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Brown, K.J.

The Review of International Organizations
https://doi.org/10.1007/s11558-023-09513-4

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Kathleen J. Brown[1]

Accepted: 21 September 2023

Abstract
Hidden debt is endemic throughout the sovereign credit market and poses a serious threat to global financial stability. Yet, little is known about why governments conceal their liabilities from creditors. I argue that governments intentionally hide debts from international financial institutions (IFIs) to maximize their ability to borrow while avoiding punishment for rising debt burdens. IFIs frequently penalize governments in low-income countries for borrowing beyond their means. By hiding some debt, governments are able to continue borrowing without being disciplined. I test this using recently released data that reveals half of the Chinese loans in Sub-Saharan Africa are missing from sovereign debt records. I find that borrower governments hide loans to avoid violating World Bank debt sustainability thresholds. However, governments hide less debt while under IMF scrutiny so as to reduce the risk that they will be discovered and punished. These findings offer evidence that borrower governments use hidden debt as a strategic tool to pursue fiscal goals. Further, this work reveals the unintended consequences of IFI intervention in less-developed countries, as efforts to ensure fiscal stability increase governments' incentives to hide debt.

Keywords Sovereign debt · Transparency · Africa · China

With each financial crisis comes the revelation that governments owe far more debt than previously thought. Despite the efforts of international financial institutions (IFIs) like the World Bank, International Monetary Fund, and OECD to track sovereign credit, these so- called "gold-standard" records often contradict one another (Abbas & Rogoff, 2019), leaving governments' true debt burdens something of a mystery. Greece and Italy famously hid billions of euros of debt to ease accession to the Eurozone (Alesina et al., 2019; Dinmore, 2013), Brazil underestimated its debt

Responsible editor: Axel Dreher

✉ Kathleen J. Brown
k.j.brown@fsw.leidenuniv.nl

[1] Institute of Political Science, Leiden University, P.O. box 9555, 2300 RB Leiden, Netherlands

Published online: 16 October 2023

and deficit levels between 2012 and 2015 to "improve investor confidence" (Aragao & Linsi, 2020), and more recently Mozambique concealed $2.2 billion in private bank loans to avoid hitting its own public debt limits (Connelly, 2021). Gelpern (2018) writes that "governments in every national income group on every continent have been caught fudging debt-related statistics," and Michalski and Stoltz (2013) and Gandrud and Hallerberg (2017) find evidence that governments routinely falsify their balance-of-payments estimates. Hidden debt is hardly unique to countries in crisis; governments are regularly found to manipulate financial records to gain political and economic advantages (Dias et al., 2014), and recent history is littered with examples of governments jumping through impressive hoops to downplay debt burdens.[1]

Hidden debt prevents creditors and other financial institutions from accurately pricing risk (Bastida et al., 2017; Kletzer, 1984) or predicting (and preventing) debt crises (Aragao & Linsi, 2020). Countries caught hiding debt jeopardize their standing on the credit market and often face severe penalties; for example, bond prices and credit ratings plummeted in Greece and Italy when their financial maneuverings were revealed, Brazil's credit rating dropped as president Dilma Rousseff was impeached for "fiscal pedaling," and Mozambique was cut off from concessional credit. In short, there is extensive evidence that countries hide liabilities from various creditors, and hidden debt poses costly risks for borrowers and creditors alike. Why, then, is so much sovereign debt hidden? Very little empirical work examines the problem of hidden sovereign debt, and none has investigated the reasons why debt is hidden in the first place.

I build on the political economy literature on fiscal transparency to argue that governments intentionally hide debt from global records to avoid punishment for growing debt burdens. It can be costly for a government to report its true debt burden as creditors increase costs and restrict credit access when borrowing is deemed'excessive.' Hiding debt allows governments to continue borrowing without triggering these consequences. However, governments also face costs if hidden debts are revealed. Even when their ability to borrow is constrained, hiding debt will not always be in the government's interest. When the risk of discovery is high, for example when a creditor audits a country's national accounts, governments may report debts more accurately.

To test this argument, I investigate why African governments hide (or report) official loans from China. While hidden debt is a global phenomenon, this context is an ideal testing ground for my theory for two reasons. First, African countries face high incentives to hide debt from IFIs. In the past twenty years, every country on the continent has experienced IMF and World Bank debt stability programs that limit external borrowing and sovereign debt burdens (Forster et al., 2019). These interventions often conflict with African governments' growing appetites for credit (Kaplan, 2021) and desire for autonomy in domestic fiscal policy (Zeitz, 2021). Second, African countries have been able to hide a specific portion of their sovereign debt: Chinese loans. China has invested nearly $150 billion in Africa since 2000,

[1] See Reinhart (2010) for some of the culprits.

but recent data from Horn et al. (2021) revealed that over half of this debt was concealed from IFIs. As China refuses to report its credit activity to the World Bank and IMF, borrowers can hide Chinese loans by simply omitting them from annual reports to IFIs. While most emerging market governments have received Chinese credit in the past twenty years, African governments have been prolific borrowers, with debt to China equivalent to 10% of GDP on average between 2000 and 2017 (Horn et al., 2021). With this deep exposure to Chinese finance, African states have also had greater opportunities to hide loans from IFIs and to use hidden debt as a strategic tool. By comparing the Horn et al. (2021) estimates of Chinese external lending to borrowing-country loan reports in the joint World Bank—IMF Debtor Reporting System (DRS), I measure how much Chinese credit governments report, and how much they hide.

I estimate the effect of IFI constraints on the share of debt to China that each government hides from the DRS. The results demonstrate that governments choose to hide debt to avoid the external debt-to-GDP thresholds imposed by the World Bank in 34 Sub-Saharan African countries. As the external debt burden moves closer to the threshold, governments hide a larger share of their Chinese loans. However, hiding debt is risky, as IFIs impose costs on governments caught underreporting. When hidden debt is more likely to be discovered like during an IMF loan program when national accounts are heavily scrutinized, governments reduce their risk of punishment by more fully reporting debt. While a country participates in an IMF loan program, approaching the World Bank threshold does not affect hidden debt. Absent the IMF however, when external debt to GDP moves 5 percentage points closer to the threshold, governments hide an additional 21% percent of debt to China. I address the potential endogeneity of IMF programs using a compound instrumental variables approach designed by Lang (2021). While reverse causality cannot be completely ruled out, this approach offers confidence that these estimates reflect the effect of IMF intervention on governments' debt reporting decisions. These results offer evidence that countries hide debt as a strategic choice rather than by accident. Alternative explanations for the variation in hidden debt cannot account for this effect, including the influence of the Chinese government and borrowers' low bureaucratic or statistical capacity. While the results are robust to a variety of alternative specifications, the conditional effect of IMF surveillance is sensitive to the inclusion of country fixed effects, suggesting caution when interpreting the within-country variation in the effect of IFI interventions on hidden debt. Although concerns remain about the coverage of Chinese lending data, these results represent a lower-bound estimate of governments' strategic use of hidden debt.

These findings contribute to a growing literature on financial statecraft in the Global South which emphasizes the role of borrower interests in sovereign debt outcomes (Bunte, 2019; Cormier, 2023b; Zeitz, 2021). Rather than considering borrower governments in the Global South to be passive actors I show that they respond to external constraints by maximizing fiscal space and minimizing the risk of punishment. Further, this work demonstrates how governments 'game the system' of IFI interventions to their advantage and shift the global influence of international institutions. Recent research has paid attention to how governments overstate their development progress to satisfy donor agencies (Sandefur & Glassman, 2015),

underestimate official statistics to maintain access to concessional finance (Kerner et al., 2017; Martinez, 2022), or strategically choose performance targets to lower the burden of IFI interventions (Buntaine et al., 2017; Honig, 2019). I add to this growing record of evidence by demonstrating another way in which governments in less-developed states use access to information to create "room for maneuver" within the constraints of international organizations.

This work joins recent research on the strategies that governments could use to hide loans from a variety of audiences, including borrowing via central bank swap lines (Horn et al., 2023) or via complex financial intermediaries (Malik et al., 2021). I present evidence of hidden debt via one strategy, the manipulation of DRS reports, which indicates that even governments in the Global South can use a variety of tools to strategically alter their debt burdens.

Finally, the results reveal how international organizations unintentionally shape state behavior as interventions in fiscal policy encourage hidden debt. These findings speak to the literature on the role of IOs in regulating fiscal balances in the developing world (Dreher et al., 2015; Lombardi & Woods, 2008; Nooruddin & Simmons, 2006). By incentivizing hidden debt, the World Bank and IMF may undermine their own mandates to monitor debt burdens and prevent debt crises. An information asymmetry between borrowers and IFIs is a threat to global financial stability, particularly if hidden debt induces adverse selection where high-risk countries have the highest incentives to conceal their liabilities. Scholars and policymakers have long warned that hidden debt can trigger a crisis (Gelpern, 2018; Reinhart & Rogoff, 2011) and hamper global responses to crises (Olivares-Caminal & Mustapha, 2020). As debt burdens rise across the Global South, understanding the incentives for hiding debt will be essential to addressing debt sustainability challenges.

1 Hidden sovereign debt

Kletzer (1984) identified two central risks of hidden debt: borrowers are permitted to borrow too far beyond their capacity, and markets underestimate the risk of a debt crisis. Hidden debt is fundamentally an information asymmetry between borrowers and creditors, where borrowers are more capable than creditors of anticipating future risks and may demand more credit while holding less precautionary savings. As risky liabilities are hidden, countries are awarded higher ratings and the market readily supplies more credit (Croitorov, 2016), exacerbating over-indebtedness in high-risk borrowers.

Detecting hidden debt is inherently difficult because of varying reporting standards, definitions of debt, and limited capacity to maintain accurate budget data. Institutional records frequently contradict one another (Abbas & Rogoff, 2019) and IFIs face collective action problems to establish one authoritative estimate of debt burdens (Strange et al., 2017). This patchwork of records leaves room for debts to slip through the cracks, either intentionally or by accident.

There are several examples of governments hiding domestic and external debt from creditors to lower their perceived exposure (Aragao & Linsi, 2020; Reinhart & Rogoff, 2011). Reinhart (2010) documents several incidents of sovereign borrowers

intentionally hiding external private loans from their national accounts, notably in Thailand, Korea, Malaysia, and Indonesia just before the 1997 Asian financial crisis. Melecky (2021) argues that South Asian countries moved liabilities "off-book" and out of official debt statistics to "mobilize greater resources from the private sector." In other words, governments could continue borrowing without alerting private creditors to growing debt burdens. Further, Gelpern (2018) describes widespread efforts by governments to omit loans from reports to IFIs, disguise new loans behind other financial instruments, and "massage the accounts" to lower payments on inflation-indexed debt.

More specifically, countries have been known to hide debts to comply with debt sustain- ability rules. Milesi-Ferretti (2004) first modeled sovereign borrowers' incentives to circumvent fiscal rules by hiding external loans, and Bernoth and Wolff (2008) found evidence that European Union members employ "creative accounting" techniques to ensure budget balances comply with the Stability and Growth Pact. In two well-known examples, Italy and Greece hid debts from the EU to meet the 2.8% budget deficit threshold necessary for Eurozone accession. The Italian deficit miraculously dropped from 7.7% in 1995 to 2.7% in 1998 without a corresponding adjustment to tax revenue or public spending (Alesina et al., 2019), aided by e31.7bn borrowed from J.P. Morgan and other foreign banks via derivatives contracts (Dinmore, 2013). Greece employed a similar strategy when borrowing e5.1 billion from Goldman Sachs between 2002 and 2005 in the form of foreign exchange swaps (Oltheten et al., 2013). Neither transaction entered the national accounts as debt and thus remained hidden from Eurostat external debt estimates, but the loans were revealed when the banks publicly demanded repayment at the start of the Eurozone crisis. Italy and Greece did not break EU accounting rules at the time but simply took advantage of gaps in reporting infrastructure to pass sustainability checks while continuing to borrow.

The manipulation of debt records reaches far beyond the "usual suspects" of governments frequently in distress. Alt et al. (2014) demonstrate that all EU member states have engaged in fiscal"gimmickry" to hide debts under the Stability and Growth Pact, while Aragao and Linsi (2020) highlight the Brazilian government's manipulation of debt statistics between 2012 and 2015 as key examples of hidden debt in Latin America. Dias et al. (2014) show that the US federal government and various municipal governments manipulate debt statistics and accounting procedures to avoid hitting debt ceilings. Even when not facing an outright debt crisis, governments still work to conceal their liabilities from creditors, the public, or international organizations.

Credit markets, IFIs, and researchers are aware that hidden debt is a common and serious problem, and yet we do not understand why sovereign debt is hidden. However, recent research has shed new light on an ideal opportunity to study the dynamics of hidden debt: Chinese credit. China is a major bilateral creditor and has lent billions of dollars to less- developed countries over the past 20 years (Bandiera & Tsiropoulos, 2019). Sub-Saharan African states have borrowed significant sums and China has become a dominant force in development finance in the region (Brautigam & Gallagher, 2014). However, as the Chinese government defines external finance information as state secrets, measuring African debt to China has proved

difficult (Dreher et al., 2018; Wallace, 2016). In 2019, Horn et al. (2021) presented new data on China's overseas lending demonstrating that measures of global debt to China were underestimated by as much as 50%. Crucially, half of the loans issued to less-developed countries between 2000 and 2017 were missing from the Debtor Reporting System (DRS), the official record of borrower governments' external debt used by the World Bank and the IMF. Recent research has examined these Chinese loans in detail (Bon & Cheng, 2021; Horn et al., 2022; Malik et al., 2021), but mostly focused on the macroeconomic consequences of hidden risk rather than the political drivers of hidden debt.

This gap could affect global debt sustainability efforts as IFIs rely on DRS data when issuing bailouts, structuring conditionality, and providing debt relief (Alfaro & Kanczuk, 2019). All low- and middle-income member states of the IMF and World Bank are required to report their sovereign borrowing and lending activities to the DRS on an annual basis; this includes all sub-Saharan African countries and China.[2] However, despite this requirement, China refuses to report any information on its official lending activities to the two organizations. Further, China does not report lending information to the Bank of International Settlement or the OECD Development Committee, two important external sources that the World Bank Group uses to "crosscheck" borrower governments' DRS reports for accuracy (World Bank Group, 2020). As a result, IFIs must rely entirely on borrowers to accurately report Chinese official loans, which gives governments a unique opportunity to hide debt.

By comparing their borrowing data to loan records in the DRS, Horn et al. (2021) showed that while borrower governments fully documented Chinese loans in some years, in other years, loans were simply missing from reports. I take advantage of this inconsistency to investigate the hidden debt puzzle in a cross-country context.

2 Why hide?

When do borrowers hide their loans, and why? I now examine Chinese official loans to African countries and discuss potential explanations for debts to be unreported to IFIs. While governments may have incentives to hide debts from various audiences (voters, other governments, etc.), the case of bilateral Chinese lending is best suited to investigate how debt is hidden from IFIs. Africa is an ideal testing ground for this question, not only because of high Chinese investment in the region, but also as African governments have faced heavy surveillance and frequent intervention from IFIs in the past two decades. This gives African governments both similar opportunities and incentives to hide debt. Within this context, I consider explanations for hidden debt proposed by IFIs and drawn from literature on the politics of data and Chinese external finance: that creditors hide loans for strategic reasons, or that borrowers hide debts by accident. Importantly, I consider both of these arguments to be plausible drivers of hidden debt, and both likely explain some of the variation in hidden debts to China that are to focus of this paper. However, these arguments are

[2] See Online Appendix for DRS reporting requirements.

insufficient to explain all (or even most) of Africa's hidden debts, and so I propose a third explanation: borrowers intentionally hide debt to avoid punishment from IFIs.

2.1 Creditors' influence

First, debt may be hidden to satisfy creditors' interests. Given the evidence of hidden Chinese loans, news media, politicians, and researchers have focused primarily on how China could gain from secretive lending (Hatton, 2021; Rajah et al., 2019). China uses external finance to compete with other creditor nations and to consolidate power in the Global South (Bandiera & Tsiropoulos, 2019; Blair et al., 2021), and so lending unobserved by Western nations and IFIs may offer some competitive advantage. Beyond the outright refusal of the Chinese government to disclose official overseas finance, several of the unique characteristics of Chinese lending may make it easier for these loans to be hidden from IFIs. Compared to other official creditors, the Chinese government administers more of its loans via state-owned enterprises (SOEs), special-purpose vehicles (SPVs), and joint-ventures (JVs), a process in which both complicates the valuation of loans and exempts some from DRS reporting requirements (Malik et al., 2021). While this is sometimes proposed as evidence of China's "debt-trap diplomacy" motives (Brautigam, 2020), these features do not themselves demonstrate that China pushes borrowers to hide debt. As Cormier (2023a) argues, borrowers often demand Chinese credit because it is less transparent than Western official finance, and so they may take advantage of these complex lending structures to limit the visibility of external debts.

Beyond creating conditions that facilitate hidden debt, there is direct evidence that the Chinese government attempts to limit borrowers' debt transparency. Gelpern et al. (2022) present a suite of recently uncovered Chinese bilateral loan contracts, many of which include confidentiality clauses that restrict how borrower governments report loan information to third parties. It remains unclear how these clauses are enforced or whether China grants exemptions, but they show clear intent to manage loan reporting.

While these confidentiality clauses demonstrate a creditor's effort to influence how bor- rowers disclose loans, upon closer inspection they also reveal that China is not always the relevant decision-maker in the choice to conceal or hide a loan from IFIs. Instead, borrower governments have substantial influence over the process of hiding debt. Of the suite of loans described by Gelpern et al. (2022), 15 contracts between China and African governments included confidentiality clauses. Of these, 14 loans were contracted exclusively by the central government and at maturities longer than 1 year, meaning they fell under DRS reporting requirements. When these loan contracts are compared to DRS records, 8 loans are reported (with consistent agreement dates and initial loan values) while 6 loans are missing entirely. Even when the Chinese government explicitly attempted to prevent disclosure, some loans were still reported to IFIs, demonstrating that the creditor is not wholly responsible for hidden debt. Following the publication of Gelpern et al. (2022) the Chinese government responded to deny that the confidentiality clauses were strategic or even unusual in sovereign lending contracts (Huang & Niu, 2021). It is difficult to

systematically measure creditors' influence in the reporting process, and future work should investigate what role China (and other creditors) play in borrowers' fiscal transparency. However, these examples suggest that even when China is involved, there is also room for borrowers to make hidden debt decisions.

2.2 Accidental misreporting

When borrower governments are the responsible actor behind fiscal reports, hidden debt could still be the result of accidental misreporting rather than strategic deception. In a recent report on low-income debt vulnerabilities, the IMF suggested that loans were missing from the DRS because of the "lack of capacity of countries to collect such information" and "limitations in their legal frameworks to require such reporting" (IMF, 2020). Hidden Chinese loans are most prevalent in low-income countries that may be unable to accurately track and report external borrowing. These countries grapple with weaker institutions, challenges to state authority, and fewer resources to devote to monitoring, all of which produce poor-quality official statistics (Jerven, 2013). While the literature on the politics of data often includes bureaucratic capacity as a key driver of 'bad data,' many scholars consider this a contributing factor alongside other, strategic reasons for inaccurate official statistics (Aragao & Linsi, 2020; Sandefur & Glassman, 2015; Boräng et al., 2018).

The IMF often emphasizes accidental misreporting as a driver of hidden debt but has also pointed to intentional borrower manipulation in several instances, demonstrating that both are likely reasons for inconsistencies in IFI debt records. While Burkina Faso was borrowing from the IMF in 2005 the Fund identified two external loans that had not been reported to the DRS, which it attributed to "authorities' failure to provide accurate data, which was the result of administrative weaknesses in public expenditure management" (IMF Press Release, 2005). Further, while lending to Chad in 2017, the Fund cited "a lack of coordination among the relevant government agencies and weak debt management procedures" (IMF Press Release, 2017) as the reason for incomplete external debt records.

In other cases, the IMF has specifically implicated government officials in intentional manipulation. An earlier loan to Chad in 2003 was halted after the IMF uncovered undeclared external borrowing and payments arrears. The IMF offered the government the opportunity to correct the inaccurate information, but Fund staff identified hidden liabilities a second time and, blaming "authorities' failure," required Chad re-pay the credit it had received so far (IMF Press Release, 2003). Similarly, in 2004, a press release announced the suspension of an IMF loan to the Gambia as staff had uncovered hidden debt via the central bank "despite the authorities' knowledge of the situation, and continued withholding of relevant details" (IMF Press Release, 2004). When hidden external debts came to light in Mozambique's notorious 'tuna bond' scandal in 2016, the IMF was one of the first creditors to dismiss the government's claim that debts were accidentally misreported and instead accused the administration of intentional manipulation (IMF Press Release, 2016a). Even among governments struggling with poor statistical and bureaucratic capacity, both accidental and intentional hidden debt are possible.

Within the specific case of hidden debt to China, these loans may be particularly difficult to report as they are often disbursed through Chinese and borrowing-country SOEs, further complicating the reporting process (IMF, 2020; Malik et al., 2021). While low reporting capacity may contribute to the hidden debt problem there is reason to doubt that is the primary explanation for unreported Chinese loans. Measures of fiscal transparency move slowly and rarely change dramatically, and the World Bank's assessment of budget reporting in Sub-Saharan Africa describes a general improvement in transparency over the past decade (World Bank Group; International Monetary Fund, 2018). Hidden debt to China has steadily increased over the same period and fluctuates dramatically from year to year (Horn et al., 2021), suggesting that other important factors drive hidden debt.

Similarly, other analyses of Chinese external finance indicate that hidden debts may reflect both accidental and intentional deception. Malik and Parks (2021) point to cases in Laos, Bosnia and Herzegovina, and Montenegro where Chinese loans were borrowed via complex intermediaries and excluded from DRS reports, and yet were still clearly observed and recorded by the central government. In a similar case, Brautigam and Wang (2021) identified $3.2 billion in debt to China that has been hidden from Zambia's DRS reports and suggest this may be due to a severe lack of debt oversight in the Zambian government (Brautigam, 2021). However, they also present evidence that the Ministry of Finance had a complete record of these loans and included them in internal estimates of central government debt (Brautigam & Wang, 2021, p. 5), indicating that the omission was not due a lack of capacity but rather an intentional choice. As with most extant examples of hidden debts to China, there is no clear "smoking gun" to indicate why loans were excluded from DRS reports, but accidental misreporting is often an incomplete explanation for reporting inconsistencies. Indeed, the best evidence of intentional deception may be whether aggregate levels of hidden debt vary around events that have no plausible effect on reporting capacity, as I test in the empirical analyses.

2.3 Borrowers' interests

Finally, borrowers may intentionally hide debt from IFIs. Hiding loans from the DRS specifically conceals them from IFIs that rely heavily on those records to monitor and limit debt accumulation in low-income countries (Horn et al., 2021; World Bank Group, 2018a, b). Notably, governments can and have used a variety of strategies to exclude liabilities from DRS reports. While DRS reporting requirements cover the vast majority of public liabilities, loans with a maturity of less than 1 year are exempt, offering governments an opportunity to lower debt reports by borrowing at very short maturities. For example, South Sudan borrowed $1.4 billion from China in 2014 (equivalent to 10% of the country's GDP), split over two loans with 45-day maturities, meaning that the government was not required to report either loan to the DRS. Further, Malik et al. (2021) note that borrowers can use joint-ventures and special-purpose vehicles as a mechanism to avoid DRS reporting requirements. They point to a key example in 2016 when the Laotian government borrowed $3.54 from China to fund a railway project,

but was not required to report the loan to the DRS as the government owned less than 50% of the special-purpose vehicle. Neither of these strategies is illicit, and describe "creative bookkeeping" rather than explicitly hidden debt that is the focus of this study, but indicate that borrower governments have ample opportunities to influence IFI records of sovereign debt.

Borrowers have incentives to influence these sovereign debt records as IFIs use the DRS to assess governments' compliance with debt sustainability measures and to impose sanctions if governments are non-compliant. Perhaps most famously, the IMF tightens constraints on external debt when countries come to the "lender of last resort" in crisis as the policy conditions attached to emergency loans often mandate debt repayment and deficit limits. Violating these conditions risks the next tranche of loans, which may be very costly for governments in a balance-of-payments crisis.

IFIs use other interventions to consistently monitor and discipline debt accumulation in low-income states, not only during times of crisis when governments may request and IMF loan. The majority of Sub-Saharan African countries have been subject to the joint IMF-World Bank Debt Sustainability Framework, which was introduced in 2005 as an effort to prevent debt crises among recipients of the Multilateral Debt Relief Initiative (MDRI) (World Bank Group, 2018a, b). Under the framework, countries are subject to biennial debt sustainability assessments (DSAs) that assign them low, medium, or high debt risk ratings and set a corresponding "safe" debt-to-GDP threshold. Low-risk countries are permitted to accumulate debt up to 50% of GDP, while medium-risk and high-risk countries are capped at 40% and 30% of GDP, respectively.

When debt crosses the threshold, the country is "downgraded" to a higher-risk rating. Particularly for governments not rated by traditional credit rating agencies, the DSA risk categories serve as a highly public signal of sovereign creditworthiness. The World Bank and IMF also accompany downgrades with "hardening terms" on future loans (World Bank Group, 2018a, b, p. 21) and reduced access to both loans and debt relief until the debt is lowered below the threshold once more (Lang & Presbitero, 2018). 34 out of 39 countries subject to DSA thresholds are in Sub-Saharan Africa, giving many African governments similar incentives to keep debt levels below DSA thresholds. While this may be accomplished through prudent fiscal policy, it could also be achieved by hiding debts.

3 Testable hypotheses

Hidden debt is a convenient tool to reconcile credit demand with credit restrictions, and Chinese loans offer borrowers the chance to make use of it. In this case, hidden debt is the product of an interaction between borrower governments and IFIs with different preferences over the country's external debt. I theorize about this interaction with the prior that African governments prefer to borrow more, while the World Bank and IMF prefer that governments would borrow less. IFIs enforce their preferences by sanctioning "over-borrowing," which governments can avoid by hiding debt.

Why, then, would governments ever report debt? Duping international actors is risky and IFIs also sanction deception. I expect that governments only engage in deception so long as they are confident that hidden debts will not be observed.

I examine the effect of IFI interventions on how countries report their external debt. I focus on external debt thresholds, which are set bi-annually for each Sub-Saharan African country using the debt statistics reported to the DRS. Crossing the debt threshold is costly as countries are subject to stricter policy conditions and limited access to future concessional lending. Violating the threshold is also a visible sign that the borrower is not following IMF and World Bank fiscal guidance, and may indicate to other creditors that fiscal risks are increasing. However, governments may prefer a higher level of debt than that set by IFIs (Lin & Wang, 2017) and may resist thresholds as an incursion on domestic fiscal sovereignty (Zeitz, 2021). By hiding new loans from the DRS, governments can move closer to their optimal level of debt without triggering the costs associated with crossing the IFI-imposed threshold.

Hypothesis 1. *Governments hide more debt when external borrowing is constrained by international financial institutions.*

If countries deploy hidden debt as a strategic tool they should not only hide more debt to avoid constraints but also hide less debt to avoid detection. Hidden debt can avoid the costs of IFI punishment for rising debt burdens, but there are also high costs when hidden debt is uncovered. I hypothesize that countries will hide less debt when there is a higher chance that IFIs will observe hidden loans, such as when a borrower is engaged in an IMF loan program. During an IMF loan, the Fund is given extensive access to the borrower's national accounts to verify compliance with policy conditions (Kentikelenis et al., 2016). External debt information is no longer borrower-supplied but is now verified by IMF staff, making it more difficult to hide debt. As discussed above in the examples of Burkina Faso, Chad, the Gambia, and Mozambique, heightened scrutiny during the IMF loan review process regularly identifies inconsistencies in official statistics.[3]

Further, IMF loan recipients expect this increased scrutiny and modify their behavior to prevent the disclosure of damaging information. Some borrower governments have voluntarily disclosed hidden debt during the loan review process, potentially to avoid the damaging discovery of these debts. When the IMF uncovered hidden debts during loan programs with Chad and the Gambia, both borrowers were required to repay the funds disbursed up to that point, with interest (IMF Press Release, 2003, 2004). In contrast, when Pakistan began a loan program in 2021 the government pro-actively informed the IMF of hidden debts dating back to 2016 and

[3] The IMF sometimes announces via a press release that Fund staff have discovered inconsistencies or misreporting in national accounts during the course of a loan review. For example, Fund staff identified misreporting during the following loan reviews (press release codes in parentheses, see https://www.imf.org/en/News/SearchNewsforreleases): Angola 2014 (14/110), Argentina 2016 (16/497), Democratic Republic of the Congo (05/195), Ecuador 2020 (20/204), Guinea 2016 (16/109), Iraq 2021 (21/60), Malawi 2021 (21/377), Niger 2014 (14/145), Rwanda (05/85), and Sierra Leone 2020 (20/131).

was cleared of any breach of reporting requirements (IMF Press Release, 2021). Although Mozambique did face penalties from IFIs after the 'tuna bond' scandal, it was the government that first notified the IMF of these hidden debts at the start of a new loan program (IMF Press Release, 2016a, b). Beyond the case of hidden debt, scholars have theorized about the effects of IMF scrutiny on government behavior in other contexts.

Hyde and O'Mahony (2010) and Ebeke and Ölcer (2013) show that leaders reduce fiscal manipulation when IMF programs begin because they expect additional monitoring of public budgets, and Andone and Scheubel (2017) argue that secretive countries may avoid loan programs altogether to prevent the IMF from observing government economic interventions. If rational governments intentionally hide debt, they should reduce this behavior while IMF loan programs are underway to offset the heightened risk of exposing their true debt burden.

Hypothesis 2. *The effect of external constraints on hidden debt is weaker when governments are subject to additional fiscal scrutiny.*

4 Data

To test these hypotheses, I examine hidden debt to China in 34 Sub-Saharan African countries between 2000 and 2017.

4.1 Dependent variable

The outcome of interest, hidden debt (H), is defined as the *hidden share* of a country's total debt to China. This is measured by the difference between Horn et al. (2021) (referred to as HRT) and World Bank DRS estimates of outstanding debt to China,[4] divided by the HRT estimate.

$$H = \frac{HRT\ debt\ to\ China - DRS\ debt\ to\ China}{HRT\ debt\ to\ China}$$

Central to this approach is the assumption that HRT captures the same types of loans that fall under the scope of DRS reports. HRT found missing loans by compiling existing academic data and supplementing this with records from secondary sources like policy reports, treaties, and individual loan contracts. If HRT and the DRS define external debt differently, then H may represent debt that is irrelevant to IFIs, not "hidden." A careful reading of the DRS manual (World Bank Group, 2013) and the HRT data collection process, as well as correspondence with HRT authors and the World Bank Debt Statistics Team,[5] confirms that this is not the case.

[4] Analogous to the "External debt stocks, public and publicly guaranteed (PPG) (constant dollars, relative to GDP)" series in the International Debt Statistics.

[5] Correspondence with the Debt Statistics Team on May 28th, 2021.

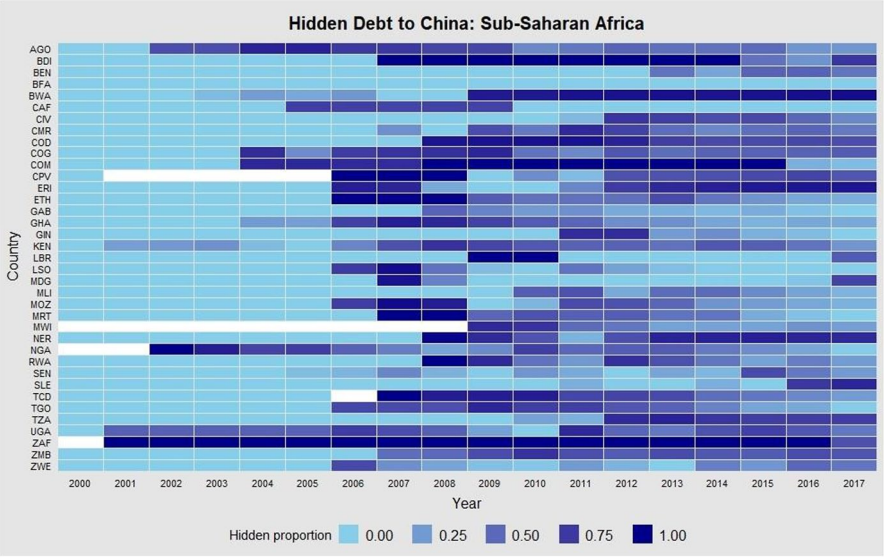

Fig. 1 Hidden proportion of outstanding debt to China: across countries and time. Rows represent countries while columns represent years. Each cell represents the value of *H*, the hidden share of debt to China, for a country-year. Lighter blue indicates that a lower share of outstanding debt to China was hidden, while darker blue indicates a higher hidden share. White blocks indicate periods when countries did not not have outstanding debt to China and did not borrow new loans from China (where *H* is coded as 'missing')

DRS reports are wide-ranging and require that borrower governments disclose loans issued to the central and local governments, public and public- private corporations, the central bank, development banks, and private entities explicitly guaranteed by the state. Horn et al. (2021) base their hidden estimates on a direct comparison between their data and DRS reports, demonstrating that newfound Chinese loans *should* appear in DRS reports but are missing. Further discussion of the validity of this hidden debt measure can be found in the Online Appendix.[6] While the HRT data covers Chinese lending to 149 countries, it also documents an intense concentration of lending activity in sub-Saharan Africa, offering these governments the greatest opportunity to use Chinese loans for strategic reporting.

Figure 1 visualizes hidden debt across countries and years, with each cell representing the value of *H* for a country-year observation. Lighter shades of blue indicate less hidden debt while darker blue indicates more hidden debt. Notably, this heat map demonstrates the heterogeneity in hidden debts across time; there is a general increase in *H* after 2005 when China began lending to most African countries (Dreher et al., 2018), but otherwise countries alternate between hiding and reporting Chinese loans with no obvious pattern.

[6] The Online Appendix is available on the Review of International Organizations' web page.

4.2 Independent variable

I propose that this variation in hidden debt is driven, at least in part, by IFI constraints on borrower governments' external debt. I examine two types of constraints: debt sustainability thresholds and IMF loan programs. Under both programs, countries are subject to IFI rules that limit borrowing and debt burdens, but debt is much easier to hide under the former than the latter. Policy conditions on IMF loan programs are accompanied by increased scrutiny of national accounts to ensure compliance (Hyde & O'Mahony, 2010). Thresholds, however, are set based on fiscal data reported by countries to the DRS and involve no additional scrutiny (World Bank Group, 2018a, b).

I estimate the effects of both interventions on hidden debts. Debt thresholds have been applied to 34 Sub-Saharan African countries consistently since 2005 and only constrain a country's fiscal policy when debt levels are close to the threshold. I collected threshold data from each country's biennial World Bank Debt Sustainability Assessment reports.[7] The external debt threshold is set to 30%, 40%, or 50% of a country's GDP.[8] To capture the constraining effect of thresholds on debt burdens I measure the absolute value of the distance between a country's reported external debt to GDP and its assigned debt sustainability threshold. I use the absolute value as the strategic incentives to hide debt are unlikely to cut off sharply when reported debt reaches the threshold. Instead, I expect governments to use hidden debt when their burdens are just below *and* just above the threshold.

When debt is far below, governments have ample room to borrow before triggering punishment, and so hiding debt offers little benefit. As debt rises towards the threshold, hiding becomes increasingly 'profitable.' Similarly, hiding is unlikely to be useful when debt levels are far beyond the threshold as it would be difficult and risky to hide a sufficient amount of debt to return to DSA compliance. However, strategic hidden debt may continue after debt levels have breached the threshold, especially if governments slightly underestimate their level of external debt/GDP compared to the World Bank's assessment. Governments have direct control over DRS loan reports but have less influence over how the World Bank and IMF aggregate outstanding debts, compare this to GDP figures, or even round the debt/GDP ratio to compare to the integer threshold levels.[9] Thus, governments have incentives to hide when they expect their debt level to be within 'striking distance' of the

[7] DSA repository: https://www.imf.org/en/publications/dsa

[8] The World Bank and IMF have deviated from these categories on two occasions. Benin was assigned a 56% threshold in 2016 and 2017. According to the DSA reports in those years, this "customized" threshold reflected Benin's higher than expected economic growth and successful debt consolidation in 2015. Comoros was assigned a 27% threshold between 2014 and 2016 when economic growth was much lower and inflation and external borrowing much higher than World Bank-IMF projections. My reading of the DSA reports indicates that custom thresholds are used when IFIs greatly over or underestimate countries' economic fundamentals and debt risk, although future research should investigate when and why DSA conventions are bent.

[9] The World Bank Group incorporates countries' official statistics into its GDP estimates, but also relies on its own data collection, processing, and standardization, see: https://datahelpdesk.worldbank.org/knowledgebase/articles/906531-methodologies.

threshold. The absolute value of the distance from the threshold reflects the intuition that hidden debt is most useful in deceiving IFIs when the reported external debt level is close to the DSA debt threshold.

Participation in an IMF loan program is measured using the IMF Monitoring of Fund Arrangements Database (MONA) to create an indicator for years when a country is subject to a loan program for at least five months. IMF loan programs were frequent during the study period, with program participation in 57% of the country-year observations. While IMF intervention is more straightforward to measure than the distance from the threshold, estimating its effect requires addressing the endogenous assignment of loan programs, which I discuss in detail below.

4.3 Control variables

I include several confounding variables that could jointly affect IFI interventions and hidden debt. First, I consider that debt thresholds are not randomly assigned and include factors that determine countries' selection into threshold categories. Countries are assigned to thresholds at 30, 40, or 50% debt-to-GDP based on their debt-carrying capacity as determined by the IMF and World Bank under the Debt Sustainability Framework. Based on the methodology described by World Bank Group (2018a, b), I include some of the economic indicators used to assess debt risk: total debt-to-GDP (World Bank Group, 2021a) and the natural logs of GDP (in billion USD) and GDP-per-capita (World Bank Group, 2019). I also include dummies for the level of threshold assigned in each country-year; these enter the regression as fixed effects. This accounts for the possibility that crossing different debt thresholds may have different consequences. I expect the incentives to hide debt to persist when reported debt is narrowly above the threshold but to decrease as a country's debt level increases beyond what can feasibly be concealed by hiding Chinese loans. However, the incentive to hide is likely stronger below the threshold where governments have more certainty that concealing loans will successfully hold the level of debt below the threshold. To address this and increase the precision of my estimates I include an indicator equal to 1 when reported debt is above the threshold, and equal to 0 below the threshold.

Additionally, I control for factors that may tighten the constraints of debt thresholds for some countries more than others. I include a country's outstanding debts to the IMF and the World Bank (World Bank Group, 2021a) as a share of GDP as countries more reliant on these sources of funding may have more to lose by crossing the debt threshold. Similarly, I include a measure of debt to China as a share of GDP. Countries with more Chinese credit have greater opportunities to hide debt, and so can more easily avoid debt thresholds than countries that borrow small amounts from China.

While I argue that hidden debt is primarily an intentional strategy, I also consider that some debt may be unintentionally hidden and include controls to capture the government's capacity to report debt. If high-risk countries are most likely to misreport external debt because of low bureaucratic capacity this could bias estimates of the effect of IFI constraints on hidden debt. I account for this by including the

World Bank statistical capacity index (SCI) (World Bank Group, 2021b), which is a composite score from 0—100 that assesses the capacity, accuracy, and methodology of a government's statistical system. Accurately reporting debt may be more difficult for countries that allow sub-national entities to borrow externally and so I include an indicator for the ability of sub-national governments to levy taxes as a measure of fiscal federalism (Strøm et al., 2017).

4.4 Estimation

First, I test the effect of debt sustainability thresholds on the hidden proportion of debt to China, *H*, using an ordinary least squares regression. My intervention of interest *Threshold* is the absolute value of the difference between reported debt/GDP and the threshold. As the absolute distance is heavily left-skewed, *Threshold* is log-transformed.[10] The absolute value of distance captures both the constraining effect when debt approaches the threshold, and a gradual drop-off in this effect as countries move beyond the threshold. A significant negative effect of *Threshold* on *H* would indicate that hidden debt increases when reported debt is closer to the threshold.

$$H_{it} = Threshold_{it}\beta_1 + \boldsymbol{X\beta_{it}} + \gamma + \alpha + \epsilon_{it}$$

The sample period is limited to 2005–2017 as thresholds were only introduced in 2005. The regression includes a vector of controls *X* discussed above as well as year fixed effects (γ) and debt-threshold fixed effects (α). As is clear from Fig. 1, it is necessary to control for time trends as there is a steady increase in Chinese lending throughout the period. I choose not to include year *and* country fixed effects for two reasons. First, while two-way fixed effects are often used to model panel data, recent work has cautioned that the combined estimation of within-country and across-time variation produces misleading results (Kropko & Kubinec, 2020). Second, I am specifically interested in the cross-country variation in hidden debt, not only the within-country variation isolated by country fixed effects. However, I also estimate models in the Online Appendix with both country and year fixed effects.

Next, I estimate the effect of both debt sustainability thresholds and IMF loan condition- ality on *H* by including an indicator for the presence of an IMF program with a mandate over external debt, *IMFprogram*. When a country is under an IMF program, greater scrutiny should reduce the incentive to hide debt, even as the debt threshold approaches. *Threshold* is interacted with *IMFprogram* to capture this effect. A significant positive effect of *Threshold*IMFprogram* on *H* would demonstrate that the effect of debt thresholds on hidden debt is strongest when countries are not subject to an IMF program.

$$H_{it} = Threshold_{it}\beta_1 + IMFprogram_{it}\beta_2 + \left(Threshold_{it} * IMFprogram_{it}\right)\beta_3 + \boldsymbol{X\beta_{it}} + \gamma + \alpha + \epsilon_{it}$$

[10] $\ln(1 + Threshold)$.

This model assumes that IMF intervention is exogenous but this is unlikely as IMF loan programs are triggered by a country's economic needs and by negotiations between the IMF and borrower. Governments usually approach the IMF under severe financial strain (Moser & Sturm, 2011), but even among countries in distress, governments are more likely to engage with the IMF when there is sufficient political will to support fiscal consolidation (Vreeland, 2002). Further, program assignment varies across a government's regime type (Bauer et al., 2012), bureaucratic capacity (Barro & Lee, 2005), and relationship with the Fund's major shareholders (Dreher & Jensen, 2007; Lang & Presbitero, 2018).

These factors are likely to be correlated with the assignment of debt thresholds, trends in Chinese lending, and a country's willingness and ability to hide debt. Controls for wealth, the size of the economy, and various aspects of a country's debt burden should block some of these pathways but there are likely to be unobserved confounders. Hidden debt may contribute to an economic crisis that requires IMF intervention, or governments that engage in extensive fiscal manipulation may be less willing to approach the IMF for fear of exposure. If this is the case then estimates of the conditional effect of debt thresholds on hidden debt will be biased.

This endogeneity problem is well-known in the literature on the economic and political effects of IMF intervention (Dreher et al., 2015) and most researchers have addressed it via an instrumental variables approach. Well-known instruments include a government's voting similarity with the United States in the UN General Assembly (UNGA) (Barro & Lee, 2005; Dreher & Sturm, 2012) and temporary membership in the UN Security Council (UNSC) (Dreher et al., 2009; Moser & Sturm, 2011). However, these instruments are unlikely to be excludable for economic outcomes that are correlated with a government's foreign policy preferences (Lang, 2021). Instead, I turn to a more recent IV approach that provides a plausible exclusion restriction for hidden debt.

4.4.1 Endogenous IMF program assignment

I address endogenous IMF program assignment via a compound instrumental variable proposed by Lang (2021) which has become increasingly popular in the study of IMF loan programs (Forster et al., 2019; Kern et al., 2019; Reinsberg et al., 2019). The instrument is the interaction between the probability that a country borrows from the IMF, *IMFProbability*, and the IMF liquidity ratio, *IMFliquidity*, which captures the budget constraint that limits IMF lending each year. Each country's borrowing probability is defined as the share of previous years in the study period in which a country participated in an IMF loan program for at least 5 months. IMF liquidity is measured as IMF liquid resources divided by IMF liquid liabilities each year, using data from Lang (2021).

This identification strategy exploits two features of IMF policymaking to recover exogenous variation in loan assignment. First, countries that have regularly engaged in past IMF loan programs are more likely to participate in loan programs again, both as repeat borrowers may be more likely to experience economic crisis (Bird & Willett, 2004) and due to bureaucratic preferences within the IMF to lend to a regular 'clientele' of countries (Reinhart & Trebesch, 2016). Second, the IMF issues

more frequent and larger loans when the organization is highly liquid (Kern et al., 2019; Lang, 2021). When the IMF has limited resources, however, it is restricted in the number and size of loans it can extend to governments in distress.

The interaction of these two features identifies an important pattern in IMF lending. At low levels of IMF liquidity, *IMFprobability* predicts program assignment as IMF staff uses past lending to guide the allocation of scarce resources. When the IMF enjoys plentiful resources, however, there may be incentives to expand the scope of the Fund's activity and offer loans to new borrowers. At high levels of IMF liquidity loan programs are not strongly predicted by past engagement and are closer to as-if random assignment (Lang, 2021).

Importantly, the compound instrument follows a difference-in-differences logic that allows for a plausible exclusion restriction (Dreher & Langlotz, 2020; Nunn & Qian, 2014; Stubbs et al., 2020). The identifying assumption is *not* that IMF liquidity has no effect on hidden debt. Rather, the assumption is that IMF liquidity does not affect hidden debt differently for countries with a low probability of borrowing from the IMF compared to countries with a high probability of borrowing, other than via IMF program assignment. I examine this parallel trends assumption in the Online Appendix and find no evidence that IMF liquidity has heterogeneous effects on hidden debt across the probability of program assignment. Further, I show evidence that there is a significant, positive correlation between IMF liquidity and the incidence of IMF loan programs that satisfies the relevance criterion of the instrument.

My main quantity of interest is the interaction between distance from the threshold and an IMF loan program. Where the IMF program indicator enters the regression as a moderator this requires instrumenting for the additive term as well as the interaction term. I follow the recommendations of Bun and Harrison (2019) to instrument for *IMFprogram* with the compound instrument, and instrument for *Threshold*IMFprogram* with the triple-interaction of the compound instrument and *Threshold*. Following the design in Lang (2021) I control for the constituent terms of the compound instrument in both stages of the 2SLS specification. First-stage results and details on the instrument, the exclusion restriction, and falsification tests are found in the Online Appendix.

5 Results

I first examine the effect of World Bank debt sustainability thresholds on hidden debt. Table 1 presents the results of regressing the hidden proportion on the (log) distance from the threshold in columns 1 and 2, both estimated using OLS, where column 2 includes the *IMFProgram* indicator as a control variable. In both models, distance from the threshold has a significant negative effect on the hidden proportion, meaning that a larger share of debt to China is hidden when countries are more constrained by the threshold.

As the *Threshold* variable is log-transformed, the coefficient alone is not useful for interpreting the substantive effect. When the distance between the debt burden

Table 1 Effect of IFI interventions on hidden debt to China

	Dependent variable: Hidden proportion of debt to China			
	OLS	*OLS*	*OLS*	*2SLS*
	(1)	(2)	(3)	(4)
Distance from Threshold (log)	−0.042**	−0.044**	−0.168***	−0.301**
	(0.021)	(0.022)	(0.051)	(0.122)
IMF Program		−0.017	−0.518***	−1.450**
		(0.055)	(0.194)	(0.712)
Threshold x IMF Program			0.147***	0.271**
			(0.054)	(0.124)
GDP per capita (log)	0.078**	0.077**	0.065**	0.045
	(0.033)	(0.033)	(0.033)	(0.039)
GDP (billion USD, log)	−0.036*	−0.035*	−0.034*	−0.038*
	(0.019)	(0.020)	(0.019)	(0.021)
External debt / GDP	−0.001	−0.001	−0.001	−0.0003
	(0.002)	(0.002)	(0.002)	(0.002)
Debt to China / GDP	0.019***	0.019***	0.019***	0.019***
	(0.004)	(0.004)	(0.004)	(0.004)
Debt to World Bank / GDP	0.356	0.355	0.334	0.380
	(0.343)	(0.344)	(0.341)	(0.368)
Debt to IMF / GDP	−0.007	−0.007	−0.007	−0.011
	(0.009)	(0.010)	(0.009)	(0.011)
SCI score	0.0003	0.0004	0.0002	0.001
	(0.002)	(0.002)	(0.002)	(0.002)
Sub-national taxation	0.253***	0.249***	0.249***	0.258***
	(0.044)	(0.045)	(0.045)	(0.051)
Above threshold	−0.051	−0.055	−0.044	−0.129*
	(0.043)	(0.045)	(0.044)	(0.073)
IMF probability				0.478
				(0.318)
IMF liquidity ratio (log)				0.005
				(0.130)
Year fixed effects	Yes	Yes	Yes	Yes
Debt threshold fixed effects	Yes	Yes	Yes	Yes
IV	No	No	No	Yes
Observations	382	382	382	382
K-P weak instrument: IMF Program F-stat				10.976
P-value				0.000
K-P weak instrument Threshold x IMFProgram: F-stat				33.982
P-value				0.000

$p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$

and the threshold shrinks by half, on average governments hide an additional 3.1% of their Chinese loans. To put this in concrete terms I predict the values of *H* as debt approaches the threshold.

When the debt burden is 10 percentage points away from the threshold (for example, a country assigned a 40% threshold with external debt at 30% of GDP), governments hide 42.3% of their debt to China, close to the average value for *H* across the entire sample. When the debt burden moves 5 percentage points closer to the threshold, the hidden proportion increases to 45.4%.

I argue that the mechanism responsible for this change in hidden debt is intentional financial statecraft. If this is the case, then government decision-makers should hide less when there is a higher risk of discovery. I examine this implication by interacting distance from the threshold with the indicator for the presence of an IMF program. Column 3 in Table 1 presents results estimated using OLS, while column 4 presents the second-stage results from a 2SLS estimation where *IMFprogram* is instrumented by the interaction of *IMFLiquidity* and *IMFprobability*. As the interaction term itself is the instrumental variable, the constituent terms of the compound instrument are included as controls in both 2SLS stages. Kleinbergen-Paap F-statistics and p-values from the first stage are reported at the bottom of Table 1 and reject the null hypothesis that the instrument is weak.

Following the best-practices outlined in Hainmueller et al. (2019) I assess the significance of the interaction term by plotting the marginal effects in Fig. 2. Both panels plot the marginal effects of *Threshold* across values of *IMFprogram*; the left panel plots OLS estimates and the right panel plots 2SLS estimates. In both estimations, the conditional effect is significant and positive which indicates that governments hide more debt to avoid the threshold when they are not under IMF surveillance. During an IMF program *Threshold* has a null effect on hidden debt, but absent the IMF, hidden debt increases significantly as governments approach their debt sustainability threshold.

The conditional effect of *IMFprogram* is both statistically significant and also substan- tively important. The 2SLS estimates show that while under IMF scrutiny, governments hide an additional 2.0% of debt to China as reported external debt/GDP moves 50% closer to the threshold, although this effect is not statistically distinguishable from 0. Without the IMF, however, governments hide an additional 21.0% of debt to China as debt moves 50% closer to the threshold.[11] Compare this to the 3.1% estimate obtained when averaging across years with and without an IMF loan program; it is clear that the conditional effect of IMF surveillance reveals important information about the circumstances under which governments engage in hidden debt.

These findings are consistent with my argument that hidden debt is driven, at least in part, by intentional manipulation by borrowers. Put simply, countries hide substantially less debt when under IMF surveillance, even when debt levels are within 'striking distance' of their World Bank sustainability threshold. When the IMF is absent, however, governments hide significantly more of their Chinese debt to avoid the threshold.

[11] The marginal effect of *Threshold* at *IMFProgram* = 0 is 0.301, this translates to 0.21 when taken out of log-terms (0.301*ln(0.5)). The marginal effect at *IMFProgram* = 1 is -0.030, this translates to 0.02 (0.03*log(0.5)).

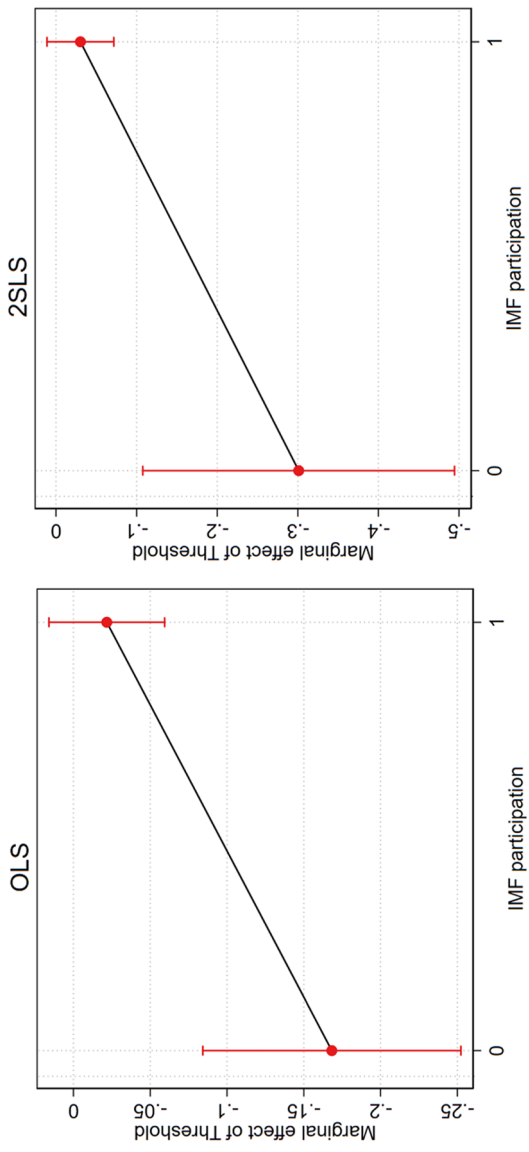

Fig. 2 Marginal effect of distance from Threshold on hidden debt, across IMF Program. The left panel plots the marginal effect of *Threshold* across the presence (= 1) and absence (= 0) of an *IMFProgram*, estimated with OLS (corresponds to column 3 in Table 1). The right panel plots the marginal effect estimated with 2SLS (corresponds to column 4 in Table 1). Dots represent point estimates and lines represent 90% confidence intervals. Both plots show that without an IMF program, governments hide significantly more debt as their debt burden approaches the debt threshold. When subject to an IMF program however, distance from the threshold has no effect on hidden debt

5.1 Alternative explanations

I explore two potential alternative explanations for variation in hidden debt – creditor influence and accidental misreporting. I do not claim that these factors do not affect hidden debt as government capacity and creditor interests likely influence the distribution of loans and the ability to accurately report them. Instead, my burden of proof is to demonstrate that IFI constraints have a separate effect on hidden debt and that this effect is evidence of borrower governments' intentional behavior. I examine this through several tests with results shown in the Online Appendix.

5.1.1 Hidden by creditors?

I first consider ways in which creditor influence may drive hidden debt. If the Chinese govern- ment pressures borrowers to conceal debt, governments with closer geostrategic relationships with China may be most vulnerable to this pressure. In addition, borrowers' relationships with other states can influence their credit market behavior and could change the incentives to hide debt. IMF loan conditions may be less constraining for countries that are politically important to the United States (Dreher et al., 2009; Lang & Presbitero, 2018). It follows that these borrowers may be less concerned about World Bank thresholds or IMF scrutiny, as support from the United States shields them from sharp consequences if IFI constraints are violated (Hyde & O'Mahony, 2010). To capture these relationships I include latent variable measures of China's and the United States' signaled support for prot´eg´e countries created by McManus and Nieman (2019) and find that the effects of debt thresholds and the interaction with IMF programs are robust.

While signaled support captures the China-borrower relationship more generally, it does not precisely identify how the Chinese government or its intermediaries could influence loan reporting. I consider two potential pathways: China could directly force borrowers to conceal certain loans, or could indirectly manage lending to make it difficult for borrowers to accurately report loans. Testing the former is difficult given the limited information available on loan negotiations between China and borrower governments. What is publicly available, however, suggests that China has limited ability to directly control borrowers' reporting decisions as shown in the earlier discussion of "confidentiality clauses" uncovered by Gelpern et al. (2022). China may also influence reporting by making loans difficult for borrowers to correctly report to IFIs. Notably, China frequently uses state-owned enterprises (SOEs) as intermediaries in bilateral credit transactions. These transactions are defined as bilateral finance by the DRS (World Bank Group, 2013) and should be included in borrowers' estimates of sovereign debt, but the complex involvement of SOEs may make it more difficult for borrower governments to correctly report loans (Malik et al., 2021; Melecky, 2021). Indeed, China may rely more on SOE involvement when the DSA threshold approaches in an effort to conceal their role in threatening borrowers' debt sustainability.

To address this, I include a measure of SOE involvement in credit transactions with China each year. Neither the DRS nor HRT data identify which loans were

issued by Chinese SOEs,[12] so I create a measure of SOE involvement in Chinese external finance in each country-year using the AidData Global Chinese Official Finance loan-level database (version 2.0) (Custer et al., 2021). Even controlling for Chinese SOE involvement, the constraining effect of debt thresholds and the scrutiny effect of IMF programs are unchanged.

Taken together these tests offer compelling evidence that IFI constraints have an effect on hidden debt that is independent of Chinese government influence. Despite this, it is impossible to completely control for China's role in the reporting process, in part because of the hidden nature of hidden debt. Even the most exhaustive records of Chinese overseas finance are likely to be incomplete, and Chinese influence may be most important in loans that are completely hidden from both the DRS and the forensic loan data used in this research (Horn et al., 2021; Malik et al., 2021). Future research should focus on loan negotiations to determine China's interests and efforts in limiting transparency.

5.1.2 Hidden by accident?

Second, I consider the role of accidental misreporting. I re-estimate all regressions replacing the SCI score with the Worldwide Governance Indicators measure of bureaucratic effectiveness (Kaufman & Kraay, 2016) and the World Bank Country Policy and Institutional Assessment (CPIA) budgetary management index (World Bank Group, 2018a, b), both of which aim to capture a government's ability to accurately record debt statistics. I also include an indicator for the presence of an independent debt management office (DMO) from CABRI (2022) as they can improve the accuracy of debt records and make it easier for IFIs to scrutinize liabilities (Sadeh & Porath, 2020). The results are robust to the inclusion of these additional reporting measures. This does not mean that government inefficiency does not contribute to hidden debt, but rather that IFI constraints have a separate effect on hidden debt that cannot be explained by borrowers' capacity.

In addition, controlling for Chinese SOE involvement (above) may capture loans that are easiest for governments to accidentally miss, in addition to being most vulnerable to Chinese influence. Unintentional misreporting may also be more likely to occur with loans issued *to* borrowers' SOEs, especially without an explicit sovereign guarantee from the borrowing government. While these are considered sovereign debt and fall under DRS reporting requirements (World Bank Group, 2013), the lack of guarantee reduces government oversight, potentially increasing the likelihood that loans will be missed by reporting officials. Again using AidData loan records I measure the annual share of Chinese loans that were disbursed to a borrower's SOE without a sovereign guarantee. Controlling for this SOE measure should estimate out loans that are most difficult for governments to report and focus instead on those that are most vulnerable to intentional misreporting.

[12] The confidential DRS data made available to me by the World Bank Group did not identify government lending intermediaries but this information is reported to the World Bank and IMF.

5.1.3 Robustness checks

I estimate the results in a variety of alternate specifications, with robustness checks shown in the Online Appendix. First, I estimate models using hidden flows of new loan commitments rather than hidden stocks of annual debt-to-GDP as the dependent variable. So far, I have assumed that borrower governments decide to hide a portion of debt to China in each year, but governments may rather choose to hide an entire loan in the year that it is signed. The ideal estimation to match this data generation process would be to estimate the likelihood that each loan is hidden, but DRS confidentiality requirements prevent the reporting of estimates below the country-year level. Instead, I replace the dependent variable (hidden share of outstanding debt) with each country's hidden share of new Chinese loan commitments in each year. The effect of *Threshold* on hidden commitments is negative and substantively similar to the effect on hidden debt but is insignificant. However, the interaction between *Threshold* and *IMFprogram* has a positive, significant effect on hidden commitments across both OLS and 2SLS specifications. When not engaged in an IMF loan program, governments hide an additional 24.3% of Chinese loan commitments as their debt burden moves 50% closer to the threshold. When the IMF is present, however, distance from the threshold has no significant effect on hidden commitments. This effect is substantively similar to that estimated using stocks of hidden debt, indicating that IFI interventions affect how governments hide or report individual loans as well as the hidden share of their overall debt burden. This specification may more precisely capture debt reporting decisions, but also introduces a complex selection problem as governments do not sign new loan agreements with China in every year. The choice to borrow from China in a particular year is likely endogenous to the choice to hide debt in response to IFI interventions. While this test indicates that governments strategically alter their reports of debt flows as well as stocks, future work should investigate how governments choose to take on new loan commitments as part of a strategy to hide debt from creditors and international financial institutions.

Next, I re-estimate the interaction models using an inverse probability weights (IPW) approach that is popular in the literature as an alternative strategy to address selection into IMF loan programs (Caselli & Wingender, 2021; Hyde & O'Mahony, 2010; Nooruddin & Simmons, 2006). I also test a more conservative construction of the compound instrument and re-estimate OLS regressions using a fractional logit specification; the results remain robust. I further estimate models including country and year fixed effects. In these most conservative estimates, the effect of *Threshold* remains negative and significant, although the conditional effect of *IMFProgram* loses significance in both OLS and 2SLS specifications.

I further examine how the IMF program indicator captures IFI scrutiny and consider other observable implications of the scrutiny hypothesis. First, I control for the number of IMF loan programs each year as the Fund may have more limited mission staff to investigate national accounts when demands on its time and resources are high (Lang, 2021). Second, I control for degrees of past participation in loan programs as the IMF may scrutinize "repeat offenders" more closely (Bird et al., 2004) and closer bureaucratic ties with previous borrowers can facilitate surveillance

(Dreher & Lang, 2019). Third, I include a running count of a country's past IMF programs that were temporarily or permanently interrupted as past non-compliance can trigger increased surveillance (Reinsberg et al., 2022). The results are robust to these inclusions, suggesting that the introduction of an IMF loan program represents an *additional* increase in the scrutiny of borrowers' national accounts.

If governments reduce manipulation during an IMF loan program because of the increased risk of being caught, then regular IMF borrowers should engage in less hidden debt as they have been subject to more frequent and increasingly intense scrutiny. I interact *Threshold* first with past participation in loan programs, and second with the measure of previous program interruptions, holding the number of previous programs constant. I find that both have a positive, significant conditional effect that mirrors the results in the IMF program models. As governments engage in repeated IMF loan programs, and particularly when they have a history of interrupting those programs, they rely less on hidden debt to avoid their debt threshold.

Finally, I am cautious of over-fitting the models, especially when including additional controls to investigate alternative explanations (Vadlamannati & Brazys, 2022). To guard against this I estimate models using only statistically significant control variables and then dropping control variables one by one. Results are robust and confirm that the estimates are unlikely to be a product of over-fitting.

6 Conclusion

I provide evidence that borrower governments intentionally hide debt from international financial institutions to circumvent constraints placed on their external debt. While less- developed countries are often viewed as passive players in the global credit market, I argue that borrower governments choose to hide and report sovereign debt strategically as a form of financial statecraft. To demonstrate this, I exploit data on Chinese bilateral loans to Sub-Saharan Africa to measure how much debt governments hide from the World Bank and IMF. While the lack of transparency in Chinese external finance offers borrowers the opportunity to hide their Chinese loans from IFIs, governments do not always choose to do so.

Hidden debt increases when borrower governments are subject to IFI interventions that limit the ability to borrow. As external debt approaches the World Bank-assigned debt sustainability threshold, borrowers conceal more of their Chinese loans from IFI records, allowing them to continue borrowing without punishment. Hidden debt decreases, however, when public budgets are heavily scrutinized as part of IMF loan programs, demonstrating that borrowers manipulate debt records to avoid detection. When governments are not subject to additional IMF scrutiny they hide over four times more of their debt to China to avoid their debt threshold. I show that these effects are not driven by several alternative explanations and are robust to a variety of conservative model specifications. In spite of efforts to address concerns about the scope of the hidden debt measure, the most interesting Chinese loans may be unobserved, meaning they are not only hidden from IFIs but also from my analysis. While this is something of an occupational hazard in the study of government

transparency and secrecy, it implies that these are conservative estimates of governments' strategic uses of hidden debt.

This new evidence of hidden debt highlights borrowers' incentives to hide and offers insight into how developing governments interact with international organizations. These findings have important implications for borrower governments, IFIs, and private creditors. While governments may benefit from hiding debt in the short term, hiding could be disastrous in the long term as hidden burdens become unsustainable. Further, hidden debt limits one of the key functions of the IMF and the World Bank to effectively monitor the global credit market. Through efforts to foster fiscal stability, these institutions help to incentivize asymmetric information and unpriced risk and may be caught unprepared when hidden debts trigger crises. Hidden debt also threatens to undermine the "seal of approval" function of IFIs, where IMF and World Bank policies help to catalyze private investment and build market confidence under the assumption that these institutions can accurately assess creditworthiness (Edwards, 2006). Where governments hide liabilities in response to the IMF and World Bank, this "seal of approval" may be misleading.

Many questions remain about the nature and impact of hidden debt on borrowers and the wider credit market. The context of Chinese loans in Africa offers an opportunity to examine hidden debt at the intersection of multilateral and bilateral lending, but more research is needed to investigate how private creditors track sovereign debt burdens, and whether borrowers can strategically deceive them to secure lower credit costs. While the depth of Chinese lending in Africa offers these governments one way to hide debts from IFIs, governments elsewhere may turn to other opportunities to conceal liabilities. It may be interesting to investigate the precise strategies used to hide debt from various audiences, and whether those strategies differ in middle- and high-income countries. I suggest that omitting loans from DRS reports is one way to conceal liabilities from IFIs, but governments have also used other creative accounting approaches that shield loans from scrutiny, such as borrowing at very short maturities or through special-purpose vehicles and joint-ventures (Malik et al., 2021). Recent work by Horn et al. (2023) also reveals that governments often borrow at short maturities and receive debt relief via swap lines with the People's Bank of China, a channel that is not always visible to IFIs. Future work could systematically investigate if governments engage in more of these borrowing strategies when facing tight IFI constraints. Further, I argue that countries choose to borrow from China and hide loans to support their own strategic and financial interests. This does not mean that loans from China do not also serve Chinese interests, or that China does not benefit when loans are hidden from IFIs. Other research could examine the interests of creditors in hidden debt and the potential gains for creditor governments that conceal their global financial reach. Finally, hidden debt also is prevalent in wealthy nations (Alesina et al., 2019; Dinmore, 2013; Gelpern, 2018; Reinhart, 2010), and more work should examine why governments manipulate debt statistics even when not facing the external constraints imposed on less-developed countries.

Hidden debt is even more concerning as external debt mounts across Sub-Saharan Africa in the wake of the COVID-19 pandemic. Debt burdens are certainly larger than commonly-used estimates suggest, and if hidden debt undermines IFI

debt sustainability efforts, they may be higher-risk as well. This analysis shows that global debt sustainability efforts do not happen in a vacuum but are altered by government behavior. As countries grapple once more with a wave of rising debt, borrowers' incentives to hide debt will be essential for understanding the fiscal challenges facing the Global South.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s11558-023-09513-4.

Funding This research was funded with European Research Council Grant #852334 (The Microfoundations of Debt Crises).

Data availability The datasets analyzed in this paper can be accessed as follows:

- Data on the Chinese government's external lending are available from the "China's overseas lending" dataset Horn et al. (2021), hosted on the Mendeley Data repository (https://data.mendeley.com/datasets/4mm6kdj4xg/1) and the AidData Global Chinese Development Finance Dataset, Version 2.0 (Custer et al. (2021), https://www.aiddata.org/data/aiddatas-global-chinese-development-finance-dataset-version-2-0).
- Data on government loans taken from the Debtor Reporting System are not publicly available due to confidentiality requirements set by the International Monetary Fund and World Bank. This data is available from the World Bank data team upon reasonable re- quest. Requests can be made via the World Bank (https://www.worldbank.org/en/access-to-information/request-submission), and should specify all capital inflows data between 2000 and 2017. This data can be accessed in aggregate form through the World Bank—IMF International Debt Statistics database, under the "External debt stocks, public and publicly guaranteed (PPG) (constant dollars, relative to GDP)" series (https://databank.worldbank.org/source/international-debt-statistics).

Declarations

Competing interests • Kathleen J. Brown declares no competing interests.

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