Beyond Foreign Aid: How do Developing Countries Substitute Concessional Financing?

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Abstract

Developing countries have traditionally relied on foreign aid from Western donors to support government budgets. Despite extensive attention to its allocation, donor incentives, and effectiveness, we know little about how foreign aid is positioned relative to other financing instruments, especially how leaders choose substitutes when aid becomes less abundant. We theorize that politicians face threats to political survival when they lose access to foreign aid and prioritize financing substitutes with higher political benefits at the expense of high financial costs. Accordingly, we develop a theoretical framework that evaluates the comparative advantages of internal and external revenue substitutes for governments transitioning away from aid-based financing based on their political benefits and financial costs. We employ an instrumental variable design, leveraging the exogenous shock of crossing the International Development Association (IDA)'s operational lending threshold. Using comprehensive data on over two decades of borrowing, we find causal evidence that developing country governments primarily turn to the bond market when experiencing a loss in aid revenues, rather than relying on taxation or Chinese finance. We also demonstrate that their choice of substitutes is influenced by global liquidity. This paper connects the literature on foreign aid volatility with the broader scholarship on the political economy of sovereign finance. Our results carry policy implications for developing countries' financial sustainability and governance outcomes following an important transitional moment.

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Introduction

Governments in the developing world have long relied on foreign aid as a source of revenue. Standard accounts have argued this reliance on aid creates all sorts of moral hazard problems as aid may be captured by elites for clientelistic purposes (Bueno de Mesquita and Smith, 2009, Jablonski, 2014) or undeserved credit claiming (Cruz and Schneider, 2017). One of the stated donor goals of providing foreign aid has been to promote economic development and state capacity such that borrower countries eventually wean off of aid through expanded domestic revenues in the form of taxation (World Bank, 2023). Rarely is the transition away from aid that straightforward, however. Governments face a critical choice of substituting aid revenues with internal and external financing instruments. While internal revenue collection such as taxation can enhance accountability, its political costs often push leaders toward external revenue sources. At the same time, financing through other external borrowing such as the bond market and bilateral creditors can introduce fiscal pressures from high interest rates and stringent repayment schedules or a different set of political costs. The choice of substitutes thus has profound implications for fiscal sustainability and the survival of policy reforms enforced through foreign aid. How then do governments in the developing world substitute aid revenues during fiscal transitions, and what underpins their choice of substitutes?

This paper examines how developing countries assess trade-offs between domestic and external resource mobilization in their efforts to adapt fiscally when concessional aid—a critical source of unearned government revenue—becomes less abundant. The end of Cold War-era politics, donor fatigue, increased skepticism about aid effectiveness, and stringent conditionalities have contributed to the gradual reduction in aid availability in the late 2000s through till present day (Dunning, 2004, Moyo, 2009). Many donors worried about aid waste and encouraged countries to stop relying on concessional grants and loans and move toward more expensive forms of official finance (Engen and Prizzon, 2019). A more recent, and perhaps extreme, example of aid skepticism manifested in the abrupt shutdown of the United States Agency for International Development (USAID) in 2025. While concessional aid aims to foster self-sufficiency, its volatility and eventual drawback often leave governments searching

for alternative revenue sources. This challenge is especially acute in sub-Saharan Africa, where aid dependency has historically been high and domestic revenue capacity remains constrained (Brautigam et al., 2008, Martin, 2023). At the same time, these governments have gained access to a more diverse selection of alternative financing instruments, including international capital markets such as Eurobonds, private capital, and loans from emerging non-traditional donors like China (Brazys and Vadlamannati, 2021). This shift has been described in recent work that conceptualizes aid as one part of an expanding marketplace for external finance, where governments gain bargaining leverage with donors by diversifying their borrowing options (Zeitz, 2024).

The rise of financing from non-traditional donors in the 2000s and 2010s like China and Gulf countries have upended Western aid regimes, attracting the most academic and policy attention as developing countries search for alternatives. China, in particular, made the second largest loan commitments to developing countries between 2010-2019, and remains the single largest bilateral creditor (World Bank, 2021), as the figure below illustrates. While recent studies pay more attention to the competition between China and traditional donors, Figure 1 from the International Debt Statistics highlights that the changing menu and composition of credit available to developing country governments is far beyond emerging creditors. In this paper, we draw attention to the bond market and argue that the bond market plays a critical role as developing countries transition out of traditional foreign aid regime.

Figure 4: Official Loan Commitments to Developing Countries
(Cumulative commitments 2010-2019, US$ billions at 2019 prices, top 20 providers)

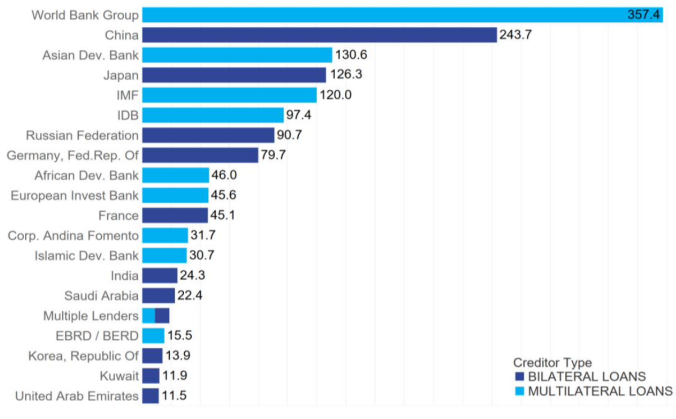
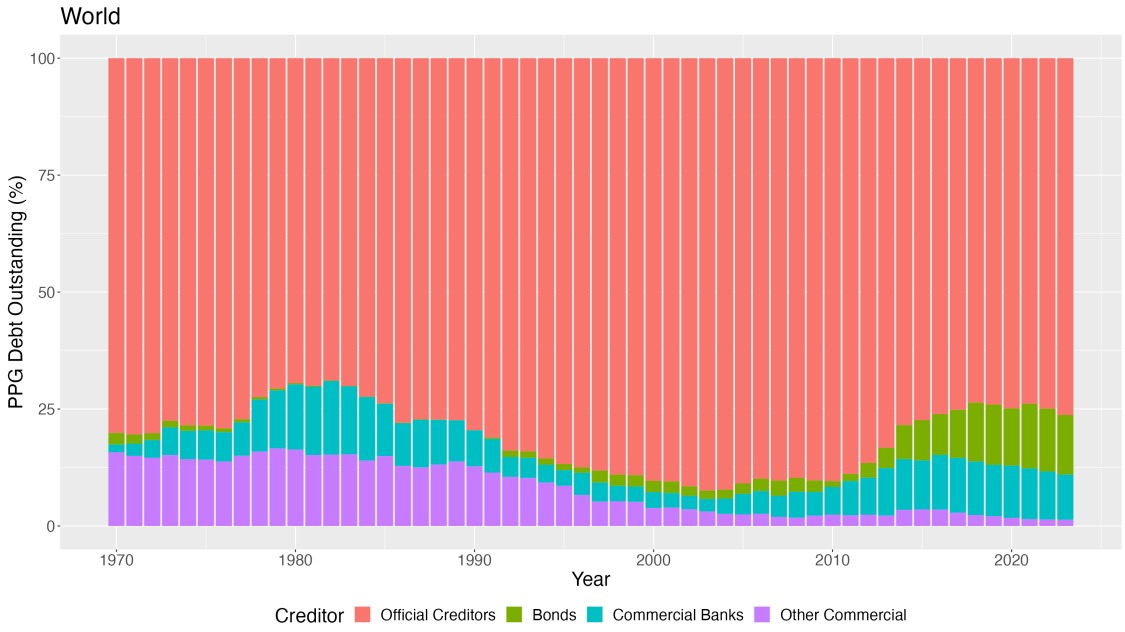


Figure 1: Proportion of External Debt Financed via Aid versus other sources (World, 1970-2021)



How do developing country governments make trade-offs as they face an increasingly diverse composition of creditors and reduction in concessional aid? We approach this question both theoretically and empirically. We first develop a simple theoretical framework that examines the government's evaluates the comparative advantages of alternatives instruments based on their political and financial benefits. Within this theoretical framework, we empirically examine how political benefits play an important role in developing country governments' transition out of an aid-dependent model. To account for the endogeneity of aid loss, we leverage an instrumental variable approach using the exogenous shock of crossing the International Development Association (IDA)'s operational country-income lending threshold as an instrument for loss in aid revenues. The instrument is plausibly exogenous because the threshold is determined by the World Bank Board members, changes annually, and is not revealed to aid recipient countries until after the results are announced. Our empirical results suggest that governments in the developing world primarily turn towards the bond market because its responsiveness ensures steady revenue flows despite loss in aid revenues. This is inspite of the fact that bond markets constitute the financially costliest form of borrowing available to developing country sovereigns. Our analysis suggests that

short-term political convenience, not financial prudence, drives borrower behavior during an important transitional period. Despite the abundant attention in the literature to concerns about China replacing Western aid (Horn et al., 2021, Qian et al., 2023), we do not find evidence of this. We also find suggestive evidence that the choice of other financing instruments is conditional on global liquidity; periods of high market liquidity that intersect with a country's transition out of IDA's borrowing threshold see a stronger push by borrowers to substitute ODA with bonds. Building on the empirical evidence, we examine how leaders choose financial substitutes under domestic political pressure through a case study of Ghana's transition process out of IDA borrowing.

Findings from this paper contribute to a few strands of literature. First, it connects the scholarship of foreign aid to the literature on foreign aid. External borrowing from IFIs, foreign aid (which includes concessional lending) and sovereign bond markets has been treated somewhat distinctly in the literature, and we attempt to bridge that gap in this paper. Second, it makes the first effort in understanding taxation in addition to external borrowing in the choice of revenue sources available to sovereigns. Although sovereign debt, foreign aid and taxation may not matter equally in developed economies with robust tax bases, they are often managed in a more wholistic manner in the developing context. The shortage of revenues from one source may have implications for fiscal pressure on other sources. While the ultimate goal of foreign aid may be to build tax capacity and achieve self-sufficiency, findings from this paper show that taxation may only be attractive when easy financing through private capital is constrained. This paper also speaks to the emerging literature on the demand-side drivers for debt composition by evaluating all fiscal instruments under a comprehensive framework, which c. Bunte (2019) and Cormier (2024) stand out as the first contributors to the question of demand-side drivers of sovereign borrowing by showing how sectoral composition and partisanship lead to different choices of instruments across countries. Building upon their work, we provide a new perspective in understanding the temporal variation in access to private capital in the developing country context.

Our findings also contribute to the literature on donor competition by showing empirical evidence on recipient countries' transition process. In this regard, our argument builds on but departs from recent work that treats borrowers' "financial statecraft" as a strategic

use of outside creditor options to increase leverage vis-à-vis traditional donors (Zeitz, 2024). In those accounts, diversification towards private credit markets and China are intentional bargaining tactics that reshape traditional aid conditionality. By contrast, in this paper, we model a constrained substitution problem: once concessional aid becomes less abundant, leaders are forced to choose among alternatives primarily to preserve political survival through the speed, volume, and political flexibility of the alternative. We argue that in the short run, leaders facing such a fiscal transition are closer to being price-takers, rather than active architects of leverage with donors; their choice of alternatives is conditioned by global liquidity conditions and domestic political pressures, not deliberate financial statecraft.

Furthermore, this paper extends the literature on aid volatility by shifting the focus to the direct *fiscal* implications of losing aid, which bears important policy implications. While access to private capital may be an essential step in self-sufficient fiscal policies, borrowing levels and terms can have a significant impact on countries' fiscal and economic stability. The decade-long Structural Adjustment Programs opened up the fiscal space for developing countries. Yet we observe the rapid rise in debt ratios exceeding government expenditure in health and education, consecutive defaults, and debt restructurings, only two decades after these countries started with a clean slate. The recent debt crises and restructuring processes in countries such as Ghana, Zambia, and Kenya call for a better understanding of the long-run implications of sovereign debtors' choice of financing instruments. Overborrowing from the politically convenient but financially risky bond markets in developing countries can have downstream consequences for long-term debt sustainability and state capacity. Many of these countries, as they moved away from primary reliance on concessional aid and grants, faced a choice of potential substitute financing options. Due to the choices they made to primarily turn to the private capital markets, several of these countries now find themselves in debt servicing or restructuring obligations to repay costly private sector debt that has undercut the state's ability to provide public goods to its citizens. Nowhere is this more emblematic than in Ghana, which crossed the IDA threshold in 2010 and then went on to substitute concessional finance heavily with private sector debt, particularly in the bond markets. The second-to-last section of this paper presents original interviews with Ghanaian finance ministry officials and descriptive accounts of Ghana's transition to lower-middle-income status, tracing the arc

of choices made during a transitional period that have contributed directly to the country's contemporary debt sustainability challenges. Overall, this paper's findings demonstrate some of the missed opportunities for developing internal fiscal capacity that countries faced when transitioning away from traditional aid.

Political and Financial Trade-offs with Different Instruments

We theorize leaders' choice of financing instruments with a few assumptions. Our central intuition is that leaders make financing decisions to maximize their chance of political survival which depends on support from citizens. We assume citizens vote for leaders they perceive as capable. An important underlying assumption here is that citizens' evaluation of leaders' ability is a function of resources they mobilize. The second, for simplicity, is that citizens constitute the winning coalition for the leader. With these assumptions, leaders' utilities is essentially a function of the amount of resources they can mobilize from domestic revenue as well as external borrowing subject to the constraint that they need to pay back what they borrow.

While we acknowledge that the government's choice of revenue instruments carries information about leaders' capability, we believe that it is not extensively leveraged by citizens in the developing world for a few reasons. First, due to capacity constraints, developing country governments have limited resources to disclose detailed financial information (Jerven, 2013). Second, and more importantly, it is costly for citizens to closely monitor financial information made public by the government. In order to obtain this information, citizens would need to have stable internet access and time to evaluate hundreds of pages of government documents, resources not typically available to an average citizen. Lastly, they may lack adequate education to understand the trade-offs across different financing instruments. Even research coming out of advanced industrialized countries finds their citizens pay limited attention to government debt (Bremer and Bürgisser, 2023). It is reasonable to expect an average citizen in developing countries will prioritize public spending choices over financing

decisions, given most financial implications are not directly observable. What matters ultimately is the relative accessibility of observing the choice of instruments compared with that of observing changes in public spending and taxation. We argue that when the latter is more salient and accessible, citizens prioritize their direct experiences in evaluating leaders' abilities.

We now turn to the menu of borrowing options available to developing country governments when access to concessional aid declines. These options differ in the political and financial trade-offs they impose on leaders. While traditional creditors remain important, many governments grappling with an aid transition may turn to non-traditional creditors, private markets, and domestic sources like taxation. As income levels rise, developing countries may lose access to ODA but they may continue financing with the traditional creditors through less concessional instruments which are referred to as Other Official Flows (OOF). In the meantime, non-traditional creditors such as China started to play a major role in the early 2000s (Zeitz, 2024). As shown in Figure 1, developing countries also gained increasing access to the bond market both internationally and domestically in the same period. Additionally, one important developmental goal of foreign aid programs is to build institutions and capacity in recipient countries to be self-sufficient. Governments transitioning away from aid should, in theory, have the option of raising funds internally through tax revenue instead of resorting to external financing instruments. Building on insights from the model, we characterize each of the four alternatives based on its political cost, financial cost, responsiveness, and volume—the key dimensions shaping the attractiveness of each option for politically motivated leaders.

As shown in Table 1, the key features of borrowing instruments vary significantly. Cormier (2024) suggests that emerging market governments make trade-offs between political and financial costs when choosing financing instruments. Building on insights from our model and Cormier (2024), we interpret these features as shaping either the political utility or the financial cost of each instrument. Political costs refer to the risk of losing office or the leader having to make concessions, broadly defined. Financial costs of different funding options are operationalized as interest rates, repayment windows, grace periods, and flexibility for restructuring. In addition, two other practical considerations—responsiveness

(how quickly funds become available) and volume (the scale of disbursement relative to fiscal needs)—influence the feasibility of relying on a given source and feed into political utility. Table 2 summarizes how each instrument scores on these dimensions, capturing the trade-offs leaders face in moments of aid withdrawal or fiscal need. Instruments with higher values on political utility and lower financial costs are more likely to be preferred, consistent with the substitution logic in the model. Alternatives with more + signs are evaluated as higher values on political or financial utility. Together, these four dimensions structure how leaders weigh borrowing options in response to shocks like the loss of concessional aid.

Traditional official creditors, including multilateral banks and bilateral donors, offer the most concessional financial terms, with low interest rates, long grace periods, and structured repayment schedules (Griffith-Jones et al., 2008, Humphrey, 2014). However, these instruments often come with political conditions or reform requirements, which may be costly for leaders seeking reelection or balancing domestic coalitions (Babb and Carruthers, 2008, Chwieroth, 2009, Dreher, 2004). Typical concessions include complying with geopolitical pressures (e.g., voting at the UN Security Council), or adhering to reform conditionalities from other official creditors like the World Bank. These concessions can be politically costly when they disproportionally affect some groups (Bunte, 2019, Cormier, 2024). In contrast, Chinese financing typically involves fewer overt conditions and faster disbursement, but with less concessional financial terms and increasing scrutiny over repayment risks. Financing terms from non-traditional creditors such as China are less favorable compared with traditional creditors but still concessional compared with market rates (Morris et al., 2020). Chinese finance is known for its "zero-conditionality policy" but studies have shown that China imposes a different set of conditions such as using Chinese labor (Bräutigam and Gallagher, 2014) and confidentiality (Gelpern et al., 2023), which are less politically costly as compared with conditions imposed by traditional creditors.

Private financing through bond markets gives leaders the most discretion over spending and is the least encumbered by external oversight. DiGiuseppe and Shea (2018) show that access to private credit enhances leaders' survival. However, this flexibility comes with high interest rates and market-driven volatility, raising long-term debt sustainability concerns. Taxation, while financially efficient in the long run and a marker of state capacity,

imposes steep political costs because citizens directly observe and respond to tax burdens. Unlike borrowing, which can be obscured or delayed in its effects, raising taxes often requires immediate political capital.

Leaders also value responsive time and volume of financing alternatives, especially when the goal is to fill a financing gap. Failure to fill the financing gap in time may result in removal from office. Despite some anecdotal evidence of China being a more responsive official creditor, reaching an agreement with official creditors, in general, entails years of negotiation and bureaucratic procedures that span beyond leaders' electoral time frame. On the other hand, raising taxes, which avoids negotiating with any external actors, can be responsive from an executive perspective. The bond market also takes less than a year or as little as weeks when market interests are aligned.

Table 1: Taxonomy of Financing Alternatives: Detailed Trade-offs

Financing Alternative	**Pros**	**Cons**
Chinese finance	- Quick access to large funds. - Fewer conditions than traditional donors. - Large-scale projects enhance visibility.	- High debt burden from non-concessional terms. - Perceived dependency on foreign powers.
Private finance (e.g., bonds and commercial loans)	- Fast, large-scale capital. - Discretion over allocation. - Funds high-visibility projects.	- High interest rates and default risk. - Debt sustainability concerns. - Credit rating agency scrutiny.
Taxation	- Sustainable and long-term. - Enhances legitimacy if transparent.	- Politically very costly and heightens demand for accountability. - Slow implementation. - Limited by institutional capacity.
Other Official Flows (e.g., IBRD, Regional Banks, Bilaterals)	- Continuity with traditional donors. - Medium-term funding opportunities.	- Higher interest rates than concessional loans. - Slow and negotiated. - Conditionalities imposed by creditors.

Table 2: Evaluation Framework of Financing Alternatives

	Political Utility			Financial Utility
	Political Flexibility	Responsive--ness	Volume	Interest Rate
Private finance	++++	++++	+++	+
Chinese finance	+++	+++	+	++
Other official finance (OOF)	++	+	++	+++
Tax revenue	+	++++	++++	++++

We expect that, all else equal, alternatives with higher political benefits (ie. more politically flexible, responsive, and higher volume) will be preferred by the leader when experiencing a higher borrowing cost or diminished supply of funds from their original instrument. Using the evaluation framework from Table 2, this would predict that private finance from bond markets would be the most preferred alternative to a loss in concessional finance.

Additionally, leaders' choice of financing alternatives can be shaped by both the availability of external and domestic resources. Leaders are rarely unconstrained decision-makers: they operate in settings of varying fiscal urgency, institutional capacity, and political competition. One key set of constraints relates to the availability of financing options. Global financial conditions—such as periods of high or low liquidity—shape whether certain instruments, like international bonds, are accessible in the first place (Ballard-Rosa et al., 2021, Zeitz, 2022). That is, we may expect a higher substitution effect between loss in foreign aid and increase in bond issuance when global markets are flush. When global liquidity is low, leaders may be forced to resort to politically costly but financially favorable instruments such as taxation.

Empirical Strategy

Empirically, we focus on IDA borrowers, where many countries lost access to concessional aid around the same time they were gaining access to credit from Chinese lenders and private capital markets. We focus on four main financing alternatives - bonds, Chinese finance, tax revenue and OOF[1] The independent variable is the level of foreign aid received by each country.

Analyzing the effect of foreign aid withdrawal on alternative financing poses identification challenges. First of all, the relationship suffers from potential reverse causality issues. Countries may voluntarily foreign aid when they gain access to alternatives. Access to foreign aid can also be endogenous to the availability of other financing alternatives. Countries may strategically move away from foreign aid for reasons that simultaneously increase their financing from alternative instruments. For example, governments preferring less transparent instruments would avoid foreign aid while having a preference for Chinese finance (Mosley and Rosendorff, 2023). The relationship could also be confounded by global trends in foreign aid reduction or the rise of non-traditional creditors.

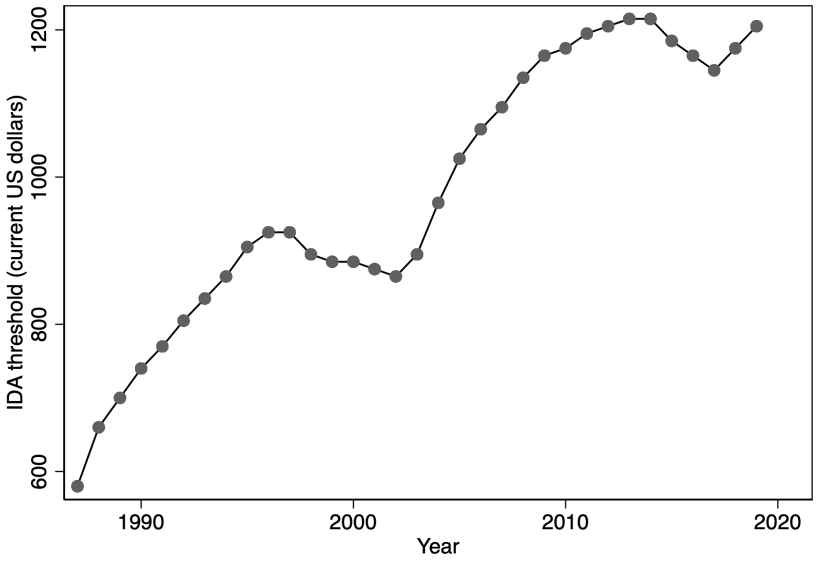
Instrumenting Aid

We overcome the identification challenge by leveraging two-stage-least-squared (2SLS) design with an instrumental variable (IV). The IV is a binary variable of crossing the International Development Association (IDA)'s *operational* lending income cutoff for concessional aid in a given year. The income cutoff is determined by the World Bank Board annually and signals potential graduation from the IDA program in the future. The IDA is part of the World Bank's lending program that provides concessional finance or "soft loans" only to countries that fall below a precise per capita income (GNI) level. Figure 2 plots the threshold over time.

The IDA starts graduation negotiation with countries when they are above the annual

[1]Bond data are gathered from *Bloomberg*. Chinese finance data are sourced from Horn et al. (2021). Tax revenue data are sourced from the World Bank. OOF data are sourced from the Credit Reporting System.

Figure 2: IDA's operational lending cutoff over time



Source: Galiani et al. (2017) and International Monetary Fund (IMF) Press and Staff Reports

income threshold for three consecutive years[2]. Once they graduate, countries can only receive high-interest IBRD loans, loses access to debt relief, and typically tends to lose the majority of multilateral and bilateral donor aid from other non-IDA donors as well, who use the IDA threshold as the standard for determining their own borrowing eligibility criteria (Moss and Majerowicz, 2012). Final graduation depends on both meeting the three-year consecutive threshold crossing criterion as well as an opaque "creditworthiness risk" assessment by high-ranking World Bank staff. Between 1987-2021, 20 countries have graduated from IDA and become IBRD-only borrowers.

Although countries do not immediately lose eligibility for concessional financing, we observe fewer foreign aid transactions towards countries that cross the threshold from not just the IDA but also other donors for two reasons. First, candidate countries that meet the consecutive crossing criterion but fail the creditworthiness requirement remain in what is officially called "blend" status, whereby they are eligible for limited funding from the IDA and

[2]Note that we exclude countries that graduated and then reverted back under the threshold into IDA eligibility. Most of these cases happened before 1980 and eight were between 1980-1990. Pre-1980 graduates were, on average, richer when they graduated and had limited dependence on the IDA's concessional financing prior to graduation. The graduates during the 1980s were poorer, and more dependent on IDA funding, and reverse graduated due to commodity shocks in the 80s. Only 4 "double-crosser" countries crossed the threshold twice between 1990-2021: Bolivia, Cote d'Ivoire, Indonesia, and Yemen.

some funding from the IBRD, but both at higher interest rates than concessional financing.[3] Additionally, crossing the income threshold makes countries candidates for graduation and thus serves as a signal to foreign aid donors that a country may lose eligibility to foreign aid in the near future. As a result, donors may not prioritize these countries when making long-term aid budget plans.

We believe that the IV is plausibly exogenous because the country income cutoffs are calculated using a predetermined formula about the state of the world economy established in 1987 during IDA meetings when a need to address the reverse graduation of several developing countries back under the historical cutoff was recognized.[4] The cutoff using this formula is revised every year during IDA meetings, where the IDA brings together board members and other stakeholders to raise funds for the next three-year fund replenishment cycle, and is not revealed to recipient countries until the threshold is published in annual reports. Between 1987 to 2021, there were 93 countries that were at some point considered eligible for IDA's concessional lending using this criterion.[5] Given that IDA countries are not aware of the thresholds, they have limited means to manipulate the process by misreporting or under-reporting their income levels to stay eligible.[6] These graduation eligibility thresholds have thus been utilized as a source of plausibly exogenous variation to identify the causal effects of foreign aid on economic growth (Dreher and Lohmann, 2015, Galiani et al., 2017).[7] To further reassure readers that there is limited manipulation to stay beneath the threshold, we perform a Mcrary bunching test as reported in Figure 3. The plot shows the fitted kernel density functions below and above the IDA income threshold. If there were

[3]See Review of IDA's graduation policy. 2012. IDA16. Washington, D.C. : World Bank Group. for more details.

[4]Review of IDA's Graduation Policy, 2012.

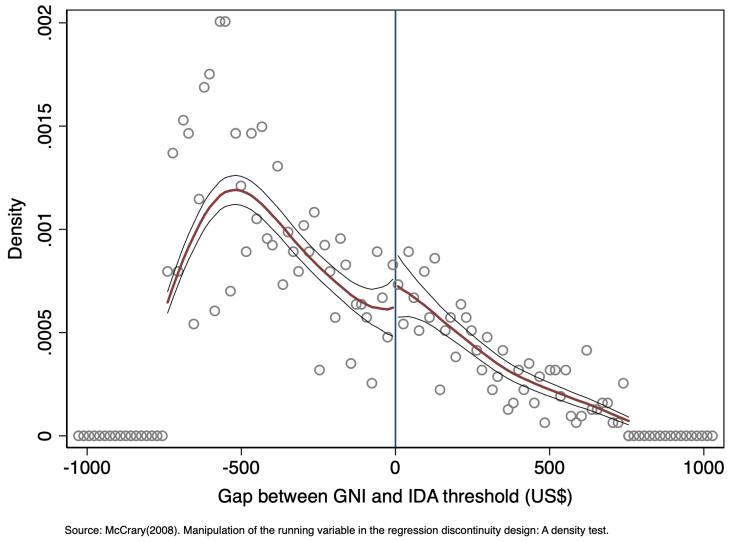
[5]See: Borrowing Countries, International Development Association for more details.

[6]That being said, it is important to acknowledge the potential for some manipulation or strategic behavior around these thresholds, as found by some other scholars. For example, Dolan (2017) highlights instances where countries may revise their GDP estimates around critical thresholds to influence their classification. She also finds that market actors might begin to respond to countries nearing graduation, affecting political ratings and creditworthiness ratings even before actual graduation occurs. However, the focus of that previous work has been on World Bank's *analytical* thresholds, whereas our study focuses on the operational thresholds which are internal to the lending decisions of multilaterals rather than the ones used for broader country classification and much less manipulable.

[7]Similarly, Carnegie and Samii (2019) use exogeneity provided by a second tier of graduation cutoffs, namely from the IBRD into developed-country status to study the effects of crossing over into a rich-country category on political liberalization reforms.

a manipulation of GNI per capita reported by countries, we would see a discontinuous jump in the density function around the threshold, which is not what we observe in Figure 3.

Figure 3: **Testing Manipulation of IDA Threshold by Countries**



This figure depicts the McCrary test for bunching near the threshold. The X-axis denotes the difference between countries' GNI per capita and the IDA threshold (in current US$). We restrict this difference to be within 750 US$ of the IDA threshold to study whether bunching is taking place. The sample includes all IDA beneficiary countries between 1990-2020. The discontinuity estimate from the McCrary density test is 0.162 and the standard error is 0.164. Source code for this test was borrowed from McCrary (2008).

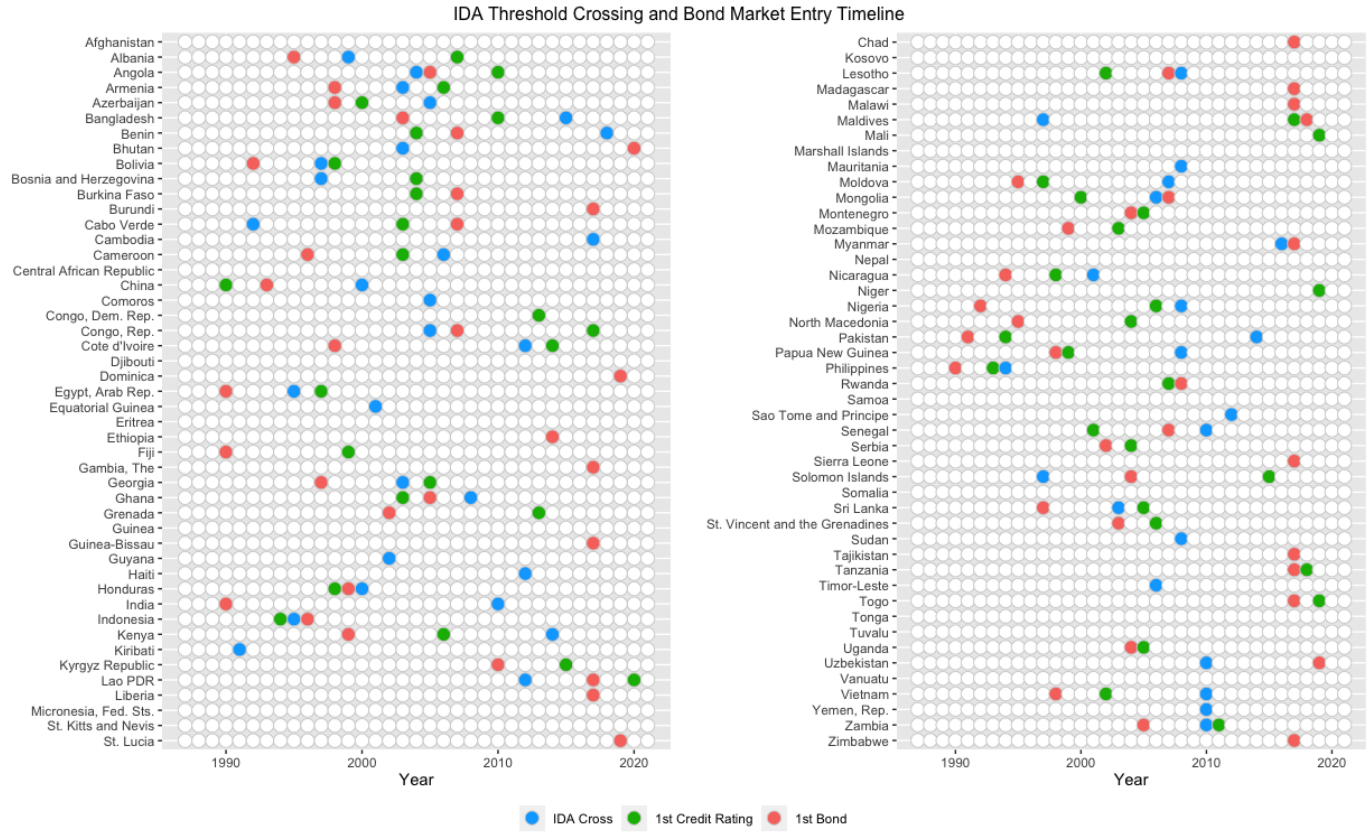
Identifying Assumptions and Exclusion Restriction

An important identifying assumption in a 2SLS design is that our IV can only affect the dependent variable (access to alternative financing) through access to foreign aid. However, concerns may arise if other external financing sources — such as private creditors or donors — perceive crossing the IDA threshold as a signal of a borrower's improved creditworthiness and expand their lending in response. This creates a direct causal link between our IV and dependent variable that could violate the exclusion restriction.

We address these concerns in a few ways. First of all, if donors respond directly to the IV or strategically push their preferred recipients over the threshold, we should expect donors that are on the World Bank Board respond with more OOF transactions because they are involved in decided the threshold. Results in Appendix F suggest that donors that are board members do not respond significantly differently from non-board members. Additionally, we examine whether private creditors respond directly to our IV by estimating

whether countries' credit ratings and bond spreads respond to crossing the income thresholds. Results in Appendix E suggest that creditors do not pay close attention to crossing the threshold. We also visualize a timeline of countries crossing the IDA threshold, obtaining their first credit rating and entering the bond market in Figure 4. If the exclusion restriction were violated, we would expect all three events to be closely timed together, which is not the case.

Figure 4: **Timeline: IDA Crossing, Bond Market, and First Credit Rating**



One may also be concerned about making a causal interpretation of our results because of omitted variable bias. For example, an increase in alternative financing in response to foreign aid reduction may be the results of different financial strategies across countries given their levels of development, long-term trends in market conditions or external perceptions, rather than governments' active choice in light of foreign aid loss.

We address this concern in a few ways. First of all, we control for GNI per capita and include country and year fixed effects, which makes our 2SLS design locally equivalent to a

fuzzy regression discontinuity: among observations with the same income, the only discontinuous source of variation relevant for aid is whether the country's income sits just above versus just below the cutoff in that year. In practice, we partial out the running variable (lagged GNI per capita) and common shocks (year FEs) and absorb time-invariant country characteristics (country FEs), then use the crossing indicator as an instrument for ODA with lags that enforce temporal ordering. Under the standard RD smoothness assumption - that potential outcomes are smooth in income at the cutoff- the exclusion restriction should hold conditional on income, that is, crossing moves outcomes only through the induced change in concessional aid. The 2SLS estimand is therefore a local average treatment effect for the country-years whose ODA responds to crossing ("compliers"). Econometrically, the majority of first stage variation comes from observations near the cutoff. Pooling the full panel therefore preserves power while still delivering a local treatment effect: we don't discard panel observations further from the cutoff that can improve precision of this local effect. In robustness checks, we also show the same patterns when we restrict to near-cutoff windows in Appendix C but trimming sample introduces power issues. Additionally, we exploit time lags in aid reductions and lending responses to ensure that observed shifts in financing substitutes are temporally linked to the withdrawal of aid. Specifically, we compare changes in financing options within a narrow window after IDA graduation to isolate immediate fiscal adjustments driven by aid reductions from longer-term trends influenced by market conditions or external perceptions. Last but not least, we conduct falsification tests using countries that approach but do not cross the IDA threshold, and observe significant changes in financing substitutes only for countries that cross the threshold. This provides confidence that the observed patterns are causally linked to the withdrawal of concessional aid rather than other unobserved factors.

In other robustness checks, we show consistent results when excluding "double crossers" and small/island countries in Appendix B.[8] We also show consistent results using a different instrumental variable by Dreher and Langlotz (2020) in Appendix H.

[8]Some World Bank designated "small, island nations" continue to receive loans on IDA terms even after crossing the threshold owing to their vulnerability to economic shocks.

Model Specification

We use a 2SLS instrumental variable (IV) design to estimate how borrower governments adjust to the withdrawal of concessional aid and the choice of various substitutes — ranging from taxation to external borrowing from China and private markets. The endogenous independent variable is the level of Official Development Assistance (ODA). Our unit of analysis is the country-year. In the first stage, we model the relationship between IDA threshold crossing and reductions in ODA:

$$ODA_t = \gamma_0 + \gamma_1 IDACrossing_{t-2} + \boldsymbol{X'}\gamma_2 + u$$

Here, $IDACrossing_{t-2}$ is a binary indicator which takes the value of 1 if a country has crossed the operational lending income cutoff in the previous two years or earlier. The indicator remains unchanged for the years after the crossing. ($\boldsymbol{X'}$ represents a vector of covariates that control for year and country-specific confounders. In the second stage, we estimate the effect of instrumented reductions in ODA ($\hat{ODA_t}$) on the adoption of substitute financing sources in the following year:

$$Alternatives_{t+1} = \beta_0 + \beta_1 \hat{ODA_t} + \boldsymbol{X'}\beta_2 + \epsilon$$

The dependent variable in the second stage measures changes in reliance on various financing alternatives, including taxation, Chinese loans, private capital market borrowing, and OOF loans.

Empirical Results

To establish the validity of IDA threshold crossings as an instrument for foreign aid, we begin by testing the first-stage assumption. Even though the graduation process itself takes several years, multilateral, regional, and bilateral donors alike utilize the crossing of the IDA income thresholds for their own lending eligibility criterion (Moss and Majerowicz, 2012). The African Development Bank, a large regional donor for assistance to sub-Saharan Africa,

for instance, cites the crossing of the IDA threshold as one of the major criteria in its concessionary loan eligibility reports (Prizzon et al., 2016). Limited donor aid budgets result in directing funding to the neediest countries, and crossing this arbitrary IDA threshold may signal to donors that a country is no longer in the neediest category. Table 3 presents the results of the first stage. It provides strong evidence for the first stage ie. the relationship between the instrumental variable (threshold crossing) and the endogenous variable (ODA availability). Column (1) shows that crossing the GNI threshold leads to a 24.3% reduction in ODA as a share of GNI in the next year. Column (3) shows that relationship holds even two years after crossing. Columns (2) and (4) provide evidence that net per capita ODA received by a country falls by 39.6 USD and 41.36 USD one year and two years after crossing the threshold respectively. We include a falsification test in the specification in Column (5) whereby we include an indicator for "future crossing" $(t+2)$ as an additional explanatory variable[9]. This future crossing should in expectation be orthogonal to current ODA received, and indeed the coefficient on the future crossing indicator is not statistically significant. This falsification exercise helps establish the strength of the instrument, given the persistent magnitude and significance of the coefficient on the $t-2$ crossing instrument in Column (5). The relationship is robust to the inclusion of country and year-fixed effects in all specifications, which further bolsters the strength of this instrument. In the appendix, we also report this first-stage relationship when we restrict our sample to African countries and exclude small, island countries that continue having some access to IDA money due to the vulnerability of their economies despite crossing the threshold (see Table B.1, and separately, restricting our sample to only the countries that crossed over the IDA threshold at some point (Table B.2). We generally see that this first-stage relationship between IDA threshold crossing and Net ODA (as a % GNI) received in subsequent years is robust to different subsamples.

We then report the reduced form relationship between crossing the IDA threshold at least one year ago and the choice of different financing instruments in Table 4. We see that the strongest and most consistent reduced-form relationship between countries that cross the threshold and choice of financing is seen in private bond market issuance. In particular,

[9]We borrow this false experiment idea from Miguel et al. (2004)

Table 3: First-Stage

	Dependent variable:				
	ln(ODA/GNI)	ODA per capita	ln(ODA/GNI)	ODA per capita	ln(ODA/GNI)
	(1)	(2)	(3)	(4)	(5)
D(crossing $\leq 1yr$)	-0.249^{***}	-39.619^{**}			
	(0.071)	(17.302)			
D(crossing $\leq 2yr$)			-0.257^{***}	-41.361^{**}	-0.233^{***}
			(0.075)	(17.834)	(0.071)
D(crossing $\geq 2yr$)					-0.046
					(0.064)
GNI pc $(t-1)$	-0.107^{***}	7.251			
	(0.031)	(5.440)			
GNI pc $(t-2)$			-0.093^{***}	8.552	-0.094^{***}
			(0.031)	(6.205)	(0.031)
Observations	2,741	2,744	2,646	2,652	2,646
Adjusted R^2	0.793	0.781	0.800	0.782	0.800
Country FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
Cluster SE	Country	Country	Country	Country	Country
Note:					*p<0.1; **p<0.05; ***p<0.01

Column (1) shows that crossing the IDA threshold leads to a 4.07 log-point increase in the total amount of bonds issued, significant at the 1% level. This effect translates into a substantial increase in bond issuance measured by bonds as a percentage of GDP (Column 2). Specifically, countries that cross the threshold see bonds as a share of GDP increase by 1.22 percentage points in the year following the threshold crossing. We don't find a similar reduced form relationship from crossing the IDA threshold with either Chinese loans or tax revenues. There is weak evidence of increase in the amount of OOF finance when countries cross the income threshold but the increase is not significant when weighted by GDP.

We now turn to the second-stage results, presented in Table 5, where we estimate the causal effect of reductions in ODA (instrumented by IDA threshold crossing) on the use of alternative financing sources. The instrument allows us to overcome the identification challenge that the choice of alternative financing may be endogenous to changes in countries' access to concessional aid. Recall that our theory predicts increase in alternative instrument with high political benefits. The second-stage results provide strong evidence that exogenous

Table 4: Reduced Form Relationship between IDA Crossing & Alternative Financing

	Dependent variable:						
	Bond amounts	Bonds/GDP	Chinese debt	Chinese debt/GDP	Taxes/GDP	OOF amt.	OOF/GDP
	(log)	(%)	(USD)	(%)	(%)	(log)	(%)
D(Crossing $\leq$ 1yr)	4.074***	1.223***	−0.991	−0.700	0.074	0.540*	0.013
	(1.127)	(0.378)	(1.236)	(1.318)	(0.898)	(0.299)	(0.027)
GNI pc ($t-1$)	−0.383	0.032	−0.428	0.137	0.313	0.223*	−0.009
	(0.254)	(0.104)	(0.328)	(0.321)	(0.446)	(0.113)	(0.020)
Observations	2,843	2,836	1,197	1,197	1,216	889	867
Adjusted R^2	0.640	0.361	0.671	0.646	0.565	0.619	0.794
Country FE	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y
Cluster SE	Country	Country	Country	Country	Country	Country	Country

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

reductions in ODA drive governments to rely more heavily on private bond markets. Columns (1)-(2) focus on private bond market activity as the dependent variable. A 1 percentage point increase in Net ODA (as a share of GNI) reduces the total bond amounts issued by 13.82 log points (Column 1) and bonds as a share of GDP by 4.92 percentage points (Column 2). These results suggest a significant substitution between ODA availability and private bond markets[10]. It follows that an exogenous decrease in Net ODA received by a country should significantly increase countries' reliance more heavily on private bond markets to finance their expenditure, as we saw in the reduced form relationship.

By contrast, there is no evidence of a significant relationship between reduced ODA and reliance on Chinese finance (Columns 3-4) or tax revenues (Column 5). The coefficients on OOF (Columns 6-7) are in the same direction that those on bonds but we do not observe a significant relationship. These findings suggest that while private bond markets act as a key substitute when concessional aid draws down, reliance on other sources, such as Chinese finance or domestic revenue mobilization, remains less sensitive to changes in ODA availability. In Appendix Table D.1, we present results using linear time trends instead of year-fixed effects of accounting for gradual shifts in financing patterns over time. Expectedly, there is

[10]One may argue that participation in IMF programs such as the Highly Indebted Poor Countries initiative leads to more aid revenues while also preventing countries from issuing bonds, and that the completion of the HIPC program would expand the debt-carrying capacity for sovereign borrowers looking to turn to alternatives, such as commercial loans. Table G.1 shows that results are robust after controlling for the expanded debt carrying capacity in the two-year period after HIPC completion.

Table 5: Second Stage: Instrumenting Net ODA received with IDA crossing

	Dependent variable:						
	Bond amounts (log)	Bonds/GDP (%)	Chinese debt (Amt.)	Chinese debt/GDP (%)	Taxes/GDP (%)	OOF amount (log)	OOF/GDP (%)
Net ODA (% of GNI), $t-1$	-13.821^{***}	-4.920^{**}	4.715	4.423	0.477	-12.133	-0.221
	(5.117)	(1.943)	(6.350)	(7.188)	(2.824)	(27.059)	(0.286)
GNI pc ($t-2$)	-1.905^{***}	-0.493^{*}	0.138	0.734	0.276	-0.065	-0.003
	(0.694)	(0.281)	(0.819)	(0.802)	(0.331)	(0.686)	(0.017)
Observations	2,741	2,734	1,194	1,194	1,199	888	866
Adjusted R^2	0.334	-0.172	0.635	0.572	0.564	-3.372	0.795
Country FE	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y
Cluster SE	Country	Country	Country	Country	Country	Country	Country
Instrument (crossing)	≤t-2	≤t-2	≤t-2	≤t-2	≤t-2	≤t-2	≤t-2

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

a gradual trend across nations in increased borrowing from China over time. However, our findings remain consistent, with private bond markets serving as the primary substitute for reduced ODA, while Chinese finance and tax revenues exhibit no significant responsiveness to aid cutbacks.

Finally, we also consider global liquidity as moderating leaders' ability to borrow from different creditors (Ballard-Rosa et al., 2021) in the aftermath of crossing the IDA threshold. As low global liquidity constrains the responsiveness and volume of private capital, we should expect countries to turn to other alternative financing when global liquidity is low. To measure global liquidity, we use annualized US treasury rates, as is standard in the literature.[11] Table 6 displays this result. Since this measure of liquidity likely affects governments' ability to borrow from international capital markets more so than it does from domestic investors, we disaggregate bond issues in the Eurobond market versus those that are domestically held. As before, the instrumented Net ODA (% of GNI) is negatively associated with total bond issuance, including domestic bonds and Eurobonds. Consistent with expectations, the coefficients of the interaction terms are in opposite directions between the domestic and Eurobond market. The results suggest that when Treasury rates are high, governments' are more likely to turn to domestic bond market rather than Eurobons because

[11]Higher US Treasury rates are associated with lower global liquidity conditions. Governments' ability to borrow from international capital markets like the Eurobond market may be constrained when US Treasury rates are high because investors have higher opportunity costs.

supply of international capital is constrained. The difference also suggests that governments can exercise financial repression over domestic private creditors when liquidity gets tight (Betz and Pond, 2023).

Interestingly, as US Treasury rates increase, governments are more likely to raise tax revenues and borrow from China (the interaction term in columns 5 and 6). Note that the coefficients on OOF as a percentage of GDP (Column 8) is in the same direction as Eurobonds (Column 3), which suggests that global liquidity may mitigate any potential substitution effects between foreign aid and OOF. This makes sense, given Eurobonds and OOF, as primarily foreign sources of finance, are more constrained by the returns on safe assets and US treasury rates. This again follows our earlier discussion that substitution effects may be constrained by the availability of different financing options. Here, we see evidence of a weaker substitution taking place with the other available alternative sources of government finance - Chinese loans and taxation - when the supply of funds from private markets is less responsive to the leader's needs under low global liquidity conditions.

Table 6: Second Stage: Conditional on Global Liquidity

	Dependent variable:							
	Total bonds (log)	Domestic bonds (log)	Eurobonds (log)	Chinese debt (Amt.)	Chinese debt/GDP (%)	Taxes/GDP (%)	OOF amt. (log)	OOF/GDP (%)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Net ODA (% of GNI), $t-1$	−12.916*	−14.824**	−9.902***	4.442	5.240	5.374*	229.187	−0.198
	(6.592)	(6.149)	(3.119)	(6.607)	(6.651)	(3.221)	(18,875.470)	(0.310)
Net ODA (% of GNI), $t-1$ × US Treasury rates ($t-1$)	−1.504	−0.556	1.358	0.895	−2.659*	−1.552*	32.670	0.016
	(1.362)	(1.179)	(1.129)	(2.237)	(1.529)	(0.868)	(2,658.627)	(0.045)
Country FE	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
GNI Per Capita Controls	Y	Y	Y	Y	Y	Y	Y	Y
Cluster SE	Country	Country	Country	Country	Country	Country	Country	Country
Instrument (crossing)	$\leq t-2$	$\leq t-2$	$\leq t-2$	$\leq t-2$	$\leq t-2$	$\leq t-2$	$\leq t-2$	$\leq t-2$
Observations	2,617	2,617	2,617	1,193	1,193	1,197	869	866
Adjusted R^2	−0.112	0.125	0.324	0.552	0.513	0.516	−3,244.640	0.795

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

Robustness Checks

For robustness checks, we show the uninstrumented OLS results of the effect of lagged net ODA on different forms of alternative financing in Appendix Table D.2. The lack of a *general*

effect between ODA received and alternative financing choices for all borrowing IDA countries suggests that our instrument is capturing a substitutional relationship between aid and other revenue sources during a particular transition moment for IDA borrowers. In Appendix Tables B.3 and B.4, we present the reduced form and second stage results excluding four countries that crossed over the threshold twice ("double crossers") during the sample period under study, and the results are substantively and statistically unchanged. We also attempt trimming the sample and find the results are directionally the same but statistically weaker when we trim the sample to countries only within a 20% bandwidth of the World Bank's gross national income threshold (appendix Table C.1). As a further check, we implement a local reduced-form fuzzy regression discontinuity (RD) around the IDA threshold. Table C.5 in the appendix shows a clear positive discontinuity only for bond issuance amounts, while bonds (as a percentage of GDP) are positive and close to conventional significance given the small sample size. By comparison, there are no sizeable shifts for Chinese debt, taxes, or OOF around the cutoff. Results are stable across 10, 15, and 20% bandwidths, as well as with uniform weighting of observations around the cutoff (instead of triangular weighting reported). Table D.8 also shows that conditional on being near 20% of the GNI threshold bandwidth, the effect of crossing the threshold is still positively significant for bond issuance but not necessarily so for other types of financing.[12] Appendix Table H.3 shows consistent results using the instrumental variable proposed by Dreher and Langlotz (2020). These results reaffirm our main finding: the substitution of concessional aid is concentrated in the bond markets for countries immediately around the cutoff.

Case Study

This section provides a close look at the IDA transition process in Ghana between 2010 and 2020, and highlights the scope condition of our argument by comparing Ghana's transition with Vietnam's. Analysis in this section draws on publicly available data as well as insights

[12]The coefficient on the first term is the effect farther than 20% from the cutoff, while the second coefficient is the incremental change in that effect at the cutoff, and the near-cutoff effect is their sum (the third coefficient). While bond borrowing is positive and strongly significant farther away from the cutoff, we see from linear combination tests that the near-cutoff effect remains positive and significant (at the 10% level) for bond amounts and for bonds as a % of GDP, but none of the other near-cutoff effects are significant.

from interviews with government officials in the Ghanaian Finance Ministry. Ghana stands out as a country that actively replaced concessional financing with private capital in its transition process. Traditional budget support, grant financing, and project aid were severely curtailed after 2010, even as Ghana was still grappling with fiscal deficits and poverty challenges. This sudden reduction in concessional finance, without a fully developed transition plan, forced Ghana to scramble for other financing through oil production, Chinese financing, and, significantly, the bond market. Among these alternative revenue sources, the bond market ended up providing the most steady revenue flows to Ghana in the 2010s but introduced a different set of challenges for its fiscal sustainability.

The country unexpectedly reached lower-middle-income status in 2010 due to a GDP rebasing exercise and the discovery of oil resources, which raised its per-capita income above the International Development Association (IDA) eligibility threshold (Moss and Majerowicz, 2012). This marked the beginning of Ghana's graduation from concessional aid. The World Bank reclassified Ghana as an IDA "gap" country (no longer IDA-only, eligible for only blend-terms) in the early 2010s (Moss and Majerowicz, 2012), and Ghana effectively received its last new IDA credit by about 2019 as it transitioned toward IBRD and other non-concessional financing (Denmark, 2018). It's worth noting that Ghana's transition was not meticulously planned in advance. The rapid reclassification to LMIC status took many by surprise, and there was no coordinated donor "exit" strategy. In this regard, analysis has shown that Ghana's unplanned transition was not unlike those of other countries graduating out of IDA's concessional lending program, and is in fact emblematic of most developing countries' experience (Engen and Prizzon, 2019).

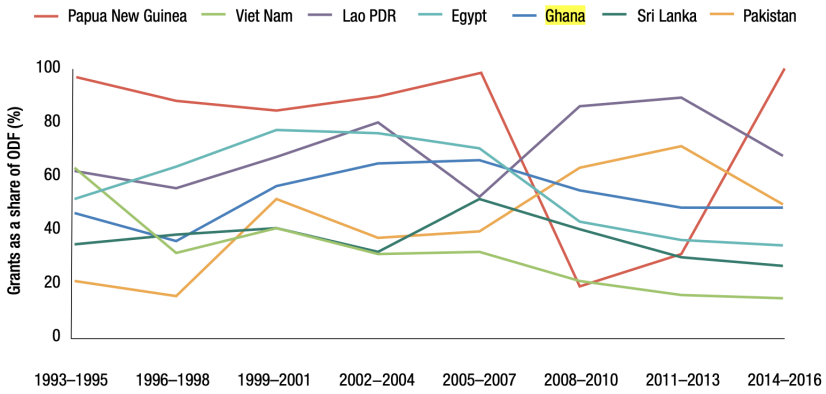
Ghana's move into the lower-middle-income IDA category was followed by swift donor responses. The Netherlands, the United Kingdom (UK) and Japan cut their ODA to Ghana significantly starting in 2011 (Engen and Prizzon, 2019), and others drew up plans to phase out development cooperation programmes significantly. Its biggest bilateral donors announced phase-out plans: for example, the United Kingdom began significantly reducing bilateral aid to Ghana after 2011, cutting annual disbursements from about £86.5 million in 2011 to £56.4 million in 2017. The UK's development strategy shifted to a "mutual prosperity" agenda, expecting Ghana to finance more of its own development as a LMIC.

Similarly, Denmark decided in 2014 to gradually wind down all aid to Ghana by 2020. By 2017, Danish officials confirmed that due to Ghana's new economic status, Denmark would "shift from aid to trade" and end development cooperation completely by 2020 (Denmark, 2018). Other long-time donors like Canada and the EU also prepared exits or transitioned to new forms of partnership. According to our calculations and as has been reported by others, Ghana experienced the largest three-year drop in IDA disbursements relative to any other sub-Saharan African country, in the three-year period after IDA crossing. Figure 5a and 5b illustrates this. By 2016 Ghana's ODA as a percentage of GNI had shrunk to only 3.2% from nearly 6% in 2010, and was particularly sharp starting in 2013-2014 with grant financing hit the hardest of all ODA funds withdrawn (Engen and Prizzon, 2019).

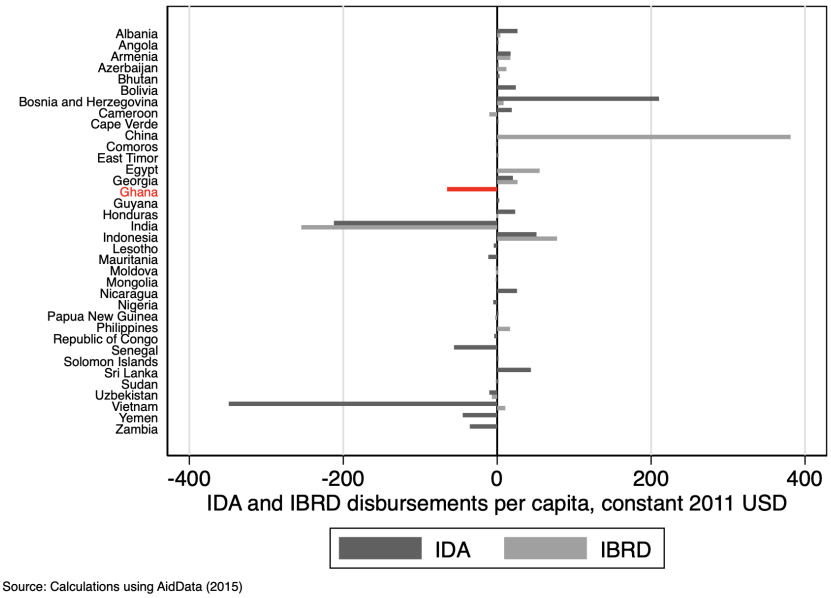
Facing loss in aid revenue, Ghana needed to mobilize resources from other channels. Although the Ghanaian government made efforts to mobilize resources from a few alternative financing instruments, the bond market ended up providing the most steady revenue flows between 2010 and 2019. Ghana was able to secure some financing from China as the emerging donor expanded its financial footprint across sub-Saharan Africa. In 2011, China Development Bank committed $3 billion in support of the development of West Corridor Gas Project and related infrastructure development in the country. Despite securing a mega deal, financial commitments from China in the next few years averaged under $300 million per year (Dreher et al., 2022). As with much Chinese financing, the disbursement versus commitment ratio is also unclear. More importantly, Ghana was not successful in its plan of paying back its Chinese debt with steady revenue from oil production. According to the World Bank, Ghana's oil rents as a percentage of GDP did jump from 0.4% in 2010 to 5.1% in 2011 but continued to decline and remained at best at modest levels (Fosu, 2017). The lack of oil revenue can be attributed to both delays in production (Gismatullin, 2012) as well as declining oil prices starting around 2014 (IMF, 2015).

On the other hand, the decade starting 2010 saw a steady increase in global liquidity, which facilitated access to capital in many frontier markets such as Ghana. Thirty countries in sub-Saharan Africa had obtained credit ratings by 2022 and according to *Bloomberg*, twenty-eight of those countries have issued bonds either domestically or internationally with an annual average of 1.8% of GDP. Ghana was able to raise steady revenues from the bond

Figure 5: Aid transition indicators around IDA-crossing for Ghana, relative to peers.



(a) Grant composition of ODF, three-year averages, 1993–2016 (Engen and Prizzon, 2019).



Source: Calculations using AidData (2015)

(b) IDA and IBRD fund disubursement changes in the three-year period post IDA-crossing (author calculations).

market at a time when it was grappling with the loss in donor budget and grant support. This is in part because the completion of the Heavily Indebted Poor Countries (HIPC) program in 2007 significantly reduced Ghana's debt responsibility and opened up fiscal space for more private borrowing. According to a staff member at the Ministry of Finance, competitive elections and frequent leadership transitions also built a democratic profile for Ghana, which helped it attract bond investors[13]. It issued its first Eurobond in 2007 but it was only after crossing over the IDA threshold that Ghana's borrowing from private capital markets really took off. Ghana's bond issuance as percentage of GDP jumped above 10% between 2012 and 2017.[14] By the end of the decade, Ghana had borrowed nearly had borrowed a cumulative US$11.025 billion from the Eurobond market in just a span of four years, a massive sum. The government took active steps during the decade to attract bond investors, such as setting up the Ghana Fixed Income Market (GFIM) for trading government bonds in partnership with Bloomberg.[15] The mixture of success and challenges in mobilizing steady revenues from different instruments suggests that Ghana reliance on the bond market was not necessarily a strategic move but more a passive action to fill its fiscal deficit. This is aligned with Zeitz (2024), who shows that unlike Ethiopia, Ghana was not able to translate its access to new sources of finance into leverage with traditional donors because of a lack of strategic donor interest in the country.

One may wonder whether it was feasible for Ghana to mobilize revenues domestically or curtail expenditures during this period of reclassification as a LMIC. The country held consecutive competitive elections, which may have facilitated Ghana's success in the bond market, but also created challenges in domestic fiscal planning. Politicians made lofty promises of infrastructure development and compensation in their campaigns with slogans such as "One village One Dam"[16] and "One District One Factory". Ghanaian citizens also use votes as leverage for securing public goods for their constituencies and have the saying of "No road, no vote"[17]. With the heightened political pressures accompanying competitive elections, it

[13]Interview 6

[14]See details: Fact-Check Ghana: Ghana's Eurobond borrowing (accessed Sep. 2025)

[15]Bloomberg and the Ghana Fixed Income Market (GFIM) Launch Trading System for Ghanaian Government Bonds.

[16]Interview 5

[17]Interview 8

is not hard to imagine why the government may want to avoid taxation. According to the World Bank, when foreign aid started to decline, tax revenue as percentage of GDP increased slightly from 13.4% to 15.4% between 2010 and 2012 but quickly declined to 10.7% the next year and stayed around 12% in the following years. The government did attempt in later years to revive its domestic revenue mobilization efforts, especially as private capital dried up and excessive bond market borrowing in the 2010s made investors wary. Starting in 2018, President Nana Akufo-Addo's administration launched the Ghana beyond Aid (GhBA) initiative. GhBA promised ambitious policies like import substitution, increasing domestic revenue to reduce aid dependence, and economic diversification. The 2019 policy charter emphasizes economic nationalism and self-sufficiency, aiming to present a vision of a self-reliant country to potential investors (Osafo-Maafo, 2019). In reality, Ghana's economy, with many informal workers and low extractive capacity, limits revenue generation options to service debt (Asante-Apeatu, 2023). It became apparent that executing the GhBA agenda would necessitate costly reforms affecting voters, such as stricter tax collection, new taxes, tariffs, price hikes, and spending cuts (Cobblah, 2023, réseaux Développement Rural IRD, 2019). Local academics observed that the "grand vision" of GhBA was being utilized to sell the public austerity measures (Kumi, 2020, Ntim and Botchway, 2023). Since its introduction, the government imposed regressive new taxes on consumption goods and services like the e-levy mobile money and electronic transactions, and raised the VAT rate. The VAT increase and new levies were especially unpopular and have since been rolled back (Apeti and Edoh, 2023, Wandaogo et al., 2022).

This is illustrative of the challenges of raising domestic revenues as a belated corrective measure against high debt servicing costs that followed Ghana's overborrowing from private markets in the 2010s. If Ghana had systematically attempted to raise domestic revenues in response to the initial aid rollbacks, it is possible the country's debt sustainability condition would not have deteriorated to the point it has today. After substituting concessional flows with market borrowing through the 2010s, Ghana *suspended* external debt service in December 2022 and launched a Domestic Debt Exchange in February 2023 (94.8% participation), before securing a 36-month, US$3 billion IMF Extended Credit Facility in May 2023 to restore stability; by January–June 2024 it had agreed main terms and signed an MoU

with its Official Creditor Committee under the G20 Common Framework and proceeded to restructure its international bonds (International Monetary Fund, 2023, Ministry of Finance, Ghana, 2022, 2023, 2024a,b). In short, the speed of the aid rollbacks, combined with electoral pressures to maintain spending, pushed Ghana toward the *fast, high-volume, politically flexible* option—bonds—at the cost of higher servicing burdens and diminished fiscal space.

By contrast, Vietnam's transition into LMIC status was planned and sequenced. It developed an explicit aid-exit strategy (Engen and Prizzon, 2019), converted the Consultative Group meeting into the Vietnam Development Partnership Forum in 2013 to coordinate the wind-down of donor pledges, and used transitional multilateral support while expanding tax-raising efforts and attracting foreign direct investment (FDI) at a massive scale. Bilateral donors like the UK exited Vietnam on a timetable with coordination, other bilaterals shifted to trade or technical cooperation after 2015 [18], and Vietnam started to lean on IBRD terms and domestic financing rather than a wholesale recourse to external bonds during this period. Crucially, large and persistent FDI inflows- rarely available at similar scale in sub-Saharan Africa (Morgan et al., 2022), helped Vietnam avoid a scramble.

The comparison between Ghana and Vietnam suggests that a smooth transition away from foreign aid is conditioned on a premeditated plan as well as cooperation from both donors and recipients. Moreover, foreign direct investment, which is not always available to countries that have just reached LMIC, plays a key role in keeping developing countries out of debt traps. Additionally, while electoral competitiveness is usually considered a positive sign for investors, it may backfire in managing public expenditure and domestic revenue mobilization without strong institutions.

Discussion

Scholarship on foreign aid has paid attention to its allocation, donor incentives, and effectiveness. Yet we know little about how foreign aid is positioned relative to other financing instruments. In an attempt to understand leaders' strategic choice of financing instruments,

[18] See this report for more details: https://assets.publishing.service.gov.uk/media/5a80b32bed915d74e33fbe81/Evaluation-Long-term-dev-cooperation-between-UK-Vietnam.pdf

we focus on how leaders choose substitutes in light of loss in aid revenues. We start by providing a theoretical framework to model and evaluate the comparative advantages of different sovereign financing instruments for governments transitioning away from reliance on concessional aid. The framework allows us to better understand leaders' choices based on the degree to which they may be politically or financially constrained. We further provide strong empirical evidence showing that leaders resort to the bond market, which is politically beneficial but financially expensive, when losing access to concessional finance. Conditional results provide suggestive evidence that leaders' choices are constrained by domestic political competition and global liquidity. The results are not driven by supply-side factors such as heightened private investor interests or World Bank Board Membership (See Appendix E and Appendix F).

Developing countries moving away from official creditors toward the politically expedient but financially risky bond markets during an important transitional moment can have downstream consequences for long-term debt sustainability and state capacity. We see many countries that turned to the private markets in the 2010s, such as Ghana, Zambia, and Kenya, subsequently seeking restructuring deals and bailouts from creditors in recent years.

In addition to the bond market, developing country governments may wish to attract more foreign direct investment (FDI), an important alternative source of revenue that should be preferred by both donor and borrower countries as bilateral relationships evolve. While beyond the main scope of this paper, we demonstrate through the case study between Ghana and Vietnam that governments face less debt burden when FDI is available in the transition process. The diverging paths between Ghana and Vietnam calls for a closer examination of the challenges and opportunities available to developing countries at the start of their transition, and calls for greater donor coordination to help borrower country governments avoid a scramble for the most politically convenient substitute.

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Part I

Appendix

A Leaders' Utility Maximization

We start with a simple exercise of modeling the leader's utility function. We model the government's (leader's) intertemporal utility from borrowing across two types of creditors: original (e.g., concessional/multilateral) and alternative (e.g., private bond markets), building upon the model in Dellas and Niepelt (2016). The government, denoted as G, borrows from original and alternative creditors, and its respective levels of borrowing are denoted as b^o and b^a. For simplicity, we consider a two-period setup where the government borrows in the first period. In Period 1, the leader receives political or consumption-related benefits from borrowing. These benefits scale with the political utility of the borrowed funds, captured by α^a and α^o. In Period 2, two scenarios are possible. With probability π, the economy remains stable, and the government repays its debt. The cost of repayment is determined by the interest rates q^a and q^o for each borrowing source. With probability $1-\pi$, the government defaults, incurring a constant political or reputational cost C.[19]

What is new about our model is that to differentiate between borrowing instruments, we introduce the parameters α and q where α refers to the political benefits from borrowing and q refers to the monetary interest rate. α captures the efficiency of borrowing in increasing leaders' utility in the first period. Instruments with less stringent terms and monitoring such as bonds are high in α while funding from multilateral banks are low in α because a significant proportion is allocated to monitoring and consulting.[20] The effective interest rate r then is $\frac{q}{\alpha}$. Borrowing close to elections can imply a higher desired α when leaders seek to allocate resources to politically salient sectors. The government's utility function is defined as

$$G(b^a, b^o) = ln(y + \alpha^a b^a + \alpha^o b^o) + \delta\pi ln(y - q^a b^a - q^o b^o) + \delta(1-\pi)C$$

where y is exogenous income or baseline public resources, α^i is the political benefit from borrowing source i ($i \in \{a, o\}$), q^i denotes the interest rate on borrowing from source i, δ is the government's intertemporal discount factor, π denotes the probability of economic stability (repayment state), and C is the constant cost of default.

The government chooses borrowing levels (b^{a*}, b^{o*}) to maximize utility. We have the government's equilibrium borrowing strategy as

$$(b^{a*}, b^{o*}) = G(b^a, b^o)$$

[19] Note that for simplicity we model the default cost as constant, and not as a function of the creditor.

[20] For example, hiring government staff members to the country's Debt Management Unit to work with and report to World Bank staff on monitoring and compliance matters.

With the first order derivative[21], we have:

$$b^{a*} = \frac{(\alpha^a q^o - \alpha^o a^a)(\alpha^o + q^o)y}{\delta\pi(\alpha^a q^o - \alpha^o q^a)^2}$$
$$b^{o*} = -\frac{(\alpha^a q^o - \alpha^o a^a)(\alpha^a + a^a)}{\delta\pi(\alpha^a q^o - \alpha^o q^a)^2}y.$$

When $\alpha^a q^o - \alpha^o q^a = 0$, it suggests that the effective interest rate is the same between alternative and original instruments and there is no single unique solution for b^{a*} and b^{o*}. It follows that the two instruments are interchangeable under this condition and government may borrow any amount from any creditor.

When $\alpha^a q^o - \alpha^o q^a \neq 0$, we have:

$$b^{a*} = \frac{\alpha^o + q^o}{\delta\pi(\alpha^a q^o - \alpha^o q^a)}y$$
$$b^{o*} = -\frac{\alpha^a + a^a}{\delta\pi(\alpha^a q^o - \alpha^o q^a)}y$$

Because $b^{o*} \geq 0$ and $b^{a*} \geq 0$, the results above suggest the government will only borrow from one type of creditor with the lowest effective interest rate.

When the government loses eligibility to access foreign aid (grants and loans from the IDA), it continues to have access to other forms of official financing such as programs with IBRD or on "blend" IDA/IBRD terms but those are less concessional (Engen and Prizzon, 2019). It suggests that q^o increases when G loses access to concessional foreign aid. The government's substitution strategy depends on how its equilibrium borrowing b^{a*} and b^{o*} change as q^o increases. Thus we are interested in the comparative static:

$$K = \frac{\partial b^{a*}/\partial q^o}{\partial b^{o*}/\partial q^o}$$

.

If $K \geq 1$, it suggests that as the equilibrium borrowing from alternative creditors increases faster than that from original creditors as q^o increases. In other words, the comparative static would predict the government borrowing more from alternative creditors as it loses access to cheap forms of foreign aid. When $0 \leq K < 1$, it suggests that equilibrium borrowing from both creditors moves in the same direction as q^o increases but borrowing from original creditors increases faster. When $K < 0$, it suggests that borrowing from both creditors move in opposite directions. When $K \leq -1$, we expect the magnitude of change in alternative borrowing moves faster than that in original borrowing but in an opposite direction.

Solving for K, we have[22]

$$K = -\frac{\alpha^o}{\alpha^a}$$

[21]See Appendix **??** for solution details.
[22]See Appendix **??** for details

As $\alpha^o \in (0,1)$ and $\alpha^a \in (0,1)$, it is straightforward to see that the government's borrowing from alternative creditors increases as borrowing from original creditors becomes more expensive. That is, borrowing from the two sources moves in opposite directions as q^o increases. When $\alpha^a > \alpha^o$, we have $K < 0$, indicating substitution into alternative creditors dominates. The magnitude of this shift, however, depends on the relative size of α^o and α^a. If the political return to alternative borrowing (α^a) is especially high—say, in the run-up to an election when leaders want to allocate funds to politically salient sectors—then even a small increase in the cost of original borrowing q^o may prompt a large increase in borrowing from alternative sources. In other words, as countries lose access to concessional finance like foreign aid, they substitute it with more politically flexible or opportunistic forms of borrowing, but the extent of this substitution depends on how politically convenient or electorally useful the alternative sources are compared to traditional aid.

Table A.1: Terms and Conditions of Financing Alternatives

	Political Cost	Financial Rates	Response Time	Volume
Bond	Limited	1-12%	Monthly scheduled	6 million USD per issue
China	Diplomatic	0-10%	1-3 years	74 million USD per loan
Tax	Accountability	NA	Varies	
ODA	Conditions	0-2%	1-3 years	0.5 million per loan
OOF		4-6%	1-3 years	++

B Sub-Sample Tables

Table B.1: First Stage: Africa Sub-Sample & Excluding Small or Island Countries

	Dependent variable:				
	ln(ODA/GNI)	ODA per capita	ln(ODA/GNI)	ODA per capita	ln(ODA/GNI)
	(1)	(2)	(3)	(4)	(5)
D(crossing $\leq 1yr$)	-0.273^{*}	-14.869^{***}			
	(0.158)	(4.576)			
D(crossing $\leq 2yr$)			-0.335^{**}	-17.093^{***}	-0.290^{**}
			(0.156)	(4.674)	(0.109)
D(crossing $\geq 2yr$)					-0.073
					(0.129)
GNI pc $(t-1)$	-185.133^{***}	$-5{,}319.784^{***}$			
	(23.653)	(452.365)			
GNI pc $(t-2)$			-155.996^{***}	$-4{,}822.905^{***}$	-155.652^{***}
			(18.002)	(500.995)	(17.757)
Observations	1,115	1,117	1,078	1,082	1,078
Adjusted R^2	0.745	0.494	0.743	0.504	0.743
Country FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
Cluster SE	Country	Country	Country	Country	Country

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

Table B.2: First Stage: Crossover Countries only

	Dependent variable:				
	ln(ODA/GNI)	ODA per capita	ln(ODA/GNI)	ODA per capita	ln(ODA/GNI)
	(1)	(2)	(3)	(4)	(5)
D(crossing $\leq 1yr$)	-0.144^{**}	-6.219			
	(0.066)	(12.183)			
D(crossing $\leq 2yr$)			-0.155^{**}	-6.772	-0.142^{**}
			(0.072)	(13.013)	(0.070)
D(crossing $\geq 2yr$)					-0.041
					(0.079)
GNI pc $(t-1)$	-167.391^{***}	$-3{,}831.517$			
	(35.842)	(3,031.338)			
GNI pc $(t-2)$			-153.284^{***}	$-4{,}166.827$	-154.920^{***}
			(31.409)	(2,898.299)	(31.689)
Observations	1,521	1,521	1,472	1,472	1,472
Adjusted R^2	0.777	0.708	0.782	0.709	0.782
Country FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
Cluster SE	Country	Country	Country	Country	Country
Note:					*p<0.1; **p<0.05; ***p<0.01

Table B.3: Reduced Form Relationship (excluding double crossing countries)

	Dependent variable:					
	Bond amounts	Bonds issued	Bonds/GDP	Chinese debt	Chinese debt/GDP	Tax revenue/GDP
	(log)	(No.)	(%)	(Amt.)	(%)	(%)
D(crossing $\leq$ 1yr)	3.894^{***}	31.013^{***}	1.308^{***}	-0.569	-0.630	-0.261
	(1.172)	(9.390)	(0.409)	(1.282)	(1.388)	(0.960)
GNI pc $(t-1)$	-0.388	-1.287	0.028	-0.495	0.137	0.320
	(0.250)	(2.415)	(0.105)	(0.339)	(0.325)	(0.447)
Observations	2,712	2,712	2,705	1,125	1,125	1,143
R^2	0.654	0.488	0.393	0.698	0.675	0.605
Adjusted R^2	0.637	0.464	0.364	0.674	0.649	0.567
Country FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Note:						*p<0.1; **p<0.05; ***p<0.01

Table B.4: Second Stage (excluding double crossing countries)

	Dependent variable:					
	Bond amounts	Bonds issued	Bonds/GDP	Chinese debt	Chinese debt/GDP	Tax revenue/GDP
	(log)	(No.)	(%)	(Amt.)	(%)	(%)
Net ODA (% of GNI), $t-1$	-11.365^{**}	-91.329^{**}	-4.579^{**}	2.323	3.530	1.251
	(4.356)	(36.678)	(1.768)	(5.320)	(6.143)	(2.571)
GNI pc ($t-2$)	-1.580^{***}	-11.026^{**}	-0.438^{*}	-0.184	0.616	0.314
	(0.590)	(5.421)	(0.260)	(0.680)	(0.660)	(0.346)
Observations	2,614	2,614	2,607	1,122	1,122	1,128
R^2	0.466	0.168	-0.019	0.692	0.626	0.603
Adjusted R^2	0.439	0.127	-0.069	0.668	0.596	0.564
Country FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Cluster SE	Country	Country	Country	Country	Country	Country
Instrument (crossing)	≤t-2	≤t-2	≤t-2	≤t-2	≤t-2	≤t-2

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

C Trimmed Sample Tables

Table C.1: Reduced Form Relationship (trimmed sample 20% around IDA threshold only)

	Dependent variable:					
	Bond amounts (log)	Bonds issued (No.)	Bonds/GDP (%)	Chinese debt (Amt.)	Chinese debt/GDP (%)	Tax revenue/GDP (%)
D(crossing $\leq$ 1yr)	3.210**	14.279	0.156	1.816	0.096	0.583
	(1.376)	(9.849)	(0.247)	(1.346)	(0.725)	(0.889)
GNI pc ($t-1$)	−5.506	−6.651	−0.261	9.251*	8.116*	1.500
	(3.634)	(17.345)	(0.669)	(4.567)	(4.210)	(3.476)
Observations	437	437	434	207	207	188
R^2	0.742	0.754	0.739	0.847	0.923	0.922
Adjusted R^2	0.677	0.692	0.672	0.790	0.894	0.884
Residual Std. Error	5.771 (df = 348)	41.741 (df = 348)	1.001 (df = 345)	3.710 (df = 150)	2.515 (df = 150)	2.296 (df = 126)

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

Table C.2: Second Stage (trimmed sample 20% around IDA threshold only)

	Dependent variable:						
	Bond amounts (log)	Bonds issued (No.)	Bonds/GDP (%)	Chinese debt (Amt.)	Chinese debt/GDP (%)	Tax revenue/GDP (%)	
Net ODA (% of GNI), $t-1$	255.077	1,027.553	0.744	−969.028	−325.783	1.942	180.997
	(2,240.134)	(9,161.672)	(23.217)	(100,098.200)	(33,564.750)	(16.042)	(1,672.914)
GNI pc ($t-2$)	143.488	593.002	0.363	−296.489	−93.873	3.535	84.522
	(1,260.404)	(5,151.476)	(13.451)	(31,278.070)	(10,488.810)	(11.419)	(789.196)
Observations	424	424	421	207	207	187	417
Country FE	Y	Y	Y	Y	Y	Y	
Year FE	Y	Y	Y	Y	Y	Y	
Cluster SE	Country	Country	Country	Country	Country	Country	
Instrument (crossing)	≤t-2	≤t-2	≤t-2	≤t-2	≤t-2	≤t-2	
R^2	−53.819	−14.918	0.721	−926.448	−112.803	0.926	−45.650
Adjusted R^2	−67.808	−18.981	0.649	−1,272.695	−155.289	0.891	−57.630
Residual Std. Error	84.611 (df = 337)	340.061 (df = 337)	1.046 (df = 334)	288.889 (df = 150)	96.695 (df = 150)	2.218 (df = 126)	60.261 (df = 331)

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

Table C.3: Reduced Form (symmetric trimmed sample +-4 yrs around crossing year)

	Dependent variable:					
	Bond amounts (log)	Bonds issued (No.)	Bonds/GDP (%)	Chinese debt (Amt.)	Chinese debt/GDP (%)	Tax revenue/GDP (%)
D(crossing $\leq$ 1yr)	0.929	18.309	0.513	0.503	0.567	0.047
	(0.887)	(16.298)	(0.495)	(1.076)	(0.814)	(0.723)
GNI pc ($t-1$)	−0.809	14.393	0.200	−5.366***	0.975	0.141
	(2.496)	(18.923)	(0.729)	(1.478)	(1.279)	(1.422)
Observations	429	429	428	249	249	204
R^2	0.828	0.729	0.628	0.847	0.883	0.948
Adjusted R^2	0.787	0.664	0.538	0.806	0.852	0.926
Residual Std. Error	4.982 (df = 345)	57.455 (df = 345)	1.908 (df = 344)	3.797 (df = 196)	2.605 (df = 196)	2.486 (df = 142)

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

Table C.4: Second Stage (trimmed sample symmetric +-4 yrs around crossing year)

	Dependent variable:					
	Bond amounts (log)	Bonds issued (No.)	Bonds/GDP (%)	Chinese debt (Amt.)	Chinese debt/GDP (%)	Tax revenue/GDP (%)
Net ODA (% of GNI), $t-1$	−2.214	−375.047	−24.146	11.944	2.132	32.284
	(37.363)	(1,073.841)	(67.686)	(10.677)	(5.938)	(41.531)
GNI pc ($t-2$)	0.582	−60.900	−4.324	0.109	−0.453	18.469
	(7.094)	(203.878)	(12.775)	(4.006)	(2.228)	(15.545)
Observations	424	424	423	249	249	203
R^2	0.178	−6.991	−39.344	−0.384	0.307	−4.703
Adjusted R^2	0.106	−7.690	−42.880	−0.498	0.249	−5.817
Residual Std. Error	10.209 (df = 389)	293.410 (df = 389)	18.673 (df = 388)	10.551 (df = 229)	5.867 (df = 229)	23.855 (df = 169)

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

Table C.5: Reduced-Form Local RD around the IDA GNI Cutoff (Fuzzy RD setup)

	Dependent variable:					
	Bond amounts (log)	Bonds/GDP (%)	Chinese debt/GDP (%)	Tax revenue/GDP (%)	OOF amount (log)	OOF/GDP (%)
Above cutoff (t-1)	2.003*	0.003	−0.527	0.110	0.427	−0.019
	(1.085)	(0.134)	(0.481)	(0.859)	(0.393)	(0.017)
Observations	341	338	159	151	110	109
Adjusted R^2	0.689	0.811	0.962	0.877	0.609	0.832
Bandwidth (relative)	0.15	0.15	0.15	0.15	0.15	0.15
Local polynomial	Linear, separate slopes (LSS)	LSS	LSS	LSS	LSS	LSS
Weights	Triangular (T)	T	T	T	T	T
Country FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Cluster SE	Country	Country	Country	Country	Country	Country

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

D Additional Specifications

Table D.1: Second-Stage with Linear Time-Trends

	Dependent variable:					
	Bond amounts (log)	Bonds issued (No.)	Bonds/GDP (%)	Chinese debt (Amt.)	Chinese debt/GDP (%)	Tax revenue/GDP (%)
Net ODA (% of GNI), $t-1$	-14.245^{***}	-114.269^{***}	-5.166^{***}	5.144	4.005	-1.083
	(5.048)	(43.317)	(1.937)	(6.732)	(6.850)	(3.483)
GNI PC ($t-2$)	-1.718^{***}	-11.814^{**}	-0.425	0.050	0.822	0.232
	(0.642)	(5.841)	(0.262)	(0.874)	(0.785)	(0.316)
Year	0.147	-0.635	-0.035	1.145^{***}	0.695^{***}	-0.022
	(0.109)	(0.958)	(0.041)	(0.156)	(0.171)	(0.158)
Observations	2,741	2,741	2,734	1,194	1,194	1,199
Country FE	Y	Y	Y	Y	Y	Y
Linear Time Trends	Y	Y	Y	Y	Y	Y
R^2	0.323	-0.050	-0.211	0.616	0.599	0.591
Adjusted R^2	0.299	-0.088	-0.255	0.592	0.573	0.565
Residual Std. Error	8.220 (df = 2645)	69.765 (df = 2645)	3.070 (df = 2638)	5.468 (df = 1122)	4.815 (df = 1122)	5.715 (df = 1126)

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

Table D.2: OLS Results: Net ODA and Alternative Financing

	Dependent variable:						
	Bond amounts (log)	Bonds/GDP (%)	Chinese debt (USD)	Chinese debt/GDP (%)	Tax/GDP (%)	OOF amount (log)	OOF/GDP (%)
Net ODA (% GNI, t-1)	-1.078^{*}	-0.249	0.158	-0.540	0.492	-0.107	-0.420
	(0.578)	(0.155)	(0.606)	(0.825)	(0.738)	(0.210)	(0.383)
GNI pc (t-2)	-0.425	0.048	-0.388	0.161	0.276	0.150	-0.002
	(0.272)	(0.122)	(0.319)	(0.353)	(0.365)	(0.094)	(0.020)
Observations	2,741	2,734	1,194	1,194	1,199	888	866
Adjusted R^2	0.640	0.355	0.669	0.627	0.564	0.613	0.796
Country FE	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y
Cluster SE	Country	Country	Country	Country	Country	Country	Country

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

Table D.3: Logistic Regression: Probability of IDA Crossing Based on Global Liquidity

	Dependent variable:
	IDA Threshold Crossing
US Treasury Rate $(t-1)$	-0.068
	(0.066)
Constant	-3.854^{***}
	(0.332)
Observations	3,153
Note:	*p<0.1; **p<0.05; ***p<0.01

Table D.4: Reduced Form Relationship between IDA Crossing Alternative Financing Composition

	Dependent variable:			
	Total Other (GDP) (%)	Bonds (%)	Chinese debt (%)	OOF (%)
	(1)	(2)	(3)	(4)
D(Crossing 1yr)	-0.608	4.916^{***}	0.746	-0.767
	(1.289)	(1.711)	(0.869)	(1.454)
GNI pc (t-1)	-0.398	3.118^{*}	0.507	-1.433^{**}
	(0.403)	(1.575)	(0.459)	(0.671)
Country FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
Cluster SE	Country	Country	Country	Country
Observations	2,843	1,842	1,196	891
Adjusted R^2	0.510	0.688	0.903	0.770
Note:				*p<0.1; **p<0.05; ***p<0.01

Table D.5: Second Stage IDA Crossing Alternative Financing Composition

	Dependent variable:			
	Total Other (GDP) (%)	Bonds (%)	Chinese debt (%)	OOF (%)
	(1)	(2)	(3)	(4)
Net ODA (% of GNI), t-1	2.395	−33.057**	−3.867	25.987
	(4.761)	(15.051)	(4.512)	(62.221)
GNI pc (t-2)	0.013	0.329	0.079	−1.036
	(0.525)	(2.527)	(0.575)	(1.415)
Country FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
Cluster SE	Country	Country	Country	Country
Instrument (crossing)	$\leq t-2$	$\leq t-2$	$\leq t-2$	$\leq t-2$
Observations	2,741	1,828	1,193	890
Adjusted R^2	0.546	0.281	0.903	0.675
Note:				*p<0.1; **p<0.05; ***p<0.01

Table D.6: Reduced Form Relationship between IDA Crossing Alternative Financing Composition (Trimmed Sample)

	Dependent variable:			
	Total Other (GDP) (%)	Bonds (%)	Chinese debt (%)	OOF (%)
D(Crossing $\leq 1yr$)	−0.738	−0.376	0.175	0.015
	(0.978)	(1.155)	(0.257)	(0.018)
GNI pc (t-1)	−2.689	−2.593	2.334**	0.126
	(2.592)	(3.258)	(1.108)	(0.082)
Country FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
Cluster SE	Country	Country	Country	Country
Trimmed sample	|GNI - cutoff| $\leq$ 20%	|GNI - cutoff| $\leq$ 20%	|GNI - cutoff| $\leq$ 20%	|GNI - cutoff| $\leq$ 20%
Observations	437	308	206	145
Adjusted R^2	0.676	0.686	0.987	0.349
Note:				*p<0.1; **p<0.05; ***p<0.01

Table D.7: Second Stage: IDA Crossing Alternative Financing Composition (Trimmed Sample)

	Dependent variable:			
	Total Other (GDP) (%)	Bonds (%)	Chinese debt (%)	OOF (%)
Net ODA (% of GNI), t-1	33.800	−215.981	−147.107	−0.197
	(233.425)	(3,213.105)	(14,341.820)	(0.233)
GNI pc (t-2)	17.355	−113.453	−43.351	0.008
	(130.050)	(1,644.883)	(4,400.764)	(0.089)
Country FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
Cluster SE	Country	Country	Country	Country
Instrument (crossing)	$\leq t-2$	$\leq t-2$	$\leq t-2$	$\leq t-2$
Trimmed sample	|GNI - cutoff| $\leq$ 20%	|GNI - cutoff| $\leq$ 20%	|GNI - cutoff| $\leq$ 20%	|GNI - cutoff| $\leq$ 20%
Observations	424	307	206	145
Adjusted R^2	−0.689	−63.788	−36.979	0.338

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

Table D.8: Reduced Form with Locality Interaction (Near 20% of IDA Cutoff)

	Dependent variable:							
	Bond amounts (log)	Bond issues No.	Bonds/GDP (%)	Chinese debt (USD)	Chinese debt/GDP (%)	Tax revenue/GDP (%)	OOF (log) (log)	OOF/GDP (%)
Crossed atleast t-1	5.505***	50.172***	1.675***	−2.647*	−0.134	−0.336	1.141***	0.059
	(1.393)	(13.640)	(0.511)	(1.496)	(1.839)	(1.058)	(0.392)	(0.043)
Near 20% (this year)	2.497***	19.833**	0.139	−2.945***	1.061	0.132	1.064***	0.058*
	(0.934)	(9.810)	(0.292)	(0.925)	(1.333)	(0.909)	(0.211)	(0.032)
Crossed atleast t-1 × Near 20%	−2.664	−34.081**	−1.165***	2.581	−0.798	0.971	−1.021***	−0.094*
	(1.614)	(15.393)	(0.436)	(1.669)	(1.872)	(1.109)	(0.382)	(0.054)
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
GNI controls?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster SE	Country	Country	Country	Country	Country	Country	Country	Country
Observations	2,656	2,656	2,649	1,196	1,196	1,132	769	751
Adjusted R^2	0.651	0.479	0.374	0.678	0.647	0.614	0.651	0.796

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

E Creditor Response

Table E.1: Bond Spread and IDA Threshold Crossing

	Dependent variable:					
	Average spread		Change in spread		Average change in spread	
	(1)	(2)	(3)	(4)	(5)	(6)
D(crossing 1 yr)	−309.058		86.982		77.760	
	(241.476)		(78.305)		(59.304)	
GNI pc (t-1)	95.988*		32.281*		27.955	
	(52.456)		(18.715)		(19.970)	
D(crossing 2 yr)		−206.684		91.784		72.462
		(179.059)		(65.262)		(65.985)
GNI pc (t-2)		125.063*		24.553		22.021
		(66.956)		(16.152)		(17.854)
Observations	287	287	287	287	262	262
R^2	0.667	0.664	0.507	0.506	0.443	0.441
Adjusted R^2	0.595	0.591	0.400	0.398	0.311	0.308
Residual Std. Error	325.134 (df = 235)	326.666 (df = 235)	276.495 (df = 235)	276.761 (df = 235)	184.835 (df = 211)	185.304 (df = 211)
Note:						*p<0.1; **p<0.05; ***p<0.01

Table E.2: Creditor Responses to IDA Threshold Crossing

	Dependent variable:							
	Fitch (Response)		Moody's (Response)		SP (Response)		DSA risk	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
D(crossing 1 yr)	0.014		0.087		0.002		0.073	
	(0.082)		(0.104)		(0.062)		(0.069)	
GNI pc (t-1)	−0.069*		−0.062***		−0.067***		0.050	
	(0.039)		(0.020)		(0.018)		(0.075)	
D(crossing 2 yr)		0.016		−0.022		−0.055		0.046
		(0.079)		(0.072)		(0.060)		(0.063)
GNI pc (t-2)		−0.053*		−0.111***		−0.084***		0.058
		(0.031)		(0.020)		(0.022)		(0.076)
Observations	527	527	646	645	637	637	655	654
R^2	0.177	0.174	0.205	0.204	0.158	0.161	0.126	0.126
Adjusted R^2	0.071	0.068	0.089	0.088	0.040	0.044	−0.015	−0.015
Note:								*p<0.1; **p<0.05; ***p<0.01

F World Bank Board Membership

Table F.1: Reduced Form: OOF Flows from IDA Board vs. Non-Board Donors

	Dependent variable:					
	OOF Total (log)	OOF Total (%GDP)	OOF Board (log)	OOF Board (%GDP)	OOF Non-Board (log)	OOF Non-Board (%GDP)
D(Crossing $\leq$ 1yr)	0.540*	0.013	0.549*	0.013	0.402**	−0.0005
	(0.299)	(0.027)	(0.315)	(0.028)	(0.186)	(0.005)
GNI pc (t-1)	0.223*	−0.009	0.254**	−0.008	−0.033	−0.001
	(0.113)	(0.020)	(0.115)	(0.020)	(0.056)	(0.001)
Observations	889	867	889	867	891	868
Adjusted R^2	0.619	0.794	0.607	0.794	0.297	0.060
Country FE?	Y	Y	Y	Y	Y	Y
Year FE?	Y	Y	Y	Y	Y	Y

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

Table F.2: Second Stage: OOF Flows from IDA Board vs. Non-Board Donors

	Dependent variable:					
	OOF Total (log)	OOF Total (%GDP)	OOF Board (log)	OOF Board (%GDP)	OOF Non-Board (log)	OOF Non-Board (%GDP)
Net ODA (% GNI, t-1)	−12.133	−0.221	−12.328	−0.225	−6.601	0.004
	(27.059)	(0.286)	(27.737)	(0.277)	(13.322)	(0.037)
GNI pc (t-2)	−0.065	−0.003	−0.029	−0.001	−0.174	−0.002*
	(0.686)	(0.017)	(0.699)	(0.016)	(0.350)	(0.001)
Observations	888	866	888	866	890	867
Adjusted R^2	−3.372	0.795	−3.389	0.795	−3.855	0.063
Country FE?	Y	Y	Y	Y	Y	Y
Year FE?	Y	Y	Y	Y	Y	Y
Instrument (Crossing)	$\leq t-2$	$\leq t-2$	$\leq t-2$	$\leq t-2$	$\leq t-2$	$\leq t-2$

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

Table F.3: Disaggregating Chinese Aid by Type

	(Log) Chinese Aid			
	ODA	OOF	Disbursement Only	Commitment Only
	(1)	(2)	(3)	(4)
GNI pc (t-2)	0.187	0.026	0.385	0.458
	(0.506)	(0.632)	(0.511)	(0.630)
Net ODA (% of GNI), t-1	5.335	1.386	6.083	5.401
	(4.469)	(6.575)	(5.708)	(5.203)
Observations	1,440	1,440	1,440	1,440
R^2	0.388	0.400	0.113	0.409
Adjusted R^2	0.341	0.355	0.045	0.364
Residual Std. Error (df = 1337)	6.199	6.984	6.356	6.326

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

G HIPC Program Completion

Table G.1: Second Stage with HIPC Post-Completion (t+1..t+2) Control

	Dependent variable:						
	(log) Bond amounts	(%) Bonds/GDP	(USD) Chinese debt	(%) Chinese debt/GDP	(%) Taxes/GDP	(log) OOF amt.	(%) OOF/GDP
Net ODA (% GNI), $t-1$	-13.946^{***}	-4.985^{**}	4.812	4.510	0.464	-12.501	-0.230
	(5.239)	(1.993)	(6.438)	(7.327)	(2.811)	(27.529)	(0.298)
GNI pc ($t-2$)	-1.916^{***}	-0.499^{*}	0.159	0.752	0.280	-0.221	-0.005
	(0.705)	(0.285)	(0.836)	(0.824)	(0.332)	(1.000)	(0.017)
HIPC post-completion	2.271	1.184	-2.254	-2.016	-0.757	6.346	0.094
	(2.279)	(0.791)	(2.726)	(2.790)	(1.124)	(14.346)	(0.151)
Observations	2,741	2,734	1,194	1,194	1,199	888	866
Adjusted R^2	0.329	-0.184	0.636	0.573	0.564	-3.371	0.795

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

H Alternative Instrumental Variable

We show results using a different instrumental variable which leverages the probability of receiving aid from any donor and donor government fractionalization as exogenous shocks. For details of this instrument, please refer to Dreher and Langlotz (2020). The advantage of this instrument is that it is a continuous variable that allows more variation while the disadvantage is that it is not available for many country-year observations and reduce our sample size significantly. The reduced form results are consistent with our main results. The second stage results have consistent signs with our main results but insignificant largely due to drop in sample size with missing data.

Table H.1: First Stage: Alternative Instrumental Variable

	Dependent variable:
	Aid/GDP
IV by Dreher and Langlotz	1.347***
	(0.407)
Observations	832
R^2	0.716
Adjusted R^2	0.674
Note:	*p<0.1; **p<0.05; ***p<0.01

Table H.2: Reduced Form: Alternative Instrumental Variable

	Dependent variable:						
	Bond amounts (log)	Bonds/GDP (%)	Chinese debt (USD)	Chinese debt/GDP (%)	Tax revenue/GDP (%)	OOF (log)	OOF/GDP (%)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
IV by Dreher and Langlotz	3.033**	1.448***	−1.291	−7.213***	−0.039	−0.935	−0.161
	(1.260)	(0.318)	(2.416)	(2.041)	(1.082)	(0.622)	(0.102)
Country FE	Y	Y	Y	Y	Y	Y	Y
Period FE	Y	Y	Y	Y	Y	Y	Y
Cluster SE	Country	Country	Country	Country	Country	Country	Country
Observations	506	583	257	257	236	129	126
R^2	0.737	0.448	0.737	0.645	0.852	0.787	0.876
Adjusted R^2	0.676	0.339	0.637	0.509	0.790	0.552	0.736
Note:							*p<0.1; **p<0.05; ***p<0.01

Table H.3: Second Stage: Alternative Instrumental Variable

	Dependent variable:						
	Bond amounts (log)	Bonds/GDP (%)	Chinese debt (USD)	Chinese debt/GDP (%)	Tax revenue/GDP (%)	OOF (log) (log)	OOF/GDP (%)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Aid/GDP	3.551	1.291	−0.310	−1.058	−0.509	0.181	−0.089
	(3.408)	(0.925)	(1.394)	(1.140)	(1.339)	(0.637)	(0.141)
Country FE	Y	Y	Y	Y	Y	Y	Y
Period FE	Y	Y	Y	Y	Y	Y	Y
Cluster SE	Country	Country	Country	Country	Country	Country	Country
Observations	293	334	177	177	152	92	91
R^2	−0.627	−3.206	0.715	0.234	0.751	0.697	0.622
Adjusted R^2	−1.048	−4.149	0.599	−0.079	0.646	0.358	0.209

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

I Conditional Results on Political Competition

Table I.1: Second Stage: Conditional on Approaching Elections

	Dependent variable:						
	Bond amounts (log)	Bonds/GDP (%)	Chinese debt (USD)	Chinese debt/GDP (%)	Taxes/GDP (%)	OOF amt. (log)	OOF/GDP (%)
Net ODA (% of GNI), $t-1$	−12.596*	−6.465*	10.934	−3.893	1.395	−17.812	−0.189
	(7.012)	(3.562)	(8.452)	(6.927)	(2.570)	(333.268)	(0.360)
Net ODA × Election year	−0.281	−0.346	−0.379	−0.582	−1.448	2.072	−0.0001
	(0.897)	(0.422)	(0.921)	(0.508)	(1.003)	(40.142)	(0.038)
Election year (t or $t-1$)	1.238	0.816	0.124	1.269	3.139	−3.769	−0.006
	(1.796)	(0.851)	(1.652)	(0.944)	(2.286)	(72.653)	(0.063)
GNI pc, $t-2$	−2.720**	−1.281*	0.818	−0.154	0.562	−1.267	0.003
	(1.281)	(0.705)	(1.108)	(0.706)	(0.808)	(29.556)	(0.022)
Observations	1,701	1,695	869	869	715	586	571
Adjusted R^2	0.459	−0.443	0.535	0.606	0.463	−9.531	0.266
Country FE	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y
Cluster SE	Country	Country	Country	Country	Country	Country	Country
Instrument (crossing)	≤t-2	≤t-2	≤t-2	≤t-2	≤t-2	≤t-2	≤t-2
Note:							*p<0.1; **p<0.05; ***p<0.01

Table I.2: Second Stage: Conditional on Domestic Political Competition

	Dependent variable:						
	Bond amounts (log)	Bonds/GDP (%)	Chinese debt (USD)	Chinese debt/GDP (%)	Taxes/GDP (%)	OOF amt. (log)	OOF/GDP (%)
Net ODA (% of GNI), $t-1$	−18.836	−7.749	4.114	−6.664	0.595	−0.736	0.400
	(12.980)	(5.374)	(6.581)	(6.507)	(2.929)	(3.457)	(3.155)
Net ODA × Political competition	−0.648	−0.891	−1.636	2.268	−1.062	−0.121	−0.023
	(3.601)	(1.704)	(2.570)	(2.372)	(1.372)	(0.508)	(0.094)
Political competition	−1.797	1.029	3.266	−4.991	0.076	0.434	0.070
	(6.770)	(2.957)	(5.446)	(4.313)	(2.018)	(0.863)	(0.081)
GNI pc ($t-2$)	−3.067	−1.141	−0.209	−0.475	0.496	0.243	0.025
	(1.882)	(0.791)	(0.594)	(0.560)	(0.772)	(0.231)	(0.119)
Observations	1,253	1,248	671	671	604	511	509
Adjusted R^2	0.293	−0.497	0.715	0.610	0.374	0.468	0.112
Country FE	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y
Cluster SE	Country	Country	Country	Country	Country	Country	Country
Instrument (crossing)	≤t-2	≤t-2	≤t-2	≤t-2	≤t-2	≤t-2	≤t-2
Note:							*p<0.1; **p<0.05; ***p<0.01