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Why Hide? Africa's Unreported Debt to China

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Abstract

Hidden debt is endemic throughout the sovereign credit market and poses a serious threat to global financial stability. Yet, little is known about how or 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 for their rising debt burdens. I test this using recently released data that reveals half of Chinese loans in Sub-Saharan Africa are missing from sovereign debt records. I find that borrowing 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 borrowing 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.

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Each financial crisis reveals that many governments owe far more debt than previously thought. So-called "gold-standard" records of sovereign debt burdens often contradict one another (Abbas and Rogoff, 2019), making it difficult to measure just how much states owe their creditors. Greece and Italy famously hid billions of euros of debt to ease accession to the Eurozone (Alesina et al., 2019; Dinmore, 2013), 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." Hidden debt is hardly unique to countries in crisis; governments are regularly found to be manipulate financial records to gain political and economic advantages, and recent history is littered with examples of governments jumping through impressive hoops to downplay debt burdens.[1]

Hidden debt prevents creditors from accurately pricing risk or predicting (and preventing) debt crises. Countries caught hiding debt jeopardize their standing on the credit market and often face severe penalties. Bond prices and credit ratings plummeted in Greece and Italy when their financial maneuverings were revealed, while 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 government fiscal transparency to argue that governments intentionally hide debt from global records to avoid punishment for their 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.

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

However, governments are also aware of costly punishments if hidden debts are revealed. Even when their ability to borrow is constrained, hiding debt will not always be in the government's interests. When the risk of discovery is high, for example when the IMF audits a country's national accounts, governments may report debts more accurately.

To test this argument, I investigate why African countries hide (or report) official loans from China. This context is an ideal testing ground for my theory for two reasons. First, African countries may be willing to hide debt. In the past twenty years, every country on the continent has experienced IMF and World Bank debt stability programs limiting external borrowing and sovereign debt burdens (Forster et al., 2019). These interventions often conflict with governments' growing appetites for credit (Lin and Wang, 2017; 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, 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. 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 Chinese loans that each government hides from the DRS. The results demonstrate that governments choose to hide loans to avoid crossing 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 under-reporting. 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 loans. 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 3.25 percentage points closer to the threshold, governments hide an additional 2 percentage points of Chinese loans. 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 capacity. My results are robust to several alternative specifications as well as inverse probability weights and instrumental variable approaches to address selection into IMF loan programs. While concerns remain that not all Chinese external loans can be observed by researchers, my results represent a lower-bound estimate of governments' strategic use of hidden debt.

This work makes two broader contributions. First, by examining a new dimension in how borrowing governments interact with international financial institutions, I demonstrate that less-developed countries have agency on the credit market and use hidden debt as a tool to avoid the constraints of international institutions. Rather than considering borrowing 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. As such, these results have important implications for the growing literature on financial statecraft in the Global South that emphasizes the role of borrower interests in sovereign debt outcomes (Bunte, 2019; Arias et al., 2021; Zeitz, 2021; Cormier, 2022).

My results also reveal how international organizations unintentionally shape state behavior as interventions in fiscal policy encourage hide debt. These findings speak to the literature on the role of international organizations in regulating fiscal balances in the developing world (Nooruddin and Simmons, 2006; Lombardi and Woods, 2008; Dreher et al., 2015). 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 crisis (Reinhart and Rogoff, 2011a; Gelpern, 2018) and hamper global responses to crisis (Olivares-Caminal and Mustapha, 2020). As debt burdens rise across the Global South, understanding the incentives for hiding debt will be essential to addressing debt sustainability challenges.

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

ternal private loans from their national accounts, notably 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 sustainability 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 €31.7bn borrowed from J.P. Morgan and other foreign banks via derivatives contracts (Dinmore, 2013). Greece employed a similar strategy when borrowing €5.1 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 until the banks demanded repayment at the start of the Eurozone crisis. Italy and Greece did not break EU accounting rules[2], but simply took advantage of gaps in reporting infrastructure to pass sustainability checks while continuing to borrow.

[2]EU accounting rules changed in 2013 to define government purchases of derivatives contracts and foreign exchange swaps as public debt (Regulation 549/2013).

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 a key example of hidden debt in Latin America. 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. This is partly due to the inherent difficulty in observing hidden debt, as anecdotal cases are not enough to test why governments embrace transparency or conceal their debts. Hidden debt is often only uncovered in the wake of financial crisis (Reinhart and Rogoff, 2011b), further complicating any effort to causally identify the reasons debt was hidden pre-crisis. However, recent research has shed new light on an ideal opportunity to study the dynamics of hidden debt: Chinese bilateral loans.

China is a major bilateral creditor and has lent billions of dollars to less-developed countries over the past 20 years (Bandiera and Tsiropoulos, 2019). Sub-Saharan African states have borrowed significant sums and China has become a dominant force in development finance in the region (Bräutigam and Gallagher, 2014; Brautigam, 2020). However, as the Chinese government considers external finance information to be state secrets, measuring African debt to China has proved difficult (Wallace, 2016; Dreher et al., 2018). 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 borrowing governments' external debt used by the World Bank and the IMF. Recent economics research has examined these Chinese

loans in detail (Bon and 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 have massive ramifications for global debt sustainability efforts as IFIs rely on DRS data when issuing bailouts, structuring conditionality, and providing debt relief (Alfaro and Kanczuk, 2019). How were these loans hidden? Most signatories to the IMF and World Bank charters agree to report their external borrowing and lending activities to the DRS on an annual basis.[3] China is one of few exceptions, and so Chinese loans are only visible to IFIs through the reports of borrowing governments. By comparing their borrowing data to loan records in the DRS, Horn et al. (2021) showed that while borrowing governments fully documented Chinese loans in some years, in other years, loans were simply missing from reports. This revelation sparked intense concern from policymakers and popular media (Spegele and Isaac, 2020; Hatton, 2021; Davidson, 2018), but it remains unclear why these loans were hidden from the IMF and World Bank. I take advantage of this development to investigate the hidden debt puzzle in a cross-country context.

Why hide?

When do borrowers hide their loans, and why? I now focus on the case of Chinese official loans to African countries and discuss potential explanations for debt to be hidden from IFI records. I consider arguments proposed by the literature on Chinese external finance and by IFIs themselves: that creditors hide loans for strategic reasons, or that borrowers hide debts by accident. However, I discuss why these arguments are insufficient to explain all (or even most) of the variation in Africa's hidden debts, and propose a third explanation: borrowers intentionally hide debt to avoid punishment from IFIs.

[3]See Appendix for DRS reporting requirements.

Creditor pressure

First, debt may be hidden to satisfy creditors' interests. Given 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; Horn et al., 2021). China uses external finance to compete with other creditor nations and to consolidate power in the Global South (Blair et al., 2021; Bandiera and Tsiropoulos, 2019), and so lending unobserved by Western nations and IFIs may offer some competitive advantage. In fact, the Chinese government does explicitly pressure borrowers to conceal loans from the credit market. Gelpern et al. (2021) presents a suite of recently uncovered Chinese bilateral loan contracts, many of which include confidentiality clauses[4] that restrict how borrowing governments disclose loan information to third parties. However, a closer look at these "confidential" loans demonstrates that borrowing governments have substantial influence over the process of hiding debt. Gelpern et al. (2021) identify 15 loan contracts between China and African countries that included confidentiality clauses. Eight of those loans were fully reported to the DRS, while seven are unreported. Even when the Chinese state explicitly attempts to limit disclosure, loans are reported to IFIs, suggesting that the creditor is not the final decision-maker in hiding debt.

Misreporting

Second, hidden debt could result from unintentionally omitting loans from official reports, as is often argued by IFIs. In a recent report on low-income debt vulnerabilities, the IMF suggested that loans were missing from the DRS because of "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,

[4] "The Borrower shall keep all the terms, conditions and the standard of fees hereunder or in connection with this Agreement strictly confidential. Without the prior written consent of the Lender, the Borrower shall not disclose any information hereunder or in connection with this agreement to any third party..."

which 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 government statistics (Mouyelo-Katoula, 2006; Jerven, 2013). Chinese loans may also be particularly difficult to report as official credit is often disbursed through Chinese state-owned enterprises (SOEs) and received by borrowers' 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 reason why Chinese loans are missing from African countries' debt reports. 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, suggesting that other important factors explain why debt is hidden.

Borrowers' interests

Finally, borrowers may intentionally hide debt from IFIs. Hiding loans from the DRS specifically conceals them from IFIs, which rely heavily on those records to monitor and limit debt accumulation in low-income countries (Horn et al., 2021; World Bank Group, 2018). Most Sub-Saharan African countries have been subject to the joint IMF-World Bank Debt Sustainability Framework since 2005, an effort to prevent debt crises after the Multilateral Debt Relief Initiative (World Bank Group, 2018). 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, 2018, p. 21) and reduced access to both loans and debt relief until debt is lowered below the threshold once more (Lang and Presbitero, 2018).

The IMF further strengthens debt constraints when countries come to the "lender of last resort" in crisis, and the policy conditions attached to emergency loans often mandate debt repayment and deficit limits. Violating this condition risks the next tranche of loans, which may be very costly for governments in a balance of payments crisis.

IFIs often want to limit debt in low-income countries, but this conflicts with the growing appetite for credit in Sub-Saharan Africa (Lin and Wang, 2017) and governments' desire to control their fiscal policy (Zeitz, 2021). Hiding debt would allow governments to neatly side-step this conflict by both meeting demand for loans and avoiding the costly punishments associated with violating IFI constraints. In hiding loans to circumvent external debt limits, African governments would join a litany of other states that have strategically manipulated sovereign debt records to maximize access to credit (Reinhart, 2010; Gelpern, 2018; Melecky, 2021). Given this tension, I investigate how IFI interventions influence government decisions to hide or report their debt.

Testable hypotheses

Hidden debt is a perfectly placed 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 borrowing 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 borrowing country 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 and 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 borrowing without triggering the costs associated with crossing the IFI-imposed debt 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. IMF loan programs represent an increase in the chance of being observed. Loan programs require that the IMF be given extensive access to the borrower's national accounts for the duration of the program to verify compliance

with policy conditions (Kentikelenis et al., 2016). External debt data is no longer borrower-supplied but is now verified by IMF staff, making it more difficult to hide debt. IMF loan recipients expect this increased scrutiny and frequently modify their behavior to prevent the disclosure of damaging information. Hyde and O'Mahony (2010) and Ebeke and Ölcer (2013) show that leaders reduce fiscal manipulation when IMF programs begin because they expect additional scrutiny 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.*

Data

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

Dependent variable

My 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)[5] and World Bank DRS estimates of outstanding debt to China[6], divided by the HRT estimate.

[5] I use data from the 2021 update to the HRT database.

[6] This is analogous to the "External debt stocks, public and publicly guaranteed (PPG) (constant dollars, relative to GDP)" series in the International Debt Statistics, the publicly-available version of the aggregate DRS data.

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

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." 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,[7] confirms that this is not the case. DRS reports are wide-ranging and require that borrowing 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 Appendix.

Figures 1 visualizes the outcome variable H across countries and years. This heat map demonstrates the heterogeneity in hidden debts. 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.

Independent variable

I propose that this variation in hidden debt is driven, at least in part, by IFI constraints on borrowing governments' external debt. I examine two types of constraints: debt sustainability thresholds and IMF loan programs. Under both programs, countries are subject

[7] Correspondence with the Debt Statistics Team on May 28th, 2021 to confirm the scope of DRS reporting requirements for borrowing governments.

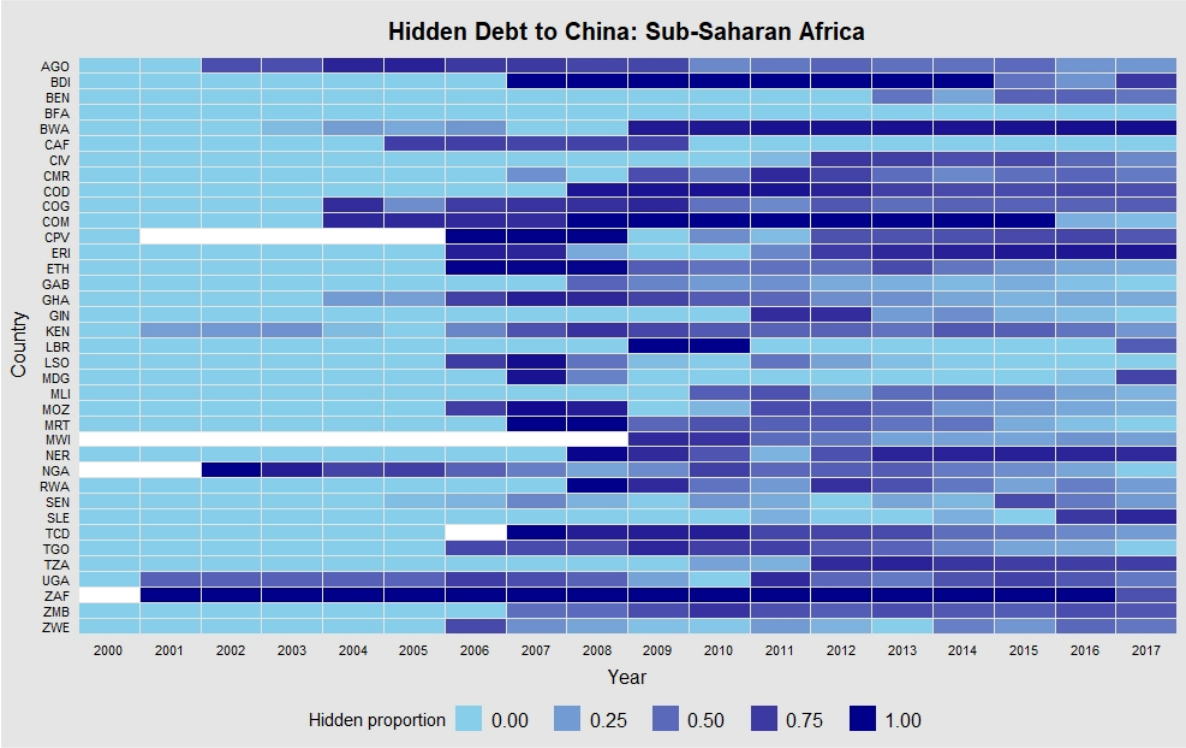

Figure 1: **Proportion of country's outstanding debt to China that is hidden over time.** White blocks indicate periods when countries did not borrow from China.

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 and 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, 2018).

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.[8] The external debt threshold is set to 30%, 40%, or 50% of a country's GDP.[9] To capture the

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

[9]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

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 because I expect governments to use hidden debt when their burdens are just below *and* just above the threshold. When debt is far below the threshold, governments have ample room to borrow before triggering punishment, and so hiding debt offers little benefit. Similarly, hiding will be less useful far above the threshold, as it would be difficult (and risky) to hide very large amounts of debt. Hiding loans should be most useful for deceiving IFIs when external debt hovers just below or above the 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.

Control variables

I include several confounding variables that could jointly affect IFI interventions and the hidden debt proportion. 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 in World Bank Group (2018), I include some the economic indicators used to assess debt risk: total debt-to-GDP,[10] GDP growth, and GDP-per-capita.[11]

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. I estimate my regressions with and without these 5 country-year observations; the results are unchanged.

[10] World Bank Debtor Reporting System (2021)

[11] World Development Indicators (2019)

Poorer countries with lower growth are usually assigned stricter debt thresholds and may have fewer fiscal resources to effectively manage debt. I also include an indicator for the level of threshold assigned in each country-year. This variable accounts for the possibility that crossing different debt thresholds may have different consequences. Countries subject to the 30% threshold are deemed to be higher-risk and may be less able to afford the consequences of violating IFI constraints than the lower-risk countries in the 50% threshold category.

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 debt to the IMF[12] as a share of total external debt, as countries more reliant on IMF funds may have more to lose by crossing the debt threshold and jeopardizing future IFI support. Similarly, I include a measure of debt to China as a share of total external debt. Countries with more Chinese credit have a greater opportunity 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. Countries' fiscal stability determines their debt threshold, but it may also determine their ability to maintain accurate fiscal records. If high-risk countries are most likely to misreport external debt because of low bureaucratic capacity, this could bias my estimates of the effect of IFI constraints on hidden debt. I account for this by including a score of budget reporting capacity from the World Bank Country Policy and Institutional Assessment (CPIA) index.[13] 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.[14] A table of summary statistics is included in the Appendix.

[12] World Bank Debtor Reporting System (2021)
[13] *World Bank Group* (2018)
[14] Inclusion, Dispersion, and Constraint Database (Strøm et al., 2017)

Estimation

First, I test the effect of debt sustainability thresholds on the hidden proportion of debt to China, H, using a linear ordinary least squares regression. My intervention of interest $Threshold$ is the absolute value of the difference between reported debt-to-GDP and the threshold. As the absolute distance is heavily left-skewed, $Threshold$ is log-transformed.[15] 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 as reported debt threatens to breach the threshold.

$$H_{it} = log(|Threshold_{it}|)\beta_1 + Level_{it}\beta_2 + \boldsymbol{X\beta_{it}} + \gamma_t + \epsilon_{it}$$

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, namely indicators for the threshold level, reported debt-to-GDP, outstanding debt to the IMF, share of external debt owed to China, budget reporting score, and measure of fiscal federalism. I also use year fixed effects (γ). As is clear from Figure 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 and 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 demonstrate in the Appendix that my results are not an artifact of this choice.

Next, I estimate the effect of both debt sustainability thresholds and IMF loan conditionality on H by including an indicator for the presence of an IMF program with a

[15] $1 + \ln(Threshold)$

mandate over external debt, $Program$. 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 $Program$ to capture this effect. A significant positive effect of $Threshold * Program$ on H would demonstrate that the effect of debt thresholds on hidden debt is strongest when countries are not subject to an IMF program.

$$H_{it} = log(|Threshold_{it}|)\beta_1 + IMFprogram_{it}\beta_2 + (log(|Threshold_{it}|) * IMFprogram_{it})\beta_3 + Level_{it}\beta_4 + \boldsymbol{X\beta_{it}} + \gamma_t + \epsilon_{it}$$

This model assumes that IMF intervention is exogenous, which is unlikely as IMF loan programs are triggered by a country's fiscal needs and by negotiations between the IMF and borrower. Factors that determine whether or not a country borrows from the IMF may be correlated with the assignment of debt thresholds and the country's willingness and ability to hide debt. If this is the case, then ordinary statistical estimates of the effect of debt thresholds on hidden debt will be biased.

Research on IMF program implementation has used a variety of strategies to address this selection problem, including the use of instrumental variables, matching approaches, and parametric selection bias corrections (often variants of Heckman (1979) selection estimators). There are advantages and drawbacks to each strategy, but matching on IMF program "treatment" and "control" could exclude the most extreme observations of hidden debt that are of particular interest to my research strategy (Atoyan and Conway, 2006). Furthermore, Dreher (2006) demonstrates that instrumental variables work best when the selection variable is continuous, rather than the dichotomous selection variable here. For these reasons, I choose to use a Heckman-style approach by including inverse probability weights (IPW) in my main models. I begin by predicting a country's IMF program "hazard rate" using the logit estimator proposed by Nooruddin and Simmons (2006) and used in Hyde and O'Mahony (2010).[16] IMF participation is predicted by the incidence of previous IMF

[16]See the Appendix for the full model specification

loan programs, economic fundamentals, and the Polity IV Project regime score (Marshall et al., 2002). My country-year observations are then weighted by the inverse probability of IMF program participation, following the method used by Caselli and Wingender (2021). By implementing this weighting strategy, I attempt to build a counterfactual group assuming that receiving an IMF loan is an as-good-as random treatment conditional on covariates that predict the likelihood of loan assignment. As the inclusion of IPW restricts the sample size somewhat, I estimate my main model with and without IPW.

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. 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. Thresholds are applied to all countries throughout the study period, but the distance from the threshold is not exogenous. In addition to controls for total external debt and debt to China and the IMF, weighting observations by the likelihood of IMF intervention (in column 2) accounts for the factors that determine the distance between debt and 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 and the threshold shrinks by half, governments hide an additional 2.6% 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% World Bank threshold with external debt at 30% of GDP), governments hide 30.6% 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 33.2%.

Table 1: Effect of IMF interventions on Hidden Debt

	Dependent variable:			
	Hidden proportion of debt to China			
	(1)	(2)	(3)	(4)
Distance from Threshold (log, absolute value)	−0.043**	−0.056***	−0.150***	−0.129***
	(0.020)	(0.020)	(0.049)	(0.037)
IMF program			−0.453**	−0.381**
			(0.190)	(0.156)
Distance from Threshold (log, absolute value) x IMF program			0.122**	0.099**
			(0.053)	(0.044)
GDP per capita (USD)	0.00004	0.0001**	0.00003	0.00004
	(0.00002)	(0.00003)	(0.00003)	(0.00003)
GDP (billion USD)	−0.0002	−0.001*	−0.0002	−0.001
	(0.0003)	(0.001)	(0.0003)	(0.001)
Total debt to China (%GDP)	0.017***	0.015***	0.017***	0.015***
	(0.003)	(0.004)	(0.003)	(0.004)
External debt (%GDP)	−0.0004	0.0001	−0.0004	0.0001
	(0.001)	(0.001)	(0.001)	(0.001)
Debt to IMF (%GDP)	0.003	−0.028***	0.002	−0.026***
	(0.008)	(0.008)	(0.008)	(0.008)
CPIA Budget Management score	−0.026	−0.030	−0.026	−0.024
	(0.035)	(0.033)	(0.036)	(0.035)
Sub-national taxation	0.235***	0.273***	0.229***	0.253***
	(0.042)	(0.047)	(0.043)	(0.049)
Threshold = 40%	−0.062	0.114**	−0.075	0.094*
	(0.046)	(0.050)	(0.046)	(0.052)
Threshold = 50%	0.107*	0.101*	0.104*	0.093
	(0.061)	(0.058)	(0.061)	(0.060)
Year fixed effects	Yes	Yes	Yes	Yes
Inverse probability weights	No	Yes	No	Yes
Observations	381	381	381	381
Note:				*p<0.1; **p<0.05; ***p<0.01

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 an indicator for the presence of an IMF program. The regression including this interaction term is shown in columns 3 and 4 of Table 1. Figure 2 shows the marginal effect of *Threshold* on H across the absence (=0) and presence (=1) of an IMF program. The left panel shows the effect estimated without IPW, and the right panel estimated with IPW.

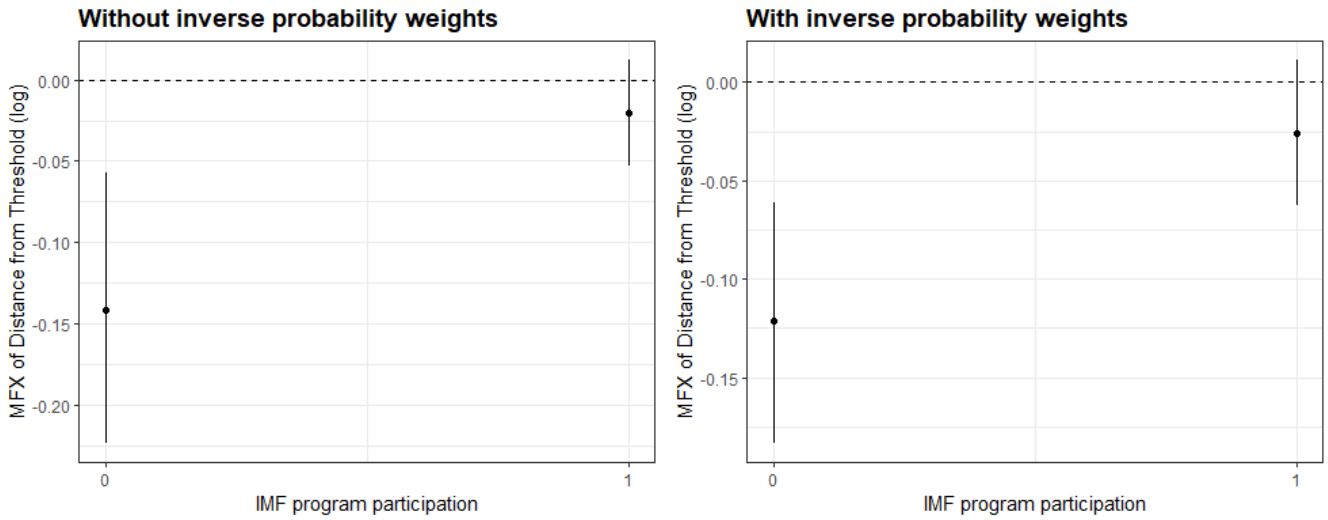

Figure 2: **Marginal effect of Distance from Threshold (log) across IMF Program.** Both panels show the marginal effect of distance from the debt threshold on the hidden debt share, while under an IMF program (= 1) and while not under an IMF program (= 0). The left panel shows the marginal effect estimated without IPW to address selection into IMF programs, while the right panel shows the marginal effect estimated with IPW. Dots indicate point estimate of marginal effect, lines indicate 95% confidence intervals.

These results demonstrate that the hidden effect is conditional on how IFIs observe debt levels. When a country is subject to an IMF program, proximity to the threshold has no significant effect on how much debt governments hide from the DRS. However, without an IMF program, governments hide 4.94% more of their debt to China as the debt burden moves

50% closer to the threshold. Again, I predict the values of H to examine how hidden debt is manipulated in the absence of IMF scrutiny. When the debt burden is 10 percentage points away from the threshold, governments hide 47.1% of Chinese loans. When the debt burden moves 5 percentage points closer to the threshold, the hidden share increases to 57.4%. This 10% increase is a substantial change, equivalent to half of a standard deviation in the share of Chinese loans that governments hide from the DRS.

This finding is 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 threaten to breach their World Bank sustainability threshold. When the IMF is absent, however, governments hide significantly more of their Chinese loans to avoid the threshold.

Alternative explanations

While the literature on hidden debt is limited, previous works have often focused on unintentional misreporting and the interests of creditors to explain why public records underestimate sovereign debt burdens. Importantly, I do not claim that these factors do not affect hidden debt. Indeed, it will be interesting for future research to investigate the roles of borrowers' bureaucracies and creditors' interests in sovereign debt reporting. Instead, I argue that these factors cannot entirely explain why debt is hidden and do not drive my results.

First, I consider that a borrower's relationships with other states may affect both IFI interventions and the incentive to hide debt. IMF loan conditions may be less constraining for countries that are politically important to the United States (Dreher et al., 2006; Lang and 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 and O'Mahony, 2010). Additionally, if hidden debt is driven by China rather than by borrowing governments, countries with

closer ties to China should have larger hidden proportions. I account for these geostrategic relationships with the United States and with China using latent variable measures of both countries' signaled support for proteges created by McManus and Nieman (2019). The effects of the debt threshold or the interaction with IMF programs are robust to the inclusion of support from China or the US.

Next, I consider the role of unintentional misreporting. Other work has suggested that HRT hidden debt measure is an artifact of bad reporting rather than financial statecraft (IMF, 2020; Sundquist, 2021), and countries with higher debt burdens may be more likely to have ineffective bureaucracies that are incapable of accurately reporting debt IFIs (Gelpern et al., 2021). I address this with the inclusion of a country's CPIA budget management score in the main models, but replicate the results with the Worldwide Governance Indicators measure of bureaucratic effectiveness (Kaufman and Kraay, 2016). Including these efficacy scores essentially estimates out any debt that is hidden unintentionally by ineffective bureaucracies. The *Threshold* coefficient should then capture debt that was hidden *intentionally*, holding bureaucratic efficacy constant.

In addition, Chinese bilateral loans may be uniquely difficult for borrowers to report to IFIs. Notably, China frequently uses state-owned enterprises (SOEs) as "middlemen" in bilateral credit transactions. The Chinese government issues loans through overseas public enterprises, and African governments accept loans through their own SOEs. 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 involvement of SOEs may make it more difficult for borrowing governments to correctly report loans (Melecky, 2021; Malik et al., 2021). When confronted with gaps in their sovereign debt estimates, the IMF and World Bank have suggested that this is because low-income countries cannot keep track of loans issued by, or to, SOEs (World Bank Group; International Monetary Fund, 2018).

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, 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[17] (Bluhm et al., 2018). Even controlling for Chinese SOE involvement, the constraining effect of debt thresholds and the scrutiny effect of IMF programs are unchanged, offering further evidence that my results are driven by borrower financial statecraft.

Robustness checks

Finally, I confirm that my results are robust to alternate specifications, with results of robustness checks shown in the Appendix. While I choose to address IMF program endogeneity with inverse probability weighting, I re-estimate my results using an instrumental variables approach. I use a Bartik-style instrument that has become popular in recent IMF literature (Lang, 2021; Reinsberg et al., 2019; Moll and Smets, 2020), which exploits the interaction between country's history of IMF involvement (recidivism) and the IMF's liquidity. The logic here is that when IMF liquidity is high, borrowing governments are assigned programs quite liberally, but when constrained by low liquidity, the IMF uses a country's past lending record to determine whether or not it receives assistance. The two-stage least squares estimator produces similar results to my main specification using IPW (although the number of observations is limited).

Additionally, I am cautious of over-fitting my models, especially when including additional sets of controls to investigate alternative explanations (Vadlamannati and Brazys, 2022). To guard against this, I estimate the main models using only statistically significant control variables, and then estimate the model dropping control variables one by one. Results are shown in the Appendix, and confirm that the main effect is robust and unlikely to

[17]This data is a constituent part of the HRT data, and so is included in the main analysis. I measure the proportion of Chinese official finance that was disbursed, co-disbursed, or managed by an SOE, although this data is only available for a subset of 28 Sub-Saharan African countries between 2006 and 2014.

be a product of over-fitting.

Conclusion

I provide evidence that borrowing governments intentionally hide debt from international financial institutions to circumvent the constraints placed on their external debt. While less-developed countries are often viewed as passive players on the global credit market, I argue that borrowing governments choose to hide and report sovereign debt strategically as a form of financial statecraft. To demonstrate this, I exploit newly released 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 borrowing 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 Chinese loans to avoid violating World Bank debt sustainability thresholds. 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 my hidden debt measure, a drawback of this study remains the reliance on incomplete Chinese lending data. The most interesting Chinese loans may be the most completely hidden, 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 I make conservative estimates of governments' strategic uses of hidden debt.

This new evidence of hidden debt exposes borrowers' incentives to hide and offers insight into how developing governments interact with international organizations. The increase and reduction in hidden debt are evidence that governments alter their behavior, and their image on the credit market, in response to IFI policy. These findings have important implications for borrowing governments, IFIs, and private creditors. Firstly, hidden debt highlights an inconsistency in the interests of borrowers. 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, in intentionally hiding debt borrowing governments limit 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 judge creditworthiness (Edwards, 2006). Where governments hide liabilities in response to the IMF and World Bank, this "seal of approval" may be misleading for private creditors that rely on IFI intervention as an important heuristic.

Many questions remain about the nature and impact of hidden debt on borrowers and the wider credit market. Future work should investigate the degree of unpriced risk posed by countries with extensive hidden debts. The context of Chinese loans in Africa was 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. 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, and more work should examine why governments manipulate debt statistics even when not facing the external constraints often 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. My 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 fiscal challenges facing the Global South.

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Supplementary Appendix: Why Hide? Africa's Unreported Debt to China

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1 Appendix

1.1 Hidden debt measure

Hidden debt is measured by comparing estimates of debt to China from the World Bank Debtor Reporting System (World Bank Debtor Reporting System, 2021) and the China's Overseas Lending Database constructed by Horn et al. (2021). Hidden debt H is defined as the *hidden share* of a country's total debt to China. This is measured by the difference between HRT and World Bank DRS estimates of outstanding debt to China, divided by the HRT estimate.

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

How confident can we be that comparing HRT and DRS data will measure debt that is hidden from the IMF and World Bank? DRS loan-level data is confidential and cannot be included here at a granular level, and Horn et al. (2021) is only available at the country-year level. Thus, I evaluate comparability of these two data sources based on their stated scopes and data collection methodologies.

Debtor Reporting System

The DRS is unique among other sovereign debt data repositories in that it has a wide scope that aims to capture all of low-income countries' external public and private publicly-guaranteed debt. Understanding the scope of the DRS is crucial for my estimates of hidden debt. If the hidden portion estimated by HRT is in fact credit that does not fall under the scope of DRS reports, then it is not hidden from IFIs, but rather outside of their interest.

I look at the Debtor Reporting System Manual to determine exactly which types of credit borrowers are expected to report to IFIs. Figure 1 shows the reporting form that borrowing countries must submit quarterly, and includes all bilateral, multilateral, and private loans both from private banks and in the form of bond issues, as well as export credits (World Bank Group, 2013, p.7-10). For each loan, the borrowing country must specify the borrowing agency (e.g. central government, local government, private entity with explicit public guarantee) and the creditor government *and* agency (e.g. China/China Development Bank, China/state owned enterprise). If China disburses official credit through a Chinese SOE to a borrowing country, this should be included in reports the DRS. Likewise, if the China disburses official credit *to* a borrowing country's SOE, this must also be included in DRS reports.

Horn et al. (2021): China's Overseas Lending

I then look at the data collection methodology outlined in Horn et al. (2021) to determine whether the authors include loans in their estimates that fall outside of the DRS scope, and would be irrelevant to my hidden debt analysis. HRT argue that that their data is directly

comparable to the DRS, and measure hidden debt "by comparing our estimates to unpublished data from the World Banks's Debtor Reporting System, which is the key building block underlying the International Debt Statistics as well as related public databases at the IMF" (Horn et al., 2021, p.7). Correspondence with the authors confirmed that Chinese loan data was included in the dataset based on the same criteria used by the DRS; namely, all official credit originating from the Chinese government (including loans disbursed Chinese policy banks and state-owned enterprises) and issued to another sovereign government (including loans issued to state-owned enterprises and sub-national governments in the recipient state, and export credits).

Based on these methodologies, I am confident that both the DRS and HRT data attempt to capture the same concept of sovereign debt owed to China, and that direct comparison of the two sources yields estimates of debt that is hidden from the DRS.

WORLD BANK DEBT REPORTING SYSTEM

FORM 1: DESCRIPTION OF INDIVIDUAL EXTERNAL PUBLIC DEBT AND PRIVATE DEBT PUBLICLY GUARANTEED

1. Reporting Country	**2. Debt No.**	**2a. Debt No. in Reporting Country (if different)**

3. Name of Borrower	**12. Name of Lender**
4. Type of Borrower (mark one) ☐ 1. Central government ☐ 2. Central bank ☐ 4. Local government ☐ 6. Public Corporation ☐ 7. Mixed enterprise ☐ 8. Official development bank ☐ 9. Private	**12a. Creditor Guaranty Agency** **13. Creditor Country**
5. Name of Guarantor	**14. Type of Creditor (mark one)** ☐ 1. Exporter ☐ 2. Private bank or other financial institution ☐ 4. International organization ☐ 5. Government or public agency ☐ 6. Bond ☐ 8. Nationalization
6. Budget Financed? ☐ Yes ☐ No	**15. Commitment Date**
7. Economic Sector and Purpose	**16. Amount of Commitment** _____ of which 1. _____ rescheduled principal arrears 2. _____ rescheduled interest arrears 3. _____ rescheduled maturities 4. _____ rescheduled interest 5. _____ rescheduled short term 6. _____ resch. private non-guaranteed debt.
8. Type of Agreement (mark one) ☐ 0. Normal loan ☐ 1. Debt refinancing ☐ 2. Debt rescheduling ☐ 3. Other (describe in Notes)	**17. Currency in Which** 1. Amount is reported _____ 2. Debt is repayable _____
9. Principal Payments 1. Pattern of Repayments (mark one) ☐ 1. Equal payments ☐ 2. Annuity ☐ 3. One lump sum ☐ 4. Other (provide schedule on Form 1A) **2. Repayment Based on (mark one)** ☐ Total commitment ☐ Each drawing **3. If Repayment is Based on Drawings** a. No of months from drawing to first principal repayment: _____ b. No. of principal payments on each drawing: _____	**18. Type of Interest or Base** ☐ 1. Interest free ☐ 2. Interest included in principal ☐ 3. Fixed rate/rates ☐ 4. Variable rate/rates ☐ 5. Other (Form 1A required) If rates are variable give base 6. 1st variable base _____ 7. 2nd variable base _____ **19. Interest Rates or Margins** 1. 1st fixed rate _____% 3. 2nd fixed rate _____% 2. 1st variable margin _____% 4. 2nd variable margin _____% 20. Interest Payment Dates 1. First _____ 2. Final _____ 3. No. of payments per year _____ 4. For items 19.3 or 19.4 above, give dates on which rates take effect:
10. Principal Repayment Dates 1. First _____ 2. Final 3. No. of payments per year	
11. Consolidation Period From _____ To (Fill in column 3 of Forms 1A with amounts rescheduled each year)	**21. Commitment Charge** (rate %) _____
22. Notes	

Figure 1: **Debtor Reporting System loan disclosure form.** Submitted quarterly by borrowing countries to the World Bank and IMF.

1.2 Summary statistics

Table 1: Summary Statistics

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Hidden proportion of Chinese loans	684	0.336	0.354	0.000	0.000	0.637	1.000
HRT Debt to China, %GDP	763	3.514	5.782	0	0.1	5.2	52
DRS Debt to China, %GDP	684	2.165	2.901	0.000	0.454	2.811	24.432
IMF program	763	0.57	0.495	0	0	1	1
Debt threshold	456	36.564	7.268	27	30	40	56
Distance from threshold (in debt/GDP points)	425	−6.447	33.785	−153.000	−21.500	16.800	38.300
Distance from Threshold (log, absolute value)	425	2.875	0.908	0.095	2.33	3.424	5.037
Threshold level = 30% of GDP	425	0.282	0.450	0	0	1	1
Threshold level = 40% of GDP	425	0.214	0.410	0	0	0	1
Threshold level = 50% of GDP	425	0.082	0.274	0	0	0	1
Total debt to China, %GDP	702	4.087	5.838	0.000	0.659	5.699	52.110
Debt to IMF, %GDP	658	3.923	9.337	0.053	0.985	3.487	90.528
Total external debt, %GDP	702	39.865	30.088	1.181	18.211	56.016	159.468
CPIA Budget Management score	466	3.054	0.648	1.000	2.500	3.500	4.500
Sub-national taxation	756	0.238	0.426	0.000	0.000	0.000	1.000
GDP, billion USD	755	31.457	73.847	0.702	4.707	22.314	464.282
GDP per-capita	755	2,330.953	3,301.140	194.873	531.048	2,126.131	20,512.940
United States support	546	−0.435	0.357	−0.908	−0.672	−0.201	0.801
China support	546	0.347	0.451	−0.158	0.034	0.452	2.154
WGI Effective governance	721	−0.743	0.629	−2.484	−1.225	−0.419	1.057
SOE involvement	343	0.100	0.272	0.000	0.000	0.000	1.000

1.3 Main Results

Table 2 shows the results from the main models including both country and year fixed effects. Columns 1 and 2 shows the effect of distance from the threshold. Column 3 shows the interaction between $Threshold$ and $IMFprogram$, while Column 4 shows in the interaction effect estimated with IPW.

Table 2: Main results: country and year fixed effects

	Dependent variable:			
	Hidden proportion of debt to China			
	(1)	(2)	(3)	(4)
Distance from Threshold	−0.033	−0.050*	−0.057	−0.049
(log, absolute value)	(0.024)	(0.028)	(0.064)	(0.057)
IMF program			−0.371*	−0.438**
			(0.206)	(0.212)
Distance from Threshold (log, absolute value)			0.018	−0.002
x IMF program			(0.063)	(0.057)
GDP per capita	−0.0003	−0.0003	−0.0002	−0.0003
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
GDP (billion USD)	0.0003	0.001	−0.0001	0.001
	(0.001)	(0.002)	(0.001)	(0.002)
Total debt to China (% GDP)	0.019***	0.023***	0.018***	0.023***
	(0.004)	(0.006)	(0.004)	(0.006)
External debt (% GDP)	−0.001	0.001	−0.001	0.001
	(0.001)	(0.002)	(0.001)	(0.002)
CPIA Budget Management score	0.021	0.037	0.033	0.037
	(0.047)	(0.049)	(0.046)	(0.050)
Sub-national taxation	−0.438	−0.776**	−0.442	−0.780**
	(0.348)	(0.355)	(0.372)	(0.372)
Debt to IMF (% GDP)	−0.007	−0.0001	0.002	−0.0001
	(0.014)	(0.013)	(0.013)	(0.013)
Threshold = 40% GDP	0.023	0.085	0.029	0.085
	(0.077)	(0.085)	(0.075)	(0.085)
Threshold = 50% GDP	0.093	0.024	0.098	0.024
	(0.106)	(0.106)	(0.104)	(0.106)
Year fixed effects	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
IPW	No	Yes	No	Yes
Observations	381	381	381	381

Note: *p<0.1; **p<0.05; ***p<0.01

1.4 IMF "hazard rate"

I estimate the probability that a country is under an IMF program, or the "hazard" rate, based on the model of IMF program participation proposed by Nooruddin and Simmons (2006). I follow the model construction used by Hyde and O'Mahony (2010). The dependent variable *Program* takes a value of 1 if a country is under an IMF program that carries fiscal conditions, and 0 otherwise. The independent variables are one-period lags of *Program*, GDP per capita, the GDP growth rate, the current account balance as % of GDP,[1] and Polity IV score.[2] The inclusion of a lagged dummy for IMF program participation accounts for recidivism which is a key determinant of participation in the present period and is frequently used to estimate IMF program selection (Nooruddin and Simmons, 2006; Stone, 2008). The hazard rate is predicted using a logit estimator:

$$Program_{it} = Program_{it-1}\beta_1 + GDP\ growth_{it-1}\beta_2 + GDP\ per\ capita_{it-1}\beta_3 + \\ Current\ Account_{it-1}\beta_4 + Polity\ IV_{it-1}\beta_5 + \epsilon_{it}$$

The results of the hazard model are shown in Table 3. All independent variables are lagged by one period.

This hazard model is used to produce inverse probability weights (IPW) following the method used by Caselli and Wingender (2021). These are used to weight country-year observations in the main results.

[1] World Development Indicators (2019)

[2] Marshall et al. (2002)

Table 3: IMF "hazard rate" prediction

	Dependent variable:
	IMF program
IMF program (lag)	23.842
	(1,504.704)
GDP (billion USD, lag)	−0.003
	(0.007)
GDP per capita (lag)	−0.0004**
	(0.0001)
GDP growth (lag)	0.004
	(0.052)
Current account balance, % GDP (lag)	0.015
	(0.031)
Polity IV (lag)	0.062
	(0.050)
Observations	576
Log Likelihood	−71.174
Akaike Inf. Crit.	156.348
Note:	*p<0.1; **p<0.05; ***p<0.01

1.5 Additional controls

I run the main models with the addition of controls for alternate definitions of budget reporting capacity, United States signaled support, China signaled support, and SOE involvement shown in Table 4 and table 5. Column 1 substitutes the CPIA Budget Management score for the World Bank Worldwide Governance Indicators (WGI)[3] measure of government effectiveness, which combines survey responses from enterprise, civilians, and local experts on the quality of bureaucracy, competence of civil service, and independence of civil service from political pressures. As countries with weaker transparency norms may be more willing to withhold information from DRS reports, I also use the Corruption Perceptions Index (CPI) from Transparency International[4] to measure perceptions of corruption in the public sector. The CPI is an aggregate of other public sector corruption measures, including the World Bank CPIA, and is included in column 2. Column 3 controls for the United States' signaled support for each country with the latent measure from McManus and Nieman (2019). Column 4 controls for China's signaled support for each country with the latent measure from McManus and Nieman (2019). Columns 5 include a measure for Chinese SOE involvement in the lending process, where SOEs directly and exclusively disbursed loan funds. This SOE-involvement measure is constructed using the AidData Global Chinese Official Finance loan-level database (Bluhm et al., 2018). I take the total value of credit (in current USD) issued by China to a borrowing country each year, and measure the proportion of that credit which is issued through Chinese SOEs (as opposed to Chinese state banks or development corporations). This captures the degree of SOE involvement in China's lending process each year.

[3] Kaufman and Kraay (2016)

[4] *Transparency International* (2020)

Table 4: Additional controls: Effect of distance from threshold on hidden proportion

	Dependent variable:			
	Hidden proportion of debt to China			
	(1)	(2)	(3)	(4)
Distance from Threshold	-0.066^{**}	-0.050^{*}	-0.051^{**}	-0.100^{***}
	(0.026)	(0.026)	(0.020)	(0.027)
GDP per capita	0.0001^{**}	0.0001^{**}	0.0001^{*}	0.0001^{*}
	(0.00004)	(0.00004)	(0.00003)	(0.00004)
GDP (billion USD)	-0.001^{*}	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Total debt to China (% GDP)	0.020^{**}	0.022^{***}	0.017^{***}	0.015^{***}
	(0.008)	(0.008)	(0.004)	(0.005)
External debt (% GDP)	0.002	0.0001	0.001	-0.002
	(0.002)	(0.002)	(0.001)	(0.002)
CPIA Budget Management score	-0.002	-0.021		-0.018
	(0.043)	(0.043)		(0.043)
Sub-national taxation	0.253^{***}	0.330^{***}	0.294^{***}	0.142^{**}
	(0.061)	(0.070)	(0.045)	(0.060)
Debt to IMF (% GDP)	-0.042^{***}	-0.037^{***}	-0.021^{**}	-0.037^{***}
	(0.013)	(0.013)	(0.008)	(0.011)
Threshold = 40% GDP	0.085	0.098	0.010	0.105^{*}
	(0.078)	(0.078)	(0.056)	(0.063)
Threshold = 50% GDP	-0.063	-0.015	-0.014	0.046
	(0.088)	(0.087)	(0.067)	(0.069)
US protegé support	0.196^{**}			
	(0.078)			
China protegé support		-0.096^{*}		
		(0.049)		
WGI Effective governance			0.116^{**}	
			(0.053)	
SOE involvement				0.170^{**}
				(0.065)
Year fixed effects	Yes	Yes	Yes	Yes
Country fixed effects	No	No	No	No
IPW	Yes	Yes	Yes	Yes
Observations	252	252	382	207

Note: *p<0.1; **p<0.05; ***p<0.01

Table 5: Additional controls: Interaction of distance from threshold and IMF program

	Dependent variable:			
	Hidden proportion of debt to China			
	(1)	(2)	(3)	(4)
Distance from Threshold	−0.149***	−0.135***	−0.115***	−0.101**
	(0.044)	(0.043)	(0.037)	(0.049)
IMF program	−0.439**	−0.465**	−0.345**	−0.011
	(0.188)	(0.190)	(0.156)	(0.222)
GDP per capita	0.0001	0.0001	0.00003	0.0001
	(0.00004)	(0.00004)	(0.00003)	(0.00004)
GDP (billion USD)	−0.002**	−0.001	−0.0005	−0.0004
	(0.001)	(0.001)	(0.001)	(0.001)
Total debt to China (% GDP)	0.020***	0.022***	0.016***	0.014***
	(0.008)	(0.008)	(0.004)	(0.005)
External debt (% GDP)	0.002	−0.0003	0.001	−0.001
	(0.002)	(0.002)	(0.001)	(0.002)
CPIA Budget Management score	0.007	−0.011		−0.001
	(0.049)	(0.049)		(0.044)
Sub-national taxation	0.227***	0.312***	0.261***	0.119*
	(0.064)	(0.071)	(0.048)	(0.063)
Debt to IMF (% GDP)	−0.041***	−0.036***	−0.020**	−0.038***
	(0.013)	(0.013)	(0.009)	(0.012)
Threshold = 40% GDP	0.032	0.043	0.017	0.136**
	(0.081)	(0.081)	(0.058)	(0.067)
Threshold = 50% GDP	−0.087	−0.034	0.005	0.079
	(0.088)	(0.087)	(0.069)	(0.074)
US protegé support	0.207***			
	(0.078)			
China protegé support		−0.111**		
		(0.049)		
WGI Effective governance			0.112**	
			(0.055)	
SOE involvement				0.161**
				(0.067)
Distance from Threshold x IMF program	0.121**	0.126**	0.079*	−0.023
	(0.053)	(0.053)	(0.045)	(0.060)
Year fixed effects	Yes	Yes	Yes	Yes
Country fixed effects	No	No	No	No
IPW	Yes	Yes	Yes	Yes
Observations	252	252	382	207

Note: *p<0.1; **p<0.05; ***p<0.01

1.6 Instrumental variables approach

Bartik-style instrument

I follow the 2SLS set-up used by Lang (2021). The first stage equation predicts the likelihood of receiving an IMF program using the interaction between a country's recidivism, $IMFprobability$, and the IMF's global liquidity, $IMFliquidity$. $IMFprobability$ is defined as the proportion of years in the observation period (2000-2017) that each country was subject to an IMF program for at least 5 months.

First stage:

$$IMFprogram_{i,t} = \alpha_1(IMFprobability_{i,t} * IMFliquidity_t) + \alpha_2 IMFprobability_{i,t} + \alpha_3 IMFliquidity_t + \boldsymbol{X'}_{i,t}\alpha_3 + \delta_i + \tau_t + \upsilon_{i,t}$$

Second stage:

$$H_{it} = log(|Threshold_{it}|)\beta_1 + IMF\hat{program}_{it}\beta_2 + (log(|Threshold_{it}|) * IMF\hat{program}_{it})\beta_3 + Level_{it}\beta_4 + \boldsymbol{X\beta_{it}} + \gamma_t + \epsilon_{it}$$

The first- and second-stage results are shown below. The interaction term between $Threshold$ and $IMFprogram$ remains significant and positive.

Table 6: First stage: Bartik IV

	Dependent variable:
	IMF program
IMF liquidity	0.001*
	(0.0005)
IMF probability	1.050***
	(0.134)
IMF liquidity x IMF probability	0.0003
	(0.0002)
Distance from Threshold (log, absolute value)	−0.003
	(0.015)
GDP per capita	−0.00001
	(0.00002)
GDP (billion USD)	0.0002
	(0.0003)
Total debt to China (% GDP)	0.005
	(0.003)
External debt (% GDP)	−0.001
	(0.001)
CPIA Budget Management score	−0.011
	(0.032)
Sub-national taxation	0.015
	(0.040)
Debt to IMF (% GDP)	0.012
	(0.008)
Threshold = 40% GDP	0.030
	(0.043)
Threshold = 50% GDP	−0.061
	(0.058)
Weak instruments	15.733 ***
	(3.52e-07)
Wu-Hausman	4.064 **
	0.0448
Year fixed effects	Yes
Country fixed effects	No
Observations	291
Note:	*p<0.1; **p<0.05; ***p<0.01

Table 7: Second stage: Bartik IV

	Dependent variable:
	Hidden proportion of debt to China
Distance from Threshold (log, absolute value)	-0.423^{***}
	(0.161)
IMF program	-1.462^{**}
	(0.618)
Distance from Threshold x $I\hat{MFprogram}$	0.445^{**}
(log, absolute value)	(0.186)
GDP per capita	-0.00002
	(0.00004)
GDP (billion USD)	-0.0002
	(0.0005)
Total debt to China (% GDP)	0.025^{***}
	(0.005)
External debt (% GDP)	-0.001
	(0.001)
CPIA Budget Management score	-0.058
	(0.047)
Sub-national taxation	0.233^{***}
	(0.056)
Debt to IMF (% GDP)	0.003
	(0.012)
Threshold = 40% GDP	-0.138^{**}
	(0.070)
Threshold = 50% GDP	0.086
	(0.085)
Year fixed effects	Yes
Country fixed effects	No
Observations	285
Note:	*p<0.1; **p<0.05; ***p<0.01

1.7 Over-fitting checks

Table 8: Impact of Distance-from-threshold on Hidden debt, dropping insignificant controls

	Dependent variable:			
	hidden_prop_china_n			
	(1)	(2)	(3)	(4)
Distance from Threshold (log, absolute value)	-0.037^{**}	-0.038^{**}	-0.128^{***}	-0.150^{***}
	(0.016)	(0.016)	(0.047)	(0.033)
IMF program			-0.412^{**}	-0.459^{***}
			(0.185)	(0.150)
Distance from Threshold (log, absolute value) x IMF program			0.097^{*}	0.123^{***}
			(0.051)	(0.042)
Total debt to China (%GDP)	0.016^{***}	0.016^{***}	0.016^{***}	0.015^{***}
	(0.002)	(0.003)	(0.002)	(0.004)
Sub-national taxation	0.222^{***}	0.212^{***}	0.208^{***}	0.209^{***}
	(0.034)	(0.035)	(0.036)	(0.042)
Debt to IMF (%GDP)				-0.031^{***}
				(0.006)
Year fixed effects	Yes	Yes	Yes	Yes
Country fixed effects	No	No	No	No
IPW	No	Yes	No	Yes
Observations	414	414	414	382
Note:				*p<0.1; **p<0.05; ***p<0.01

Table 9: Impact of Distance-from-threshold on Hidden debt, dropping control variables one-by-one

	Dependent variable:									
	Hidden proportion of debt to China									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Distance from Threshold	−0.048**	−0.044**	−0.046**	−0.052**	−0.049**	−0.049***	−0.042*	−0.049**	−0.052**	−0.043**
	(0.021)	(0.021)	(0.019)	(0.021)	(0.020)	(0.018)	(0.022)	(0.020)	(0.020)	(0.020)
IMF program	−0.030	−0.036	−0.042	−0.110**	−0.049	−0.043	−0.039	−0.044	−0.051	
	(0.052)	(0.052)	(0.050)	(0.052)	(0.051)	(0.052)	(0.055)	(0.051)	(0.052)	
GDP per capita	0.00004	0.00004	0.00003	−0.00000	0.00003	0.00003	0.0001**	0.00003		0.00003
	(0.00002)	(0.00002)	(0.00002)	(0.00003)	(0.00002)	(0.00002)	(0.00003)	(0.00002)		(0.00002)
GDP (billion USD)	−0.0002	−0.0002	−0.0002	0.001**	−0.0001	−0.0001	−0.001		0.0001	−0.0001
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)		(0.0003)	(0.0003)
Total debt to China (% GDP)	0.016***	0.017***	0.016***	0.017***	0.017***	0.017***		0.017***	0.018***	0.017***
	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)		(0.003)	(0.003)	(0.003)
External debt (% GDP)	−0.0002	−0.0004	−0.0002	0.0003	−0.00004		−0.00000	−0.00003	0.0002	−0.0003
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)		(0.001)	(0.001)	(0.001)	(0.001)
CPIA Budget Management score	0.014	−0.046	−0.018	−0.042		−0.019	−0.020	−0.019	−0.022	−0.027
	(0.031)	(0.030)	(0.034)	(0.037)		(0.036)	(0.038)	(0.036)	(0.036)	(0.035)
Sub-national taxation	0.222***	0.232***	0.233***		0.222***	0.219***	0.220***	0.215***	0.206***	0.228***
	(0.043)	(0.043)	(0.041)		(0.044)	(0.044)	(0.046)	(0.040)	(0.043)	(0.042)
Debt to IMF (% GDP)	−0.002	0.006		0.005	0.003	0.003	−0.007	0.004	0.0005	0.003
	(0.007)	(0.008)		(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Threshold = 40% GDP	−0.111***		−0.061	−0.384**	−0.256	−0.243	−0.174	−0.248	−0.270*	−0.228
	(0.036)		(0.041)	(0.160)	(0.155)	(0.157)	(0.166)	(0.155)	(0.156)	(0.157)
Threshold = 50% GDP		0.159***	0.109**	−0.220	−0.088	−0.072	−0.072	−0.075	−0.086	−0.058
		(0.048)	(0.055)	(0.164)	(0.158)	(0.160)	(0.170)	(0.160)	(0.161)	(0.161)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	No	No	No	No	No	No	No	No	No	No
IPW	No	No	No	No	No	No	No	No	No	No
Observations	381	381	413	381	382	381	381	381	381	381

Note: *p<0.1; **p<0.05; ***p<0.01

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