associated with non-concessional Chinese finance, such as loans. Landry and Portelance demonstrate that riskier countries are more likely to receive Chinese loan commitments but also to see these loans canceled. Finally, Hoeffler and Sterck (2022) find no significant relationship between risk and Chinese finance. In both cases, however, the testing is limited to loan values, and not to loan terms.

According to Kaplan (2016), the global expansion of Chinese state capital can be characterized by a patient approach, a long-term horizon, and a promise of non-interference in sovereign affairs. Compared to private creditors, Chinese lenders' long-term perspective and their willingness to endure emerging market business cycle risk are appealing to debtors who are frustrated by the short-term volatility of market capital. Additionally, the focus on the infrastructure of Chinese state finance helps address China's construction sector overcapacity while providing the fiscal space for recipient countries' governments to defer their infrastructure spending and, in the short term, increase spending on their political agendas. Similarly, Shi (2015) argues that Chinese state-owned enterprises generally have a higher tolerance for risks compared to Western multinational corporations. This tolerance allows them to invest and operate in politically volatile countries in the Global South, ensuring long-term access to energy and raw materials. Likewise, Lee (2017), through comparative case studies of Chinese state

[2] See, for instance, Maizels and Nissanke (1984), McGillivray (1989), Alesina and Dollar (2000), Burnside and Dollar (2000), Dollar and Levin (2004), Berthelemy (2006), and Claessens et al. (2009).

capital and global private capital in Zambia, argues that Chinese state capital's greater interest in long-term relationships, as opposed to financial capital's focus on short-term profits, enables a more flexible relationship with African governments, civil society, and labor.

In contrast, Chalmers and Mocker (2017) dispute the notion that Chinese capital is risk-averse. Instead, using firm-level mergers and acquisitions data reflecting China's state-owned oil and gas companies' overseas foreign direct investment (OFDI), the authors find that these firms are risk-averse. They favor host states with low corruption levels, a robust rule of law, a favorable regulatory environment, and long-term stability. Chalmers and Mocker argue that Beijing's Going Out Policy in 2006 shifted the risk from the state to SOEs by enhancing their autonomy over investment decisions, including in the evaluation of investment-related risks. This led to Chinese SOEs ultimately prioritizing host states with relatively lower political risks.

Beyond how Chinese state financiers respond to risk in how they allocate capital, the literature demonstrates that they can take a strong approach to protect themselves against default. For example, in the Democratic Republic of Congo's infamous Sicomines deal, which is discussed in depth in this paper, when Kinshasa rejected the changes, it proposed to reduce its risk exposure, China Export-Import Bank (Eximbank) rescinded its funding (albeit temporarily) (Landry, 2018). Similarly, China placed the second phase of the Standard Gauge Railway in Kenya on hold until it could establish the project's commercial viability after President Uhuru Kenyatta failed to secure funds for the project (Guguyu, 2018).

Short of putting a stop to projects, Chinese state lenders have a diverse set of tools at their disposal to protect their loans. First, in cases where a project's risk level is considered high, there is evidence that commercial loans from Eximbank require insurance coverage from Sinosure—China's official export credit insurance agency (Brautigam and Hwang, 2016). Beyond that, Chinese lenders use what Dreher et al. (2022) call a "special set of tools—which are generally not used by Western lenders—to reduce the risks of financial misappropriation and repayment delinquency" (p.145). Analyzing a set of 100 Chinese loans to 24 countries, Gelpern et al (2021) find that many Chinese loans feature agreements to exclude the debt from collective loan restructuring (Ibid.). They also find that some clauses in Chinese contracts entitle lenders to terminate loans and demand immediate full repayment on them when a borrower "defaults on its *other* lenders" or, in some cases, when they take "any action adverse to China's investment interests in the borrowing country" (p.7). Likewise, AidData also finds that co-financing with private or multilateral capital is an approach for Beijing to de-risk, suggesting that Currently, over 80% of China's syndicated loans in low- and middle-income countries involve Western banks and multilateral institutions, such as the International Finance Corporation, the European Bank for Reconstruction and Development, Standard Chartered Bank, and BNP Paribas (Parks et al., 2023). They argue that this represents Beijing's shifting away from relying on its banks for risk management in lending and increasingly using institutions that have stronger due diligence standards (ibid). All of this suggests that Chinese creditors pay significant attention to borrowers' creditworthiness levels.

Chen (2023) also argues that the natural resource-collateralized lending to developing countries is an internationalization of China's commercial rationale in dealing with domestic local governments' debt insolvency. For instance, the China Development Bank has started to use local governments' collateralized future land and fiscal revenues to facilitate the growth of local government debt.

From the demand side, Gupta et al. (2008) find that sound macroeconomic policies, including fiscal consolidation and high public investment, lead to lower political risks and, consequently, lower borrowing costs for emerging market debtors. In contrast, political instability, poor fiscal discipline, and weak institutions result in higher political risk, wider credit spreads, and higher borrowing costs. Similarly, using a dataset of international sovereign bonds from both primary and secondary markets, Gbohoui et al. (2023) find that countries in Sub-Saharan Africa (SSA) pay significantly higher coupon rates compared to their peers from other regions, even after controlling for risk ratings. The authors argue that the perceived risk premium for SSA countries is driven by structural challenges, including the countries' low levels of financial sector development, the low transparency levels of their governments' budgeting processes, the large size of their informal sectors, and the low quality of their regulatory systems.

RBL and Risk

Resource-backed loans have a historical precedent dating back to the late 1840s when Peru, amid severe political instability and economic challenges, reached an agreement with British bondholders to resume payments on wartime debt. This debt was incurred from the London Capital Market and had remained unpaid for over two decades. At the time, Peru was in the midst of a resource boom—albeit an unexpected one. The Chincha Islands, located off its coast, were rich in guano, an extremely productive and highly sought-after fertilizer. Eager to leverage this guano windfall for foreign financing, Lima inked the earliest recorded resource-backed loan agreements. Despite political turmoil and economic uncertainties, Peru's use of guano as collateral on foreign debt marked a turning point. This innovative approach allowed Lima to access foreign finance and regain solvency, ultimately enabling the issuance of new bonds in the London capital market. However, the guano boom came to an end in 1875, leading to another default on foreign debt (Vizcarra, 2009).

Likewise, Queralt (2022) argued that public assets or revenue streams such as customs revenue, state monopolies, and railroads were used as collateral to reduce the risk premium in emerging economies with poor creditworthiness during the 19th century when sovereign lending started to become frequent. However, Queralt (2022) demonstrates that repeated defaults in these Global South countries led to the loss of collateralized assets to foreign control and trapped countries in debt cycles without expanding state capacity.

Other "risky" countries have leaned on RBLs for finance more recently. During the 1980s and 1990s, while Angola was amid a bloody civil war, the Dos Santos government took out many oil-backed loans. By the end of the war, Angola had taken 48 such loans, most of which were

arranged by Western banks like BNP Paribas, Standard Chartered, and Commerzbank (Brautigam, 2011).

It was also in Angola that China got its feet wet as a provider of RBLs. In 2004, two years after the end of the Angolan Civil War, the Export-Import Bank of China (Eximbank) extended its first oil-backed loan to Luanda, a practice that has grown and evolved substantially. According to AidData, 123 of the 350 Chinese loans committed to Angola between 2004 and 2017—or 62 percent of the total value of the loans—were resource-backed.

The former deputy general manager of the China Eximbank, Chunning Dai, who created the "Angola Model", emphasized how it was innovative in mitigating risks facing the Global South.

> "On March 2, 2004, the "Framework Agreement for One-Stop Cooperative Financing on Oil, Engineering, and Credit" was officially signed between China Eximbank and the Ministry of Finance of Angola…The agreement entailed China Eximbank providing a $2 billion export buyer's credit to Angola to support their purchase of Chinese goods and engineering projects. To ensure the security of the loan, the Angola Oil Company exported 30,000 barrels of crude oil to China International Petroleum & Chemical Corporation (SINOPEC) daily. SINOPEC directly paid the loan for the imported oil into a custody account opened by the Ministry of Finance of Angola at China Eximbank, which was used for loan repayment and guarantees…By introducing the concept of oil resources and guarantees, this financing approach resolved the long-standing financing challenges faced by African countries, particularly the problem of insufficient risk guarantees. It was well-received by African nations and subsequently replicated in countries such as the Republic of Congo, Ethiopia, Equatorial Guinea, and Sudan, earning it the name "Angola Model". (Dai, 2022)[3]

However, as Chen (2023) noted, Chinese top leadership has urged more cautious risk control and the Chinese central bank has suggested discouraging collateralized lending with "risk-profit mismatch" to prevent excessive collateralized lending by debtors and urging China's policy banks and state-owned enterprises to engage in low-risk and small-scale projects that could generate greater social impacts.

Alves (2013) uses a comparative case study of China's oil-backed loans in Angola and Brazil and argues that RBLs served as an economic statecraft tool for China in pursuing its energy goals by helping secure long-term oil-supply contracts. Alves (2013) also highlights the influence of institutional differences on the outcomes of RBLs. She concludes that RBLs perform better in centralized institutional contexts, such as Angola, where the executive has control over the oil sector. In contrast, in Brazil, a fragmented institutional structure and a complex regulatory framework led to a contentious and lengthy negotiation process for China's RBLs.

[3] It is worth noting that the Angola Model, as discussed above is a sub-category of resource-backed loans called resources-for-infrastructure agreement whereby the loan is automatically repaid using natural resource revenues (instead of backed by natural resources, which are only used for repayment as a measure of last resort).

Thirty-eight percent of the 100 loans reviewed by Gelpern et al. (2022) are collateralized. Interestingly, these collateralization practices occur much more prevalent among the loans funded by CDB than Eximbank, potentially because the CDB makes larger loans and operates without formal subsidies from the central government, thus more incentivized to minimize repayment risk. Similarly, Brautigam and Gallagher's (2014) survey of China's commodity-backed finance in Africa and Latin America between 2003 and 2011 indicates that Chinese finance generally aligns with global private interest rates. Finally, Mihalyi et al. (2021) compare the interest rates on 19 Chinese RBLs in sub-Saharan Africa to regular loans—Chinese or otherwise—reported via the World Bank Debt Reporting System. They find that controlling for various factors, interest rates on RBLs are higher compared to other loans on average.

Hypotheses

How are Interest Rates Negotiated?

Interest rates reflect the creditor's perception of nonpayment risks (Gelpern et al., 2022). The rates and terms of each Chinese loan are negotiated on a bilateral, project-by-project basis. The negotiation process is highly concentrated between the Chinese government (primarily the Chinese policy banks and the Ministry of Commerce(MOFCOM)) and senior economic officials from the debtor countries (Corkin, 2011).

Typically, the borrowing country initiates the loan request, which goes through an approval process involving the MOFCOM and policy banks. The MOFCOM assigns assigns an amount to subsidize interest rates from the foreign aid budget. Policy banks, such as the China Eximbank, then conduct risk analysis to determine financing rates and fees, handles disbursement and monitoring, though may have limited ability to reject projects already approved by the Ministry (Corkin, 2011). The interest rate set on a loan determines whether the Ministry of Finance subsidizes it from their budget. For example, China Eximbank offers some concessional loans with 2% interest rates subsidized by the Ministry to cover the bank's higher cost of funds (Brautigam, 2011). This suggests that for policy bank loans, China's internal risk calculations largely shape interest rates.

However, debtor countries have some leverage in negotiating loan terms. Countries with more financing options can leverage alternatives to secure better terms from China (Bunte, 2019). Borrowing country policies and institutions also matter - independent debt management offices, parliamentary loan approval requirements, and public investment vetting can strengthen negotiation capacity (Morris et al., 2020). Additionally, the macroeconomic condition of the borrower affects negotiations. For instance, China renegotiated Venezuela deals with more

favorable terms when the country struggled with original debt service after oil price declines (Dollar, 2018). But in general, because the discussion and decision-making is so concentrated at the top political and economic officials within the recipient governments, particularly at the cabinet level. This gives political elites

In summary, China bilaterally negotiates loan interest rates and conditions based on recipient country risk and strategic importance, unlike multilateral lenders with standardized terms. The loan negotiations provide insight into China's risk perceptions on sovereign lending. These negotiations on terms of loans therefore provide insight into China's risk perceptions on sovereign lending.

In Table 1, we propose a framework to summarizing the costs and benefits of RBLs from both the supply and the demand sides in their consideration of whether to back their loan with natural resources.

Table 1. Costs and Benefits of Resource-Backing

	Cost of using RBLs	**Benefits of using RBLs**
Supply side (China)	RBLs face heightened repayment risks related to corruption and political cycles, as their scale and opacity increase susceptibility to governance issues.	Resource-backing provides an additional layer of securitization that enables lending and project delivery in otherwise unattractive countries from the perspective of Chinese infrastructure companies, while also helping to secure natural resources.
Demand side (Recipient countries)	Resource-backing risks locking in natural resources at below long-term market rates, incurring significant opportunity costs from potentially forgoing higher future earning potential.	Resource-backing enables countries to accelerate access to China's development financing and infrastructure construction by leveraging future natural resource revenue as collateral.

Building upon existing theories related to Chinese lending practices, we posit the following hypotheses:

- H1: China's resource-backed loans are more likely to be deployed in nations with heightened political and financial risks, indicating a deliberate strategy to mitigate risk exposure.

- H2: The interest rates for China's RBLs are expected to be higher than those for non-resource-backed loans, which can be attributed to the risks endogenous to RBLs, reflecting China's pursuit of both resource-backing and increased interest rates to counter potential risks.

- H3: Higher corruption levels generate higher political risk for sovereign lenders. As this risk is disproportionately high in the case of RBLs, interest rates are expected to be higher as part of RBLs extended to countries that suffer from higher corruption levels.

- H4: Given the political salience of RBLs, which combine the borrowing of vast sums of money and the commitment of future resource rents, interest rates in cases where RBLs feature prominently in the "political business cycle" are expected to carry higher interest rates.

- H5: The larger the share of a country's exports of the resource attached to the loan, as a percentage of China's total imports of the resource, the lower the expected interest rate. This is because, in such cases, China's appetite for the resource in question increases the borrowing country's negotiating power, all else equal.

Data and Methodology

Data

We employ development finance data from two main sources to construct this paper's dependent variables: AidData, a research laboratory based at the College and William and Mary, and the Global Development Policy Center, which is based at Boston University. The AidData dataset used for this paper is Version 2.0 of the Global Chinese Development Finance Dataset, which "captures 13,427 development projects worth $843 billion financed by more than 300 Chinese government institutions and state-owned entities across 165 countries in every major region of the world from 2000-2017". The only loans from that dataset employed in the analysis of this paper are those that were extended by Chinese government agencies, policy banks, and state-owned firms (including commercial banks) and those for which interest rates are reported by AidData. In total, 2003 loans fit these criteria. Furthermore, the dataset contains information about whether project loans are collateralized or securitized, along with information about the collateral or security that underpins them. In total, 517 loans are coded as collateralized/securitized by AidData. Only the loans that are backed by minerals, coal, or hydrocarbons are coded as RBLs for this paper.[4] A total of 234 of the 2003 AidData loans included in the analysis are coded as RBLs. These 234 loans total USD 277.8 billion in nominal terms and account for 43 percent of the total value of the loans included in the AidData sample. The Global Development Policy Center (GDPC) data used in this paper only covers Africa and

[4] For instance, a Eximbnak loan for the construction of the Ninh Binh nitrogenous fertilizer plant in Vietnam was secured by the plant itself, a loan by ICBC to Indonesia for the building of a skyscraper was collateralized by the land on which the building was built, and part of the Chinese loan financing provided by Eximbnak for the Bui Dam project in Ghana was backed by cocoa. None of these loans were coded as RBLs in this paper.

was originally collected by the China Africa Research Initiative (CARI).[5] This is because only the CARI-collected subset of the GDPC data contains information on resource-backing. In total, this database—as accessed in April 2022—contains information on 1,230 Chinese loans committed between 1994 and 2021. The only loans from that dataset employed in the analysis of this paper are those that were extended by Chinese government agencies, policy banks, and state-owned firms (including commercial banks) after 2000 and for which interest rates are reported. In total, 651 loans fit these criteria. Of those, 153 are coded as being secured by natural resources, but only the loans secured by minerals and oil are coded as RBLs in our analysis.[6] These loans total USD 26.8 billion and account for 30.1 percent of the total value of the loans included in the GDPC sample.

To provide a comparative perspective, we also employ data on loans to African governments from other creditors, which are compiled as part of the Africa Debt Database (Mihayi and Trebesch, 2023). This database includes all publicly-reported sovereign loans to African countries from all creditors committed or disbursed between 2000 and 2020—including from private sector lenders, multilateral institutions, and bilateral creditors, including members of the Organization for Economic Co-operation and Development's Development Assistance Committee (DAC), members of the Gulf Cooperation Council (GCC), and China.

Additionally, as a robustness check, we approximate sovereign debtors' borrowing costs using secondary market bond trading information. The underlying data is drawn from the J.P. Morgan Emerging Markets Bond Spread (EMBI) index. Another indicator is the Bloomberg 5-year credit default swaps (CDS), which are financial instruments investors use to evaluate creditworthiness and hedge against a sovereign default or debt restructuring.

The variables that capture economic risk are compiled using data from the Organization for Economic Co-operation and Development (OECD) and Kose et al. (2022). The OECD's Country Risk Classification classifies countries based on the minimum premiums they can expect to pay to receive official export credits. This index was adopted because of its extensive coverage across low- and middle-income countries and over many years and because it relates specifically to the risk associated with export credit, which accounts for a substantial large share of Chinese development finance. The alternative measures of sovereign economic risk included in the models are the gross government debt-to-GDP ratio, which is compiled by the World Bank, the inflation rate, and a sovereign rating index compiled by Kose et al. (2022), which reflects the "annual average of foreign currency long-term sovereign debt ratings" produced by taking the average of the Moody's, Standard & Poor, and Fitch Ratings.

The variables reflecting debtor countries' political risk levels are generated from the International Country Risk Guide (ICRG) and the World Bank's Worldwide Governance Indicators (WGI). The ICRG political risk index reflects a wide range of measures of "government stability, socioeconomic conditions, investment profile, internal conflict, external conflict, corruption, military in politics, religion in politics, law and order, ethnic tensions, democratic accountability,

[5] CARI, which is based at the Johns Hopkins University School of Advanced International Studies, has been collecting Chinese loans data since 2014. However, as of 2023, the CARI database has been merged with that of the GDPC.
[6] The cocoa backed Eximbnak loans to Ghana mentioned above are not counted as RBLs.

and bureaucratic quality". The WGI Political Stability and Absence of Violence/Terrorism index captures "perceptions of the likelihood of political instability and/or politically motivated violence, including terrorism". Finally, the WGI Control of Corruption index captures "perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests". These indices do not exhaustively capture the nuances behind the phenomena driving political risk that play out in the real world. That said, these variables do offer enough breadth to capture the variance in 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. That said, no better indicators exist for this research. And, importantly, the mechanisms through which these phenomena are expected to affect development finance as part of this paper are perception-driven themselves.

The variables reflecting the characteristics of the debtor countries sampled are drawn from two data sources. First, the variable that captures the importance of natural resource rents as a share of GDP is from the World Bank (WB). Second, data on economic activity (per capita gross domestic product) and population are drawn from the *Centre d'Études Prospectives et d'Informations Internationales* (CEPII).

Finally, the variables reflecting bilateral factors specific to China and the 120 debtor countries included in this paper—the geographical distance between their respective capitals, in kilometers, and their diplomatic disagreements, which is based on an index developed by Bailey et al. (2017) using on their respective UN general assembly voting records—are drawn from the CEPII data.

Methodology

This paper explores how Chinese financiers respond to credit risk through tools like resource-backing and interest rates using large-N analysis and small-N case studies. Three sets of models test three categories of questions, respectively. Equation 1 is used to test why some loans are backed by resources while others are not. Equation 2 tests whether interest rates systematically differ between resource-backed and non-resource-backed loans. Equation 3 tests the three mechanisms expected to contribute to the higher interest rates charged for resource-backed loans. The models control for four categories of factors: debtor countries' economic risk levels, as measured by credit risk; their levels of political risk, as measured by governance indicators; debtor-country specific controls, such as their per capita GDP and population; and the political and economic ties between the borrowing country and China.

Equation 1: Why are some loans backed by resources while others are not?

$$Resource\text{-}backing_{ijt} = \gamma x_{it} + \beta w_{jt} + \gamma v_{jt} + \delta u_t + \varepsilon_{ijt.}$$

Equation 2: Are RBLs more or less expensive than non-RBLs?

$$Interest\ rate_{ijt} = Resource\text{-}backing_{ijt} + \gamma x_{it} + \beta w_{jt} + \delta u_t + \varepsilon_{ijt.}$$

Equation 3: What factors explain the double risk mitigation measures (both the higher interest rate and the resources) adopted by China?

$$Interest\ rate_{ijt} = \alpha + Resource\text{-}backing_{ijt} * Mechanism\ variable_{jt} + \gamma x_{it} + \beta w_{jt} + \delta u_t + \varepsilon_{ijt.}$$

Where Interest $rate_{ijt}$ reflects the characteristics of loan i extended to country j by China in year t, x_{it} is a set of controlling the loan-level characteristics, such as the type of the loan, the size of the loan, and whether the loan is insured. *Resource-backing*$_{ijt}$ is a dummy variable that equals 1 if loan i is resource-backed. w_{jt} represents a vector of macroeconomic and political risk control factors specific to debtor country j in year t, including variables such as the OECD risk rating, sovereign debt ratings, debt to GDP ratio, inflation rate, total trade volume, total resource rents as a share of GDP, level of corruption, UN diplomatic disagreement degree with China, and country risk rating. δu_t is a time-fixed effects that controls for the price fluctuations across countries, while ε_{ijt} is an error term.

Table 1: Summary Statistics of the Data

Table 1. Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
year	4006	2010.204	4.506	2000	2020
control of corruption index (WB)	3756	-.709	.584	-1.673	1.477
resource-backed loan	4006	.153	.36	0	1
resource export share to China's total import	611	8.923	7.77	0	47.368
loan insurance	3355	.104	.305	0	1
diplomatic disagreement index	3996	.369	.322	0	3.089
gross government debt to GDP %	3962	44.297	29.761	.488	450.955
Bloomberg cds5y	544	1073.754	4964.479	25.307	62777.134
sovereign rating (average)	2262	8.8	2.707	1.682	17.305
financial development index (IMF)	3907	.183	.133	.026	.665
interest rate	4006	2.658	2.43	0	33
grace period	2890	5.82	2.759	0	15
GDP per capita	3780	3.079	3.67	.121	33.276
Resource rents as GDP % (WB)	3984	13.801	14.493	0	87.577
credit risk rating (OECD)	3847	5.963	1.363	0	7
J.P Morgan EMBI index	1298	529.03	415.733	64.997	3224.22
maturity	3525	17.783	6.63	.13	40
polity score	3846	1.229	10.262	-88	10
inflation rate	1450	70.418	1062.078	-8.975	24410.98
infant mortality	3862	71.413	44.285	3.62	204
country code	4006	55.947	36.682	1	120
(log) loan amount	3860	15.405	5.634	0	24.635
natural resources	3978	13.419	13.674	0	79.431
loan type	4005	3.966	1.808	1	10
regime type	4006	1.871	.941	1	3
(log) trade flow	3965	12.913	2.928	-2.996	17.812

The credit risk level of a country that is granted favorable loan terms by a Chinese policy bank may decrease. That same country may find itself more receptive to Chinese positions at the UN General Assembly. To help mitigate such potential reverse causality issues, the time-varying independent variables in the paper's models are lagged by a year (in line with Dreher and Fuchs, 2015 and Dreher et al., 2018). Heteroscedasticity could easily impact the estimation of the paper's models. For example, the variance in interest rates among RBLs could systematically differ from that among non-RBLs. This would result in inefficient estimates, even if they are unbiased. To mitigate this issue, the models presented in this paper feature heteroskedasticity-robust standard errors. Multicollinearity can impact the estimation of regression models by reducing the size of coefficients, thus leading to an underestimation of the true impact of correlated independent variables. To account for potential multicollinearity, variance inflation factor (VIF) tests were run for each independent variable in each model specification. The highest factor recorded in any of the tests was for the Financial Development Index variable, with a VIF of 4.23**.** This is much lower than the threshold of 10 suggested by Kennedy (1992), which strongly suggests that multicollinearity is not a substantial issue in the models presented in this paper.

While our large-N analysis provides a good overview of the general pattern for the risk perception of Chinese overseas lending, we support our regression results with qualitative

evidence based on cases from the Republic of Congo, Ecuador, the Democratic Republic of Congo, and Ghana, which are all resource-rich countries that have borrowed extensively from China. Two of the cases (Angola and the Republic of Congo) are based on archival research and the other three (the Democratic Republic of Congo, Ecuador, and Ghana) are based on semi-structured field interviews conducted between 2016 and 2022.

Empirical Results

Descriptive Data

Does China lend more to resource-rich countries? In line with Landry (2021), Figure 1 demonstrates that Chinese loans are concentrated in resource-rich countries. Roughly half of China's loan commitments to African countries between 2000 and 2020 were extended to countries whose resource rents accounted for more than 14.54 percent of GDP, on average, during those years. The data illustrated in Figure 1 reflects the total amount of loans extended to categories of creditors—China, members of the Gulf Cooperation Council (GCC), members of the OECD's Development Assistance Committee (DAC), multilateral lenders, and private lenders, as reflected in the Africa Debt Database. The quartile breakdown reflects natural resource rents as a share of GDP, as compiled by the World Bank. As the charts included in Figure 1 demonstrate, Chinese loans are more concentrated in resource-rich African countries than those of other creditors.

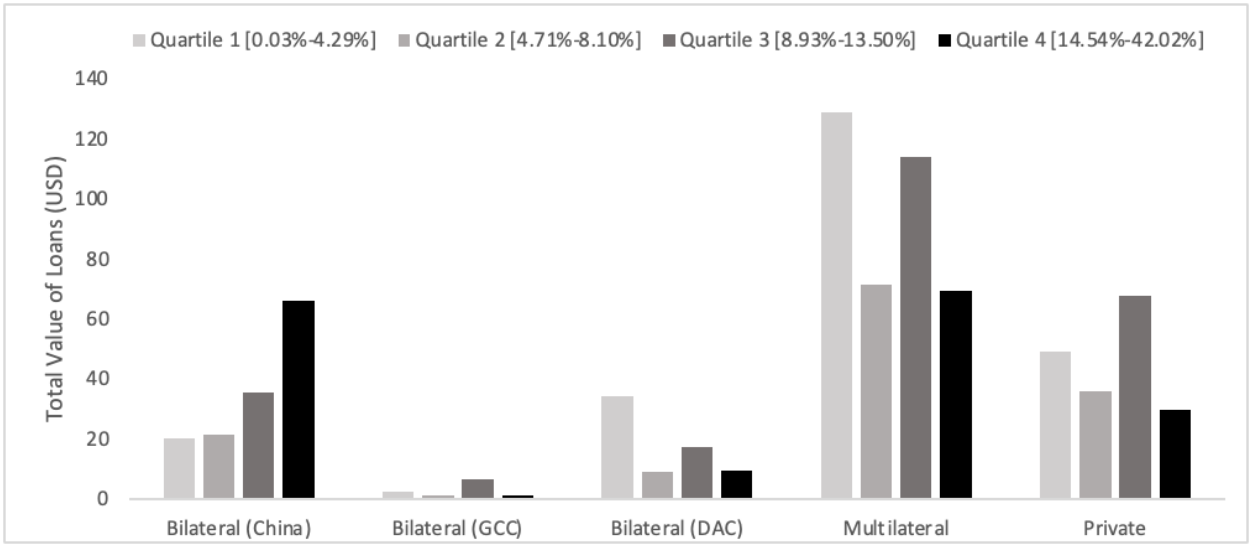


Figure 1: Total Loans to African Countries (USD) by Natural Resources Wealth (% of GDP), 2000-2020

How are Chinese loans structured? Figures 2 and 3 suggest that only a small subset of the loans committed by China between 2000 and 2017 were resource-backed. As discussed above, only 234 of the AD loans contained in our analysis are coded as RBLs (out of a total of 2,003 loans). In other words, only 12 percent of Chinese loans were structured as RBLs. In monetary terms, however, RBLs account for a much larger share of Chinese loans. As discussed above, they account for 43 percent of the USD 640 billion in Chinese loans comprised in our sample of the AD database. This means that, on average, much larger loans tend to be resource-backed, which is hardly surprising given that these larger loans also come with additional risks.

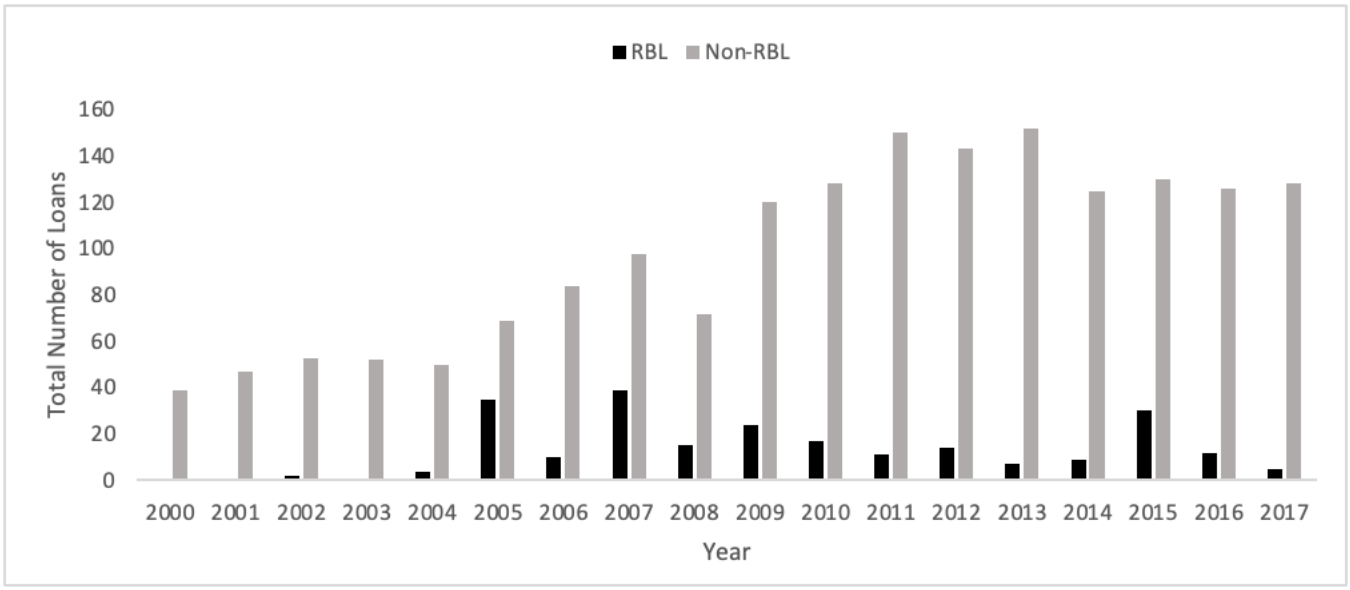


Figure 2: Total Number of Chinese Loans, Non-RBL vs. RBL, 2000-2020

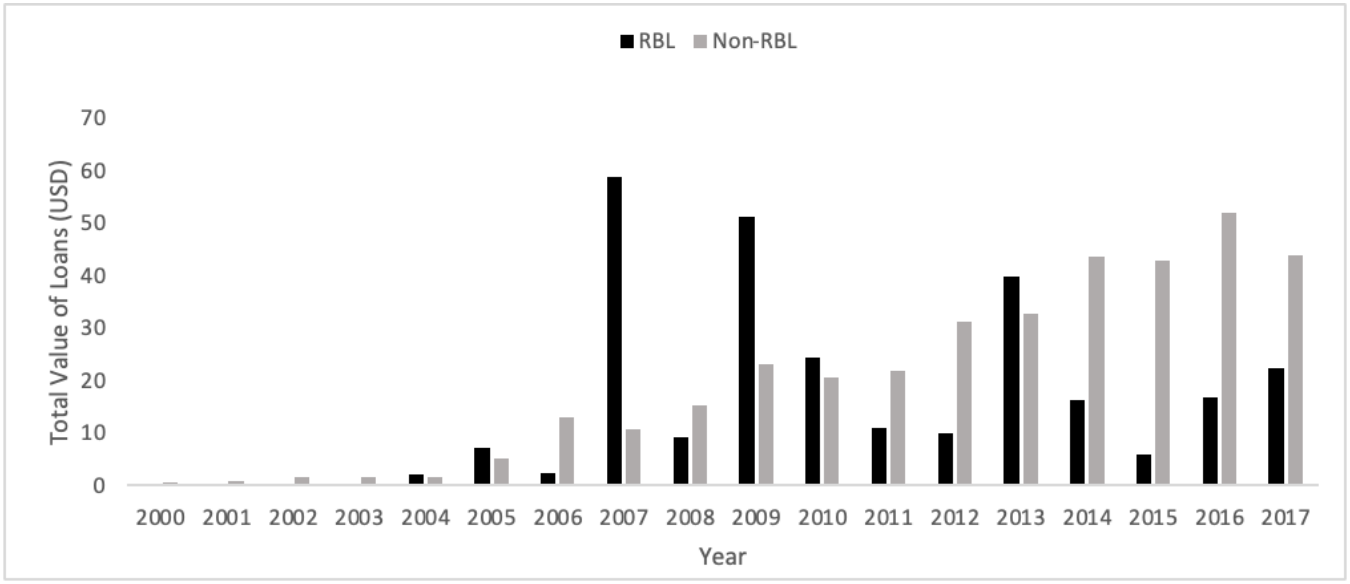


Figure 3: Total Value of Chinese Loans (USD), Non-RBL vs. RBL, 2000-2020

Are resource-rich countries more reliant on resource-backing to obtain Chinese financing? Given that natural resources are a prerequisite for resource-backing, the answer is a clear yes. As shown in Figure 4, only two of the 561 Chinese loans extended to resource-poor countries (countries whose natural resource rents account for 2.97 percent or less of GDP) were resource-backed. Both were extended to Tajikistan. On the other hand, almost 40 percent of Chinese loans committed to resource-rich countries (whose natural resource rents account for 18.21 percent or more of GDP) were resource-backed. In terms of loan values, the difference is even more stark. As Figure 5 demonstrates, RBLs represent roughly 0.1 percent of the value of Chinese loans extended to resource-poor countries and more than 63 percent of those to their resource-rich counterparts.

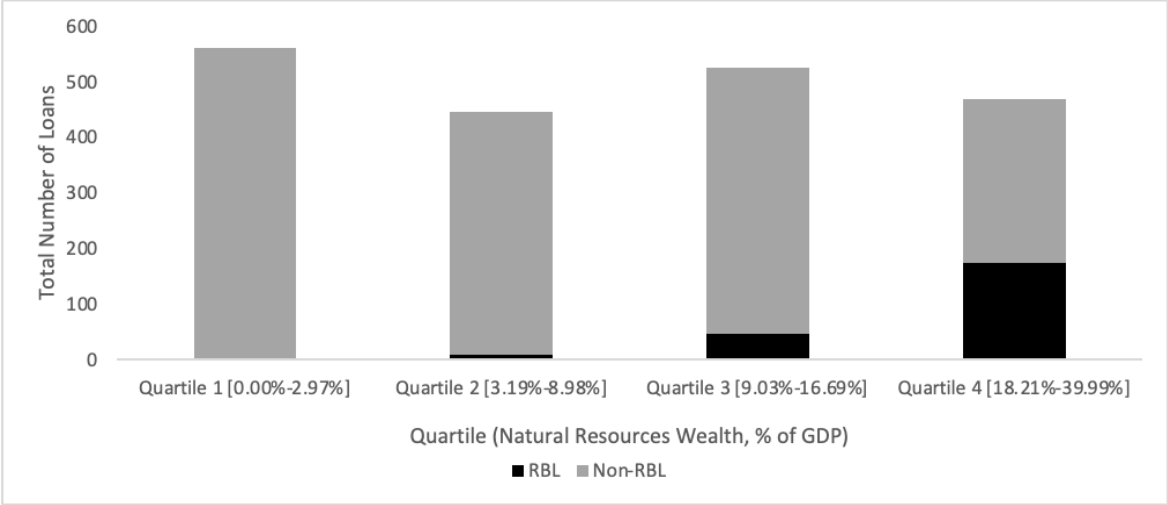


Figure 4: Number of Chinese Loans by Recipients' Natural Resources Wealth (% of GDP), Non-RBL vs. RBL, 2000-2020

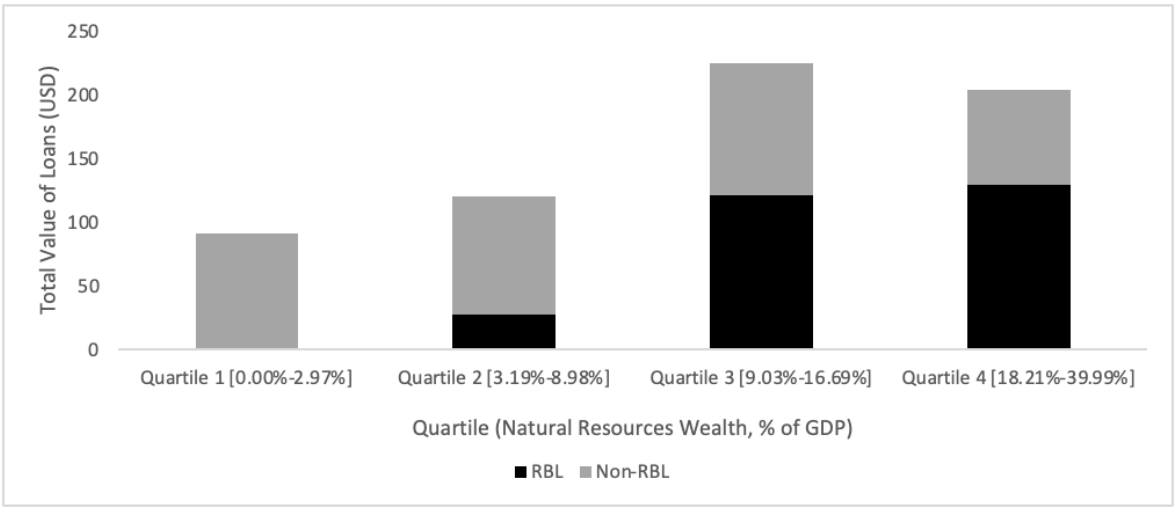


Figure 5: Total Chinese Loans (USD) by Recipients' Natural Resources Wealth (% of GDP), Non-RBL vs. RBL, 2000-2020

Finally, how do the costs of RBLs and non-RBLs compare? RBLs carry a higher price tag, on average, than non-collateralized loans. As demonstrated in Figure 6, the average interest rate of non-resource-backed loans is 2.63% while that of RBLs is 4.45%.

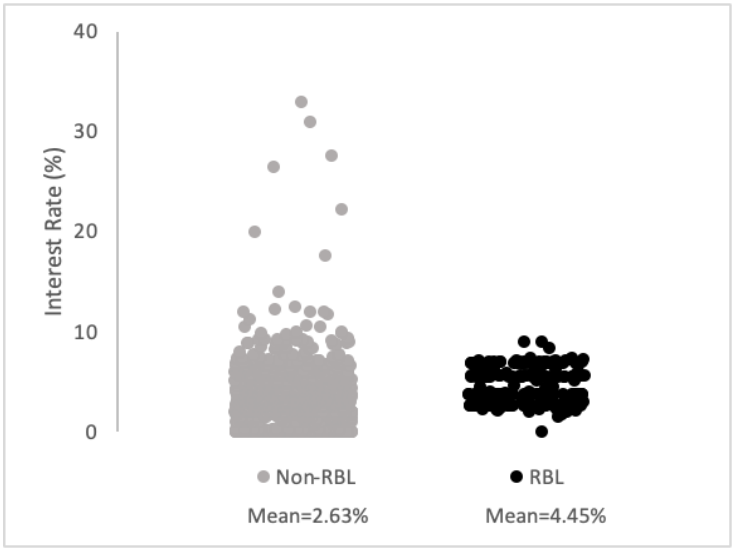


Figure 6: Chinese Loans' Interest Rates (%), Non-RBL vs. RBL, 2000-2020

Is the higher cost of collateralized loans, on average, because the countries that use that instrument are riskier? In other words, given that resource backing is widely viewed as a risk-mitigation tool, do these countries carry so much risk that even after putting up their resources as collateral to access credit, they must pay a higher price to access Chinese credit? The models presented in the next section test that question.

Causal Mechanism: Why Use RBL and What Explains the Risk-Mitigation Efforts?

The first question we investigate is why some Chinese loans are backed by resources while others are not. In the models presented below, the dependent variable is the dummy resource-backed loan (RBL) variable, In addition to the six variables included in the figure—financial development, imports, loan amount (log), LIBOR rate, exports, resources (as a share of GDP), and insurance, the models control for loan types, borrowing countries' political alignment with China, borrowing countries' OECD country risk classification, and borrowing country-level fixed effects. Country-year level variables include the country's diplomatic disagreement level with China, the financial development index constructed by the International

Monetary Fund, the average imports and exports of the year, OECD country credit risk rating, as well as a set of loan-specific variables such as the type of the loan, whether the loan is insured by the China Export & Credit Insurance Corporation (Sinosure), as well as the London Interbank Offered Rate (LIBOR rate), which captures the short-run market interest rates.

As shown in Figure 7, the coefficient of the impact of the financial development index on resource-backed is negative, indicating that the less financially developed a country is, the more likely the Chinese loans it takes to be resource-backed. Additionally, the larger the loan's size, and if the loan is insured by Sinosure, the more likely that the loan is backed by resources. This means that if a country with few alternatives to borrow money from (low level of financial development) wants to borrow a huge amount of loan from China, China uses both sovereign loan insurance and commodities to buffer the high risk. The full regression results are shown in Table 2, where we listed two models–one controlling for only year-fixed effects and the other controlling for both the year and the country-fixed effects. The fact we are trying to capture cross-country differences and factors means that using country-fixed effects, while better controlling for the time-invariant factors at the country level, also loses a lot of cross-country variations we try to capture.

Table 2. Factors determining whether a loan is resource-backed or not

Dependent variable: Resource-backed Loan		
	Year FX	Country-Year FX
UN diplomatic disagreement index	-0.00948	0.0547
	(0.0198)	(0.0368)
Financial development Index(IMF)	-0.694***	-0.0552
	(0.0981)	(0.204)
log_imports	0.0170	-0.0157
	(0.0127)	(0.0214)
Commercial loan	0.0172	0.0338**
	(0.0151)	(0.0140)
Supplier’s Credit	-0.0678*	0.0221
	(0.0388)	(0.0358)
log_amount	0.0293***	0.0305***
	(0.00539)	(0.00463)
6-Month LIBOR Rate	0.0217***	0.00776
	(0.00568)	(0.00878)
log_exports	0.0275***	0.0445**
	(0.00883)	(0.0211)
Gross government debt to GDP ratio	-0.000253	0.000485
	(0.000200)	(0.000309)
Resource rents as % of GDP (WB)	0.00525***	0.00349**
	(0.000606)	(0.00141)
insurance	0.315***	0.0972***
	(0.0303)	(0.0314)
GDP per Capita	0.00220	0.00431
	(0.00324)	(0.00756)
OECD Risk Rating	YES	YES
Year Fixed Effects	YES	YES
Country Fixed Effects		YES
Constant	-0.956***	-0.276
	(0.132)	(0.305)
Observations	2092	2092
R-squared	0.471	0.702
Adjusted R-squared	0.464	0.685

Standard errors in parentheses
* p<0.10, ** p<0.05, *** p<0.01

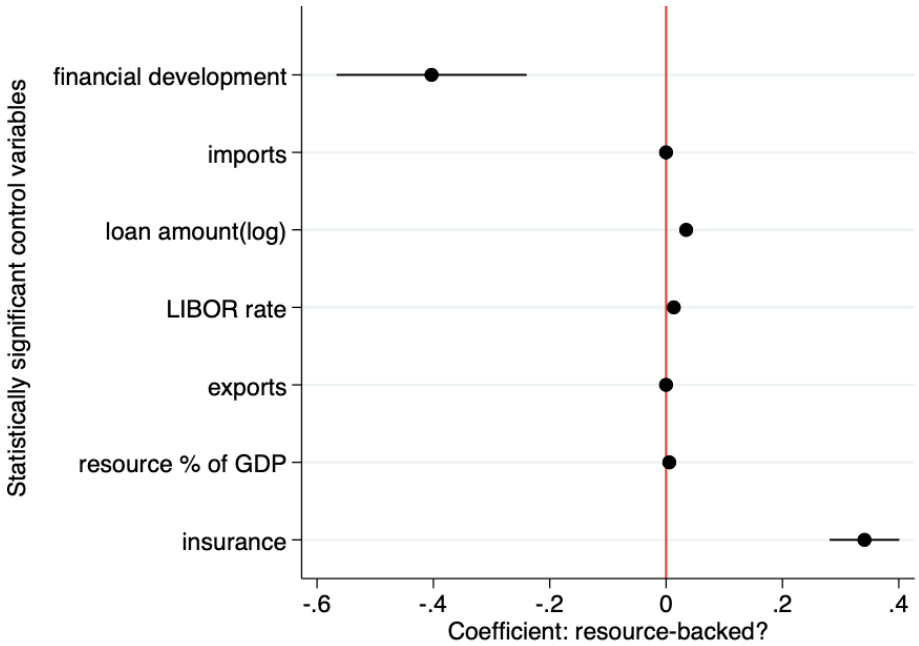


Figure 7. Factors Determining Whether a Loan is Resource-Backed (95% CI)

Table 3 shows the baseline estimation of the effects of resource-backed loans on interest rates while controlling for other variables that could affect a loan's borrowing cost. It demonstrates that China also necessitates higher interest rates as risk premiums for such resource-backed loans. To explain this double risk-mitigation measure adopted by China, we propose four channels of risks China tries to mitigate with the high-risk premiums: corruption, political business cycle, and resource importance to China. Table 3 also shows the results for the first mechanism: corruption.

Table 3. Summary of baseline estimation and corruption mechanism

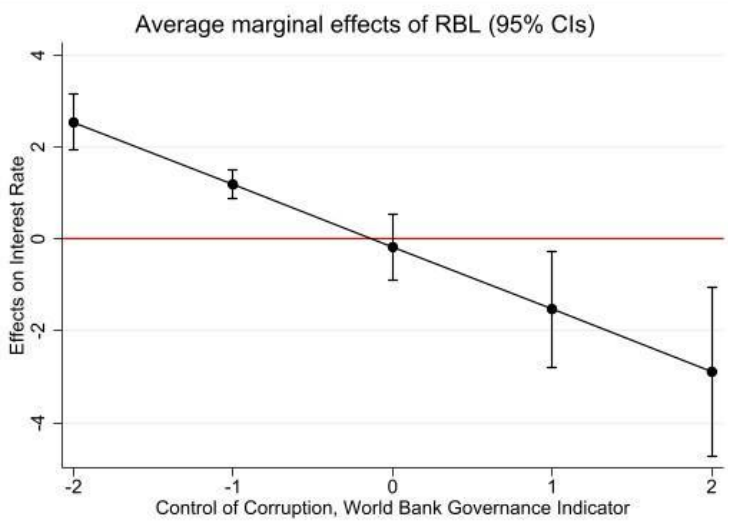
Dependent variable: Interest rates	Baseline estimation	Corruption mechanism
resource-backed loan	1.349***	-0.0918
	(0.140)	(0.346)
Control of Corruption index		0.240**
		(0.111)
Rbl # Control of Corruption index		-1.243***
		(0.293)
(Log) loan amount	0.163***	0.183***
	(0.0366)	(0.0379)
log_trade	0.222***	0.239***
	(0.0208)	(0.0241)
Debt to GDP ratio	-0.00470***	-0.00574***
	(0.00122)	(0.00137)
Insurance from Sinosure	0.904***	0.858***
	(0.126)	(0.135)
Resource rents as GDP ratio	-0.0432***	-0.0459***
	(0.00451)	(0.00436)
GDP per Capita	0.122***	0.116***
	(0.0287)	(0.0276)
Country risk rating	0.155**	0.198**
	(0.0712)	(0.0833)
Loan type	YES	YES
Year-fixed effects	YES	YES
Constant	-4.150***	-4.645***
	(0.632)	(0.684)
Observations	2849	2736
R-squared	0.313	0.314
Adjusted R-squared	0.307	0.307

Standard errors in parentheses
* p<0.10, ** p<0.05, *** p<0.01

Mechanism 1: Corruption

Previous research on emerging markets, such as Gupta et al. (2008) has indicated that political risks, particularly expropriation risk, significantly raise the cost of sovereign borrowing.
To calculate the interest rates for RBLs across regimes with different levels of respect for the rule of law and corruption controls, we use the World Bank's WGI indicators, and V-Dem's various indexes on corruption and rent-seeking (Coppedge et al., 2023). By interacting with country-year corruption levels and the RBL dummy, we find that the better control a regime has on corruption, the lower the interest rates it pays on Chinese RBLs. On average, compared to non-resource-backed loans, a standard deviation improvement in the Control of Corruption index (a standard deviation improvement in governance) is accompanied by a 135% percent decrease in the interest rate of its RBLs.

Figure 6. Average Marginal Effects of Resource-Backed Loans for Countries with Different Levels of Control of Corruption Index



Case study: Republic of Congo

In 2006, during the official visit of Premier Wen Jiabao to the Republic of Congo, an agreement was reached between China Eximbank and the Ministry of Finance of the Republic of Congo. When the former deputy managing director of Eximbank Chunning Dai arrived in the Republic of Congo, he was informed of a potential complication related to the upcoming agreement–a debt relief agreement recently negotiated between the Republic of Congo and the World Bank. As Dai recalls:

> "According to this agreement, the Republic of Congo could only accept concessional loans with a 15-year term and an interest rate not exceeding 1.5%. The Congo Minister of Finance was reluctant to endorse the agreement under these terms…President Li Ruogu of the China Eximbank stressed the imperative of ensuring the agreement's execution according to the established plan. He clarified that the terms of the debt relief agreement between the Republic of Congo and the World Bank did not constrain China Eximbank. He suggested that any discrepancies could be resolved through the signing of a supplementary agreement. Understanding President Li Ruogu's intention, I immediately instructed my assistant to engage in discussions with the Republic of Congo's representatives regarding the drafting and signing of a supplementary agreement. Consequently, on the same day, President Li Ruogu signed a supplementary agreement with the Republic of Congo's Minister of Finance. This supplementary agreement separated the 4% interest from the main agreement, obligating the Republic of Congo to independently remit this 4% interest to China Eximbank. Subsequently, both parties arranged a new financing structure following a similar pattern." (Dai, 2022)

In this case, the interest rates for the Republic of Congo were raised in separate agreements because of the high level of personalization in decision-making in the recipient regime. Raising the interest rates to a higher level was the way for Chinese finance to counter project risk

Case Study: Ecuador

After winning Ecuador's October 2006 presidential election and assuming power in January 2007, Rafael Correa firmly turned Ecuador away from the West through his heterodox views on the economy and populist political rhetoric. In April 2007, less than four months into his presidency, the Correa government ordered the expulsion of the World Bank's Quito representative (Weitzman, 2007). Correa and the financial institution had a bitter history, as he had resigned from his position as Minister of Economy and Finance under the previous administration after the Bank had refused to disburse a USD 100 million loan to Ecuador in response to some economic policies he was pursuing (Martínez, 2005). The very next year, in December 2008, Correa announced that Ecuador would intentionally default on billions of dollars of foreign debt on the basis that it was illegitimate. The move was staunchly criticized by financial experts, who argued that there was "no economic necessity for default at the time, as Ecuador's debt stock was relatively moderate" (Bunte, 2019). In any case, the default came as little surprise, given that in his previous role as Minister of Economy and Finance he had prioritized investing in social programs over reimbursing Ecuador's debt, and had pledged to cut foreign debt payments during his presidential campaign (Soto, 2007). Quito's relations with Washington deteriorated when, in April 2011, Correa expelled the U.S. Ambassador after embarrassing comments about corruption in the Ecuadorian police force were leaked via WikiLeaks. Ecuador's relations with the wider West continued to deteriorate when Correa decided to offer WikiLeaks founder Julian Assange refuge in its London embassy and subsequently granted him asylum.

Over the same period, Correa presided over a dramatic rapprochement with China. The crux of the relationship was China's willingness to loan huge amounts of money—at high interest rates—to Correa's government. Most of the loans financed ambitious infrastructure projects that formed the backbone of Correa's development vision for Ecuador. For instance, between 2007 and 2011, Quito signed loan agreements with China Eximbank and China Development Bank for the financing of at least six hydropower projects, with a total price tag of more than USD 5 billion (Custer et al., 2021). In total, between 2007 and 2017, Quito borrowed more than USD 32 billion from Chinese government agencies and state-owned banks. One series of loans—structured as resources-for-infrastructure agreements—obliged Ecuador to supply petroleum to PetroChina (and later UNIPEC, a subsidiary of SINOPEC) as a repayment mechanism for China's infrastructure loans (Ibid.). By 2013, largely through these RFIAs, Chinese firms had secured control over roughly 90 percent of the oil shipments that would leave Ecuador in subsequent years—a "rare feat in today's diversified oil market" (Schneyer and Perez, 2013).

While the Ecuadorian government was negotiating large RBLs with China Development Bank, a massive corruption scandal, which resulted in what The Economist has referred to as

“Ecuador’s trial of the century” was unfolding. The *Arroz Verde* (Green Rice) case, which was eventually renamed *Sobornos* (which simply means Bribes) saw the payment of millions of dollars in bribes by many multinational energy and construction companies—including Sinohydro. The payments were used to illegally fund the political campaigns of Correa’s political party between 2012 and 2016 in exchange for the award of millionaire contracts. The trial, which was concluded in 2020, saw both Correa and Jorge Glas—his Vice President between 2013 and 2018—sentenced to eight years in prison. Glas served 4.5 years of the sentence while Correa, who resides in Belgium, has not spent any time behind bars.

A separate corruption case recently captured the attention of the Ecuadorian public. As part of what is referred to as the Sinohydro case, an indictment that was unsealed in March 2023 alleges that defendants—including Lenin Moreno, who served as Correa’s Vice President between 2007 and 2013 and then as President between 2017 and 2021—received bribes of up to USD 76 million to a massive hydropower project. The bribes were allegedly paid concerning Coca Codo Sinclair, Ecuador’s largest Chinese project, for which Quito has borrowed more than USD 2 billion from China Eximbank. The project—which was one of Ecuador’s few non-RBL Chinese loans—was constructed by Sinohydro (hence the name of the corruption scandal). An Ecuadorian journalist interviewed in Quito as part of this research revealed that a former Chinese ambassador to Quito—who then returned to the country as a Sinohydro representative—was deeply involved in the scheme.

The two corruption cases discussed above—which reached the highest levels of the Correa administration—underscore some of the risks that could impact RBLs. RBLs, by virtue of being extremely complex and opaque, pose significant embezzlement risks, which are more acute in the context of countries marked by high levels of corruption. In addition to this risk, which might lead financiers to adjust interest rates, another corruption-related factor might drive up the interest rates of RBLs. The corrupt government officials who might stand to personally benefit from large-scale RBLs, through kickbacks or embezzlement, might not be incentivized to negotiate their terms aggressively.

Mechanism 2: Political Business Cycle

Chinese RBLs, because they combine sovereign borrowing, infrastructure development, and future natural resource rents, carry huge levels of political importance in the countries that sign them. In both the Ecuadorian case explored above and the Congolese case discussed below, multiple opposition politicians vowed to revise or cancel their countries' RBLs if elected. In contrast, incumbents could use Chinese projects for credit claiming. As Parks et al., (2023) suggest, political transitions in host countries may lead to significant alterations in the nature, extent, and pace of China's involvement. When a new leader assumes power and adopts a less confrontational stance toward China, Beijing actively works to solidify bilateral relations by assisting the incumbent administration in claiming credit for prominent infrastructure projects.

Due to their inherent complexity and substantial volume, many resource-backed loans involve protracted negotiations that culminate in the signing of framework agreements. These negotiations often occur independently of election cycles, making it impractical to rely solely on election years as a proxy for capturing changes in risk perception and borrowing costs. Initial findings from simple correlation tests indicate a weak negative correlation between RBLs' interest rates and both presidential and legislative elections. Ideally, a quantitative assessment of our hypothesis would involve obtaining information on the extent to which presidential or parliamentary candidates utilize Chinese loans during their campaigns and its impact on their electoral success. Unfortunately, such data is unavailable. Instead of this, we leverage detailed case studies to exemplify the heightened risks associated with RBLs due to their political salience.

Case Study: Democratic Republic of Congo

After the assassination of Congolese President Laurent Kabila by his bodyguards in 2001, his son Joseph became the world's youngest head of state at the tender age of 29. In 2006, three years after the Second Congo War ended—leaving millions dead in its wake—Kabila won the DRC's first democratic election in over four decades. As part of his election campaign, he announced his ambitious *Cinq Chantiers* (Five Construction Sites) program, which focused on infrastructure, job creation, education, water and electricity, and health. After the election, Kabila began looking for funds to bring his *Cinq Chantiers*—the backbone of his development strategy—to life.

In the West, Kabila's pleas for the billions of dollars in financing needed to bring the *Cinq Chantiers* to life fell on deaf ears. In the words of a minister in the Kabila government interviewed in 2016, Western actors wanted "zero risk". A Congolese senator also interviewed in 2016, who held a ministry when the Sicomines deal was signed, added that the situation was too dire to do nothing: "The Congolese government gets 5-year mandates. It needed to deliver something *now.*"

It was against this backdrop that, in 2007, Kabila's government signed an enormous agreement valued at a total of over US$ 9 billion with China Railway Engineering Corporation (CREC). As part of the deal, the Chinese consortium led by CREC would secure the financing of US$ 6.565 billion worth of infrastructure projects of a public goods nature, such as roads and hospitals, and invest about US$ 3 billion in the mining project itself. In exchange, the consortium would obtain the rights to two mining licenses, As the agreement was structured as an RFIA, the mine's revenues would be used to reimburse the infrastructure financing. By 2009, after multiple rounds of negotiations, a final agreement that would deliver the DRC US$ 3 billion worth of infrastructure and US$ 3 billion in investment for the mine itself was reached. At the time, this resource-for-infrastructure agreement was the largest resource-backed loan ever extended by China.

An advisor in the Congolese Ministry of Finance, cited by Global Witness, stated that the DRC was in a very weak bargaining position when the deal was negotiated, and likened his country to a "sick man". Based on our interviews, there appears to be a consensus that the Congolese

party was in fact in a precarious position when it was signed and that this transpired in the agreement. A member of Kabila's cabinet said: "Natural resource wealth is useless if it stays in the ground" and added "The Chinese may have gotten more as part of this deal, but when the people are dying of hunger, who cares?" Another senior elected official—and member of Kabila's cabinet at the time of the deal's signature—echoed the same thoughts: "Did the Congo get robbed? It doesn't matter. The situation was too dire to do nothing. The Congolese government gets 5-year mandates. It needed to deliver something now".

The Sicomines loans package was instrumental in shaping the political career of Joseph Kabila and constituted a major part of his 2011 re-election campaign. It was also seized upon by prominent members of the Congolese opposition as part of their election campaigns. Multiple Congolese opposition candidates in the country's 2011 presidential election vowed to renegotiate or outright cancel the deal. These political business cycle risks can exist as part of any sovereign debt agreements—as the Correa administration's default on Ecuador's debt discussed above demonstrates—but they are particularly salient in the case of RBLs due to these loans' size and the fact that they have implications for future natural resource rents.

Interestingly, it was the son of one of the Congolese politicians who had vowed to revisit the Sicomines agreement and who was eventually elected president. Though it was his father Etienne who promised, as part of his own 2011 presidential campaign, to revise *les contrats chinois* (the Chinese contracts), Felix Tshisekedi won the following Congolese presidential election in 2018. Until recently, it did not appear as though he would re-negotiate the Sicomines agreement. But, more than four years after assuming power, Tshisekedi traveled to Beijing in 2023 to renegotiate the Sicomines contract.

Mechanism 3: The Importance of the Resource for China

To capture the importance to China of the resources used as collateral as part of RBLs, we constructed a variable called "resource export as a share of China's total import" for all the RBLs in our data. This variable denotes the share of total Chinese imports of the specific resource(s) used as collateral in a Chinese RBL originating from the debtor country in the year of the loan agreement. For instance, Angola's total oil exports to China in many years account for around 14% of China's total oil imports. The larger this variable is, the more important the resource(s) used as collateral for an RBL should be considered as a strategic resource for China. As Table 4 shows, a one percent increase in the share of total Chinese imports of the resource(s) is associated with a 3.94% decrease in the interest rates charged by China on an RBL. This suggests that the more important a resource is to China, the less risk premium China charges the debtor country.

Table 4. Resource importance to China mechanism

	Dependent Variable: Interest Rate
Resource export as a share of China's import	-0.0394** (0.0189)
(log)loan amount	-0.0279 (0.0401)
Debt to GDP ratio	-0.0353*** (0.00713)
GDP per Capita	0.0882*** (0.0240)
Country Risk Rating	0.441*** (0.120)
Loan type	YES
Year-Fixed Effects	YES
Constant	2.055 (1.338)
Observations	462
R-squared	0.620
Adjusted R-squared	0.598

Standard errors in parentheses
* p<0.10, ** p<0.05, *** p<0.01

Case Study: Ghana

In May 2018, the Government of Ghana and Sinohydro Co. Ltd. signed a *master project support agreement* (MPSA) totaling US$2 billion. The MPSA encompasses various projects aimed at improving critical infrastructure in Ghana, including rural electrification, construction of hospitals, bridges, roads, affordable housing, and fishing landing sites. According to the terms of the MPSA, Sinohydro is responsible for financing 85% of the total construction cost through an Engineering, Procurement, and Construction (EPC) contract. The projects funded under the MPSA are financed through a deferral of the payments system, enabling Ghana to repay the funding using proceeds generated from the sale of refined bauxite, following a predefined deferred payment schedule for each project. The Government of Ghana bears the remaining 15% of the construction cost, with Phase 1 of the MPSA having a total EPC cost of US$646.6 million. Additionally, Deferred Payment Agreements (DPA) associated with this phase amount to US$550 million, featuring a tenor of 15 years and a 3-year grace period. These DPAs carry an interest rate of 6 months US Libor + 2.8% per annum, accompanied by a management fee of 0.70%, a commitment fee of 0.5% per annum, and a Sinosure premium of 7.00% for the export credit insurance it provides.[7]

The MPSA is categorized as a "barter agreement" to ensure that it does not contribute to Ghana's public debt. As the borrower, the newly formed Ghana Integrated Aluminum Development Corporation (GIADC), operates as an independent entity established by the Ghanaian government to manage bauxite resources and repayment, with no direct financial

[7] Parliament of Ghana - http://ir.parliament.gh/bitstream/handle/123456789/1179/330601102854_0001.pdf?sequence=1&isAllowed=y

liability placed on the government.[8] Under the MPSA, Ghana will repay Sinohydro using proceeds from refined bauxite sales, to develop an integrated bauxite-aluminum industry, rather than merely exporting raw bauxite (Purwins, 2023). However, an interview with a representative of the Ghanaian Ministry of Finance, who participated in the negotiation process with Sinohydro in Beijing, revealed that from the point of view of the Chinese, though the loan was to be repaid using bauxite, the bauxite resource itself was not considered collateral for this loan. This is primarily due to the volatility of Ghana's bauxite production.

> "The Chinese did not view bauxite as a "safe" resource for loan collateral. Chinese banks mostly assessed regular macroeconomic indicators, such as fiscal space, when evaluating the risk of this loan. The bauxite mine operates as a joint venture between Sinohydro and a Ghanaian firm, and the Chinese were cautioned about the productivity of the bauxite mine due to the joint-venture nature of the partnership. Another factor is that, unlike well-established resources like cocoa or gold, there is no guarantee of the total reserves of Ghana's bauxite mine. "[9]

This case highlights the rationale behind China's decision to apply higher interest rates to the loan despite having resources to serve as collateral, particularly in the context of the instability in natural resource extraction. While bauxite resources are designated as collateral of loan repayment, the interest rate remains pegged at the commercial level (libor+2.8%). This can at least partly be attributed to the uncertain nature of Ghanaian bauxite production and the fact that Ghanaian bauxite only occupies a relatively minor part of Chinese total imports. These dynamics, prevalent in many countries that have taken Chinese RBLS—including Brazil, Ecuador, Ghana, Laos, Nigeria, Tajikistan, and Zimbabwe—might explain China's inclination to seek double insurance when assessing potential risks.

Robustness Check

In line with the previous vast research on the relationship between risk perception of Western capital and sovereign lending, we analyze two parallel regressions of the sovereign bond spreads for the same country-year observations in our sample, based on the J.P. Morgan EMBI index and the Bloomberg CDS 5-year index. As Table 5 shows, in general, the perception of risk from the secondary sovereign bond market is negatively associated with the sovereign debt ratings–meaning that the higher the credit risk rating, the more yields the Western capital market charges the debtor countries as premiums. This is in line with Chinese capital's higher interest rate premiums for countries with significantly higher political and financial risks. However, it is worth noting that these private bondholders do require commodity-backing on their loans in addition to the higher interest rates they charge—unlike Chinese financiers, which employ a double risk mitigation strategy.

Table 5. Sovereign Bond Spreads and Risk Analysis

[8] Parliament of Ghana - http://ir.parliament.gh/bitstream/handle/123456789/1280/BILLION%20CORPORATION.pdf?sequence=1&isAllowed=y
[9] Interview with a former economist at the Ghanian Ministry of Finance. May 13, 2022. WhatsApp Call.

	Dependent Variables	
	(Log)EMBI	(Log)CDS 5 year
Sovereign debt ratings	-0.191***	-0.229***
	(0.00865)	(0.0133)
resource-backed loan	0.0793	0.104
	(0.0699)	(0.0877)
Inflation rate	0.0114***	0.0171**
	(0.00380)	(0.00687)
(Log) trade volume	-0.0316***	-0.00180
	(0.00776)	(0.0171)
Resource rents share of GDP	-0.00286	0.0186***
	(0.00292)	(0.00531)
Debt to GDP ratio	-0.00516***	-0.00169
	(0.00109)	(0.00152)
GDP per Capita	0.0393***	0.0354***
	(0.00894)	(0.0110)
Loan Type	YES	YES
Year-Fixed Effects	YES	YES
Constant	8.849***	8.053***
	(0.207)	(0.417)
Observations	317	183
R-squared	0.864	0.864
Adjusted R-squared	0.857	0.850

Standard errors in parentheses
* p<0.10, ** p<0.05, *** p<0.01

Conclusion

Collateralized loans comprise almost 30 percent of the roughly USD 843 billion in state finance extended by Beijing between 2000 and 2017. Furthermore, by combining lending—which is predominantly used to finance Chinese-provided infrastructure—and resource extraction, RBLs have greater economic and political implications than their non-RBL counterparts.

Rather unsurprisingly, the results presented in the previous section demonstrate that resource backing itself is a product of resource wealth and economic risk. Chinese loans to resource-rich countries are much likelier to employ this contractual structure than loans to countries with few natural resources. Furthermore, loans to countries that suffer from lower levels of financial development and creditworthiness, loans that are insured by Sinosure, and larger loans, are disproportionately likely to be resource-backed.

The second set of models presented in the paper demonstrates that even though resource-backing is a risk-mitigating strategy, loans that are resource-backed nevertheless carry significantly higher interest rates than non-RBLs. In other words, these loans appear to be subjected to a double risk mitigation strategy—resource-backing and high interest rates (and, in some cases, Sinosure insurance, which represents a third risk mitigation tool).

The paper explores three possible mechanisms to explain this finding—these mechanisms are expected to impact RBLs differently than non-RBLs, given the vast differences between the two.

The first mechanism explored relates to corruption. As discussed above, Chinese loans to the resource-rich are more likely to be resource-backed. Resource-rich countries are also more likely to suffer from high corruption levels. The risks associated with corruption are especially marked in the case of RBLs, as the agreements weave together complex financial and extractive agreements in utmost secrecy—it is through those very mechanisms that, in the Congolese and Ecuadorian cases explored as part of this paper, RBLs appear to have contributed to corruption. There are two possible mechanisms through which corruption could drive up the cost of Chinese RBLs. First, financiers might recognize the risks inherent to working with corrupt governments and adjust interest rates in consequence. Second, government officials who might stand to personally benefit from large-scale RBLs, through kickbacks or embezzlement, might not be incentivized to negotiate their terms aggressively.

The second such mechanism is the political business cycle. RBLs, by combining large financing packages with resource extraction, are often extremely politically contentious. This was the case for all three case studies explored in this paper. Furthermore, in both Ecuador and the Democratic Republic of Congo specifically, opposition politicians vowed to cancel their countries' loan agreements with China if elected. In fact, both the Congolese and Ecuadorian presidents recently traveled to Beijing to renegotiate their Chinese resource-backed loans. In the Ecuadorian case, President Guillermo Lasso traveled to Beijing in 2022 and subsequently announced that his country had reached an agreement to restructure USD 4.4 billion in debt, which would save Quito USD 1 billion from 2022 to 2025. In 2023, Congolese President Felix Tsishekedi traveled to Beijing to renegotiate the terms of the Sicomines agreement, asking for 60 percent of the venture (up from 32 percent as it was initially agreed). The negotiations are ongoing, and the details have not been made publicly available.

Finally, the paper explores the relationship between the importance to China of the resources that are used as collateral for RBLs—in terms of the share of Chinese imports of said resources that originated in the borrowing country the year a loan agreement was signed—and interest rates. As expected, RBLs that are underpinned by "important" resource deposits from Beijing's standpoint, which account for a greater share of Chinese total imports, are subject to lower interest rates than RBLs secured with resources that China predominantly imports from elsewhere. This finding suggests that interest rate decisions are impacted not just by the value of natural resources but also by their relative importance to China. This is likely due to the additional leverage afforded to governments that realize their natural resources are key to China's economy. These governments can likely extract more concessions from Chinese lenders as part of loan negotiations.

These findings contribute to the study of Chinese foreign policy and economic statecraft, the literature on the political risks of sovereign lending, and the broader literature on international political economy by demonstrating that Chinese state capital is not as different from global private capital in terms of risk tolerance as has been argued in the existing literature. Much like

global private capital, Chinese state lenders seek to reduce their risk exposure, and resource-backing—along with higher interest rates and loan insurance—is a way to do so.

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