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## Full Length Articles

### China's overseas lending

Sebastian Horn <sup>a,\*</sup>, Carmen M. Reinhart <sup>b</sup>, Christoph Trebesch <sup>c</sup>



<sup>a</sup> University of Munich and Kiel Institute, Germany

<sup>b</sup> Harvard University, United States of America

<sup>c</sup> Kiel Institute, University of Kiel, Germany

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#### ABSTRACT

Compared with China's pre-eminent status in world trade, its role in global finance is poorly understood. This paper studies the size, terms and destination of Chinese official international lending on the basis of a new "consensus" database of 4900 loans and grants to 146 countries, 1949–2017. Using the loan-level lending data we estimate outstanding debt stocks owed to China for more than 100 developing and emerging economies since 2000. As of 2017, China had become the world's largest official creditor, surpassing the World Bank and the IMF. The terms of China's state-driven international loans typically resemble commercial rather than official lending. We also find that 50% of China's official lending to developing countries is not reported in the most widely used official debt statistics. These "hidden" debts have important implications for debt sustainability.

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## 1. Introduction

While China's dominant footprint in world trade and global output is well known, its expanding role in international finance is poorly understood. The entry of China in the international financial system about two decades ago has created a significant gap in the academic literature on global finance. While trade issues and the effects of China's "trade shock" have been the subject of a flourishing body of research (see the survey of Autor et al., 2016), there is no comparable body of work on China in international finance. This paper contributes to filling this gap by providing the most comprehensive analysis of Chinese overseas lending so far, focusing on the characteristics of the lending flows as well as on the resulting debt burdens in developing and emerging economies.

Apart from its massive scale, the most notable feature of China's capital exports is its opacity. Data is scarce and the process of lending is not transparent. This helps to explain why relatively little work exists on China's large-scale cross-border lending. In this paper, we study the surge in China's capital exports to the rest of the world during the past two decades by building an encompassing new database. We document the size, destination, and characteristics of China's overseas lending systematically and estimate the outstanding debt stocks of recipient countries. A main insight from the data is that about half of China's lending

\* Corresponding author.

E-mail address: [sebastian.horn@ifw-kiel.de](mailto:sebastian.horn@ifw-kiel.de) (S. Horn).

to developing countries is not picked up by the “gold standard” databases of international finance. The “hidden debts” owed to China are consequential for debt sustainability and macroeconomic stability in recipient countries (see [Alfaro and Kanczuk, 2019](#)).

Unlike other major economies, much of China's external lending is official, meaning that it is undertaken by the Chinese government, state-owned policy banks, or state-owned commercial enterprises and banks. The Chinese government does not report on its official international lending and does not publish any data on outstanding overseas debt claims. Debt restructuring agreements between China and debtor countries that would constitute a “credit event” are largely off the radar screen of the credit rating agencies. Moody's and Standard and Poor's, like other rating agencies, monitor sovereign borrowing from private creditors (banks, bondholders, or others); official lending to sovereigns is not a regular part of their menu of activities. The Paris Club tracks sovereign borrowing from official bilateral creditors (i.e. other sovereigns), which in principle, should cover most of China's overseas lending. However, China is not a member of the Paris Club and therefore has not been subject to the standard disclosure requirements. In addition, China does not divulge data on its official flows with the OECD's Creditor Reporting System, and it is not part of the OECD Export Credit Group, which provides data on long- and short-term trade credit flows. As such, documentation of China's international lending has literally fallen through the cracks.

Adding to the data scarcity, commercial providers such as Bloomberg or Thomson Reuters (which primarily report on bond offerings) do not keep track of China's official overseas loans, and such lending is missed even by the most ambitious recent attempts to measure international capital flows (e.g. [Coppola et al., 2019](#)). Similarly, China does not provide details on the direct lending activities of its “Belt and Road” initiative. With regard to cross-border banking, China recently joined the list of countries reporting to the Bank for International Settlements (BIS), but the data are not made publicly available on a bilateral basis. At the recipient end, data collection and dissemination by borrowers is hampered by the inclusion of confidentiality clauses into lending contracts that oblige debtors not to disclose loan terms ([Gelpern et al., 2021](#)). Taken together, these data limitations make it very challenging to trace and quantify China's expanding network of cross-border financial transactions, let alone analyze empirically China's capital exports and its potential impacts on the rest of the world.

In light of the acute data shortcomings, our first step is to compile a new “consensus” database of Chinese official loans to the rest of the world. Building on standard definitions, official lending is defined by creditor, so that we consider direct lending by the Chinese state and state-owned Chinese entities to private and public sector recipients abroad. “Consensus” refers to the approach adopted, which attempts to reconcile what multiple sources record about the same bilateral lending transaction. The data is granular and was gathered from a variety of sources including international treaties, debt contracts, policy reports, as well as the work of academics.

Our new dataset spans more than six decades from 1949, when the People's Republic was established, until 2017, and covers a total of 2151 loans and 2824 grants by Chinese state-owned creditors to 146 emerging or developing countries, with total commitments of 564 billion US\$. Second, we use this data along with information on the terms of the loans to estimate the outstanding debt stocks that more than 100 recipient countries owe to Chinese state-owned creditors since 2000. Third, we compare our dataset of Chinese official lending amounts to official debt statistics and check what part of the debt is publicly reported and how much is “hidden”, in the sense that it is not picked up by the official statistics, in particular by the World Bank's International Debt Statistics. Finally, we revisit debt and default dynamics in developing and emerging markets in the light of our newly collected data on (unreported) debt to China.

We find that the People's Republic has always been an active international lender, even in the 1950s and 1960s, when it lent substantial amounts to Communist brother states. What has made China such a dominant global creditor in the recent 20 years is the strong increase of China's GDP, combined with China's “Going Global Strategy” to foster Chinese investment abroad, which was initiated in 1999. Chinese loans have helped to finance large-scale investments in infrastructure, energy and mining in developing and emerging market countries, with potentially large positive effects for growth and prosperity ([Dreher et al., 2017](#)).

At the same time, China's overseas lending boom resulted in the build-up of high debt servicing burdens in the developing world. According to our estimates, for the 50 countries most indebted to China, the average stock of debt to China's state-owned creditors increased from less than 1% of debtor country GDP in 2005 to 15% of GDP in 2017. For these countries, debt to Chinese creditors now accounts for more than 30% of total reported external debt, on average. In addition, China's official lending abroad typically involves relatively high interest rates and short maturities, in contrast to the mostly concessional lending terms of other official lenders such as the World Bank or OECD governments.

In addition, we find that a substantial portion of China's overseas lending goes unreported and does not appear in publicly available debt statistics. Using unpublished data from the World Bank's Debtor Reporting System, we estimate that the volume of “hidden” lending from China has grown to more than 200 billion USD as of 2016. The resulting “hidden” debt stocks and interest payments to China are particularly problematic in two dozen developing countries. First, debt sustainability analyses and risk pricing are hampered if a country's true debt service burden remains unknown and if part of the debt is excluded from the published aggregates. Second, opacity can be a serious obstacle to crisis resolution, because information on the size and composition of a country's debt is important for fair burden sharing across creditors and orderly crisis management ([Alfaro and Kanczuk, 2019; IMF, 2020; OECD, 2020](#)).

In the last part of the paper, we take a long-run perspective and study the parallels of China's overseas lending boom with the syndicated bank lending boom of the 1970s and 1980s, in which a group of mainly Western commercial banks channeled large amounts of syndicated bank loans to commodity-rich developing countries at a time of booming commodity prices. The sovereign debt situation of many borrowers looks similar to the debt levels of the 1970s, once unreported liabilities to China are taken into account. Similarly, incorporating data on debt restructurings with Chinese state-owned creditors, shows that even prior to the

Covid-19 health crisis, developing countries exhibited elevated levels of sovereign credit events, not captured by standard crisis tallies and rating agencies.

Our encompassing overview on China's official overseas lending opens up new possibilities for future research. Much work remains to be done to understand the global consequences of China's "finance shock". The literature on international capital flows, for example, emphasizes US financial conditions and a related set of well-known "push" and "pull" factors (Calvo et al., 1993; Forbes and Warnock, 2012; Fratzscher, 2012; Bruno and Shin, 2014).<sup>1</sup> It is doubtful that the empirical approach in this literature is well suited to describe China's massive official capital outflows. In a historical context, for example, few would assert, that the vast post-WWII Marshall Plan lending by the US government was driven by the search for yield. As shown in the 200-year study by Horn et al. (2020), rising economic powers have recurrently used government loans to tap into new markets abroad, to secure commodity imports, and to further their global ambitions.

Our paper contributes to various strands of literature that place an emphasis on China. Several papers have studied "uphill" capital flows from emerging markets to advanced countries (e.g. Song et al., 2011; Alfaro et al., 2014; Gourinchas and Jeanne, 2013). In that work, China's central bank features prominently as a buyer of advanced country bonds, but other types of capital exports such as China's "south-to-south" overseas lending are not explored. Another body of research studies the consequences of Chinese lending for economic development and economic growth, often focusing on specific regions, such as Africa (Bräutigam, 2009; Dreher and Fuchs, 2016; Dreher et al., 2018). However, thus far, this literature has not focused on questions of financial stability and debt sustainability (two recent exceptions with a focus on the Belt and Road Initiative are Hurley et al., 2018 and Bandiera and Tsipopoulos, 2020). Others explore Chinese FDI and equity investments in advanced countries (e.g. Fuest et al., 2019), while Agarwal et al. (2020) provide a detailed analysis of the allocation patterns of Chinese institutional investors - a key form of foreign portfolio investments. Yet another line of work is interested in the role of China's currency in the international monetary system, but without exploring the role of capital flows (Prasad, 2016; Farhi and Maggiori, 2019; Ilzetzki et al., 2019). The aim of this paper is to provide both a systematic overview as well as a granular database to study the determinants and consequences of the large-scale overseas lending activities of Chinese official creditors.

The remainder of the paper is structured as follows. Section 2 starts by presenting our new "consensus" database of Chinese official lending flows and debt stocks, including a discussion on definitions and concepts, on our coding approach and sources, and on our method of estimating the outstanding stocks. Section 3 presents key insights from the resulting database: We describe the evolution of Chinese overseas lending over the past decades, the main recipients and typical lending terms. Section 4 compares our results with information reported by debtor countries to the World Bank. We quantify unreported lending flows and estimate the corresponding "hidden" debt to China. Section 5 illustrates the importance of China as an official creditor by revisiting debt and default trends in low- and middle-income countries in the light of our new data. The last section concludes.

## 2. Chinese official overseas lending: an encompassing database of flows and stocks

This section describes our new database of Chinese official lending to the rest of the world and how we construct debt flow and debt stock estimates. We begin by describing key concepts and definitions (subsection 2.1.). We then describe the data sources (2.2.), how we estimate debt stocks (2.3), and compare our data to existing data collections on Chinese lending by other academics as well as to Chinese data sources (2.4.). Overall, we cover more than 2100 Chinese loans and more than 2800 Chinese grants to 146 emerging or developing countries from 1949 to 2017. Debt stocks are estimated for more than 100 recipient countries since 2000.

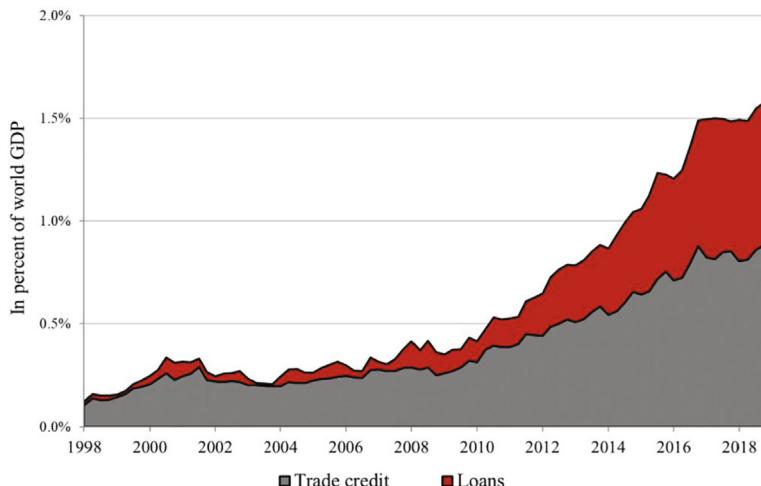
To illustrate China's overseas lending boom over the past 20 years, Fig. 1 shows aggregate data from China's balance of payments (BoP) statistics. China's direct loans and trade credits have climbed from almost zero in 1998 to 1.6 trillion USD, or to more than 1.5% of world GDP in 2018. It is worth noting that these flows of direct loans constitute just one form of a broader surge in Chinese capital exports that also involved record high portfolio debt investments (see appendix Fig. A7 and Agarwal et al., 2020 for details). While portfolio debt outflows were mainly targeted at high-income and selected upper middle-income countries, the direct loans displayed in Fig. 1 mostly go to low- and middle-income countries. In total, estimates suggest that Chinese banks now account for a quarter of total bank lending to developing and emerging markets.<sup>2</sup> Beyond that, however, there is no official data on the characteristics and destination of outstanding claims. Among our tasks is to identify these borrowers.

### 2.1. Concepts, definitions and scope of data collection

We code China's official lending to developing and emerging countries, measured as direct lending by the state and state-owned entities. To do so, we build on the widely used OECD definition of official lending, according to which "Official transactions are those undertaken by central, state or local government agencies at their own risk and responsibility, regardless of whether these agencies have raised the funds through taxation or through borrowing from the private sector. This includes transactions by public corporations i.e. corporations over which the government secures control by owning more than half of the voting equity securities or otherwise controlling more than half of the equity holders' voting power; or through special legislation empowering the government to determine corporate policy or to appoint directors" (OECD, 2018, p. 10).

<sup>1</sup> Also, the literature on a "global financial cycle" is concerned with international financial spillovers from the United States (Obstfeld, 2015; Rey, 2015; Miranda-Agrippino and Rey, 2020; Jordà et al., 2018; Kalemli-Özcan, 2019). Few, if any papers, study capital flows from China and their potential spillovers effects.

<sup>2</sup> These number includes flows via offshore financial centers (see Cerutti et al., 2018, 2020).



**Fig. 1.** China's overseas lending boom. Note: The figure represents a subset of outstanding Chinese overseas debt claims as reported in China's BoP Statistics. Trade credit includes short- and long-term trade credits and advances. Portfolio debt investments are excluded (see Fig. A7). Sources: PBoC and IMF.

When applying this definition to China, official creditors include China's central government, government agencies such as the Ministry of Commerce, as well as lending by China's *state-owned policy banks*, in particular by China Development Bank (CDB) and China Export-Import Bank (Ex-Im). This definition also captures lending by China's *state-owned commercial banks* such as Industrial and Commercial Bank of China (ICBC) or Bank of China (BoC) and supplier credits by state-owned enterprises, which play an important role in overseas finance, in particular under the umbrella of the Belt and Road Initiative. Since China's banking sector is dominated by large, state-owned banks, this definition is likely to capture much of China's capital exports, at least when it comes to direct loans and grants.<sup>3</sup> Appendix Fig. A2 illustrates the institutional landscape of China's overseas creditor institutions in further detail and lists the key players whose lending we track in this paper. Since all creditors in the database are directly controlled by China's State Council, we use the terms official lending and state-driven lending interchangeably (see Fig. A2).

On the recipient side, we cover lending to both the public and the private sector, although almost all of the Chinese official loans in our database are to public debtors. In line with the standard definition, we define public sector entities as "*all resident institutional units that are controlled directly or indirectly by government units*" (see for example IMF, 2011, p. 6). This definition includes central, state and local governments, the central bank and all majority-owned public enterprises.<sup>4</sup> Conversely, private sector recipients are defined as entities that are not state-controlled. As shown below, we identify only few Chinese loans to private sector debtors in low and middle-income countries.

While the distinction between private and public sector recipients is clear in principle, it tends to be blurry in practice, in particular in developing countries and during financial crises.<sup>5</sup> Private debt often turns into public debt once a crisis hits and many of the loans that we code as private might have explicit or implicit government guarantees. This is especially true for private loan recipients in sectors that are of strategic relevance for the debtor country government, e.g. in the energy or oil production industries. To be conservative, however, we nevertheless drop all Chinese loans to non-public entities in the later parts of our analysis, meaning that we disregard lending to private corporations altogether, especially when comparing our aggregates to data on public and publicly guaranteed lending of the World Bank.

Regarding lending instruments, we follow standard practice and include all types of direct (i.e. non-tradeable) debt instruments with maturities exceeding one year (this is in line with e.g. the World Bank, 2020). With this definition, we cover a broad range of different instruments, including concessional government loans, supplier credits, commercial bank loans, or large syndicated bank loans. We also include oil-backed loans that take the form of advance payments by China's state-owned oil importers.<sup>6</sup> Furthermore, our data tracks (non-repayable) grants that form an important part of concessional flows.

Building on these definitions, we gathered information on commitment amounts for each transaction, the creditor and borrower type, the year of the commitment and, whenever possible, the terms, i.e. the currency denomination, the interest rate,

<sup>3</sup> In addition to China's three policy banks (China Development Bank, China Export-Import Bank and the Agricultural Development Bank of China), the country's four largest commercial banks by assets are all state-owned (ICBC, Bank of China, China Construction Bank, Agricultural Bank of China). For an overview on China's banking system see Allen et al. (2012) and Amstاد et al. (2020).

<sup>4</sup> For more details, also see chapter 22 of the 2008 System of National Accounts jointly published by the European Commission, the IMF, the OECD, the UN and the World Bank.

<sup>5</sup> A large empirical and theoretical literature shows that governments tend to assume debts of private banks and corporations during crises and that SOE debt often migrates to the government balance sheet (Winkler, 1933; Schneider and Tornell, 2004; Reinhart and Rogoff, 2011; Bordo and Meissner, 2016). For insightful case studies on the assumption of private debt by sovereigns see Díaz-Alejandro (1985) on the Latin American debt crisis of the 1980s, Burnside et al. (2001) on the Asian Crisis or Obstfeld (2014) on the Euro Zone crisis.

<sup>6</sup> In these contracts, the state-owned Chinese oil importers CNPC and PetroChina make large, interest-bearing advance payments on long-term oil supply contracts. We are able to identify only four such transactions to two countries, but commitment amounts are large (2 billion USD to Ecuador and 35 billion USD to Russia).

the maturity and the grace period.<sup>7</sup> We also include, to the extent available, information on subsequent debt restructurings with Chinese state-owned creditors. Our primary and secondary data sources are described in detail in the next subsection.

## 2.2. A consensus database of lending flows: sources and merging approach

Our data collection is based on a broad range of data sources, including publicly available databases, historical archives, country-specific debt reports and much of the existing literature. In the following, we provide a summary on our sources and our merging and verification approach. [Appendix A](#) describes the underlying sources and methods in greater detail. We dub the resulting data collection as a “consensus database” because it attempts to reconcile what multiple sources record about the same bilateral lending transaction.

### 2.2.1. Data sources for modern period (2000–2017)

For the modern period, our main source is AidData's Chinese Official Finance database ([Dreher et al., 2017](#)), which encompasses more than 1200 loans and 2300 grants to 140 recipient countries during 2000–2014 and was coded from hundreds of primary sources. We complement and cross-check this rich source with various region- and sector-specific databases that have excellent coverage for subsets of China's foreign lending and which allow us to extend our dataset until 2017. These sources are summarized in [Table 1](#) below and include Boston University's China Global Energy Finance database ([Gallagher, 2019](#)) that tracks Chinese lending in the energy sector, the China Latin-America Finance Database by [Gallagher and Myers \(2019\)](#) and the data on Chinese lending to Africa by Johns Hopkins University ([Bräutigam et al., 2020](#)). These sources identify Chinese lending on the basis of a large number of primary sources that range from Chinese embassy statements and reports in Chinese (government-affiliated) media to annual reports of recipient entities as well as the implementing agencies (e.g. construction companies or Chinese suppliers). We further complement these sources with a variety of country-specific reports and academic studies listed in detail in [Appendix A](#).

### 2.2.2. Merging data sources and reconciling conflicting information

To generate our consensus database, we embark on an extensive merging and cleaning process that entails examining the details of more than 5000 loans and grants. In particular, we compare each loan or grant across all data sources in the case their coverage overlaps. As a first step, we filter out duplicates and identify missing data points as well as conflicting information between data sources. Whenever we encounter conflicting information between two databases, we move beyond the above listed databases and consult the primary sources ourselves. In these cases, we follow two conservative coding rules to minimize upward bias from measurement error: First, we exclude loans that we cannot verify on the basis of primary sources. Second, if data sources disagree on the commitment amount of a transaction, we use the lower of the two amounts in order to err on the downside rather than on the upside. Finally, and once data collection is completed, we conduct a series of cross-checks and benchmarking exercises, in which we compare our micro-level data collection to aggregate numbers in the annual reports and balance sheets published by individual Chinese creditor banks (see [Section 2.4](#)).

### 2.2.3. Data sources for historic period (1950–2000)

To go further back in time, we collected a large number of historical sources, most importantly a set of recently declassified CIA reports that contain rich transaction-level details on China's international grants and loans in the post-WWII era. We cross-check and complement the information from this source with multiple other archival documents and sources on Chinese overseas lending going back to 1949, when the People's Republic was founded. Data gathering was most difficult for the 1990s. For this decade, our coverage of Chinese official lending is incomplete, mainly because no CIA reports have been declassified (yet). As an alternative, we draw on the academic work of [Hawkins et al. \(2010\)](#) and on [Copper's \(2016\)](#) three-volume history of Chinese aid.

### 2.2.4. Data sources on debt restructurings with Chinese official creditors

As described above, our consensus database on Chinese official lending also aims to capture all instances, in which debt to Chinese creditors was restructured. In this context, we follow standard definitions of credit rating agencies and consider all loan term adjustments that resulted in less favorable terms for the creditors, e.g. due to debt write-offs, reduced interest rates, or longer maturities (for a discussion see [Cruces and Trebesch, 2013](#)). As is the case for the lending data, there is no official data source that tracks defaults on or restructurings of debt to Chinese official creditors. It is, however, possible to generate an (incomplete) picture using the information on defaults and debt restructurings from a variety of academic sources and policy reports. For the historic period, we rely mainly on information on debt relief events contained in declassified CIA reports and in [Lin \(1993\)](#). For the past two decades, information on credit events can be gained from the AidData Chinese Official Finance database ([Dreher et al., 2017](#)), from [Acker et al. \(2020\)](#), [Hurley et al. \(2018\)](#), [Kratz et al. \(2019\)](#) and from selected IMF country reports. Through these sources, we identify a total of 164 restructuring events with Chinese state-owned creditors since 1950. Since neither Chinese state-owned creditors nor their debtors provide detailed information on the terms or outcomes of the restructurings, our data only includes a simple dummy variable that indicates the occurrence of a credit event.

<sup>7</sup> The grace period of a loan is the time period after the loan commitment, in which the borrower does not need to make amortization payments.

**Table 1**

Data sources on Chinese foreign lending, 1950–2018.

Institution	Dataset/source	Geographic coverage	Time coverage	Type	Total commitment
AidData at William & Mary	China's Official Finance Database	Global	2000–2014	Loans and grants	275 bn
	China's Public Diplomacy Dataset	East Asia & Oceania	2000–2016	Loans and grants	38 bn
Boston University GDPC	China's Global Energy Finance	Global	2000–2019	Energy finance	251 bn
Inter-American Dialogue	China - LA Finance Database	Latin America	2005–2019	Loans	137 bn
Johns Hopkins CARI	Chinese Loans to Africa	Africa	2000–2018	Loans	148 bn
Lowy Institute	Chinese Aid in the Pacific	Pacific Islands	2002–2018	Loans and grants	6 bn
CIA	Reports on Communist Aid	Global	1950–1983	Loans and grants	6 bn
Lin (1993)	Foreign Aid of the PRC	Global	1950–1992	Loans and grants	11 bn
Bartke (1989)	Chinese Aid Projects	Global	1950–1988	Aid projects	n.a.
Copper (2016)	China's Foreign Aid & Investment	Global	1950–2015	Country case studies	n.a.
Our merged database	Horn, Reinhart, Trebesch	Global	1950–2017	Loans and grants	564 bn

Note: A complete list of sources and the respective references are provided in the appendix. Commitments are in current USD.

### 2.2.5. Final database coverage

Our final, unified database covers 2151 loans and 2824 grants by different Chinese state-owned creditors to 146 countries and spans the history of the People's Republic from 1949 to 2017, with total recorded commitments amounting to 564 billion USD. As the next step, we use this flow data to estimate the corresponding debt stocks.

### 2.3. Estimating debt stocks from flow data: 2000–2017

To estimate outstanding debt stocks from the loan-level (flows) data we estimate repayment histories for each loan and then aggregate these at the country-year level. The result is a new annual time series database of debt stocks owed to Chinese official creditors, and the associated interest and amortization payments. This procedure requires reliable data on the repayment terms of each loan, which is best available for the period 2000–2017. The dataset therefore starts in 2000 and covers 108 recipient countries of Chinese direct lending for which sufficiently detailed lending data is available (Table A2 in [Appendix A](#) provides the country list). This section discusses how to impute loan terms for observations, for which detailed information on loan terms is not available. We also explain how we adjust our lending data in order to account for loans that are likely to be undisbursed.

#### 2.3.1. Imputing loan terms

For about one third of all loans in our dataset, we know all necessary details on interest rates and repayment terms, in particular the grace period and the years to maturity, mainly using the entries from AidData, the Johns Hopkins CARI database and information from a variety of country-specific sources that are listed in [Appendix A](#). To extend coverage of loan terms to a broader sample, we make use of the fact that Chinese official lending practices are highly standardized and largely predetermined by who lends (see [Bräutigam, 2009](#); [Gelpern et al., 2021](#)).

We therefore created a typology of creditor-specific lending terms, complementing the quantitative patterns we see in the data with qualitative information from the websites and annual reports of the most important Chinese creditor agencies. Chinese official loans fall into three broad categories:

- (i) Interest-free, highly concessional loans with zero interest rate, 20-year maturity and 10-year grace period, by China's central government, usually represented by the Ministry of Commerce that oversees China's foreign aid program. These loans make up a very small share of overall Chinese official foreign lending (just 0.5% of commitments in our database).
- (ii) Concessional Government Loans and Preferential Export Buyer Credits by the China Export-Import Bank: These loan instruments are subsidized by the Chinese government and carry fixed interest rates of 2 to 3%, 20-year maturity and a 5-year grace period. Concessional loans by the Export-Import Bank account for about 15% of all commitments in our database.
- (iii) Commercial terms on loans by the China Export-Import Bank, the China Development Bank and by state-owned commercial banks and enterprises. On average, the interest rate in this category is 5% (2% over the 6 months LIBOR), the grace period is 4 years and the maturity is 13 years. More than two thirds of all commitments in our database fall in this group.

We group all loans, for which no detailed lending terms are known, to one of the three categories based on their creditor agency and instrument type and assign to them the category-specific values.<sup>8</sup> Taken together, this approach gives us detailed lending terms for around 85% of lending commitments in our database. For the remaining 15%, no clear assignment into one of the categories is possible. This group comprises a small number of transactions, in which the official creditor agency is unknown and 70 billion in loans (14% of the sample) by China Export-Import Bank, for which the lending instrument could not be identified. Since China Export-Import Bank provides both concessional (category 2) and commercial loans (category 3), no clear

<sup>8</sup> As an alternative approach, we can estimate a simple linear regression model, in which we regress loan terms on dummy variables for the creditor agency, loan type and time fixed effects. We then use the estimated coefficients of this model to impute loan terms for those transaction, for which we lack information on loan terms. This exercise yields very similar results for imputed loan terms and estimated debt stocks.

imputation of terms is possible. For this group we make the assumption that loans are extended at concessional terms as in category 2, i.e. at 2% interest, 5-year grace periods and maturities of 20 years.<sup>9</sup>

### 2.3.2. Treatment of late payments

One potential source of (*downward*) bias in our debt stock estimates is that we do not know whether payments have been made on schedule or not. Specifically, we have no systematic information on late payments (arrears), even though press reports regularly report that developing countries delay or miss their debt servicing obligations towards Chinese creditors. Given the lack of data, we assume that all repayments have been made on schedule when estimating debt stocks, so we assume zero arrears. This assumption is likely to result in an underestimation of debt stocks, because arrears that build up over time result in increasing debt stocks (see Schlegl et al., 2019) and this increase is not reflected in our estimates.

### 2.3.3. Commitments versus disbursements

Another important challenge for estimating debt stocks is that much of our loan-level data is based on commitment amounts. This could result in an *upward* bias in estimated debt levels in countries where loans are disbursed with delay, or not at all (note that this concern does not apply in the same way for the benchmarking exercises involving World Bank data in Section 4, for which we compare commitments to commitments, see below).

To deal with the lack of disbursement data, we drop a large number of projects from the sample, for which the full disbursement of committed amounts is unlikely. Specifically, we drop all umbrella or framework agreements that represent general credit lines between China and the recipient countries without specifying actual projects. We further exclude all projects that are known to have been canceled or suspended or for which there is evidence available that they are not being implemented.<sup>10</sup> Moreover, we exclude all loans that as of the end of 2017 remained in an initial “pledge phase”, i.e. projects, for which only an initial Memorandum of Understanding has been signed, but for which there is no evidence that the loan has been formalized and paid out.

Despite these adjustments and checks, we might still overestimate debt to China for some countries or years, in particular when we have no indication or data suggesting that disbursements fall short of promised commitments. To assess the scope of this potential bias, we conduct a range of checks and compare our estimates with available information from balance sheet and balance of payments data. The resulting sensitivity analysis is presented in the next section.

## 2.4. Sensitivity analysis of debt stock estimates: measurement error, sluggish disbursements and aggregate comparisons

In this section we present robustness checks regarding our estimated debt stocks owed to China. Two forms of measurement error are of particular concern. As mentioned above, slow or incomplete disbursement of loan commitments can lead to *upward* bias in estimated debt stocks. On the other hand, our numbers and estimates could be biased *downward*, since we are not able to identify all relevant Chinese loans and due to the accumulation of delayed payments (arrears) resulting in a higher debt stock. To assess the empirical relevance of these concerns, we first compare our estimated aggregate debt stocks to data made available by Chinese authorities and banks. Second, we conduct a sensitivity analysis that explicitly accounts for sluggish loan disbursement. Third, we combine the two approaches and benchmark our aggregates to Chinese balance of payments data over time, differentiating between full and sluggish disbursements. The results indicate that we are likely to underestimate the true extent of official Chinese lending worldwide. We conclude that the main form of measurement error in our data collection and debt estimation is a downward bias from not identifying all relevant lending transactions.

### 2.4.1. Benchmarking our data to aggregate numbers and bank-level balance sheets

With estimated debt stocks on hand, a plausible cross-check is to compare our estimates with available aggregate balance-of-payments data for China and bank-level balance sheets. Our estimates on debt stocks show that the 108 countries in our sample owed 392 billion USD to Chinese official creditors at the end of 2017. This number is considerably smaller than the debts reported in China's International Investment Position, which shows a total of 637 billion of outstanding loans.<sup>11</sup> Another piece of evidence is provided by Cerutti et al. (2018) who, based on confidential data reported to the BIS, report a stock of 919 billion USD in Chinese bank claims towards emerging market debtors at the end of 2018. This estimate is more than twice the amount of 392 billion USD we were able to trace down for developing and emerging markets as of 2017.<sup>12</sup> They further show that two thirds of total Chinese bank lending to EMEs is channeled through offshore financial centers and foreign affiliates of Chinese banks. These offshore flows are often hardest to track, as emphasized by Zucman (2013) or Coppola et al. (2019).

The granular nature of our data also allows to compare our debt stock estimates at the level of individual creditor banks. For this purpose, we searched for publicly available balance sheet data and annual reports that show at least partially disaggregated data, focusing on the big Chinese creditor banks that are most active in the country's overseas lending. This exercise suggests that we are likely underestimating Chinese official claims abroad. One example is China Development Bank (CDB), one of the largest

<sup>9</sup> Aggregate debt stocks in 2017 change by less than 2% if we assume instead that these loans are extended at commercial terms (as in category 3).

<sup>10</sup> For Africa, there is up to date information on the status of loans in the Johns Hopkins CARI database (Bräutigam et al., 2020). Here we drop all loans that were signed but are not being implemented. Note that the share of these loans in the database is low at just 7% of total commitments.

<sup>11</sup> The 392 billion USD figure builds on our main sample of 108 developing and emerging countries, but the full sample figure is almost the same. Nevertheless, part of the discrepancy to the IIP value might be explained by direct lending to advanced countries, for which no rigorous data collection exists.

<sup>12</sup> The gap to the BIS data might partly be explained by overseas deposits and holdings of portfolio debt that we do not aim to capture here.

Chinese overseas lenders. In its annual report of 2015, CDB reports total outstanding overseas loans of 210 billion USD (only this aggregate number is available, but no breakdown by destination country). In comparison, our dataset identifies a stock of 145 billion in outstanding overseas loans of CDB towards developing countries in 2015, about 69% of the aggregate reported number. Two other examples are Bank of China (BoC) and the Industrial and Commercial Bank of China (ICBC), two of China's four large state-owned commercial banks, for which the gap is even larger. In its 2017 annual report, Bank of China reports to have extended credits totaling 100 billion USD to Belt and Road countries since 2015. In comparison, we only capture around 25 billion USD in BoC loans as of 2017. Similarly, ICBC reports to have extended 94.5 billion USD in overseas credit facilities by 2017, of which we capture only 38 billion USD.

For lending to Belt and Road projects, we can also refer to a recent World Bank report, which is based on a survey on China's BRI investment projects (Bandiera and Tsiropoulos, 2020). The report identifies around 500 billion USD in Chinese investments to 50 developing countries between 2013 and 2018. Of this amount, around 300 billion USD are estimated to have been financed via public and publicly guaranteed debt. For the same 50 BRI countries and a slightly shorter time span (2013 to 2017), we identify only 130 USD billion in Chinese loan commitments. Our data thus covers only around 40% of their aggregate loan commitment estimate. Fig. 2 summarizes our benchmarking exercise.

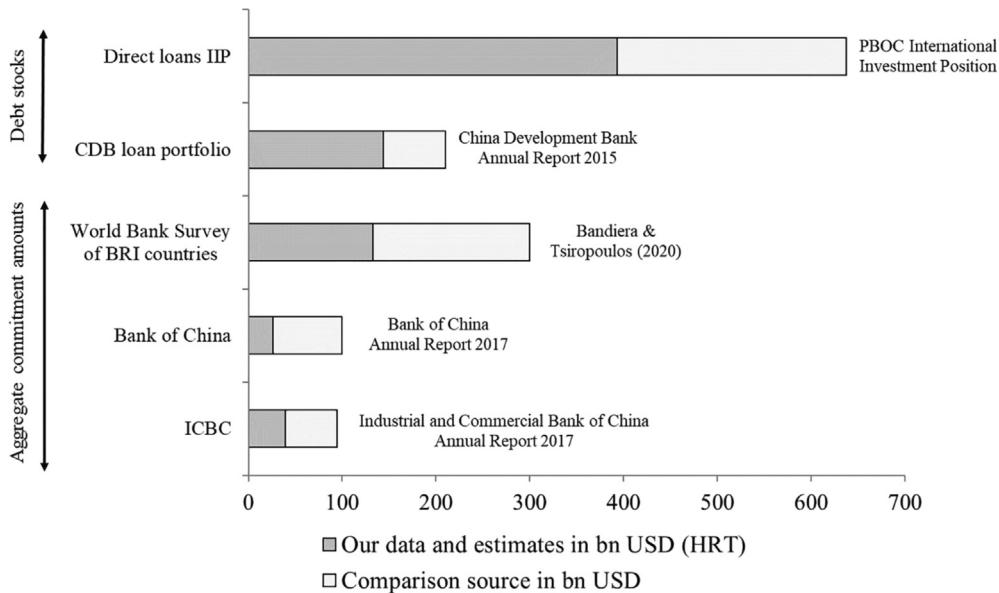
#### 2.4.2. Commitments vs. disbursements

As noted above, our debt stock estimates are biased upwards if loan disbursements fall short of our (adjusted) commitment series or are more gradually spaced than commitments. In this section, we check the relevance of this concern, by assuming delayed disbursements for all loans in our dataset.

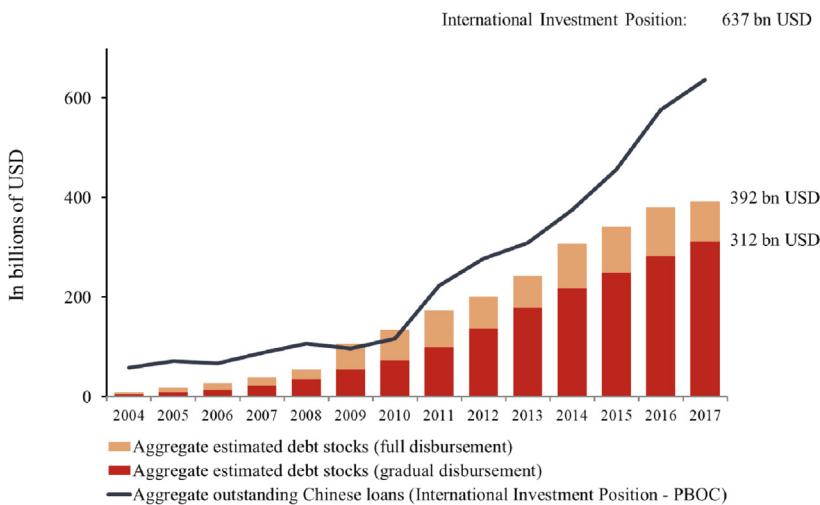
To learn about the time lag between commitment and disbursement of Chinese official loans, we evaluated micro-level data for around 200 Chinese development projects. We found that most projects are implemented within 4 years and that, by the end of year 5, more than 85% of projects had been completed. One can thus assume that the average delay between commitment and full loan disbursement is also around 4 to 5 years. This number is broadly in line with the median grace period of 5 years on Chinese loans in our dataset.

For the purpose of this sensitivity analysis, we therefore assume that commitment amounts are disbursed linearly over the course of each loan's grace period. For example, take a loan signed and committed on January 1st, 2016 with a 5-year grace period. Two years later, in end-December 2017, we assume that only 2/5th (40%) have been disbursed. Our estimated debt stocks for end-2017 would thus include only 40% of a loan committed in early 2016.

This analysis shows that delayed disbursements yield lower debt stock estimates, as expected, but the bias does not change the big picture on the amounts and destinations of Chinese official lending. In the sample of the top 50 most indebted recipients, the estimated debt disbursed and outstanding decreases by an average of 20% in comparison to the benchmark estimate in 2017. This corresponds to an average decrease in the debt to GDP ratio by around 3% of GDP. There are only few countries, for which the introduction of sluggish disbursements makes a large difference, in particular a few smaller economies such as Djibouti or the Maldives that have received large Chinese commitments for infrastructure projects recently.



**Fig. 2.** Benchmarking our data and estimates to official information. Note: The figure shows the results of different benchmark exercises that compare our lending data and debt stock estimates to a variety of officially reported numbers on Chinese overseas lending. See text for sources and details.



**Fig. 3.** Aggregate external debt stocks to China with and without sluggish disbursement. Note: This figure compares our estimated aggregate debts stocks per year (red bars, baseline) with estimates assuming sluggish disbursement (dark red bars, see sensitivity analysis above). The blue bold line shows total Chinese overseas loans (on non-residents) as published by the PBoC in its International Investment Position.

#### 2.4.3. Benchmarking over time

Thus far, we have used a single year as benchmark, and find that our aggregate estimates on external debt to China decrease by 20% (or 80 billion USD) when assuming sluggish disbursement. Fig. 3 now shows the estimates over time, both with and without assuming sluggish disbursement (dark red and light red bars, respectively). We complement the graph with PBoC data on the evolution of total Chinese loans outstanding, as reported in the country's International Investment Position (IIP, blue line). Maybe the most important insight of this graph is the wide gap between our estimated aggregate debts owed to China and the IIP data on Chinese overseas loan claims. Importantly, the gap gets even wider once we use the debt estimates with sluggish disbursements. Indeed, for 2017 that estimate is less than half the IIP number.

Taken together, the comparison of both aggregate and bank-level data suggests that, despite our best efforts to gather data from as many sources as possible, we capture only about 50–65% of total Chinese overseas loans. The lending aggregates and debt stocks we report can therefore be regarded as a lower bound, at least in aggregate.

### 3. China's overseas lending 1950–2017: overview and recipient countries

This section presents main findings from our data. We show that the Chinese government has always been an active international lender. However total lending amounts have risen to new records since 2008. As of 2017, China has become the largest official creditor to developing and emerging countries, with outstanding claims surpassing those of the World Bank or those of all Paris Club Governments combined. At the same time, we find that the lending terms differ from those of most OECD governments. More than two thirds of China's official lending is extended at commercial terms that are similar to those arranged with private international creditors, i.e. with comparatively short maturities and non-concessional interest rates.

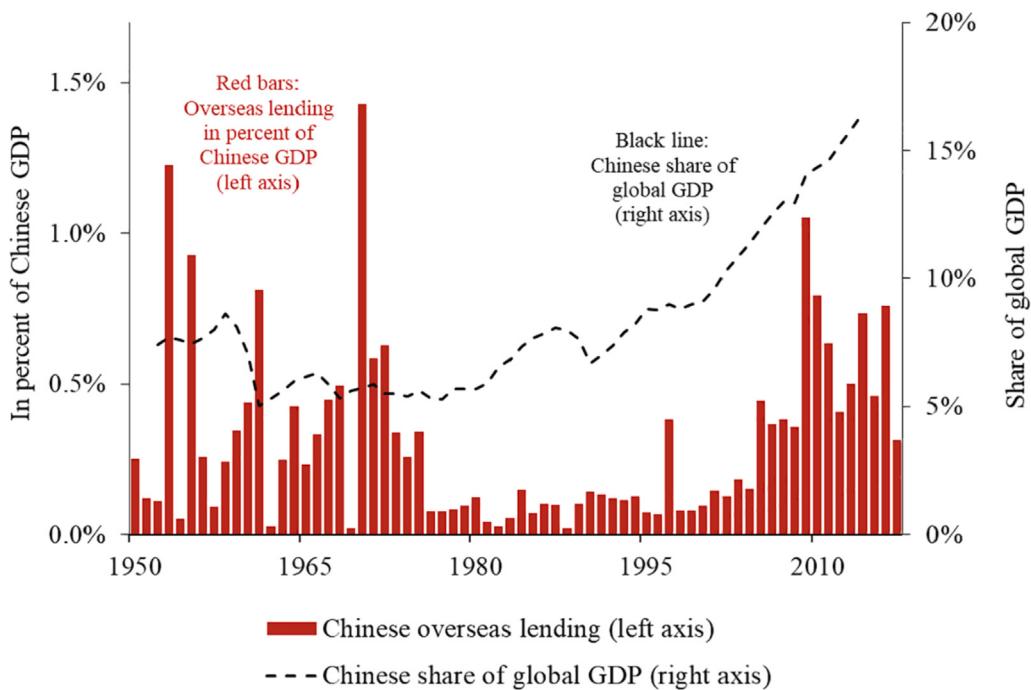
#### 3.1. China has always been an active international lender

A first insight from our dataset is that the People's Republic of China has extended considerable international loans since its foundation in 1949 (see Fig. 4). During the 1950s and 1960s, the Chinese government channeled sizeable bilateral loans and grants to selected communist allies, even though the country was going through severe hardship and famines (Meng et al., 2015). Overseas official lending was much lower in the 1980s and 1990s, and starts rising again in the early 2000s in the wake of China's "going-out" policy. This coincides with China's economic boom and its increasing share of world GDP, which is illustrated with the black dotted line. Now that China represents more than 15% of global GDP on a purchasing power parity basis, the financial ramifications of its overseas lending are larger than ever before.

Along with the much larger amounts, the geographic scope of China's official lending has also increased notably. The share of developing and emerging countries receiving Chinese official grants or loans has increased to more than 80% as of 2017 (Fig. 5). With almost full global coverage, US official lending is still further-reaching than Chinese official finance, but the gap is narrowing.

#### 3.2. China is the world's largest official creditor

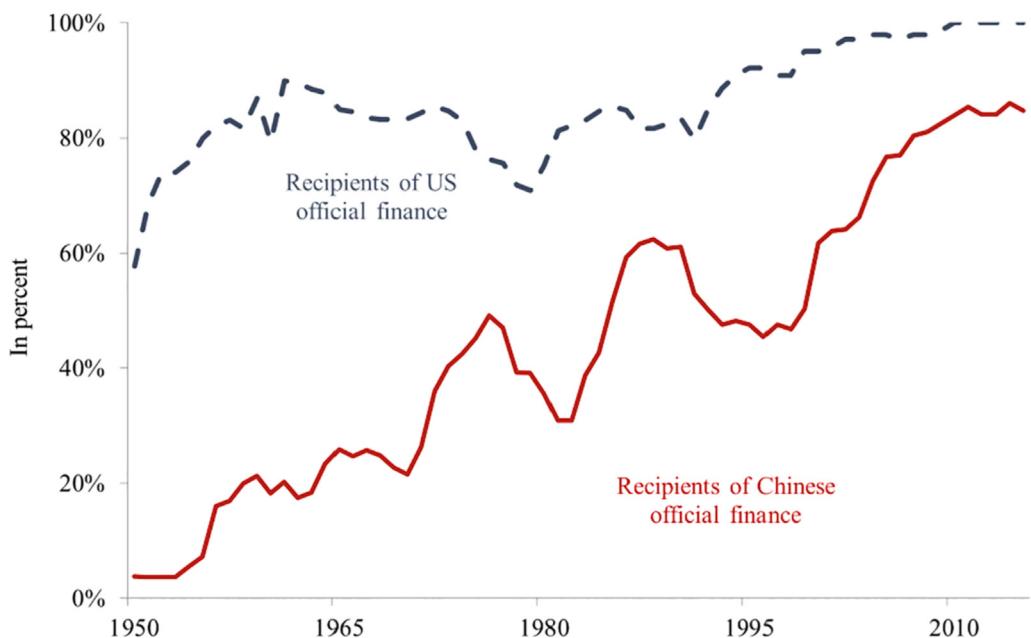
The flipside of the large-scale lending flows are increasing debt stocks and growing annual debt service obligations in many recipient countries. Fig. 6 ranks countries that are most indebted to Chinese official creditors in terms of their domestic GDP. The debt stock estimates include both loans to public borrowers as well as to private borrowers in recipient countries, although



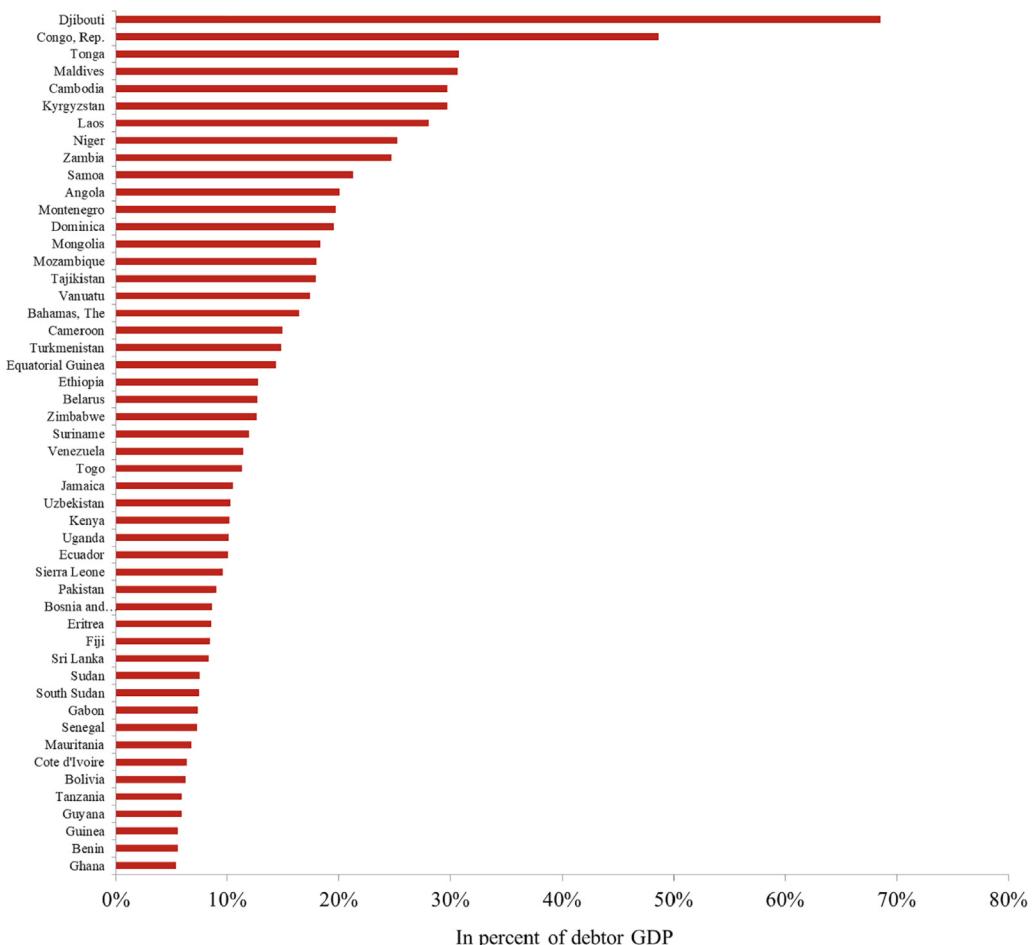
**Fig. 4.** China has always been an active international lender, 1949–2017. Sources: Chinese official lending commitments from our database (Appendix A), Chinese share of global GDP on a purchasing power parity basis from the Penn World Tables (Feenstra et al., 2015).

official lending to private entities account for less than 10% of total flows (see Fig. 10 below; we drop private borrowing in much of the remainder of our analysis).

More than two dozen countries now owe more than 10% of their GDP to Chinese state-owned creditors. On average, for the top 50 most indebted recipients of Chinese direct loans, debt to China has increased to more than 15% of their respective GDP



**Fig. 5.** China vs the US – global reach of direct, official lending. Note: Share of developing and emerging countries that have received Chinese or US official funds during the past five years. The data on US official lending is from Horn et al. (2020).



**Fig. 6.** External debt to China (estimated debt stock as share of GDP) – top 50 recipients. Note: Estimated stock of total external debt from direct loans owed to China as of 2017. Data is shown for the 50 countries that are most indebted to China in terms of their GDP. Total debt includes loans to public sector borrowers as well as to private sector borrowers. Sources: HRT database (see Appendix A) and World Economic Outlook.

in 2017. Among these are many commodity exporting low income developing countries (LIDCs) as well as former highly-indebted poor countries (HIPCs) who benefitted from large-scale official debt relief in the 1990s and 2000s.<sup>13</sup>

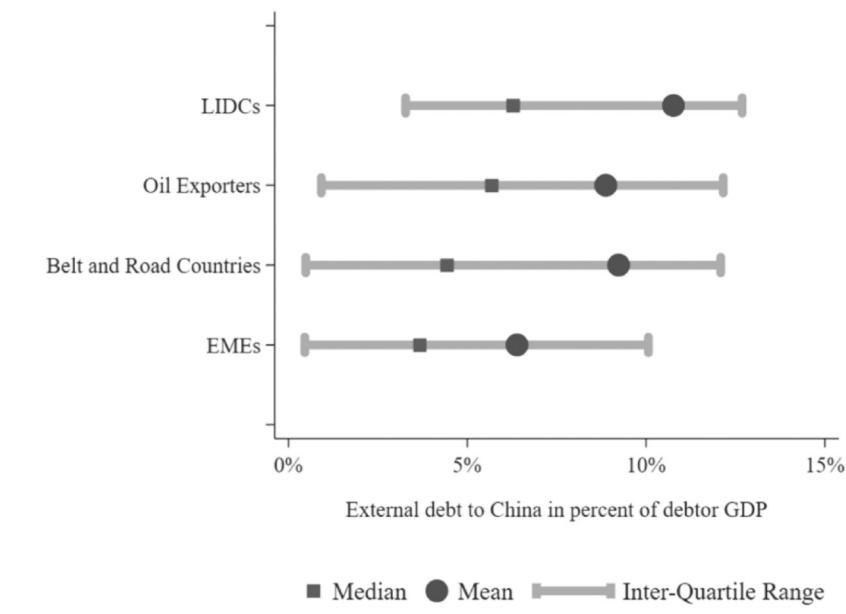
Fig. 7 (Panel A) shows that the average LIDC indebtedness to Chinese state creditors was 10.8% of GDP as of 2017. This compares to an average of 6.4% of GDP owed by emerging market (EME) countries. Oil-exporting countries, such as Angola, Ecuador, Niger, or Venezuela are also highly indebted to China, as are countries that are commonly associated with China's Belt and Road Initiative (listed in [World Bank, 2019](#)). For the BRI countries, the average is a high 9.2% debt to GDP, while the median is comparatively low at 4.4% debt to GDP. This reflects the fact that some BRI countries have already borrowed heavily from China (pushing up the average), while others, e.g. in Eastern Europe and the Middle East, have only recently joined the BRI and were not as highly indebted as of 2017.

Panel B of Fig. 7 shows that the regions most indebted to China are Far East Asia and Central Asia, including several small economies that are in geographic proximity to China, such as Laos, Cambodia, and the Kyrgyz Republic. Next come Sub-Saharan Africa and Latin America, as well as some parts of the MENA (Middle East and North Africa) region. The debt flows to Eastern Europe are smaller, when measured as a share of debtor country GDP, but the amounts of credit to Europe have been growing over the past five years. To complement these graphs, Fig. 8 shows a world map on the scale of indebtedness towards Chinese official creditors, measured as a share of debtor country GDP.

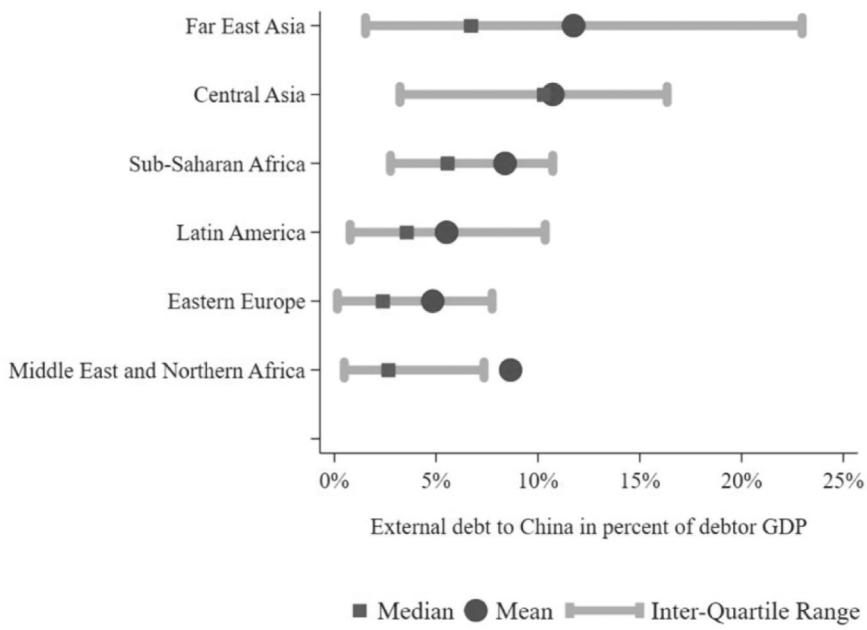
Fig. 9 sums up total outstanding Chinese official claims towards 120 developing and emerging market countries contained in the World Bank International Debt Statistics and compares these to the debt stocks owed by this group to other official creditors.<sup>14</sup> The main takeaway is that China has become the world's largest *official* creditor, surpassing the outstanding claims of

<sup>13</sup> Through the HIPC Initiative multilateral and bilateral official creditors provided full or partial debt relief to 39 heavily-indebted poor countries (HIPCs). 21 of these countries (54% of HIPCs) are in our top 50 group of borrowers from China (see Fig. 6), i.e. owe more than 5% of their GDP to Chinese state-owned creditors.

<sup>14</sup> For the purpose of this comparison, we drop Chinese official claims on *private* sector entities from our data and from Fig. 9. Data on claims on private sector recipients is not available for multilateral and Paris Club creditors.



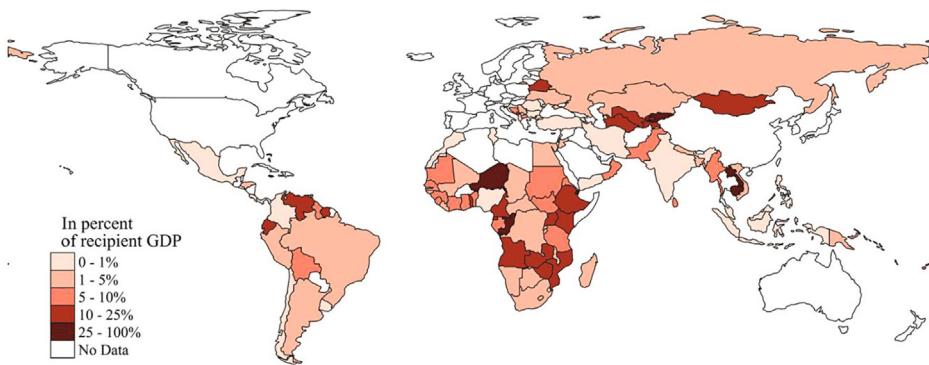
Panel B. Debt to China by region



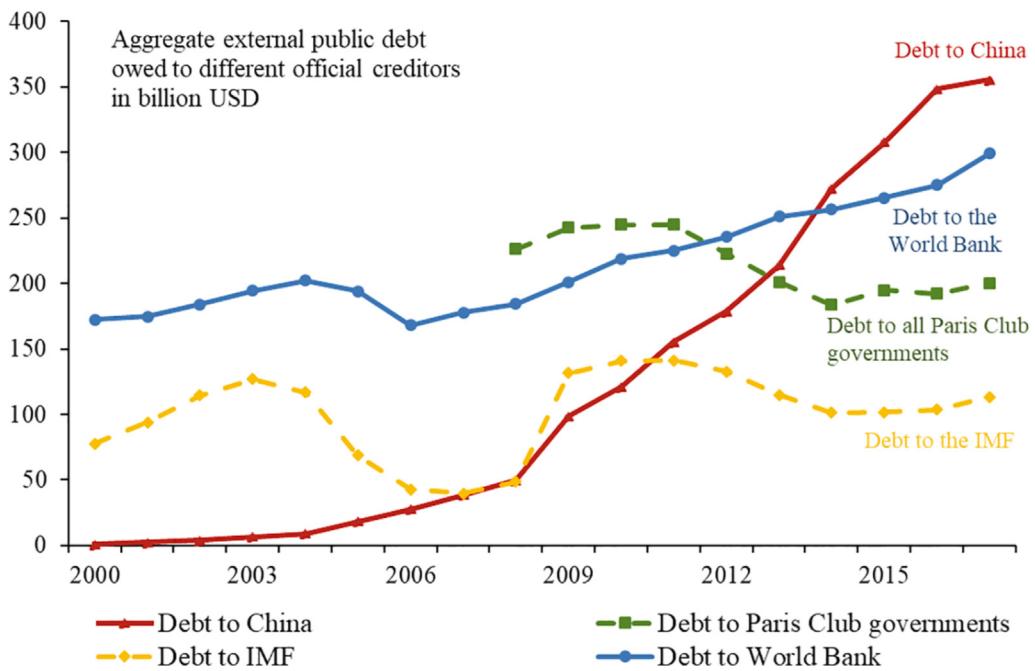
**Fig. 7.** External debt to China by region and functional groups (as of 2017, share of GDP). Panel A. Debt to China by country group. Panel B. Debt to China by region.  
Note: Debt estimates are based on loan-level data (see text and Appendix A) and include loans to public borrowers as well as to private borrowers. GDP and country classifications from IMF WEO, LIDCs stands for Low Income Developing Countries. See Appendix A for the list of countries in our sample.

the World Bank, of the IMF, or of all 22 Paris Club governments combined.<sup>15</sup> According to our estimates, developing country public borrowers owed a total of 355 billion USD to Chinese official creditors in 2017. This compares to around 200 billion USD owed to the 22 Paris Club member governments and to 300 billion USD owed to the World Bank (see Fig. A6 in Appendix A for a comparison at the country level).

<sup>15</sup> The largest overall (private and official) gross creditor country remains the United States.



**Fig. 8.** World map of external debt to Chinese official creditors (as of 2017, direct loans only). Note: The debt estimates are based on loan-level data (see text and Appendix A) and show total external (private and public) debt to Chinese official creditors. GDP data is from the IMF World Economic Outlook.



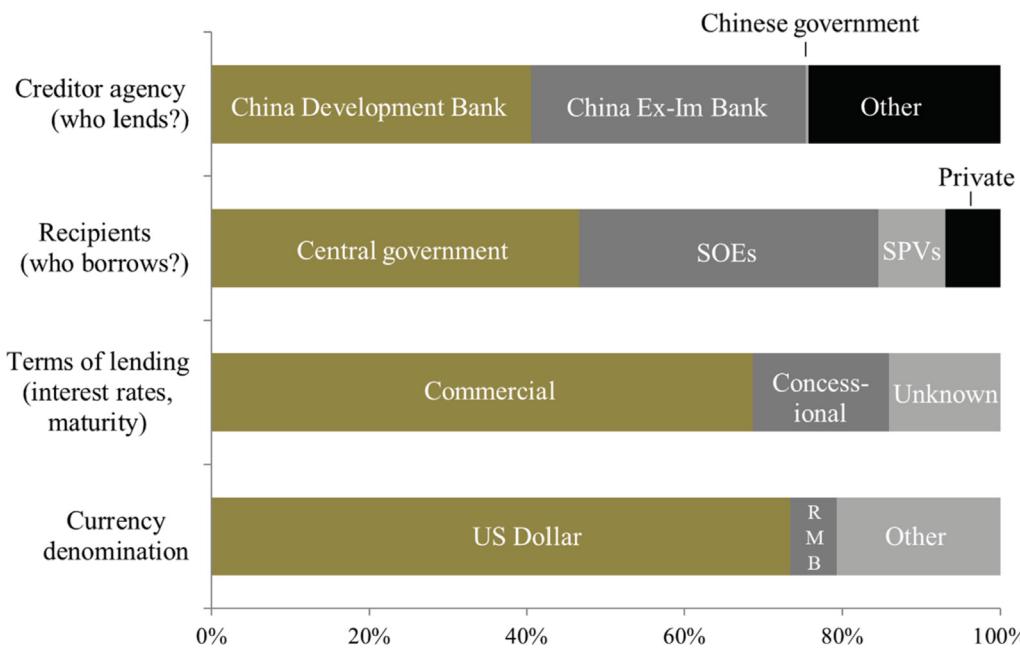
**Fig. 9.** China is the largest official creditor to the developing world. Note: This figure shows aggregate public debt to different official creditors for all developing and emerging market countries contained in the World Bank International Debt Statistics (excluding China). Debt to Chinese official creditors is based on our own estimates introduced above. Debt to all 22 Paris Club governments is taken from the Paris Club website (available since 2008). Debt to the IMF and the World Bank Group (IBRD plus IDA) is from the World Bank's International Debt Statistics. Unlike in Figs. 6, 7 and 8, we now drop private debt to Chinese official creditors to make the different series comparable.

### 3.3. Lending terms: are these official or commercial loans?

We now explore the loan characteristics in detail. Fig. 10 summarizes the characteristics of China's official lending as weighted averages. We consider all loans in our sample since 2000 and use loan commitment amounts for weighting.

On the creditor side, two policy banks have dominated China's official lending universe over the past two decades. In our dataset, the Chinese Export-Import Bank and China Development Bank account for more than 70% of all direct cross-border lending between 2000 and 2017 while government entities such as the Ministry of Commerce play only a subordinated role (see also Fig. A5 in Appendix A showing the share of each creditor per year).

On the borrower side, central governments account for close to 50%, or 245 billion USD, of total lending commitments in our database between 2000 and 2017. Next come state-owned enterprises with 200 billion USD and special purpose vehicles in the mining, infrastructure and energy sector with 45 USD billion. As we discuss in Section 4, these quasi-sovereign entities often fail to report details on their liabilities and debt stocks to their own government and/or international organizations. Lending to SOEs can therefore result in significant reporting gaps at the country and global level. Lastly, private sector borrowers account



**Fig. 10.** Characteristics of Chinese official overseas loans. Note: The figure shows commitment-weighted shares in our dataset of Chinese official lending since 2000. See Appendix A and Section 2.2 for details on sources.

for 35 billion USD or 8% of total. This is small compared to the large lending amounts to public sector recipients, although we acknowledge the possibility that flows to private corporations might be particularly hard to identify.

Regarding lending terms, many of China's official overseas loans resemble commercial international lending transactions. Most loans are denominated in US dollars and interest rates tend to be non-concessional, i.e. reflect risk premia. For example, in low income countries China's loans typically have interest rates of 2 to 3%. This is in contrast to the typical LIDC loans or grants by multilateral creditors, which tend to be interest-free. To emerging markets and middle-income countries, most Chinese official loans are extended at market terms, meaning with interest rates that are comparable to those prevailing in private bond or loan markets. For example, Ecuador in 2010 borrowed 1.7 billion USD from China Export-Import Bank at 7% interest over 15 years. As shown in Appendix A both the currency weights and lending terms have been rather stable over the past two decades (Figs. A3 and A4, respectively).

Moreover, the loans enjoy a comparatively high degree of seniority, since they are often backed by collateral and because debt stocks and repayment flows are not public information. Most importantly, the interest and principal repayments are often secured, either in the form of commodity export proceeds (e.g. from raw materials and agricultural products) or through the proceeds from financed projects (Bräutigam and Gallagher, 2014). To our knowledge, no other official lender collateralizes its international loans in this way, at least not this systematically (for a detailed analysis of international lending contracts by Chinese state-owned entities see Gelpern et al., 2021).

All of these features are unusual for official lending as extended by OECD governments and Paris Club member countries during the post-WWII era. Around 70% of Paris Club claims on low-income and emerging countries are in the form of Official Development Assistance as defined by the OECD, i.e. are concessional in character and have a grant element of at least 25%. The United States government, for example, typically extends funds for military and economic cooperation in the form of grants rather than loans. The same is true for official creditors in Europe, where the European Stability Mechanism, ESM, lent with maturities of up to 30 years and at almost no risk premia (Corsetti et al., 2018). China's official lending overseas is thus not comparable to the lending activities by most other creditor governments, in particular, those organized in the OECD and Paris Club (see Kraay, 2014; Horn et al., 2020; Gelpern et al., 2021).

#### 4. Hidden debts: how large is the underreporting problem?

How large is the underreporting problem on Chinese official loans? Here, we quantify the degree of unreported Chinese debt flows and stocks of more than 100 developing countries.

#### 4.1. Benchmarking approach: how we compare the World Bank data to our own

Our first and main step is to benchmark our loan-by-loan data, aggregated on the country and year level, to the debtor-reported aggregates of the official debt statistics by the World Bank.<sup>16</sup> To do so, we use data on debt commitments made by Chinese official creditors from the so-called Debtor Reporting System (DRS), to which developing debtor countries report on a regular basis. Specifically, we use an unpublished data extract from the DRS at a dyadic (country-pair) level and assess the size of unreported debt commitments by comparing our own data collection on Chinese loan commitments to the commitment amounts that recipient countries have reported to the World Bank. Details from the DRS data are used exclusively as a benchmark to our own data collection, but are not displayed here or elsewhere, for reasons of confidentiality, and do not enter our calculations in any other form.

To make a clean comparison, we first need to adapt our data of Chinese official loans to the definition of the DRS. The DRS extract we use covers all reported loans granted by Chinese *bilateral creditors* to *public sector recipients* in developing countries ("external public debt"). In the following exercise, we match the World Bank DRS definition of bilateral creditors and external public debts.

First, on the creditor side, we only consider "bilateral loans" in the World Bank DRS definition, and drop all loans by commercial banks. According to the DRS, bilateral creditor loans are loans extended by public entities, including "*the general government, central government; state and local government; central bank and public enterprise*" (World Bank, 2020). This definition of "bilateral lending" is more restrictive than the broad OECD definition of "official lending" that we rely on for our own coding purposes (see Section 2.1). Most importantly, the World Bank's definition does not cover lending by commercial banks such as the Industrial and Commercial Bank of China (ICBC) or the Bank of China (BoC), despite the fact that they are state-owned. These banks are official creditors according to our (OECD) definition (they are owned and controlled by the Chinese government), but they are not bilateral creditors according to the World Bank's definition, because they are not a "public enterprise" in a narrow sense, in contrast to the policy banks such as China Ex-Im Bank or CDB. This means that we keep loans granted by state-owned policy banks such as Ex-Im and CDB but not loans by state-owned commercial banks such as ICBC or BoC.

In a second step, on the recipient side, we follow the World Bank DRS definition of external public debts, defined to include loans received by the *central government and their departments, the central bank and local governments, public corporations, mixed enterprises (in which the public sector has more than 50% of voting power), official development banks and debt of the private sector that is guaranteed by the sovereign* (World Bank, 2020). This broad definition of public sector debt covers debt of all public corporations, SOEs, and mixed enterprises, "*irrespective of whether such borrowing has a guarantee from the sovereign government*" (World Bank, 2020, p. 3).

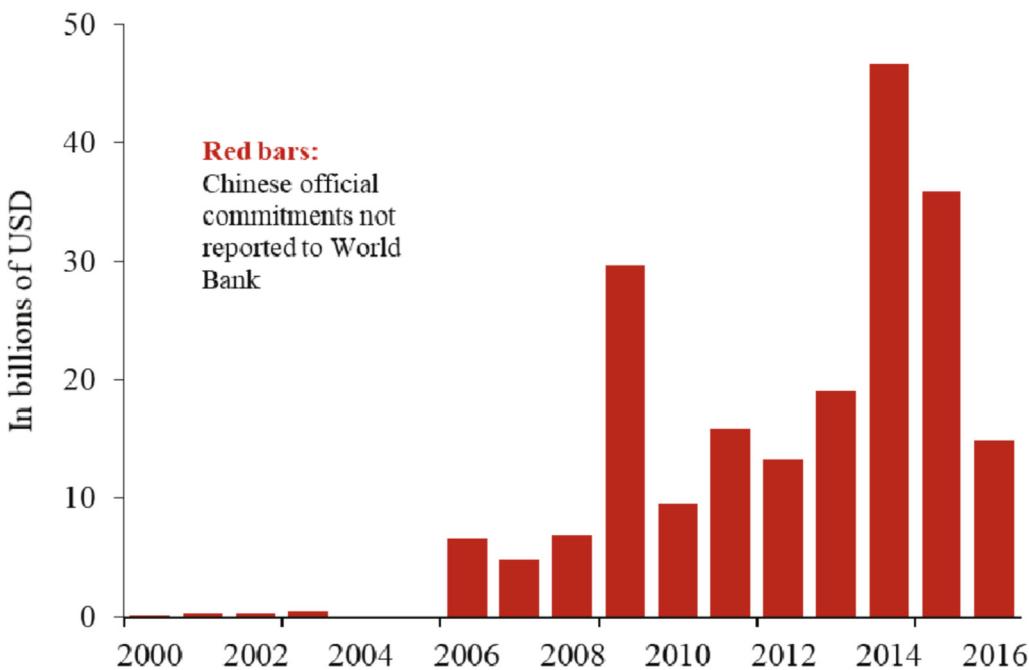
To match this definition, we drop all loans given to private corporations. Some of these loans might have a government guarantee and should be included according to the DRS definitions, but there is no systematic and reliable information on loan guarantees given the confidential nature of most of China's official loan and project agreements. We therefore drop every loan to private recipients, thereby potentially underestimating publicly guaranteed debts in our data when benchmarking to the DRS data. Conversely, and in line with the DRS definitions, we keep USD 230 billion bilateral loans to governments as well as USD 190 billion in bilateral loans to SOEs, irrespective of whether the debts are explicitly guaranteed by the government or not. We also include 40 billion USD in bilateral loans that go to special purpose vehicles, in particular to the infrastructure, mining and energy sectors.<sup>17</sup>

To summarize, for the benchmarking exercise, we drop close to USD 45 billion in loans that do not meet the World Bank definition of "bilateral credits" (loans by Chinese commercial but state-owned creditor banks) and USD 35 billion in loans that do not meet the World Bank external public debt definition (loans to private recipients).

When interpreting the results in the next section, it is important to keep in mind that the broad DRS definition of external public debt is not necessarily adopted one-to-one in practice. Many developing countries ultimately report public debt in a narrow sense and not in the broad DRS sense, meaning that they focus their data gathering on loans taken up by the central government or by SOEs and private corporations that benefit from explicit guarantees (IMF, 2018; World Bank, 2020). The result are potentially sizable reporting gaps on SOE debt towards Chinese and other external creditors, which explain part of the "hidden" debts discussed below.

<sup>16</sup> In Appendix II.2 we also compare our debt stock estimates to data on Chinese debt claims extracted from the BIS banking statistics. That comparison is complicated by the fact that China, unlike other BIS members, has not agreed to publicly release a bilateral (country by country) data break-down. We can however exploit a structural break in the aggregate time series right after China joined the BIS data reporting system. The result is a "snapshot" of Chinese claims for two quarters, as no time series is possible. There are significant discrepancies between our estimates and the BIS-implied snapshot and the gaps are especially large for high-risk countries. Of course, it is well known that the quality of the general economic data is also questionable for those countries.

<sup>17</sup> It is not always straightforward to determine whether SPV debts need to be included in public sector debt statistics or not. Given that the underlying contracts tend to be confidential, the exact ownership and guarantee structures of these arrangements are often unknown. Indeed, some of these arrangements might be explicitly designed to remain off the sovereign's balance sheet and borrowers might therefore not be required to report these loans from an accounting standpoint. From an economic point of view and given the long track record of crisis bailouts and government subsidies in developing and emerging countries, these debts at the minimum represent important contingent liabilities. Moreover, many of the SPV contracts entail clauses to secure repayments by revenue streams from the underlying projects or from commodity exports (Bandiera and Tsiropoulos, 2020; Gelpem et al., 2021). They therefore reduce available fiscal revenue for the service of (reported) outstanding debt, irrespective of ownership or guarantees. Still, we prominently flag these transactions in the accompanying dataset so that users of our data can decide for themselves, whether to include them as part of recipient country public debt or not.



**Fig. 11.** "Hidden" Chinese official loans to the developing world: total non-reported flows. Note: This figure shows our annual estimate of total unreported Chinese lending flows to public sector recipients. To estimate "hidden" debts we compare aggregated flows from our loan-level dataset to the aggregate commitments in the World Bank's, 2018 DRS database.

#### 4.2. Estimating the scope of "hidden" debts from China

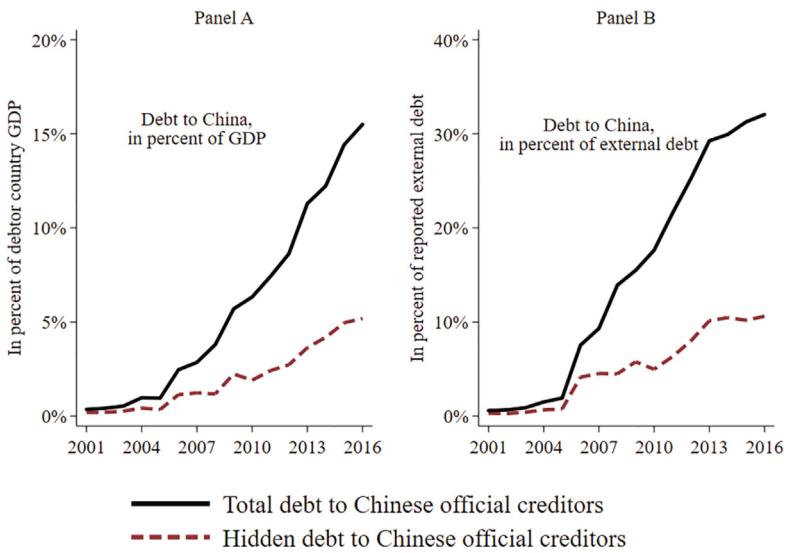
The main insight from our benchmarking exercise is that 50% of Chinese official lending commitments were not reported by recipient countries to the World Bank and thus do not enter officially reported debt statistics. As of end-2016, the amount of "missing" Chinese loans to developing countries has reached more than 200 billion USD in total. Compared to the early and mid-2000s, the yearly amounts of unreported debt flows have increased substantially in recent years (see Fig. 11).

The best explanation for these large discrepancies are the inadequate debt reporting systems in developing and low-income countries. As we have shown, Chinese official loans are often taken up by SOEs or SPVs (see also Fig. 10) and these types of transactions are only rarely reported to the World Bank DRS despite the fact they should be according to the DRS external public debt definition (see previous sub-section). According to the IMF, only one in ten low-income countries report debts of public corporations and only two thirds of low-income countries report guaranteed debt that is outside of the general government (IMF, 2018). This results in large coverage gaps on public sector debt that are not specific to Chinese lending per se. However, the coverage gaps on Chinese official loans are amplified by the fact that the Chinese government itself does not share detailed data and because Chinese official lending contracts often contain strict confidentiality clauses that prohibit the borrower to share any details publicly (Gelpert et al., 2021).

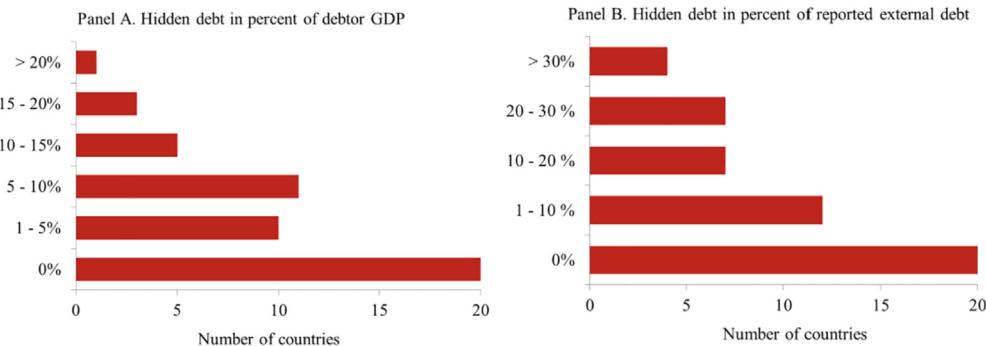
In a next step, we estimate the size of "hidden" debts in percent of debtor country GDP. We focus on the top 50 recipient countries most indebted to China (see Fig. 6). For this group, debt stocks owed to China on average soared to more than 15% of GDP in 2016 (Panel A of Fig. 12).<sup>18</sup> Of these debts, on average, around 5% of GDP is not reported in the official statistics of debtor countries.

The averages in Fig. 12 conceal the large heterogeneity in the hidden debts owed to Chinese official creditors. Fig. 13 presents frequency distributions for our sample of the 50 most indebted recipients. The left panel shows that, for around half of the sample, hidden debt levels are low or zero. But for the other half, the hidden liabilities to China are sizeable. They exceed 5% of GDP in twenty countries, and for nine of them they exceed 10% of GDP. Given the limited debt-carrying capacity of many developing and emerging countries, these are sizeable amounts (see for example Reinhart et al., 2003). To put these magnitudes in perspective, the right panel of Fig. 13 shows unreported liabilities as a share of total (reported) external liabilities. As before, hidden liabilities are modest for about half of the sample, but for about twenty countries the underreporting problem is severe. In these countries, hidden liabilities amount to more than 10% of the total, officially reported external debt stock and in eleven countries exceed 20%.

<sup>18</sup> Given that some of the most highly indebted recipients are small countries (e.g. Djibouti or Tonga), the GDP weighted averages are lower at 11% of debtor GDP and 27% of reported, external debt.



**Fig. 12.** Debt to Chinese official creditors, total and “hidden” parts, 2001–2016. Note: The figures show averages for external public debt for the top 50 developing countries most indebted to China (in relation to recipient country GDP). “Hidden” debt to China by the same country group is based on missing commitments, (i.e. Chinese loan commitments not reported to the World Bank’s DRS). Sources: HRT database and IMF World Economic Outlook.



**Fig. 13.** Scale of hidden debts to China – histograms. Note: Data shown is for the top 50 developing countries that are most indebted to China.

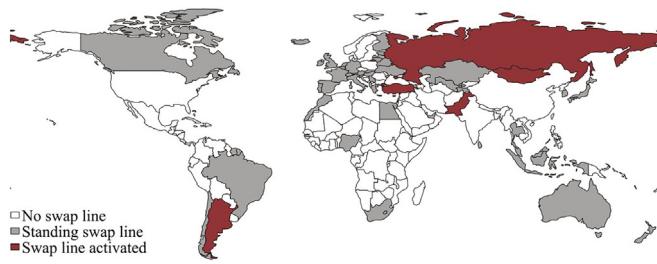
#### 4.3. Central bank swap line debt

Another relevant source of unreported or “hidden” external liabilities result from central bank swap lines extended by the People’s Bank of China (PBoC). Swap lines are standing lines of credit arranged between central banks, and they constitute an important type of bilateral official finance when they are activated, which is typically the case during financial crises (Bahaj and Reis, 2020).

The maturities on PBoC swap drawings are typically short (3 to 6 months), but China tends to set up its swap lines to remain in effect for three years. This means that swap line credits that are drawn once, can be rolled over multiple times so that the de facto maturities resemble those of long-term debt. For consistency, outstanding swap debt should thus be considered a part of China’s direct (non-tradable), long-term debt instruments. Indeed, the World Bank plans to include long-term swap line debts in future releases of its external debt statistics (World Bank, 2020).

Since 2009, the PBoC has set up a global network of bilateral swap line arrangements with 38 central banks on total drawing rights amounting to more than 500 billion USD (see Fig. 14). In terms of geographical reach, this is by far the largest swap network of any central bank worldwide (Horn et al., 2020). Thus far, however, there is no systematic database on the amounts and destination of PBoC swap line lending.

To identify which PBoC swap lines were activated and the size of flows, we draw on press releases, annual reports and balance sheets of the PBoC as well as of all the recipient central banks. We find evidence that, since 2013, Pakistan, Argentina, Mongolia, Russia and Turkey have all made drawings on their swap lines with the PBoC to curb market pressures and to address liquidity



**Fig. 14.** Swap line network and drawings with the People's Bank of China. Note: This figure marks all countries whose central banks signed a bilateral swap line agreement with China's central bank (PBoC) between 2009 and 2018. Grey shaded countries have a standing credit line for which we have no evidence that it was ever activated. Red shaded countries activated their credit line with the PBoC at some point after 2009.

needs.<sup>19</sup> In end 2018, China still had outstanding claims towards three of these countries: In Argentina, swap debt to the PBoC stood at 18.9 billion USD, in Pakistan at 3 billion USD and in Mongolia at 1.75 billion USD. These are sizable amounts when viewed as percent of debtor country GDP (1%, 3% and 15% of debtor country GDP, respectively). Since our data is incomplete, however, we do not include these numbers in the remainder of the analysis.

## 5. Reassessing debt and default dynamics in developing countries

This section illustrates how incorporating our new data on Chinese official debt claims can help to better understand debt and default dynamics in developing and emerging countries. Many of China's debtors, as has been discussed, figure among the poorest countries in the world. As such, a crisis there (even a severe and protracted one) may not produce any systemic aftershocks in global capital markets.

The descriptive analysis in this section adds to several strands of academic literature. First, we show that debt stocks in about a dozen countries are considerably higher once "hidden" Chinese loans are accounted for. This is consistent with Alfaro and Kanczuk (2019), who find that undisclosed lending can have large negative effects on debt sustainability. More work is needed to explore the causes and consequences of opacity in sovereign debt markets.

Second, we place the ongoing lending boom from China in historical perspective, in the tradition of many previous papers on sovereign debt and default that draw lessons from the past (see Eichengreen, 1991; Reinhart and Rogoff, 2009; Oosterlinck, 2013; Mitchener and Trebesch, 2020). In particular, we draw parallels to the syndicated bank lending boom of the 1970s, which ended in dozens of sovereign defaults in developing countries in the 1980s. Our findings suggest that, in the wake of the Covid pandemic, much can be learned from the rich academic literature on that era, in particular on how crises involving sovereign bank loans can be resolved (see e.g. Eichengreen and Lindert, 1989; Cline, 1995; Rieffel, 2003).

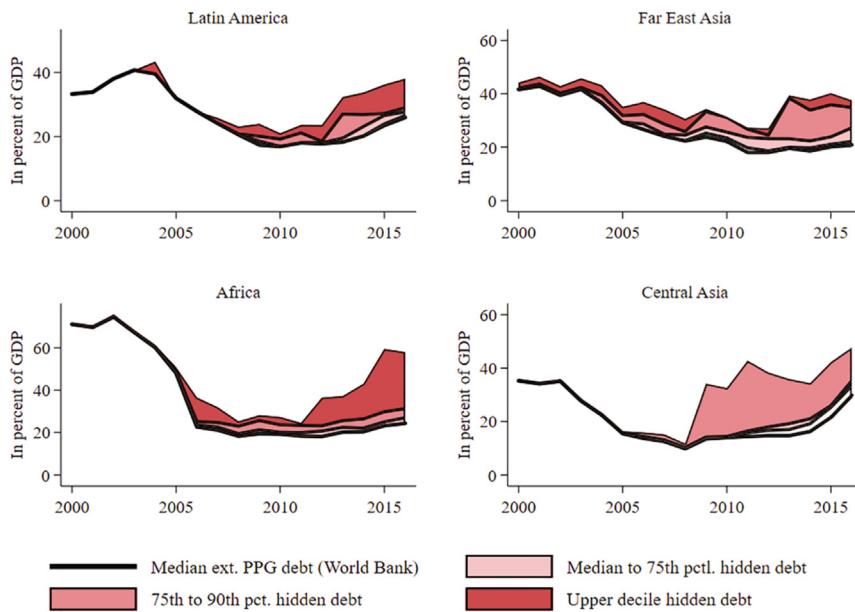
In a third step, we expand our analysis by gathering data on restructurings of Chinese debt. We show that even prior to the outbreak of the Covid crisis, developing countries experienced many more credit events than what the most widely used databases of default and debt restructurings suggest (this includes datasets by rating agencies such as Moody's but also our own previous work, e.g. Reinhart and Rogoff, 2009; Cruses and Trebesch, 2013). The findings add to the academic discussion on why we have seen so few sovereign defaults in the past 20 years. We show that the number of defaults has not been so small after all, once defaults vis-à-vis Chinese creditors are taken into account. We conclude that future research in the field should move beyond the traditionally used databases of sovereign default and restructurings that focus solely on privately-held debt (see also Reinhart and Trebesch, 2016; Schlegl et al., 2019; Beers et al., 2020; Bon and Cheng, 2021).

### 5.1. Reassessing external debt dynamics in the developing world

Unreported Chinese lending calls for a reassessment of external debt trends in the developing world. To do so, we start with the reported debt/GDP series by the World Bank and then add the "hidden" liabilities to Chinese state-owned creditors using our estimates. Fig. 15 shows the evolution of external sovereign debt (public and publicly guaranteed) to GDP for developing and emerging countries in four different regions since 2000.

Once we account for "hidden" liabilities, the debt levels for more than two dozen countries change markedly (red areas). This is particularly true for Asian countries that are in geographic proximity to China as well as for several resource-rich African countries. The median debt levels do not change much, because Chinese lending and its "hidden" parts are heavily concentrated in around two dozen countries (as shown in Fig. 13). But for this group of countries, which has borrowed heavily from Chinese official creditors, external public debt to GDP levels have risen much more strongly over the past 15 years than is generally known. It is notable that many of the main recipients of Chinese loans are low-income countries that not long ago had been in default since the aforementioned crisis of the 1980s.

<sup>19</sup> Press releases suggest that recipient central banks exchanged RMB into USD upon drawing on the swap lines in order to service foreign currency debt and bolster foreign exchange reserves.



**Fig. 15.** External debt trends and “hidden” debt to Chinese official creditors. Note: The black line shows median external, public and publicly guaranteed debt to GDP according to the World Bank’s widely used International Debt Statistics. We add the distribution of “hidden debts” to Chinese official creditors, focusing on the most exposed countries (median, upper quartile and upper decile level by region).

### 5.2. A historical analogue: the developing country lending boom of the 1970s

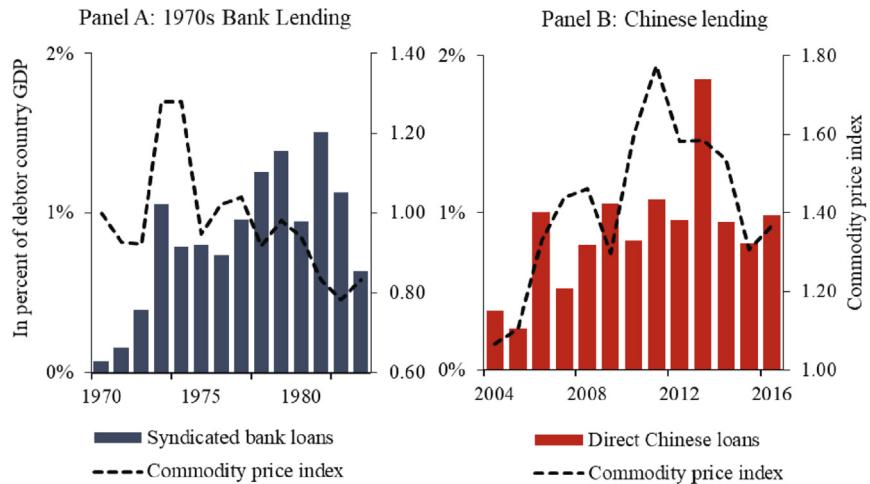
China's overseas lending boom shares many characteristics with earlier lending booms to periphery countries. The parallels are particularly striking with regard to the 1970s syndicated bank lending boom (see [Cline, 1995](#) and [Rieffel, 2003](#) for a review of this episode). The main borrowers at the time were developing and resource-rich countries, many of which had not been able to access international capital markets for decades. From the early 1970s on, however, these countries quickly started to receive large debt inflows in the form of bank loans, typically from a syndicate of 10 or more Western Banks from the US, Europe and Japan. The lending recipients were the central government or public companies and the loan's purpose was often to improve the country's infrastructure, its resource extracting industries, or to finance other potentially growth-enhancing projects. The bulk of the lending was in US Dollars, maturities were rather short, typically between three and seven years, and interest rates implied risk premia, mostly between 1 and 2% above LIBOR or more. Moreover, much of the lending was not picked up by official statistics so debtor countries and the IMF and the World Bank also had an incomplete picture on the resulting debt flows and debt sustainability risks at that time ([Díaz-Alejandro, 1985](#)).

The ongoing Chinese overseas lending boom shares many characteristics. Many of the recipients are the very same countries, lending is again bank-based rather than bond-based, many of the loans are issued in USD at market terms and there is a lack of systematic data on these terms. The two lending booms can largely be seen as “twins.”

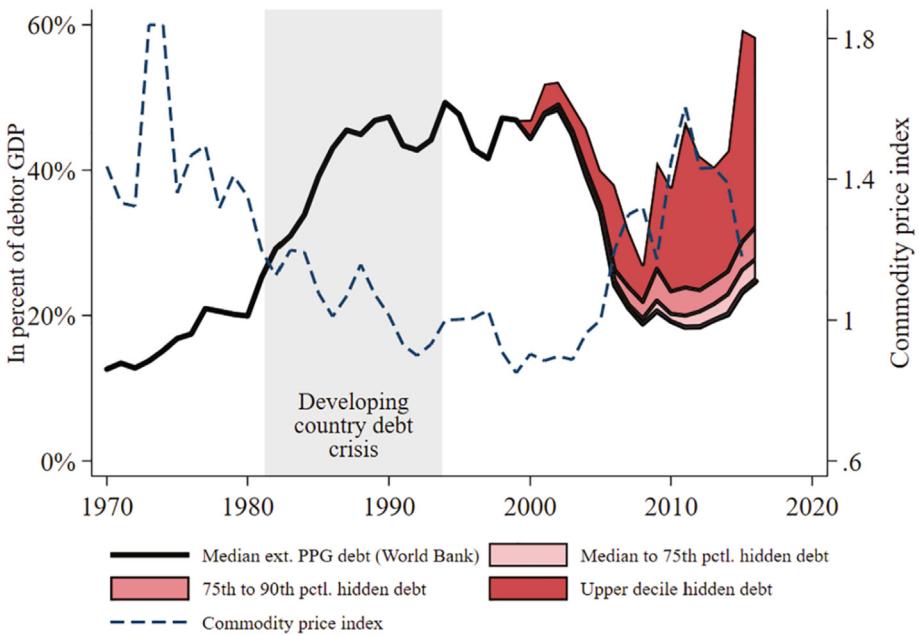
[Fig. 16](#) compares the lending booms more systematically, by showing debt flows to all developing and emerging countries. The bars represent the average yearly bank loan inflows in percent of debtor country GDP, while the dotted line is an index for global commodity prices taken from [Boughton \(1991\)](#) and [Reinhart, Reinhart, and Trebesch \(2016 and 2017\)](#). The loan-level data from the 1970s comes from World Bank reports of the time, complemented with data from [Stallings \(1987\)](#), while the lending data from China is based on our loan-level data described above.

The duration and size of the two booms are roughly comparable from a recipient country perspective. Moreover, both booms were accompanied by a large boom-bust cycle in commodity prices. The more recent commodity-price boom was even more pronounced than the one of the 1970s (see [Reinhart et al., 2017](#)). After 1982, after US interest rates had spiked and with commodity prices decreasing further, bank lending to the developing world quickly dried up. Mexico's debt default in August 1982 was only the most visible sign of distress. Today, it is difficult to say whether the Chinese overseas lending boom has ended or is simply slowing. Total lending amounts have decreased in 2017, but lending to LICs remains relatively high.

[Fig. 17](#) combines the two time spells, the 1970s and the 2010s, into a longer-run picture. The black line shows median external debt to GDP levels (PPG debt) of 120 developing countries across five decades. On top, we again add our estimate of hidden debt to Chinese official creditors and illustrate the changing debt dynamics. Even without counting “hidden debts” to China, debt levels in the developing world look close to their level in 1981, just before the so called “Third World Debt Crisis” broke out. Once we take unreported liabilities into account, total debt levels for a number of countries increase importantly. Recent developments in the wake of the Covid crisis strengthen these debt sustainability concerns further.



**Fig. 16.** Two international lending booms: 1970s (blue) vs this century (red). *Note:* The bars show average yearly financial commitments by Western commercial banks and by Chinese official creditors to all 119 developing and emerging countries in the World Bank's IDS (excl. China). Sources: Boughton (1991), HRT dataset, IMF, Stallings (1987), and World Bank.

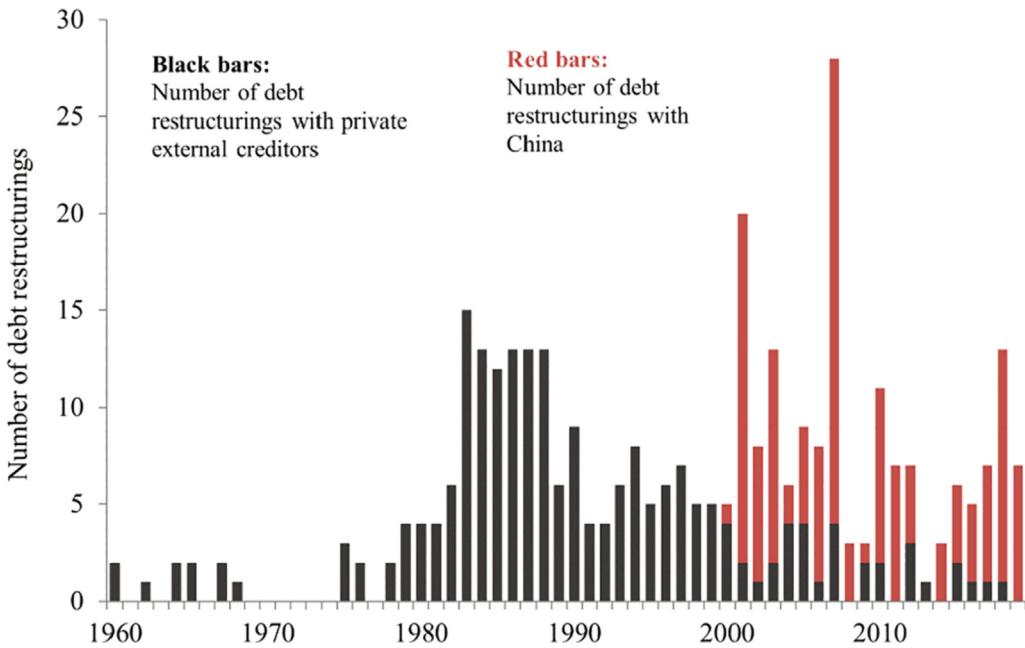


**Fig. 17.** Long-run debt and commodity price trends in developing and emerging countries. *Notes:* Data for 119 developing and emerging countries included in the World Bank's IDS (excl. China). Sources: Boughton (1991), HRT database, IMF, World Bank.

### 5.3. "Missing defaults" on Chinese overseas loans

In their 200-year history of capital flows, Reinhart, Reinhart, and Trebesch (2016 and 2017) document that the global economy has been subject to a "double bust" since 2012, with a collapse in commodity prices and a stark decline in capital inflows (and in some cases, outflows). Yet, unlike prior episodes of similar adverse shocks over the long horizon they study, the worldwide incidence of sovereign defaults has risen only modestly. Compared to prior historical episodes, their model indicates that there should have been an additional 15 to 20 defaults in the latest post-2012 double bust. These are what they dub the "missing defaults."

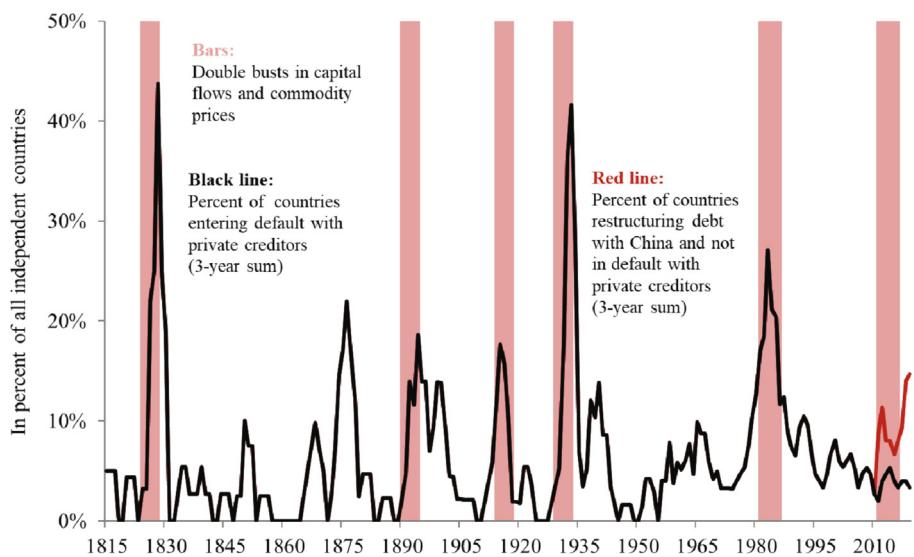
Why have there been so few sovereign defaults in the past 20 years? Several competing explanations have been brought forward in the literature. These include better (less pro-cyclical) macroeconomic policies, in particular better capital flow



**Fig. 18.** Restructurings and debt write offs: Chinese official vs. private external debt. Note: This figure shows the number of sovereign debt restructurings and debt write-offs with foreign banks and bondholders (black bars) using data from [Cruces and Trebesch \(2013\)](#) and from [Meyer et al. \(2019\)](#). In addition, we show restructurings and debt write-offs on outstanding debt with Chinese official creditors (red bars) using data from [Acker et al. \(2020\)](#), [Bon and Cheng \(2021\)](#), [Dreher et al. \(2017\)](#), [Hurley et al. \(2018\)](#) and [Kratz et al. \(2019\)](#); data for China is only shown for years after 2000.

management and macroprudential regulation ([Ostry et al., 2012](#)), more wide-spread use of hedging techniques ([Miyajima et al., 2015](#)), and increased legal risks due to creditor litigation, which have made sovereign defaults costlier ([Schumacher et al., 2021](#)). In this section, we revisit this academic debate based on our newly collected data on debt restructurings with Chinese state-owned creditors. We conclude that many defaults since 2000 had simply not been counted in earlier work.

[Fig. 18](#) shows the number of restructurings by year from our “China debt restructuring database” (red bars), which includes write-offs and rescheduling of debt owed to China’s government or its state-owned banks and enterprises (see [Section 2.2](#) and appendix for details). Overall, we identify more than 150 credit events by governments and public entities of developing and



**Fig. 19.** The curious case of the missing defaults – adding Chinese restructurings. Note: Restructuring and default data from [Reinhart and Rogoff \(2009\)](#) and [Meyer et al. \(2019\)](#). Data on Chinese credit events since 2011 from [Acker et al. \(2020\)](#), [Dreher et al. \(2017\)](#), [Hurley et al. \(2018\)](#) and [Kratz et al. \(2019\)](#). Double bust events from [Reinhart, Reinhart, and Trebesch \(2016 and 2017\)](#).

emerging countries. In the early 2000s, many cases are linked to the HIPC initiative and involve debt relief on older Chinese development loans. In contrast, the more recent wave of restructurings (since around 2011) involves distressed debt exchanges on loans granted since the early 2000s and with sovereign debtors that faced liquidity or solvency problems. As with the number of loans, it is probable that our tally still misses some restructuring episodes.

[Fig. 18](#) also compares the number of restructurings on Chinese debt with that of restructurings on private banks and bondholders, which are events typically covered by credit rating agencies and the international press. For this comparison, we use data on sovereign restructurings towards private external creditors from [Cruces and Trebesch \(2013\)](#) and [Meyer et al. \(2019\)](#). It is remarkable that the number of credit events on Chinese international loans has clearly surpassed the number of restructurings towards foreign bondholders and banks. This illustrates how important it is to move beyond the traditional approach to measure sovereign default as credit events on debt to private creditors only, as typically done by credit rating agencies such as Moody's (for a more detailed discussion see [Reinhart and Trebesch, 2016](#) and [Schlegl et al., 2019](#)).

We conclude that adding the "missing defaults" on official debt to China yields a more complete picture on the frequency of sovereign default in developing countries and emerging markets over the past decade. This can also be shown in a longer-run graph as that in [Fig. 19](#) which builds on [Reinhart, Reinhart, and Trebesch \(2016 and 2017\)](#) and shows the share of independent countries that entered default with private creditors over the past 200 years. The red line adds to this the share of countries that restructured their debt with China since 2011, but that were not in default on private creditors. Once we account for sovereign credit events with China, the number of countries in default more than doubles, exceeding 10% globally after 2016. This finding underlines that even prior to the outbreak of the current COVID pandemic, developing and emerging countries showed elevated levels of credit events.

## 6. Conclusion

Over the past two decades, the Chinese government and its state-owned entities have become dominant players in the international financial system. We document the size, nature, and destinations of Chinese official lending to developing and emerging countries. Our estimates suggest that about one half of China's lending to developing countries is not recorded in the main international databases used by researchers and practitioners alike. The mismeasurement of external debt has potentially significant consequences for those developing countries that borrowed heavily from Chinese official creditors since the early 2000s.

More generally, this paper has provided evidence that the global financial landscape has changed markedly in the past two decades, as China has emerged as a global economic power. In the Bretton Woods era, global capital flows were largely dominated by official flows from the United States, as capital controls kept a tight lid on private financial cross border activity. The dismantling of capital account restrictions in advanced economies following the breakdown of Bretton Woods gave rise to a new era of private capital flows in international finance; the 1970s and 1980s was importantly shaped by international syndicated bank lending, until portfolio bond and equity flows displaced bank loans from the 1990s until today. The academic literature that emerged during these past decades has almost entirely focused on understanding the drivers, nature and economic effects of private cross-border flows.

Our work suggests that the surge of official Chinese overseas lending has swung the pendulum back, albeit partially. To develop an informed understanding of global capital flows and external indebtedness it is now necessary to supplement the analysis of private sector flows in Western capital markets to incorporate a relatively new but systemically important creditor - China. The drivers and consequences of this shift in international finance offer fertile ground for academic and policy research.

## Acknowledgements

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## Appendix A. Dataset on Chinese overseas lending: sources and methods

In this appendix section, we explain the sources and methods used to build the dataset on Chinese overseas lending through direct loans and grants. As a starting point, Fig. A1 summarizes why we know so little about Chinese overseas lending from official sources.

Organisation	What data they collect & share	Why data on China's lending is incomplete
IMF / World Bank	International debt statistics	Data reported by debtor country. Gaps if recipient is public company ( <u>50% of Chinese lending missed</u> ). 
Paris Club / OECD	Data on official-to-official debts and restructurings	China is not a member ( <u>China does not share data on its official lending and debt abroad</u> ). 
Rating agencies/ Investment banks	Risk ratings and analysis on private-to-private and private-to-official debts	Chinas overseas lending is official-to-official ( <u>not covered by rating agencies and analysts</u> ). 
Trade Credit Agencies (Berne Union, OECD)	Data on private and official export credits	China does not report to the OECD. Berne Union does not share data. ( <u>no data on Chinese trade credits</u> ). 
People's Bank of China	Asset purchases, bond holdings, details on BoP	Only aggregates publicly shared ( <u>no data on China's central bank bond holdings or asset purchases</u> ). 
BIS	Data on international bank claims and liabilities	China reports to the BIS since 2015, but bilateral data not public ( <u>moreover, reporting gaps</u> ) 

Fig. A1. Why we know so little about Chinese overseas lending.

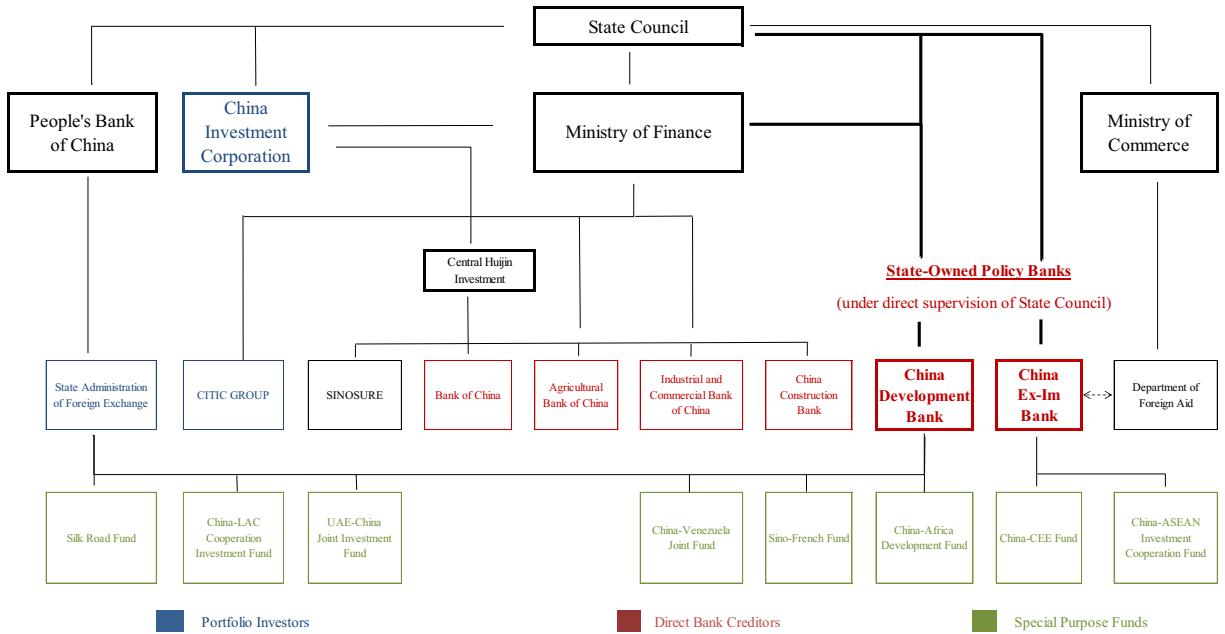
### A.1. Compiling the dataset on Chinese overseas loans, 1950–2017

#### A.1.1. Coverage

Our comprehensive, micro-level dataset of Chinese overseas lending since 1950 attempts to capture all cross-border loans and grants extended by Chinese *official* creditors as defined by the OECD: *Official transactions are those undertaken by central, state or local government agencies at their own risk and responsibility, regardless of whether these agencies have raised the funds through taxation or through borrowing from the private sector. This includes transactions by public corporations i.e. corporations over which the government secures control by owning more than half of the voting equity securities or otherwise controlling more than half of the equity holders' voting power; or through special legislation empowering the government to determine corporate policy or to appoint directors*" (OECD 2018, p. 10).

When applying this definition to China, official creditors include China's central government, government agencies such as the Ministry of Commerce, as well as lending by China's *state-owned policy banks*, in particular by China Development Bank (CDB) and China Export-Import Bank (Ex-Im). This definition also captures lending by China's *state-owned commercial banks* such as Industrial and Commercial Bank of China (ICBC) or Bank of China (BoC) and supplier credits by state-owned enterprises, which play an important role in overseas finance and which are owned and controlled by the central government. The universe of official Chinese creditors is summarized in Fig. A2.

On the recipient side, we cover lending to both the public and the private sector, although almost all of the Chinese official loans in our database are to public debtors. In line with the standard definition (see for example IMF, 2011), we define public sector entities as "*all resident institutional units that are controlled directly or indirectly by government units*". This definition includes central, state and local governments, the central bank and all majority-owned public enterprises. Conversely, private sector recipients are defined as entities that are not state-controlled. Regarding lending instruments, we follow standard practice and include all types of direct (i.e. non-tradeable) debt instruments with maturities exceeding one year (this is in line with e.g. the World Bank, 2020). With this definition, we cover a broad range of different instruments, including concessional government loans and grants, supplier credits, commercial and syndicated bank loans, as well as advance payments on oil delivery contracts.



**Fig. A2.** The universe of Chinese official creditors. Note: This figure shows a stylized overview of China's main official creditor agencies (distinguishing between direct bank creditors, portfolio investors and special purpose funds) and their link to China's central government. Black lines reflect ownership. Data is from annual reports and company websites.

In the following, we give a detailed overview on the sources that we use to compile the data:

#### A.1.2. Sources for 2000–2017

The starting point of our data collection is AidData's Chinese Official Finance database, the most comprehensive, publicly available source on Chinese foreign official finance (Dreher et al., 2017). It is based on hundreds of primary sources such as creditor and debtor annual reports, embassy press releases, news sources, debtor aid management systems and the academic literature to identify Chinese foreign loans and grants to private and public sector borrowers in 140 countries between 2000 and 2014. Transactions only enter the final dataset after an extensive data triangulation. This way AidData identifies more than 1200 Chinese official loans and more than 2300 grants amounting to a total of 275 billion USD in Chinese official commitments.<sup>20</sup>

One draw-back of this database is that it ends in 2014 and thus misses much of the lending flows associated with the Belt and Road Initiative, which was unveiled in end-2013.<sup>21</sup> Moreover, there is no data prior to 2000, which makes it difficult to study China's evolution as an international creditor. We therefore expand on AidData by combining it with a number of region- and sector-specific databases that have excellent coverage for subsets of China's foreign lending and that therefore allow us to fill gaps and carefully cross-check with AidData. We also identify a variety of old and new sources that allow us to expand the time coverage on Chinese overseas lending for the years pre-2000 and post-2014.

The China-Latin America Finance Database by Gallagher and Myers (2019) from the Inter-American Dialogue provides loan-level data on 137 billion USD in loan commitments by China Development Bank and by China Export-Import Bank to 15 Latin American and Caribbean sovereigns and their state-owned enterprises between 2005 and 2018. The China-Africa Research Initiative at John Hopkins University (SAIS-CARI) provides data on 148 billion USD in Chinese official loans to governments and state-owned enterprises in 51 African countries between 2000 and 2018 (Bräutigam et al., 2020). For Oceania, the Lowy Institute released the Chinese Aid in the Pacific Database as well as the Pacific Aid Map, which together traces 6 billion USD in Chinese official financial flows to 14 countries since 2002.

In addition to these region-specific data sources, we also make use of two sector-specific data sources: The China Global Energy Finance Database at Boston University (Gallagher, 2019) tracks Chinese lending to the fossil fuel, nuclear power and renewable energy sector since 2000 and has identified total financing amounts of 250 billion US by the China Export-Import Bank and the China Development Bank. Furthermore, we draw on the China Export Credit Agency Project database that is regularly updated by the US Export-Import Bank as part of its Competitiveness Reports and which covers medium and long-term export loans extended by China's Export-Import Bank since 2013. Since entries in this database, unlike in the other sources, do not undergo a

<sup>20</sup> We exclude from our dataset all transactions linked to technical assistance, debt relief, scholarships, or training.

<sup>21</sup> For the countries of Far East Asia and Oceania an AidData update is available that includes years 2015 and 2016 (see Custer et al. 2018 and the associated dataset).

rigorous verification procedure, we only consider those Chinese commitments in the US Export-Import Bank data that are confirmed by official sources on either the recipient or the creditor side.

Whenever available, we additionally make use of debtor-specific resources such as national debt management systems or scholarly articles on single countries and regions. These sources are useful to cross-check amounts and lending terms from other sources and to expand the coverage for more recent years and selected countries, especially when no other loan-level data is available.

#### A.1.3. Historical sources

To obtain a long-run perspective on Chinese foreign lending, we go back all the way to the foundation of the People's Republic of China in 1949. For this purpose, we again build on a broad array of different sources. An excellent overview of early Chinese lending is provided by historic CIA reports that were compiled from the end of World War II until the late 1980s. The confidential reports were recently declassified and contain rich transaction-level details on China's international grants and loans. We cross-check the information from this source with the work of political scientists and historians, such as a collection of Chinese foreign aid projects by Bartke (1989) and work on Chinese foreign aid by Lin (1993) and use these sources to supplement the coverage of the CIA reports in cases of incomplete documentation.

The 1990s are a more challenging period to identify Chinese overseas lending. No CIA reports have been made public and the modern databases described above only start tracing Chinese flows in the early 2000s. Our data collection for this period builds on the project level data collected by Hawkins et al. (2010) and on the three-volume history of Chinese aid by John Copper (2016), which documents Chinese economic and military assistance to dozens of developing countries in the form of country case studies. We emphasize, however, that our coverage of lending during the 1990s is likely to be incomplete, also because information on commitment amounts is often missing, even when foreign aid or investments projects are identified.

The following list summarizes the sources that we use to construct our database:

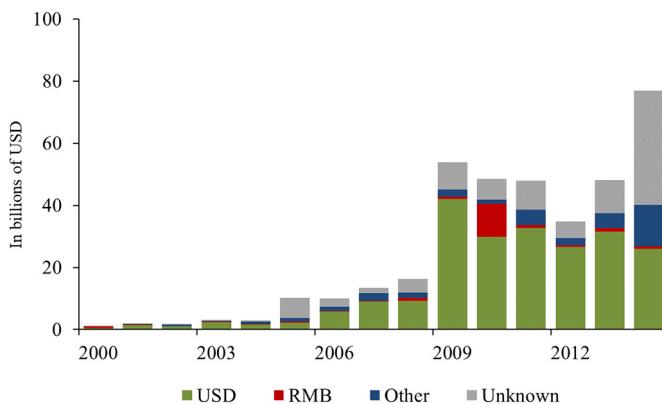
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#### A.1.4. Merging data sources and reconciling conflicting information

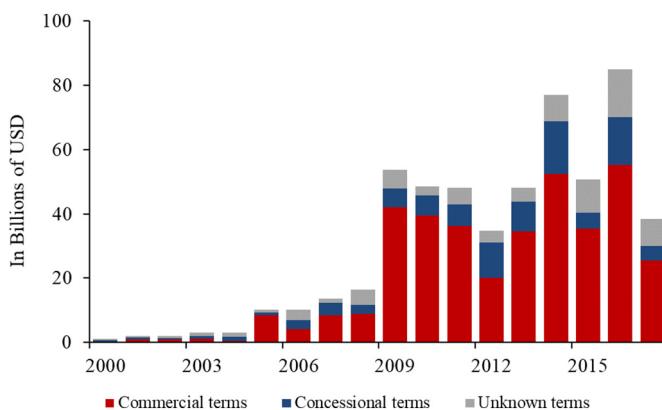
To generate our consensus database, we embark on an extensive merging and cleaning process that entails examining the details of more than 5000 loans and grants. In particular, we compare each loan or grant across all data sources in the case their coverage overlaps. As a first step, we filter out duplicates and identify missing data points as well as conflicting information between data sources. Whenever we encounter conflicting information between two databases, we move beyond the above listed databases and consult the primary sources ourselves. In these cases, we follow two conservative coding rules to minimize upward bias from measurement error: First, we exclude loans that we cannot verify on the basis of primary sources. Second, if data sources disagree on the commitment amount of a transaction, we use the lower of the two amounts in order to err on the downside rather than on the upside.

#### A.2. Characteristics of Chinese official lending: time trends 2000–2017

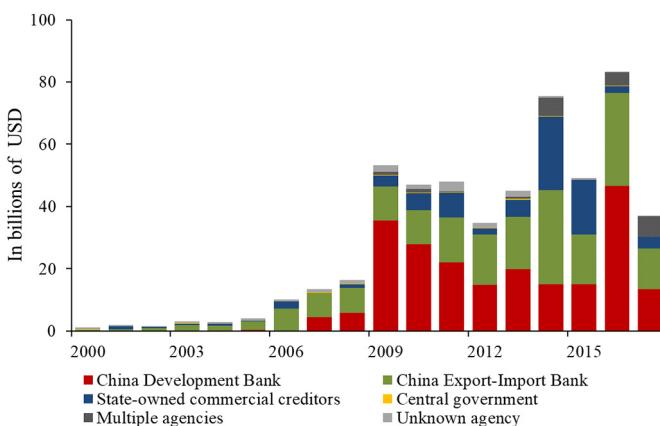
Our data show that the terms and characteristics of Chinese official lending have been fairly constant over the course of the past two decades. Fig. A3 demonstrates this with respect to currency denomination, Fig. A4 with respect to the dominance of commercial loans and Fig. A5 with respect to the relative importance of China Export-Import Bank and China Development Bank.



**Fig. A3.** Currency denomination of Chinese overseas lending 2000–2014. Note: This figure shows the currency denomination of Chinese overseas lending in our database. The data on currency denomination are largely from AidData's Chinese Official Finance database (Dreher et al., 2017).



**Fig. A4.** Terms of Chinese overseas lending 2000–2017. Note: This figure shows the evolution of Chinese lending terms over time. Concessional flows encompass grants, zero-interest loans and Concessional Government Loans as well as Preferential Buyer Credits by China Export-Import Bank. Commercial lending includes Buyer Credits by China Export-Import Bank and all lending by China Development Bank, state-owned commercial banks and credits by state-owned enterprises.



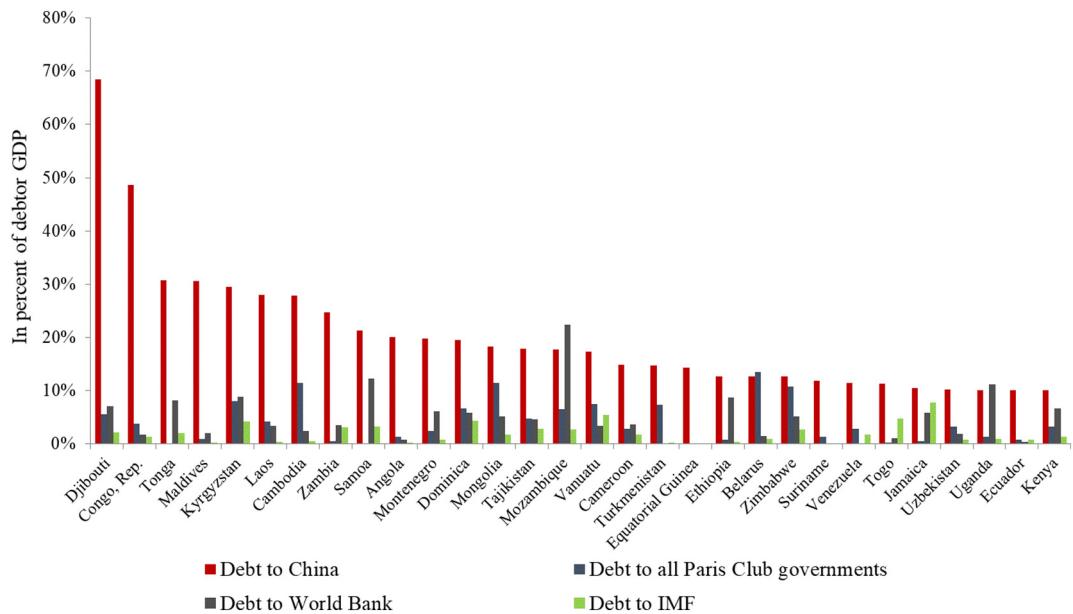
**Fig. A5.** Composition of Chinese overseas lending by creditor agency 2000–2017. Notes: This figure classifies China's overseas lending commitments by the type of creditor, i.e. by which state-owned agencies extended the loans. Loans by state-owned commercial creditors includes commercial bank lending and supplier credits by SOEs, but not lending by China Development Bank which is shown separately. Loans by "multiple agencies" refer to loans that are jointly extended by state-owned commercial and policy banks.

### A.3. Additional information on outstanding debt owed to Chinese creditors, 2000–2017

**Table A1**

Country sample for debt stock estimation from direct loans.

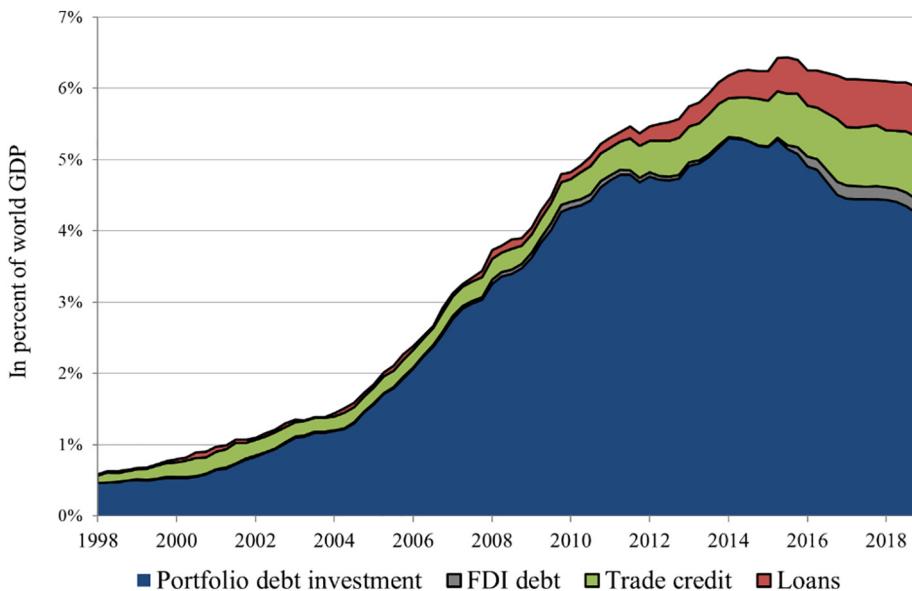
Low Income Developing Countries			
Bangladesh	Guinea-Bissau		Papua New Guinea
Benin	Honduras		Rwanda
Bolivia	Kenya		Senegal
Burundi	Kyrgyz Republic		Sierra Leone
Cambodia	Laos		South Sudan
Cameroon	Lesotho		Sudan
Central African Republic	Liberia		Tajikistan
Chad	Madagascar		Tanzania
Comoros	Malawi		Togo
Congo, Dem. Rep.	Mali		Uganda
Congo, Rep.	Mauritania		Uzbekistan
Cote D'Ivoire	Mongolia		Vietnam
Djibouti	Mozambique		Yemen, Rep.
Eritrea	Myanmar		Zambia
Ethiopia	Nepal		Zimbabwe
Ghana	Niger		
Guinea	Nigeria		
Emerging Market Economies			
Albania	Fiji		Peru
Angola	Gabon		Philippines
Antigua and Barbuda	Guyana		Romania
Argentina	India		Russia
Armenia	Indonesia		Samoa
Bahamas, The	Iran		Serbia
Barbados	Jamaica		Seychelles
Belarus	Jordan		South Africa
Bosnia and Herzegovina	Kazakhstan		Sri Lanka
Botswana	Lebanon		Suriname
Brazil	Macedonia		Tonga
Bulgaria	Malaysia		Trinidad and Tobago
Cabo Verde	Maldives		Tunisia
Chile	Mauritius		Turkey
Colombia	Mexico		Turkmenistan
Costa Rica	Montenegro		Ukraine
Dominica	Morocco		Uruguay
Ecuador	Namibia		Vanuatu
Egypt	Oman		Venezuela
Equatorial Guinea	Pakistan		



**Fig. A6.** Debt owed to China versus debt owed to other official creditors. Note: This figure shows external public debt owed to Chinese official creditors (red bars) for the 30 developing and emerging market countries most indebted to China as of 2017 (in terms of debtor country GDP). Similarly, the blue bars show debt levels owed to the 22 governments organized in the Paris Club; the green bars show indebtedness to the IMF; the brown bars show indebtedness to the World Bank Group (including IDA and IBRD). Data on China is based on our loan-level estimates (Appendix A), data on Paris Club debt is from the Paris Club website and data on debt to IMF and World Bank is taken from the World Bank's WDI database. Unlike in Fig. 6 in the main text we only consider external public debt, to make our estimated debt stocks comparable to those of the Paris Club, the World Bank and of the IMF.

## Appendix B. Additional material and results

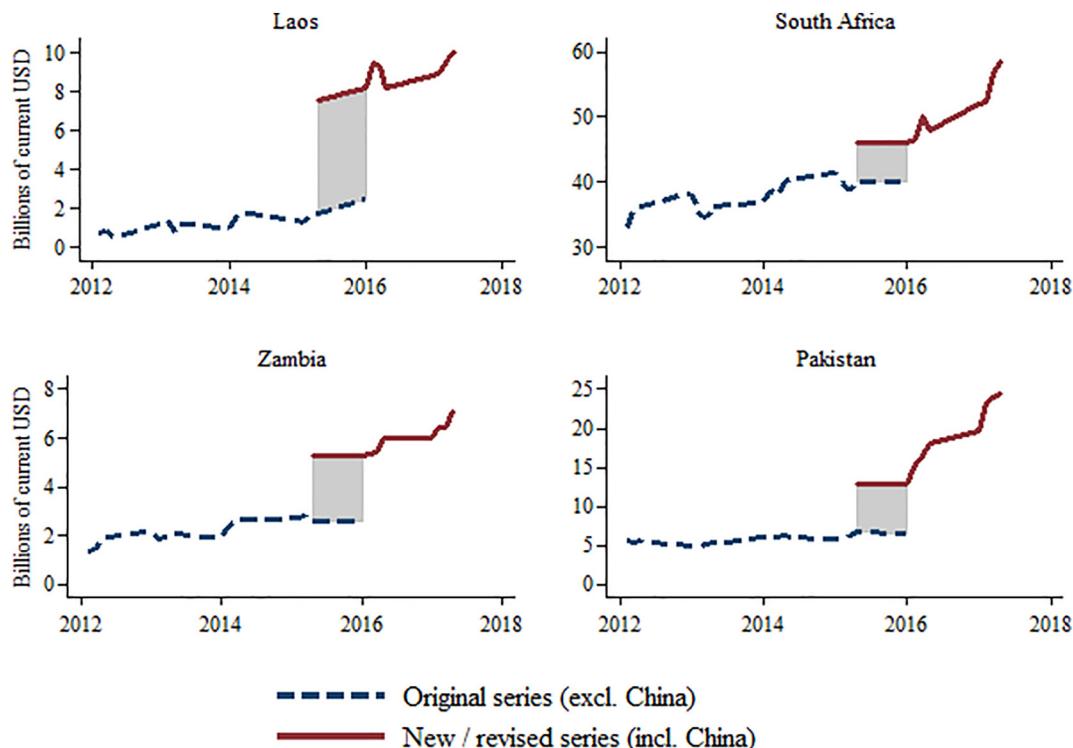
Fig. A7 quantifies different elements of China's overseas lending boom by adding overseas portfolio debt investments by the PBOC (reserve assets) and by non-official entities (non-reserve assets) as well as FDI debt investments to the boom in direct overseas lending depicted in Fig. 1.



**Fig. A7.** Chinese gross capital exports. Note: Portfolio debt investment summarizes claims on non-residents from PBoC holdings of debt instruments (reserve assets) and from holdings of non-reserve asset portfolio debt. Trade credits include short- and long-term credits and advances. FDI debt is a form of cross-border inter-company lending. Sources: PBoC and IMF World Economic Outlook.

### B.1. Comparison of loan-level debt estimates to BIS banking statistics

A secondary approach to benchmark our loan-level debt estimates builds on recently released BIS data. This approach, however, does not allow for time-series comparisons and only shows a snap-shot for one year (2016). China (along with Russia) started reporting its cross-border bank claims to the BIS Locational Banking Statistics in 2016. The BIS is not authorized to publish data on bilateral (country to country) Chinese claims, but we can exploit the structural break in total reported claims after China joined the locational banking statistics (following the approach of Cerutti and Zhou, 2018). Specifically, we focus on the fourth quarter of 2015 and the first quarter of 2016. In the original BIS time series, the claims of China or Russia were not included. But in 2016 the series were revised backward to include total claims by all reporting countries, including the recently joined ones, and the old and new series are both publicly available. More specifically, we downloaded the new, revised series (which includes China and Russia) in February 2019 and compare it to the original series (without claims by China and Russia), which we hand-coded from the BIS Statistical Bulletins for 2015 and 2016.



**Fig. A8.** Aggregate bank claims towards selected debtor countries (BIS). Note: This figure shows aggregate bank claims in billions of USD towards various debtor countries (all currencies, all instruments, all sectors). We compare the BIS time series on total bank claims (dotted blue line) to a revised series that also contains bank claims by China and Russia (red line). The break in the series occurred because China and Russia started to report to the BIS in end-2015. The difference between red line and dotted blue line thus represents claims by China and Russia, i.e. the size of external debt stocks owed to the banks resident in these two creditor countries.

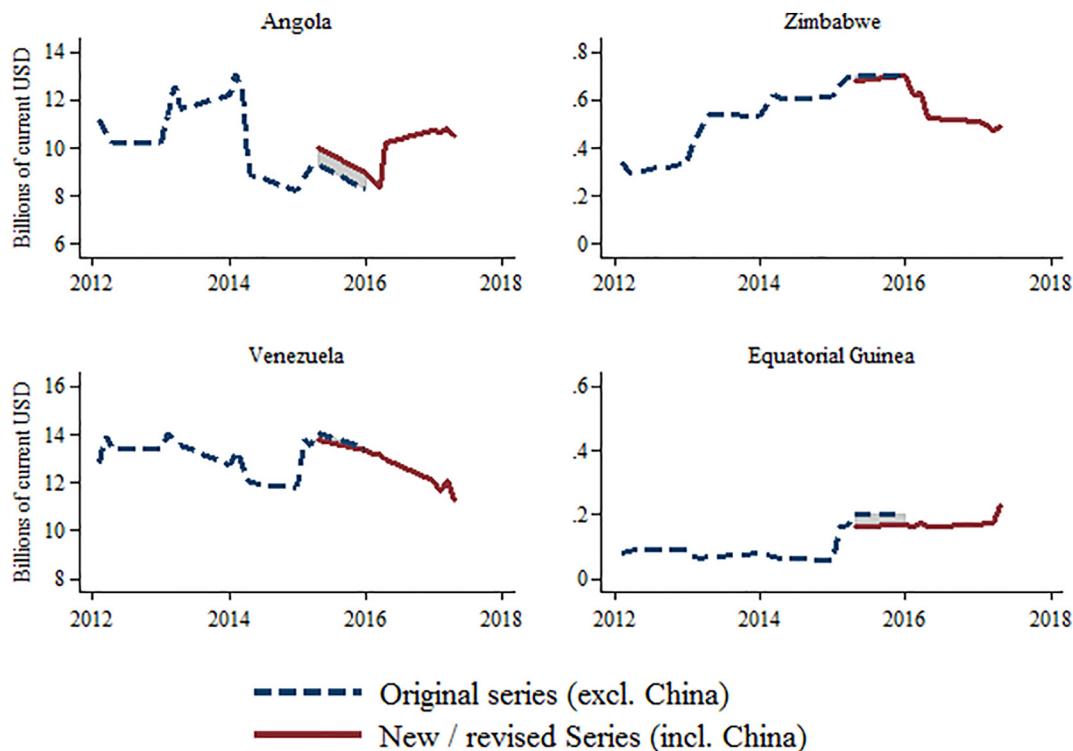
This procedure yields aggregate claims towards each country *with and without* China. Subtracting one series from another gives us an estimate of bilateral Chinese bank claims around the world. Fig. A8 illustrates this procedure for four countries that heavily borrowed from China, namely Laos, South Africa, Zambia, and Pakistan. In each case, total claims increase substantially and the dynamics of the time series changes markedly after claims to China (and Russia) are included.

The obvious confounder here is that Russia's bank claims were added to the BIS at the same point in time. Russia's overseas lending, however, is much smaller and concentrated on a few regions only. Russia's banks mostly lend to countries of the former Soviet Union, plus a few advanced countries and to offshore havens. The rest of the world, however, especially countries of Africa, East Asia and Latin America receive little if any bank loans from Russia (Cerutti and Zhou, 2018). For most countries in the sample, the approach of comparing old and new BIS series will thus generate a useful proxy of total bank claims by banks resident in mainland China. We then compare the BIS-based estimates of total Chinese claims to our own debt stock estimates.

As expected, the two estimates are highly correlated for the majority of countries and a scatter plot of the two sources (using end-2015 data) reveals only small deviations for the majority of countries. We do, however, find a number of anomalies that point towards under-reporting of Chinese lending in some parts of the world. In particular, our estimates significantly exceed BIS implied debt stocks for some of the riskiest and most volatile debtor countries worldwide, such as Angola, Equatorial Guinea, Venezuela or Zimbabwe.

All four countries have received large amounts of Chinese official bank loans, but these loans do not show up in the reported BIS banking claims. Fig. A9 (Panel A) shows that the old series (without China) is very close to the new series (with China) in each case, suggesting that banks in mainland China have barely any outstanding claims towards these countries. Our loan-level dataset, however, shows that Chinese banks lent extensively to each country. The scope of the discrepancies is evident in Panel B of Fig. A9, which compares BIS claims by China to our own debt stock estimates for the four countries, shown as a share of debtor country GDP. As of end-2015, our debt estimate for Zimbabwe is 1.3 billion USD, compared to no debt in the BIS data. The gap is similarly large for the other countries, with discrepancies of 1.5 billion USD, 17 billion USD and 36 billion USD in Equatorial Guinea, Angola and Venezuela, respectively. As a share of output, the underreported claims range from 8% of GDP in Zimbabwe to more than 15% of GDP in Angola.<sup>22</sup>

With regard to the BIS data, another potential explanation is that Chinese banks lend abroad through foreign affiliates and off-shore centers (Cerutti et al., 2020). In such a case, banks in mainland China would not hold direct claims against the foreign country, but their claims might instead appear elsewhere in the BIS Locational Banking Statistics. However, for high-risk countries, such as those included in Fig. A9, lending through foreign affiliates cannot explain the observed gaps. Indeed, our estimates of Chinese debts owed by Angola, Equatorial Guinea, Venezuela and Zimbabwe (and other similar countries) are higher than the *total* aggregate bank claims reported in the BIS statistics (i.e. higher than the sum reported by all BIS members combined).<sup>23</sup>



**Fig. A9.** Comparison to BIS data – discrepancies in crisis countries. Panel A: BIS reported debt stocks. Panel B: BIS implied debt stocks vs. our own estimates. Note: Panel A is analogous to Fig. A8 above but for a different set of countries. It compares the BIS time series on total bank claims (dotted blue line) to a revised series that also contains bank claims by China and Russia (red line). The grey shaded area between these two series captures claims by China and Russia, i.e. the size of external debt stocks owed to banks resident in these two creditor countries. Panel B then compares the BIS-implied estimate of debts owed to China (red bars) to our own debt stock estimates (blue bars), both shown as percent of debtor country GDP (in 2015).

<sup>22</sup> Note that hidden bank claims in the BIS Locational Banking Statistics (a source based on reporting by creditor countries) do not necessarily imply that there is also hidden debt in the World Bank's International Debt Statistics (a source that is based on debtor country reporting).

<sup>23</sup> In addition, the patterns in Panel B of Fig. A9 do not significantly change, when we take into account lending by banks from Hong Kong, the main off-shore center for Chinese banks.

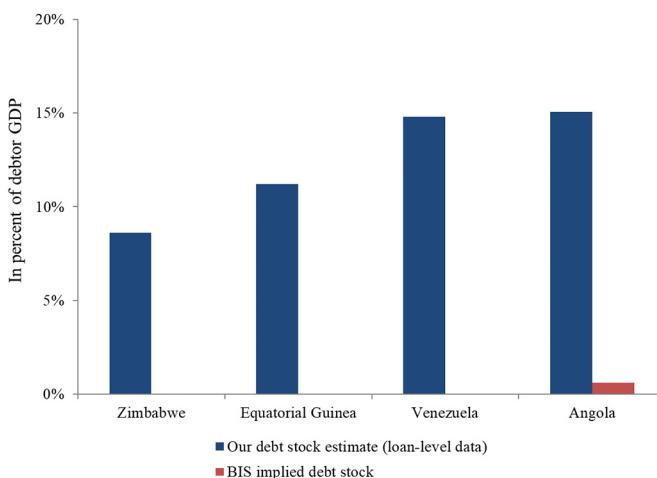


Fig. A9 (continued)

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