



# Does debt relief “irresistibly attract banks as honey attracts bees”? Evidence from low-income countries’ debt relief programs

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## ABSTRACT

The Covid-19 crisis has recently rekindled discussions about debt relief, leading official lenders to grant a moratorium on low-income countries' external public debt service. Private creditors, which had massively invested in LICs (especially in Africa), have been so far relatively spared. But would they keep lending to these countries if a new wave of debt write-offs were to occur? Building on the two largest debt relief programs for LICs, namely the Heavily Indebted Poor Countries Initiative (HIPC) and the Multilateral Debt Relief Initiative (MDRI), we investigate whether debt relief leads international private creditors to withdraw or to resume lending to beneficiary governments. Using a difference-in-differences approach, our results suggest that debt relief has fostered borrowing from private creditors, and identify the absence of reputational effects and the short-term horizon of private creditors as the key drivers that made renewed access to the credit market possible.

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## 1. Introduction

Over the past few years, various reports from the Bretton-Woods institutions (BWIs) have stressed the worrying evolution of public indebtedness in low-income countries (LICs) (IMF, 2017, 2018; World Bank, 2020). One reason for this is the paradoxical change in LIC financing. Because of the administrative burden and limitations of traditional IMF-WB style concessional finance, some LICs have turned to the international financial markets, where they face much higher interest rates and shorter loan duration. In addition, the recent pandemic is painting an even gloomier picture of the situation, with most scholars and experts agreeing that the Covid-19 crisis is likely to worsen public finance and to raise current public indebtedness to unsustainable levels, especially for LICs. These various threats have thus revived debates about the need for a new

debt relief scheme. Yet despite improvements in domestic resource mobilization, developing countries need, more than ever, external financing in order to ensure a sustainable development path.

It may therefore be legitimately asked how new debt write-offs would impact beneficiary countries' borrowing capacity, especially toward private lenders. It is this question that the present study addresses, adopting a historical perspective focused on developments in borrowing from external investors in the aftermath of the two largest debt relief programs for LICs. Many low-income countries have indeed been granted debt relief by bilateral creditors and international financial institutions under the Heavily Indebted Poor Countries (HIPC) initiatives since 1996, and the Multilateral Debt Relief Initiative (MDRI) since 2005. Have these initiatives led international private creditors to change their perception of beneficiary countries, either reinforcing their risk-aversion or prompting them to resume lending? This paper sets out to answer this question with an empirical assessment of debt relief's impact on external private financing and identifies the circumstances under which this might have happened. In other words, our study aims to appraise whether debt relief “irresistibly attracts banks as honey attracts bees” (as

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initially formulated by Dornbush with respect to the sovereign risk<sup>1</sup> or, conversely, deters them from providing further financing. These questions are particularly timely and important in light of the recent debates regarding a possible (or inevitable) HIPC III in a near future.

Historically, Rawling's Ghana refused HIPC debt relief in the first place, because of fears of subsequent increases in interest rates (although it was the only African HIPC country to do so). The same concern lay behind the refusal of Sri Lanka, Indonesia and India to have their debt rescheduled following the 2004 tsunamis. Yet can the increase in borrowing costs and the narrowing of financing opportunities be deemed rational following debt cancellation? In actual fact, debt relief probably sends a mixed signal.

On the one hand, debt relief would not be expected to build investor's confidence because countries unable to repay their debt in the past could be seen as risky borrowers, leaving private creditors exposed to the risk of sovereign default and with little legal coverage in the event of a new debt relief scheme. Indeed, under the Enhanced HIPC initiative (HIPC II) some private creditors had their claims being cancelled by unilateral decisions stemming from the main G7 official creditors. Even though some of them resorted to various legal systems to challenge such decisions, the enforced cancellation of a contract between a private and a public entity might have major implications for future financial relationships.<sup>2</sup> Legal struggles in recovering claims for private creditors might therefore deter them from resuming lending to debt relief countries (assuming that the creditors' memory is sufficiently long for these events to affect their decisions). On the other hand, debt write-offs improve debt sustainability by creating fiscal space, thereby enhancing borrowing capacity. Investors might therefore be tempted to take advantage of this and lend over the short run in order to secure interest and capital repayments before new debts start piling up. The question is therefore which signal prevails over the other, as in the title of [Bulow and Rogoff \(1989\)](#): "Sovereign debt: Is to forgive to forget?"

The surge in bond issues by African countries on the international financial markets over the past decade seems to provide an initial answer: investors like countries without debt. In 2011, Graham Stock, Director of JP Morgan's Research Department on Emerging Countries, explained that the increase in commodity prices, high Chinese demand, and the growing quality of institutions on the continent was improving the appeal of African bonds to investors seeking portfolio diversification with attractive returns.<sup>3</sup> He went on to say that the debt relief initiatives had significantly improved debt sustainability in these countries, as they had reassured investors about the debtor's capacity to pay over the short and medium run.<sup>4</sup> But the story is not that straightforward, because some bond-issuing countries were not LICs or HIPCs (Kenya and Gabon, for instance). The observed surge might then be due to the "irrational exuberance of the markets" in a situation of historically low interest rates in OECD countries. This increase could also be explained by Africa's improved economic prospects attracting new investors such as emerging countries, particularly China, India and Brazil. However, despite increasing access to external private financing, the majority of LICs and HIPCs still keep resorting massively to official financing, which accounts for nearly all external public debt disbursements (see [Fig. A.1](#) in the appendix). Neverthe-

less, although official creditors switched, at least partly, from loans to grants after the 1982 debt crisis, this trend has been reversing since 2006 due to commitments to increase Official Development Assistance (ODA) in a situation of tension in public finance in donor countries. It is thus likely that bilateral creditors, who had already agreed to cancel a significant part of the claims they had on HIPCs, were then looking for higher returns. Therefore new loans would come with tightened financing conditions such as lowering the level of concessionality (namely by "blending" grants and loans). Such a shift might also have contributed to driving beneficiary governments to seek alternative financing sources, which though more expensive are less burdensome in terms of conditionality.

Bearing in mind the specificities of these LICs and recent developments in the external financing architecture, the present study makes use of a difference-in-differences (DiD) approach to investigate whether debt relief provided under the Enhanced HIPC initiative and the MDRI has fostered access to international credit markets for beneficiary governments. Building on comparisons with developments in 65 non-benefiting developing countries (non-HIPCs), this methodology attempts to provide an estimate of the effect of debt relief on external private financing, as compared to a situation where countries would not have participated in these initiatives. Yet since the debt relief initiatives being studied cannot be randomly allocated, the usual endogeneity issues arise and undermine the identification of a genuine causal effect stemming from debt cancellations. We therefore interpret with caution the results highlighted throughout the paper, given that overcoming endogeneity issues in the evaluation of macro-scale programs is tricky. Nevertheless, we provide a large set of robustness checks intended to minimize estimation bias of the debt relief effect on new private financing. These tests encompass sensitivity estimates to control group composition, alternative measures of dependent variables, and the inclusion of various controls and fixed effects. We also apply the synthetic control group method which confirms the findings stemming from the DiD specification.

Our results support a more salient increase in external private borrowing for countries that benefited from debt relief under the Enhanced HIPC initiative and the MDRI. These findings suggest that debt relief initiatives, and the MDRI in particular, helped beneficiary governments in accessing international credit markets and borrowing from foreign private banks. As well as the impact of debt relief on debt flows, we also seek to identify some of the channels that might have prompted this renewed market access and look at the evolution of interest rates charged on new unconventional borrowing by HIPCs. Results do not show any absolute or relative increase in interest rates associated with this new financing but do support a genuine lowering in interest rates for all developing countries (both HIPCs and non-HIPCs). Going further on the mechanisms, the second part of the paper emphasizes the short-term memory of private lenders, who appear not to have sanctioned HIPCs that defaulted on private debts during the debt relief process. This idea is supported by the analysis of commercial creditors' lawsuits against HIPCs. According to our results, while private creditors seemed reluctant to lend to HIPCs in years when the latter were facing commercial lawsuits, they did not discriminate against HIPCs in the long run irrespective of whether or not these had been subject to legal action from their private creditors. This seeming amnesia on the part of lenders was probably encouraged by the international context in which the renewed access to credit market occurred. Indeed, our findings show that throughout the post-debt relief period the enlarging of financing opportunities mainly took place at the time of the financial downturn experienced by the OECD economies at the end of the 2000s. This leads us to suppose that private foreign banks, motivated by appealing capital returns in developing countries, withdrew from industrialized economies and again turned toward LICs, among which those that had been

<sup>1</sup> Back cover of the Lissaker's book ([Lissakers, 1993](#)).

<sup>2</sup> This issue is even more complicated in that some creditors sued governments in the courts of developed countries, while others had no choice but to sue the defaulting government in the courts of the debtor country.

<sup>3</sup> With spreads on African bonds 400 to 600 basis points higher than on European bonds.

<sup>4</sup> *Les Afriques*, No. 167, 23 to 29 June, 2011.

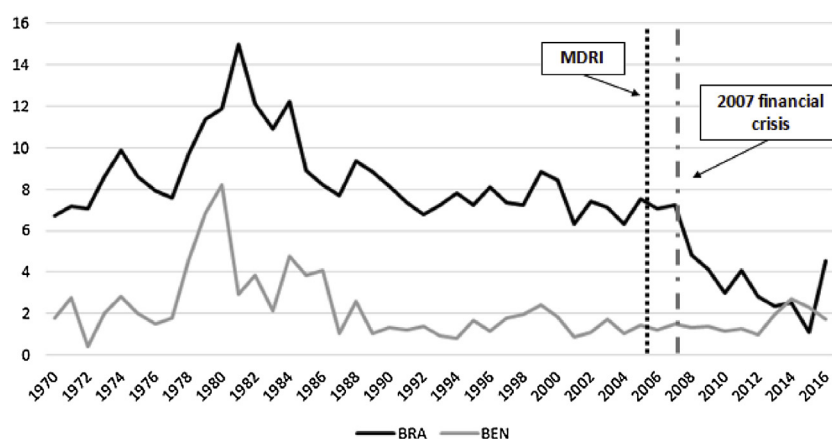


Fig. 1. Interest rates on private financing – MICs vs LMICs. Source: World Bank, International Debt Statistics.

granted debt relief were favored because of their renewed borrowing capacity. Lastly, additional results suggest that the potential withdrawal of multilateral financial institutions in the wake of the debt relief initiatives probably obliged HIPC to seek other external financing sources, and therefore turned to private creditors allowing them both to assert their sovereignty and to break free from conditional financing.

The rest of this paper is organized as follows. Section 2 introduces a brief background about financing of LICs and the potential effects of debt relief on unconventional borrowing. Section 3 details the data and the methodology used to assess the effect of the debt relief initiatives on external private financing. Section 4 presents the main results and robustness tests. Section 5 investigates the circumstances under which market access by HIPC has been made possible. Section 6 concludes.

## 2. LICs' external private financing and debt relief

### 2.1. Double original sin

Middle income countries (MICs) have the option of borrowing on international financial markets, but not in their own currency, and on borrowing on their own financial domestic market, but only in the short term. This state of affairs has been termed “original sin” by (Eichengreen et al., 2002), because it cannot be explained by the “fundamentals” of these economies. The constraint has been somewhat relaxed since 2003, as some emerging countries have been able to borrow from international investors in their own currency and from their own domestic market for longer periods. The situation is different for low income countries. We propose describing their historical (non-) access to the international financial market as “double original sin” because they cannot usually borrow from international private sources even in hard currency and subject to market conditions.

In the 1960s, a special framework for the financing of LICs was put in place and introduced what is known as “concessional lending”: low interest rates and long maturity and grace periods. A special branch of the World Bank, the International Development Association (IDA), was created to provide loans of this kind to a set of countries labeled as LICs. However, in the 1970s, competition and deregulation of the high-income countries' banking sector resulted in a rush of lending to developing countries, without any distinction among them being made. For this reason, many LICs were able to access private financing (mainly credits from foreign banks) up until the 1980–1982 debt crisis.

After that episode, LICs were denied private loans and had to rely on official bilateral and multilateral finance (grants and conces-

sional loans). Yet although benefiting from soft lending conditions, LIC governments were accumulating large amounts of external debt owed to official creditors throughout the 1980s and 1990s. Inefficient project loans and poor public management contributed to debt stockpiling in LICs, especially in Sub-Saharan Africa (Krumm, 1985; Greene, 1989). Given these countries' unsustainable debt situation at the end of the 1980s, debt relief started with small bilateral decisions, before becoming systematic for bilateral lenders at the Paris Club under the Toronto Treatment (1988) and being extended to 90% of claims under the Cologne treatment (1999) (Daseking and Powell, 1999). Multilateral debt was not involved before 1996, since it was considered senior and could therefore never be canceled or even rescheduled. However, under the Heavily Indebted Poor Countries (HIPC) Initiatives (of 1996 and 1999) and the 2005 Multilateral Debt Relief Initiative (MDRI), virtually all the multilateral debt stock held by HIPC was canceled by their multilateral creditors (IMF, World Bank, African Development Bank and Inter-American Development Bank). Under the HIPC initiative (and especially the Enhanced HIPC initiative launched in 1999), debt relief has been conditional on fulfilling each of the following steps in the process. First, a country has variously to be classified low-income by IDA, to pass certain debt thresholds and to follow a macro-stability program in order to be eligible for the initiative. Once eligible, the country reaches the decision point and is granted cancellations on its debt service (initially due to either official or private creditors). Then, subject to the implementation of a Poverty Reduction Strategy Paper (PSRP), the HIPC reaches the “completion” point, where the process ends and irrevocable debt relief is granted on a pre-determined amount of external public debt stock. The MDRI then cancels the remaining multilateral debt stock for LICs that have already reached the HIPC initiative's “completion” point (see Fig. A.2 in the appendix for an illustration of this debt relief scheme). As shown by Fig. A.3 in the appendix, these initiatives significantly helped to reduce HIPC debts to sustainable levels.

### 2.2. Theoretical intuitions and potential channels

What might the consequences of these debt relief initiatives be for private financing? From the standpoint of international private investors, debt relief may be seen as an exogenous market shock reflecting either a negative (incapacity to repay the former debt) or a positive signal (recovered capacity to pay). Which side they come down on will first depend on the investors' characteristics, mainly their memory of past defaults and losses, but also their ability to assess the risks in a context that always looks different from the past: the “this time is different” syndrome ana-

lyzed by Reinhart and Rogoff (2009). The existing literature on the cost of sovereign default agrees that having benefited from debt restructuring or cancellations leads to temporary exclusion from international financial markets (Aguar and Gopinath, 2006; Richmond and Dias, 2008). However, many studies suggest that the “this time is different” syndrome often materializes since, even though temporarily excluded, defaulters regain access to international credit markets quite rapidly (within one or two years after default) especially when legal sanctions are imposed (Bulow and Rogoff, 1989), and do so without incurring a sizable and long-lasting borrowing penalty (Borensztein and Panizza, 2009). This outcome has also recently been underlined by Benczúr and Ilut (2015) and Catão and Mano (2017), who show that although recent defaults significantly affect spread levels, more temporally distant defaults tend to have no impact on borrowing costs. Conversely, Cruces and Trebesch (2013) suggests that private lenders who suffered substantial haircuts from prior restructuring wait longer before lending to defaulters again.

The decision to resume lending to debt relief countries also largely depends on the capital return that private investors can obtain. How might this be affected by debt relief? To illustrate this point, consider the story of two countries: one a typical MIC, Brazil, and a typical LIC, Benin. Fig. 1 shows the interest rates on new borrowing (both private and public). Because of concessional lending available for Benin, but not for Brazil, interest rates are usually higher in Brazil than in Benin. In the early 1990s, the interest rates for Benin became flat at very low levels, and so did Brazil's, but with a spread of approximately 5 percentage points more than Benin. The 2005 final debt relief initiative (MDRI) and the 2007 financial crisis changed this pattern. The world “without risk” interest rate decreased, and so did the spreads for emerging economies. As a result, the interest rates charged to Brazil plummeted, falling to a historical low in 2015. Conversely, countries such as Benin have been able to access the private market, charging higher interest rates. As in previous debt crises, some international investors were willing to take on the risk in order to obtain high returns.

Yet the above comparison between Brazil and Benin is only an illustration. For a more general case, we consider a private investor who faces a choice between investing in a risk-free bond (say, US government bonds) and a developing country's government bond, which is deemed risky. The interest rate on US bonds is  $r$ . Let us assume that the investor is not risk averse. Thus to invest in the developing country's bond, he will charge a risk premium (spread)  $\mu$ . Let us further assume that in the event of default (with probability  $p$ ), the investor will be repaid a fraction  $h$  of the face value of the loan. Hence the expected value of repayments of the developing country's debt will be:

$$(1 - p)(1 + r + \mu) + p(1 + r + \mu)h \quad (1)$$

And the equilibrium condition:

$$1 + r = (1 - p)(1 + r + \mu) + p(1 + r + \mu)h \quad (2)$$

Hence giving:

$$\mu = (1 + r) \frac{p(1 - h)}{1 - p(1 - h)} \quad (3)$$

Moreover,  $p$  can be split in two parts. The first,  $\pi$ , is the probability linked to the fundamentals of the economy and can be thought as a function of the spread's determinants so far identified in the existing literature.<sup>5</sup> The second term reflects how investors forget

a debt reduction (or a default) on date  $t^*$  as time passes (assuming  $\lambda < 0$ ):

$$p = \pi \lambda^{t-t^*} \quad (4)$$

Thus leading to:

$$\mu = (1 + r) \frac{\pi \lambda^{t-t^*} (1 - h)}{1 - \pi \lambda^{t-t^*} (1 - h)} \quad (5)$$

What are the consequences of debt cancellation on this equilibrium? According to Bandiera et al. (2010) and Kraay and Nehru (2006), the determinants of default for LICs are high levels of debt (NPV of debt to exports) and the quality of policy and institutions (CPIA). In some specifications, the type of financing (concessional or not) becomes (negatively) correlated with default. Surprisingly, the track record of repayment does not appear to be a determinant of default (this is a fairly general result), suggesting that the memory of markets is quite limited (Reinhart and Rogoff, 2009).

Following debt relief, the probability  $p$  of default is likely to decrease, because of low levels of indebtedness, and  $h$  is likely to increase for the same reason. The spread will then typically fall to the risk-free interest rate, everything else being constant. Accordingly, the risk premium on HIPC's should be very small. Furthermore, the economic literature has widely pointed out that high levels of debt may result in a debt overhang, where partial cancellation would benefit both the debtor and its creditors (Krugman, 1988; Sachs, 1989). This results from the particular case where the market value of the debt becomes lower than its face value, which occurs when the debt is so large that it weighs negatively on economic activity, lowers investment and growth (see a survey in Obstfeld et al. (1996)), and thus reduces the debtor's capacity to pay (Krugman, 1988; Corden, 1989). This view (often termed the Debt Laffer Curve) holds that debt relief should boost investment and growth. The increase in capital accumulation induced by debt relief can therefore reinforce the attractiveness of beneficiary countries (by, for instance, lowering  $\pi$ ) and might explain, along with other factors, why HIPC's are increasingly indebted to private investors without facing a significant risk premium.

Although the impact of debt relief on private financing flows (both amounts and prices) is hard to predict, the above mentioned studies and the development in financing for LICs in the late 2000s suggest that regaining access to financial markets is possible for HIPC's, even though it might differ according to countries benefiting (conditionally on their economic activity and/or credit history (Cruces and Trebesch, 2013; Trebesch and Zabel, 2017)). Indeed, as of 2007 (so right after the MDRI), some HIPC's have been able to borrow not only from public institutions and emerging countries but also from the Eurobond market, albeit at quite high interest rates (between 5 and 10%).<sup>6</sup> Yet sluggish economic growth in high income countries and low interest rates have made LICs potentially interesting borrowers in the eyes of private international investors.<sup>7</sup> Ghana issued USD 750 million in Eurobonds in 2007.<sup>8</sup> M. Baah-Wiredu, Ghana's Minister of Finance at that time, stated that this bond issue: “... came as the next logical step after the completion of the HIPC Program and the Poverty Reduction Growth Facility Program with the IMF which classified Ghana as a matured stabilizer”.<sup>9</sup> To what extent is this renewed access to financial markets linked to debt relief? This is what the following sections try to assess.

<sup>5</sup> cf. Table S.A1 in the supplementary appendix.

<sup>7</sup> See the Economist n24, International Sovereign Bond Hunters On Safari in Africa, 24/12/07.

<sup>8</sup> With ten-year maturity and a B+ Fitch rating at 8.5%.

<sup>9</sup> Accra Mail, 12/01/2007.

<sup>5</sup>  $\pi = \phi[\text{debt stock; GDP per capita; GDP growth; institutional quality; ...}]$



### 3. Empirical approach

#### 3.1. Temporal depth and HIPC sample

One important feature of our study is that we now have enough temporal depth to observe the potential effects of these multilateral debt relief initiatives. However, although the Enhanced HIPC initiative was launched in 1999, some countries only benefited from it later on, because they did not meet the eligibility criteria at that time. To properly observe the impacts of debt relief in recipient countries, we therefore need to exclude countries that entered the HIPC initiative late, such as Afghanistan, Liberia, Togo, Cote d'Ivoire, and Comoros. Haiti is also excluded because of the 2010 earthquake that prompted huge amounts of foreign aid (both public and private), which might be wrongly attributed to the debt relief initiatives.

As our study period runs from 1992 up to 2015, we retain HIPCs for which data are available for a long enough period after the provision of debt relief. As mentioned in Section 2, the HIPC initiative is a step-wise process: decision point, interim period, and completion point. But since it was forbidden for a beneficiary state to borrow from private creditors at a non-concessional rate throughout the HIPC process, we chose to focus on the effect of the interim period, during which HIPCs receive debt cancellations (i.e. from the decision up to the completion point). The restriction on the years available after the debt relief initiative leads us to consider 24 HIPCs that reached their completion point no later than 2009 and for which data are thus available at least six years after the end of the process (which is long enough to observe potential changes in unconventional borrowing and maximizes the number of HIPCs included in the analysis). Table A.1 in the appendix provides the list of countries that have benefited from the HIPC initiative and emphasizes the sub-sample of HIPCs considered for this study (in bold type).

#### 3.2. Credit market access for LICs: proxies and determinants

We measure intensity in credit market access with data on new debt flows from external private creditors. More specifically, we take on alternately as our variables of interest, the public and publicly guaranteed (PPG) debt disbursements from private commercial banks (*Priv.Bk.*), and private creditors overall<sup>10</sup> (*Priv.Cred.*). In addition, we consider PPG external debt commitments to private creditors (*Priv.Com.*) as it reflects the attractiveness of the debtor, even though funds may not be already disbursed. Lastly, given the massive surge in bond issues by African governments in the late 2000s, we add PPG bonds (*Bonds*) to our set of variables of interest. All these variables were retrieved from the International Debt Statistics (IDS) database of the World Bank, and are measured as a percentage of the debtor country's gross domestic product.

Regarding interest rates that HIPCs face on international markets, we retrieve data on the average interest rate on new disbursements to foreign private creditors (*Priv.Int.*), which is also available in the IDS database. However, one of the shortcomings of this measure is that the IDS dataset wrongly attributing "0" to some countries and years when there is no new debt flow from private creditors. We therefore replace these zeros with missing values when no debt is observed for the corresponding country and year. This correction generates numerous missing observations and restricts the number of HIPCs for which we have figures before and

after the debt relief process (and before and after 2000 for non-HIPC countries). Results from estimates assessing the effect of debt relief on prices associated with borrowing from private creditors must thus be considered as specific to a certain sub-group of HIPCs (i.e. those for which we have the information) and should be interpreted with caution.

We then consider various control variables in order to observe the effect of debt relief conditional on changes to other country-level covariates that might directly affect the various dependent variables. Amounts of public debt contracted to private creditors and their associated interest rates are influenced by both supply and demand factors, which are not easy to differentiate. Indeed, some economic and political factors are likely to reflect both creditors' motives for lending and debtors' demand for borrowing. Following the existing literature on the determinants of market access and on default reputation effects, we cast a wide net of explanatory variables for which relevance and expected effects are discussed in a supplementary appendix (see also Table S.A3 in the supplementary appendix for descriptive statistics on our study sample).

#### 3.3. Motivations for the difference-in-differences approach

Following Djimeu (2018), our empirical assessment of the impact of debt relief on international private financing is based on the variability in participation in the Enhanced HIPC initiative and the MDRI across countries and over time. More specifically, we use a difference-in-differences (DiD) specification similar to Reinhart and Trebesch (2016), which takes the following form:

$$Y_{i,t} = \alpha + v_i + \delta_t + \beta POSTHIPC_{i,t} + \gamma X_{i,t} + \varepsilon_{i,t} \quad (6)$$

where  $Y_{i,t}$  is the dependent variable for country  $i$  in year  $t$  (alternately volumes of new external private debts, or the associated average interest rate) and  $X_{i,t}$  is a set of control variables for country  $i$  in year  $t$ .<sup>11</sup>

$POSTHIPC_{i,t}$  is the product of  $POST_t \times HIPC_i$  that takes 1 for the HIPC  $i$  when it is observed in one of the year  $t$  in its post-completion point period ( $POST_t$ ) (i.e. the period following the interim period). Considering the interim period as the debt relief "treatment" implies setting  $POSTHIPC_{i,t}$  to 0 for the years prior to the decision point and to 1 for the years following the completion point (after the HIPC process exit). Observations in between are intentionally omitted (replaced with missing values) in order to compare changes in the outcome variables before and after the HIPC process, regardless of what happened in between. Additionally, given the inability of defining a  $POST_t$  period (that should be included in the specification along with its interaction term) for control group countries because HIPCs experienced interim periods of various lengths and reached their completion point at different dates, we replace the  $POST_t$  variable with time fixed effects  $\delta_t$ . We also replace the HIPC dummy  $HIPC_i$  (that should be entered in the specification as well) with country fixed effects  $v_i$ . We think the inclusion of country fixed effects rather than a binary variable for HIPCs addresses the countries' unobserved and time-invariant heterogeneity better. Furthermore, considering a dummy variable for all HIPCs implicitly assumes a homogeneous treatment group, whereas HIPCs can significantly differ from each other.

Despite the non-random feature of our "treatment", we think that this empirical strategy is appropriate regarding the issue we intend tackling. First, reverse causality between dependent variables (HIPC market access) and debt relief seems rather unlikely.

<sup>10</sup> which in addition to private commercial banks encompasses other private creditors such as exporters, and other suppliers of goods or bank credits covered by a guarantee of an export credit agency.

<sup>11</sup> Among the pool of control variables exposed above, we only include those that maximize the explanatory power of our model, i.e. GPD\_PC, GDP\_GROWTH, CAB, DURABLE, ECO\_FREE, KOF, RES\_RENT.

Debt relief programs have been fully initiated by official creditors and were designed to clear the path for healthier financing cooperation between HIPCs and the BWIs. Furthermore, private creditors had turned away from HIPCs for almost ten years prior to these initiatives (see for instance Fig. A.4 in the appendix). From the standpoint of private creditors, debt relief might thus be viewed as an exogenous market shock.

Second, regarding our focus on private debt flows and interest rates faced by HIPCs, the inclusion of time fixed effects  $\delta_t$  captures global macroeconomic phenomena (common to both HIPCs and non-HIPCs) that might influence changes in outcome variables such as variations in capital returns in OECD economies, slowdown of emerging economies or fluctuations in international commodity prices. These “push factors” affecting private investors’ decisions to redirect capital flows toward developing countries are thus likely to be captured with the inclusion of such fixed effects, thus mitigating the risk of omitted variables bias at the international level.

The combination of country and time fixed effects with the context in which this DiD applies helps allay some of the econometric issues that arise when assessing the effects of a national-scale program. Yet problems relating to confounding factors affecting both selection for the debt relief initiatives and private debt inflows cannot easily be taken into account. This limitation therefore leads us to interpret the results with caution, although we attempt to tackle these specific issues in the various robustness tests conducted thereafter and in the supplementary appendix. Lastly, with regard to the control group’s composition (see Table A.2 in the appendix), although the 65 non-HIPC developing countries record (on average) figures rather similar to those of the HIPCs in terms of eligibility criteria for the Enhanced HIPC initiative (over the years preceding the decision point), Table S.B1 in the supplementary appendix highlights a significant ex-ante difference when it comes to other economic features (included as covariates in the DiD estimates). However, these differences between “treated” and “control” countries are of no great concern when it comes to identifying the effects of debt relief, since unobserved factors that could explain these structural (and therefore time-invariant) differences between two groups of countries are supposed to be captured by country-fixed effects. Furthermore, time-varying factors that might explain changes in the outcome variables are partially accounted for through the inclusion of numerous covariates and time-fixed effects. The main concern regarding the DiD approach stems from the assumptions made about the existence of an ex-ante common trend in outcome variables for control and treated countries. The supplementary appendix discusses the importance of such assumptions and provides additional tests (Table S.B2), suggesting that HIPCs and control countries experienced (on average) a similar trajectory in the variables of interest prior to debt relief, hence supporting their relevance as counterfactual.

We thus start by running DiD estimates of Eq. (6) using OLS estimators over an unbalanced sample of 24 HIPCs and 65 non-HIPC developing countries observed between 1992 and 2015, the latter being categorized as either low-income countries or lower-middle income countries over the six years of each HIPC cohort.<sup>12</sup> As suggested by Cameron et al. (2012), when suspecting observations dependency within countries and within time periods (since trends are particularly strong in international credit markets), we impose a multiple-way clustering to our standard errors at both country and year levels.

## 4. Results and robustness checks

### 4.1. Main findings

We start by reporting results regarding the effect of debt relief on new financing delivered by foreign private creditors. Table 1, Panel A, presents OLS estimates of Eq. (6) for our four dependent variables, capturing credit market access. Focusing first on odd columns, estimate results show that, when no control is entered, having fully benefited from the HIPC initiative is associated with a positive change in disbursements from external private banks and private creditors overall and a significant increase in commitments to private creditors. Yet when country-level controls are entered (in even columns), the positive association between the post-debt relief period and financing flows from private creditors becomes considerably less significant. The correlation with private creditors’ commitments remains positive but falls below the 10% level of statistical significance, although it remains significant at the 10% level when standard errors are clustered at the country-level only. Regarding issuance of bonds, contrary to what might be expected regarding the recent trends observed in the international credit markets, results do not support disproportionate bond issuance by HIPCs following the debt relief initiatives compared to other developing countries (columns (3) and (4)).

Estimate results thus suggest a substantial increase (on average) in borrowing from private external banks of around 0.35 additional percentage points of gross domestic product (relative to what happened in non-HIPCs) and of around 0.43 additional percentage point for debt commitments in the aftermath of the Enhanced HIPC initiative. However, when a more conservative strategy in terms of standard error clustering is imposed, the correlation between debt relief provision and new external commitments from private creditors disappears.

We next investigate developments in interest rates as a potential driver of this renewed access to private external banks. Results are reported in Table 1, Panel B. Columns (1) to (4) display the OLS results stemming from specification (6), where the average interest rate on new disbursements from private creditors is now the dependent variable. Overall, results are rather steady from one specification to the other. They suggest that once HIPCs exit the debt relief program, they experience an increase of around 0.9 additional percentage points in the interest rate they faced when borrowing from foreign private investors (on average and without entering any controls), although the correlation is not statistically significant. Similarly, when time-varying controls are entered,<sup>13</sup> results suggest that no effect is observed. This second set of results (obtained on a reduced sample of HIPCs – see Section 3.2) shows that debt relief did not affect risk premiums associated with new financing from private creditors. As suggested by our theoretical framework and underlined by time trend coefficients in columns (3) and (4), a more convincing explanation might be that developing countries have experienced a reduction in interest rates (probably induced by the lowering in the world interest rate in the late 2000s), which has been shared by our sample countries, regardless of the provision of debt relief.

Overall, DiD estimates suggest that debt relief granted from the decision point up to the completion point has helped beneficiary countries to alleviate the double original sin and to resume borrowing from foreign private banks, thereby enlarging their financing opportunities. While these findings are robust to the inclusion of many covariates and are not altered by the way the dependent variables are measured (percentage of GDP versus percentage of

<sup>12</sup> HIPC cohort denotes the year of attaining each HIPC’s decision point, i.e. the entry year of the HIPC process.

<sup>13</sup> See Olabisi and Stein (2015) and Presbitero et al. (2016) for the determinants of risk premiums in developing countries.

**Table 1**  
Difference-in-differences. estimates – baseline results.

Control group: All DCs POST-HIPC:	(1)	(2)	(3)	(4)
	Post-interim period (with at least + 6 years after)			
Panel A: OLS-DiD, Debt flows				
Dep. var. (% of GDP)	Priv..Bk <sub>i,t</sub>		Priv..Cred <sub>i,t</sub>	
POST-HIPC <sub>i,t</sub>	0.257** (0.103)	0.344*** (0.091)	0.675* (0.347)	0.513 (0.322)
Observations	2338	1732	2338	1732
No. of country	101	89	101	89
Controls	No	Yes	No	Yes
Dep. var. (% of GDP)	Priv..Com <sub>i,t</sub>		Bonds <sub>i,t</sub>	
POST-HIPC <sub>i,t</sub>	0.501* (0.265)	0.434 (0.291)	−0.122 (0.147)	−0.202 (0.196)
Observations	2338	1732	2338	1732
No. of country	101	89	101	89
Controls	No	Yes	No	Yes
Panel B: OLS-DiD, Interest rates				
Dep. var. (%)	Priv..Int <sub>i,t</sub>			
POST-HIPC <sub>i,t</sub>	0.909 (0.613)	1.254 (0.831)	0.793 (0.560)	1.239 (0.728)
Time trend <sub>t</sub>			−0.126*** (0.017)	−0.120*** (0.039)
Observations	1083	726	1083	726
No. of country	92	76	92	76
Controls	No	Yes	No	Yes
Year fixed-effects	Yes	Yes	No	No

Notes: Panel A shows the results for a sample of 24 HIPC that have reached their completion point no later than 2009 and of 65 developing countries (when imposing controls) that did not benefit from debt relief under the Enhanced HIPC initiative. *Priv..Bk.*, *Priv..Cred.*, *Priv..Com.*, and *Bonds* denote respectively debt disbursements to private external banks, external creditors, debt commitments to external private creditors, and PPG bonds in percentage of GDP. Panel B displays results when the dependent variable consists in the average interest rate (in percentage points) on private debt disbursements. All regressions from Panel A include country- and year-fixed effects. All regressions from Panel B include country-fixed effects. The set of control variables (when entered in the estimates) for Panel A estimates encompasses: GDP.PC in log, GDP.GROWTH, CAB, DURABLE, KOF, and RES.RENT. The set of control variables (when entered) for Panel B estimates comprises GDP.PC in log, RES.RENT, GROSS.SAVING, FINA.FREE, FDI, which have been found to maximize the explanatory power of the interest rate's variance. F-Statistics are not reported in order to save space but are all significant at the 5% level. Robust standard-errors in parentheses (clustered at both the country- and year-level). \*\*\*, \*\* and \* denote significance at 1%, 5% and 10% levels.

exports), as shown in Table S.C1 in the supplementary appendix, the usual precautions apply to the identification of a causal effect. Based on those results, and in the absence of a positive correlation between debt relief provision and the three other outcome variables, we continue the analysis, focusing mainly on the contribution of debt relief to new borrowing from private foreign banks.

#### 4.2. Sensitivity to control groups

Although increasingly used in applied macroeconomics, the DiD approach is often justified by the existence of a natural experiment which, at the national level, is unusual if not nonexistent. Nevertheless, since benefiting from the HIPC initiative is determined by eligibility criteria, some countries can be found that met these conditions, but ultimately did not benefit from the initiative. Such a counterfactual selection process can help in considering as a control group countries that are (on average) more similar to HIPCs than the entire sample of developing countries. Consequently, we challenge the sensitivity of our main results to the composition of the control group. As previously noted, a country is eligible for the HIPC initiative if: (i) it is classified as a low-income country (LIC) by the World Bank; (ii) it is IDA-eligible only, meaning that the country's government can only borrow from the World Bank through its concessional window (the International Development Association); (iii) the government has agreed to a macro-stability program with the World Bank and the IMF; and (iv) the external public debt is considered to be unsustainable (net present value of over 150% of the country's exports).

We thus define a first alternative control group (Indebted and Poor DCs) made up of countries which, in the five years preceding the decision point of each HIPC cohort, were categorized as LIC for at least three years<sup>14</sup> and posted an average external public debt (face value) of over 170% of their exports over the same period. In addition, we challenge the sensitivity of our main results to a second control group (Indebted DCs) made up of indebted developing countries, regardless of their income category (LIC, Lower-, Upper-Middle Income Countries) and to a third made up of low-income countries only, regardless of their indebtedness level (Poor DCs). Lastly, as most HIPCs are African countries, we also run our main estimates considering African developing countries (African DCs) that did not benefit from debt relief initiatives as the control group. As in [Chen et al. \(2008\)](#), this helps us control for a potential trend in borrowing to private creditors within the continent.

Table S.C2 in the supplementary appendix displays the composition of these alternative samples. Results of Table S.C3, also in the supplementary appendix, show that the coefficient associated with the POST-HIPC variable remains unchanged. They thus reinforce the idea that HIPCs experienced a genuinely different trend in borrowing from private lenders over a period corresponding to the years following debt relief provision, and with respect to what happened (on average) within developing countries or within

<sup>14</sup> Which often goes in hand with borrowing from the IDA and the application of a macro-stability program. This therefore controls (to some extent) for the potential contribution of conditionality to financial market access.

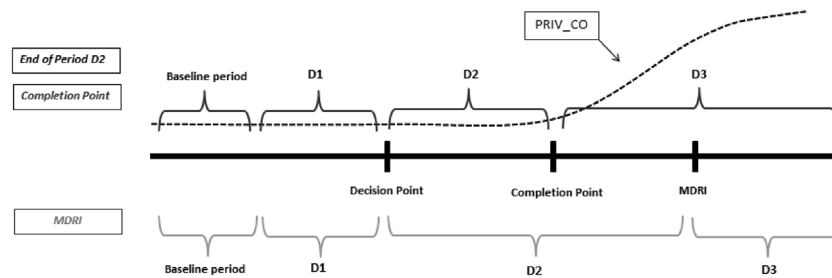


Fig. 2. Debt to private creditors evolution – Case 1.

sub-groups of developing countries sharing similar features with HIPC.

#### 4.3. Expectations' effects of HIPC initiatives' implementation

We then attempt to tackle the potential effect of the 1999 announcement of the enhanced HIPC initiative (and of the 1996 announcement of the original HIPC initiative). Indeed it might be suspected that official disclosure of debt relief programs impacted investors' decisions, leading them to target potential benefiting countries beforehand, betting on the probability of the debtor getting debt relief in the short run. Accounting for potential expectations and private lending over the years between disclosure and the decision point dates leads us to set  $POSTHIPC_{i,t}$  to 0 for all the years prior to 1999 (still giving 1 for each year following the completion point year). As the same time, we also make the same modification in the  $POSTHIPC_{i,t}$  variable with respect to 1996 (the disclosure date of the original HIPC initiative). These restrictions lead us to compare changes in the outcome variables before and after debt relief provision under the enhanced HIPC initiative, regardless of what happened between 1999 and the exit year from the HIPC process (and alternately between 1996 and the exit year), which varies across benefiting countries (with respect to the completion point year of each HIPC). Results in Table S.C4 in the supplementary appendix suggest that setting the beginning of the debt relief period to 1999 or 1996 does not affect the sign, magnitude, or significance of our main results.

#### 4.4. Potential outliers

Table S.C5 in the supplementary appendix then reports results when the DiD estimates exclude one HIPC at the time of the sample. They show that the positive effect of debt relief on disbursements to private foreign banks is not driven by certain outliers (among HIPCs) that may have contracted unusual amounts of these debts. The magnitude of the coefficients is similar to that obtained in the main estimates, suggesting a genuine average effect of the enhanced HIPC initiative among benefiting countries. Furthermore, we also run our DiD estimates dropping countries in the entire sample displaying the largest debt disbursements to private creditors (as a share of GDP). We then rerun the estimates, this time removing HIPCs that borrowed the most from private lenders over the period of study. Results remain unaffected, although the magnitude of the coefficient associated with the post-interim period significantly differs from one estimate to the other.

#### 4.5. Timing in credit market access

The above results support the idea that debt cancellations lead recipient countries to contract more loans from private banks as compared to a situation where they would not have been granted debt relief. This raises the question as to which step of the HIPC process prompts international investors to lend to HIPC govern-

ments. Being eligible for the HIPC initiative could be interpreted by private creditors as a promise of future debt cancellations and could thus encourage them to lend more to HIPCs even before the debt relief process ends (although this was officially considered as strictly forbidden by the BWIs). Given the low creditworthiness of HIPCs, private creditors could also wait until the end of the debt relief process, i.e. the completion point, before resuming lending to beneficiary government. However, since HIPC debt substantially fell but still remained significant following the HIPC process, some creditors may even postpone their first loans up to the MDRI in order to contract with a debtor having a clean slate, which would ensure future repayment of their claims. Consequently, in the same vein as Papaioannou and Siourounis (2008) and Ferry (2019), we run two different versions of Eq. (6) in order to identify which step of the HIPC process fostered lending by private investors. The modified specification hence takes the following form:

$$Y_{i,t} = \alpha + v_i + \delta_t + \sum_{k=1}^3 \beta_k Dk_{i,t} \times HIPC_i + \gamma X_{i,t} + \varepsilon_{i,t} \quad (7)$$

where  $D1$  is a binary variable taking one for the four years preceding the decision point, and zero otherwise.  $\beta_1$  approximates the announcement effect of the HIPC initiative launched in 1996, i.e. four years before the first HIPC entered the initiative (which should not remain significant in the presence of ex-ante parallel trends – see Section 3.3). The  $D2$  variable is a binary variable equal to 1 for the years from the decision point up to the completion point (i.e. for interim period years). Lastly,  $D3$  is a third binary variable that takes the value 1 for each year following the completion point. Furthermore, in order to identify the step in the debt relief scheme driving access to the international credit market, we alternately estimate this model with  $D2$  covering the entire period from the decision point up to the MDRI (the variable now taking 1 for each year between the decision point and the MDRI). Consequently  $D3$  becomes equal to 1 for all years in the post-MDRI period. Comparisons between these two specifications (with respect to non-HIPCs) would hence reveal whether private creditors react immediately after the HIPC initiative completion point or wait for subsequent debt cancellations under the MDRI before lending to HIPC governments. We schematize these two potential cases in Figs. 2 and 3.<sup>15</sup>

Fig. 2 presents the hypothetical situation where private creditors start lending to HIPC governments as soon as they complete the HIPC process. In this scenario, coefficient  $\beta_2$  of equation (7) should not be statistically significant if we consider period  $D2$  as the interim period. However, under the alternative specification, where  $D2$  covers the period running from the decision point through to the MDRI (in light gray below the time arrow), coefficient  $\beta_2$  should be

<sup>15</sup> Note that since the completion point becomes mixed up with the MDRI after 2005, this strategy relies on variability in private financing access among HIPCs having reached their completion point before 2005.



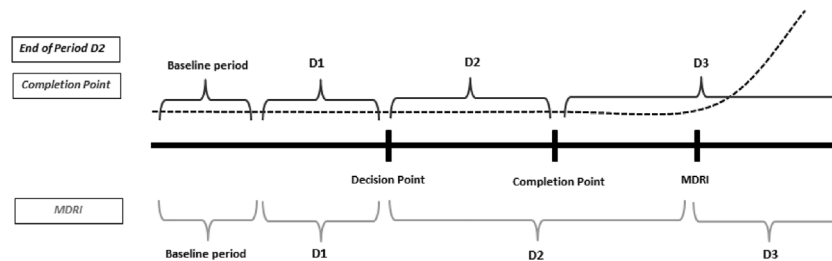


Fig. 3. Debt to private creditors evolution – Case 2.

significant (since amounts of debt disbursements would be different from those in the baseline period).

In the second scenario (Fig. 3), where private investors wait for the MDRI before resuming lending,  $\beta_2$  should not be significantly different from the baseline period, regardless of whether the D2 period runs through to the completion point or to the MDRI. Note that if an increase in debt commitments occurs over the short term instead of being long-lasting (as schematized in Figs. 2 and 3), the results should not be different except for the  $\beta_3$  coefficient if the temporary increase takes place immediately after the completion point and if D2 denotes the period between the decision point and the MDRI. In this scenario,  $\beta_2$  would be significantly different from the baseline period, but  $\beta_3$  should not.

Columns (I) and (II) in Table 2 report  $\beta_1$ ,  $\beta_2$ , and  $\beta_3$  coefficients when the D2 variable covers the interim period. Results suggest that debt disbursements from private banks grew in period D3, i.e. after the completion point, the coefficient being robust to the inclusion of our set of country-level controls used so far. However, in columns (III) and (IV), when D3 denotes the post-MDRI period, results are similar. This means that the increase in financing from private banks occurs, on average, at the end of the period of study, i.e. after the MDRI. These results therefore suggest that private foreign banks require HIPC benefiting from the entire debt relief package (cancellations under the HIPC initiative and additional debt write-offs granted under the MDRI) to display a clean slate before lending to their governments.

In order to challenge this pattern in borrowing from private external banks, we carry out a synthetic control analysis allowing us to visualize graphically the effect of having benefited from the MDRI. The interest of this method is to build a synthetic control group using a weighted combination of countries from the pool of non-HIPCs. The ex-ante evolution and level of the variable of interest (and controls) for the synthetic control group hence closely match those of the HIPCs i.e. the “treated group” (Abadie and Gardeazabal, 2003; Abadie et al., 2010). Our synthetic control approach regarding the effect of having been ultimately granted debt relief under the MDRI is reported in the supplementary appendix, which discusses the selection of control variables and the choice of lag structure in the variable of interest, and displays the composition and weight distribution of the various synthetic HIPC groups (Table S.C9). Figure S.C3 (in the supplementary appendix) confirms the existence of an increasing trend in borrowing from external private banks for HIPCs which is larger than the one observed for the synthetic HIPCs. Sensitivity tests using alternative predictors for the synthetic control group (see Table S.C8) are reported in figure S.C4 and support the results.

## 5. What did trigger market (re)access?

Are there certain distinctive features among HIPCs that prompted some of them to resume borrowing (more or faster) to private lenders in the aftermath of debt relief? The following subsections seek to answer this question and start by investigat-

ing the effect of lawsuits between benefiting countries and private creditors on credit market access.

### 5.1. Commercial creditors' lawsuits

Although the economic literature has paid little attention to the legal dimension of sovereign lending (Weidemaier and Gulati, 2014), public debts remain contracts that are intended to be honored. Yet under the Enhanced HIPC initiatives, members of G7 unilaterally decided to write-off some of the commercial debts owned by private lenders that were weighing on the debt burden of HIPCs. As a result, some aggrieved creditors decided to take legal action and sued HIPC governments in order to recover their claims. The growing number of commercial lawsuits was not limited to a small pool of creditors and HIPCs.<sup>16</sup> The proliferation of lawsuits against HIPC governments became possible as a result of the period in which the debt relief initiatives took place. Up to the mid-twentieth century, the principle of sovereign immunity prevailed, and thus protected sovereign debtors from legal pursuit in the event of default (Panizza et al., 2009). Despite increasing demand from private creditors to waive sovereign immunity (Weidemaier, 2014), significant legal changes only started to be observed in the early 1970s, when a growing number of jurisdictions adopted new sovereign immunity acts, holding states legally accountable for their performance on debt contracts, like any other private entity (Buchheit, 1995). As the HIPC initiatives occurred in the late 1990s, aggrieved investors that saw their claims being cancelled by G7 were by then in position to turn to legal procedures and demand repayment.

Between 2005 and 2015, one third of HIPCs (twelve out of thirty-six) had been sued, often in courts located in the creditors' country, or had to rely on private arbitration to settle their legal disputes. But the outcome was not guaranteed for creditors, as some trials lasted several years (with some of them still ongoing) while others went to appeal. Furthermore, even when a settlement was reached and a ruling made, for the most part in favor of commercial creditors, payment (if any) was not immediate because of the limited procedures available to enforce compliance (Gelpern, 2013; Weidemaier and Gulati, 2015).

What might be the consequences of commercial creditors' lawsuits (and thus of legal sanctions) against HIPCs on credit market access? Could it affect the reputation of HIPCs? Would it reassure foreign investors, since these lawsuits show that they can be protected (to some extent) against sovereign default and potential future debt relief schemes? As initially formulated by Eichengreen (1987), credit market access is mostly determined by the size of the debtors' economy and trade. Such a situation thus leaves little room for legal sanctions to play a role in market re-access by HIPCs. But according to Bulow and Rogoff (1989), while reputation alone cannot account for capital market access, legal sanctions would

<sup>16</sup> See Table S.C10 in the supplementary appendix.

**Table 2**  
Difference-in-differences estimates – gradual effect of debt relief.

Control group: All DCs POST-HIPC:	(1)	(2)	(3)	(4)
	Post-interim period (with at least + 6 years after)			
Dep. var. (% of GDP)	<i>Priv..Bk.</i>			
OLS-DiD	D2 = DP – CP period		D2 = DP – MDRI period	
POST-HIPC X $D1_{i,t}$	–0.182 (0.111)	–0.022 (0.067)	–0.185 (0.111)	–0.023 (0.067)
POST-HIPC X $D2_{i,t}$	–0.104 (0.129)	0.118 (0.077)	–0.104 (0.125)	0.118 (0.079)
POST-HIPC X $D3_{i,t}$	0.153* (0.083)	0.338*** (0.084)	0.190** (0.091)	0.381*** (0.098)
Observations	2424	1818	2424	1818
No. of country	101	89	101	89
Controls	No	Yes	No	Yes
Prob ≥ F (p-val)	0.031	0.036	0.033	0.039

Notes: This table shows the results for a sample of 24 HIPC that have reached their completion point no later than 2009 and of 65 developing countries (when imposing controls) that did not benefit from debt relief under the Enhanced HIPC initiative. Fixed effects and control variables (when entered) are the same as in Table 1. Note that results with respect to alternative control groups as defined in Section 4.2 have not been reported in order to save space but are similar to those reported above. Robust standard-errors in parentheses (clustered at both the country- and year-level). \*\*\*, \*\* and \* denote significance at 1%, 5% and 10% levels.

be necessary to allow future financial relationships and sovereign lending to resume. Indeed, since debtors can negotiate with lenders to reach a settlement (or can consent to pay the claim to the creditors once a judgment has been made), they could potentially regain a degree of creditworthiness and reputation.

Conversely, it could also be assumed that the occurrence of commercial lawsuits between HIPCs and former private creditors might deter new lenders from contracting claims with HIPCs, regardless the lawsuit's outcome. On the one hand, new creditors might fear that a HIPC losing in court and required to pay a substantial amount to the aggrieved creditor, would end up with a reduced capacity to repay new loans. In addition, as in the case of the Argentina's 2001 default, the threat that HIPC payments on new debt might be claimed by creditors suing them could also lead interested investors to postpone lending until after the trial, or even induce self-restraint by debtors in contracting new loans (Datz and Corcoran, 2020). On the other hand, in the case of an HIPC winning a lawsuit or facing a small penalty (or even continuously postponing the settlement), creditors might fear future cancellations of commercial debt by G7 or G20, because even resorting to legal proceedings does not guarantee their being repaid.

Having gathered information about commercial creditors' lawsuits against HIPCs (reported periodically in the IMF HIPC Status of Implementation documents), we then investigate whether private creditors discriminate among HIPCs based on the track record of commercial creditors' lawsuits. We thus run estimates of Eq. (6) but adding an interaction term between POST-HIPC and variables capturing the history of commercial lawsuits. Since we focus on lawsuits that resulted from the HIPC initiatives only, and given that most of those lawsuits occurred at the end of the interim period, the interaction term is confounded with the commercial lawsuit variable, which is therefore omitted for reasons of collinearity. We also differentiate lawsuits between those still ongoing (i.e. in appeal or not settled in the year we record it in the dataset) and those that have been settled (agreements between the two parties).<sup>17</sup>

We start by looking at the differential effect of debt relief on borrowing from private foreign banks in relation to the occurrence of at least one commercial lawsuit over the period of study. We thus interact the POST-HIPC variable with a dummy variable taking value one if an HIPC  $i$  faced at least one lawsuit over 2005–2015 (regardless of the total number of lawsuits). This leads us to investigate whether the previous correlation observed in the main results

differs between HIPC that faced at least one lawsuit and those that did not. Results from Panel A in Table 3 suggest that (on average) private foreign banks did not discriminate among HIPCs on the basis of the occurrence of lawsuits at the country-level (regardless of the year in which the lawsuit took place), hence supporting the absence of a borrowing penalty (such as exclusion from the credit market) based on the track record of lawsuits. Moreover, no particular effect is observed with regard to the lawsuit outcomes (settled versus ongoing). We continue the analysis by interacting our variable of interest with a dummy capturing the occurrence of one or more lawsuits at the country-year level. Panel B results display negative coefficients for the interaction term, which are nevertheless significant only for settled lawsuits (columns (5) and (6)). However, columns (5) and (6) estimate the differential effect of debt relief on market access as compared to HIPCs that did not face any lawsuits and those which did face lawsuits that were still ongoing (probably in appeal) in year  $t$ . In order to get a homogeneous baseline category of HIPCs, column (7) and (8) estimates include two interaction terms (one with settled lawsuits and one with lawsuits in appeal). In this way, the coefficient associated with the interaction term for settled lawsuits should be read only in relation to HIPCs that had no lawsuits. Results are similar to those of columns (5) and (6) and the differential effect remains statistically significant.

Going further, we then investigate whether commercial lawsuits at the intensive margins (i.e. the number of lawsuits over the period of study) affected unconventional new borrowing in the aftermath of the debt relief initiatives. Panel C estimates show a negative and significant coefficient associated with the interactive term (column (1)), suggesting that among HIPCs, those having experienced greatest number of lawsuits over the entire study period have been less able to borrow from private foreign banks. This effect seems to be influenced by settled lawsuits, as shown by the results in Panel B. Yet when the control variables are included, statistical significance falls below the 10% level, indicating no robust differential effect of the number of lawsuits (at the country level) on credit market access following debt relief provision. Lastly, Panel D reports estimate results when POST-HIPC is interacted with the number of lawsuits a HIPC  $i$  faced in year  $t$  (and so varies at the country-year level). Results display a negative and significant coefficient of POST-HIPC when it interacts with commercial lawsuits (overall) and with those having been settled in particular.

Overall, this set of results suggests that private investors were rather reluctant to lend to HIPCs in years during which they were facing commercial lawsuits and especially when such lawsuits

<sup>17</sup> See Table S.C8 in the supplementary appendix.

**Table 3**  
HIPC's market access and commercial lawsuits.

Control group: All DCs POST-HIPC	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Post-interim period (at least +6 years after)							
Dep. Var. (% of GDP)	<i>Priv..Bk<sub>i,t</sub></i>							
<b>OLS-DiD</b>								
<b>Panel A</b>	Interaction with the occurrence (0/1) (at the country level) of:							
VAR1 <sub>i</sub>	Comm. lawsuit		Ongoing		Settled			
VAR2 <sub>i</sub>					Ongoing			
POST-HIPC <sub>i,t</sub>	0.254** (0.094)	0.299*** (0.071)	0.240** (0.094)	0.331*** (0.075)	0.254** (0.094)	0.299*** (0.071)	0.254** (0.094)	0.300*** (0.071)
POST-HIPC X VAR1 <sub>i,t</sub>	0.007 (0.075)	0.092 (0.133)	0.051 (0.092)	0.039 (0.111)	0.007 (0.075)	0.092 (0.133)	-0.070 (0.070)	0.147 (0.146)
POST-HIPC X VAR2 <sub>i,t</sub>							0.107 (0.109)	-0.076 (0.081)
<b>Panel B</b>	Interaction with the occurrence (0/1) (at the country-year level) of:							
VAR1 <sub>i,t</sub>	Comm. Lawsuit		Ongoing		Settled			
VAR2 <sub>i,t</sub>					Ongoing			
POST-HIPC <sub>i,t</sub>	0.271** (0.099)	0.346*** (0.089)	0.265** (0.099)	0.344*** (0.089)	0.272** (0.101)	0.350*** (0.091)	0.274** (0.100)	0.347*** (0.090)
POST-HIPC X VAR1 <sub>i,t</sub>	-0.134 (0.134)	-0.019 (0.095)	-0.120 (0.202)	-0.002 (0.115)	-0.302** (0.129)	-0.139** (0.059)	-0.288*** (0.101)	-0.180** (0.077)
POST-HIPC X VAR2 <sub>i,t</sub>							-0.035 (0.147)	0.067 (0.088)
<b>Panel C</b>	Interaction with the number (at the country level) of:							
VAR1 <sub>i</sub>	Comm. Lawsuit		Ongoing		Settled			
VAR2 <sub>i</sub>					Ongoing			
POST-HIPC	0.295*** (0.104)	0.352*** (0.083)	0.273** (0.102)	0.355*** (0.086)	0.307*** (0.107)	0.363*** (0.087)	0.297*** (0.104)	0.361*** (0.086)
POST-HIPC X VAR1	-0.019*** (0.003)	-0.004 (0.013)	-0.015 (0.010)	-0.010 (0.020)	-0.040*** (0.010)	-0.015 (0.019)	-0.084*** (0.028)	-0.023 (0.035)
POST-HIPC X VAR2							0.061* (0.030)	0.011 (0.035)
<b>Panel D</b>	Interaction with the number (at the country-year level) of:							
VAR1 <sub>i,t</sub>	Comm. Lawsuit		Ongoing		Settled			
VAR2 <sub>i,t</sub>					Ongoing			
POST-HIPC <sub>i,t</sub>	0.274** (0.102)	0.350*** (0.092)	0.268** (0.101)	0.348*** (0.091)	0.271** (0.102)	0.349*** (0.091)	0.273** (0.101)	0.350*** (0.091)
POST-HIPC X VAR1 <sub>i,t</sub>	-0.071* (0.035)	-0.024* (0.012)	-0.086 (0.057)	-0.028 (0.020)	-0.131** (0.058)	-0.048** (0.022)	-0.112** (0.047)	-0.043* (0.024)
POST-HIPC X VAR2 <sub>i,t</sub>							-0.035 (0.034)	-0.008 (0.017)
Observations	2338	1732	2338	1732	2338	1732	2338	1732
Number of country	101	89	101	89	101	89	101	89
Controls	No	Yes	No	Yes	No	Yes	No	Yes

*Notes:* We study changes in disbursements to private foreign banks around the interim period and investigate the differential effect of having benefited from the debt relief initiatives respectively to the occurrence and the number of commercial lawsuits faced by HIPCs. **Panel A** estimates report the correlation between the POST.HIPC<sub>i,t</sub> variable and market access as well as of its interaction with a dummy variable capturing the occurrence of at list one commercial lawsuits for a HIPC over 2005–2015 (1 if the HIPC *i* faced a commercial lawsuit, 0 otherwise) while **Panel B** do the same but for the occurrence of at list one commercial lawsuits in a HIPC in a given year (1 if the HIPC *i* faced a commercial lawsuit in the year *t*, 0 otherwise). **Panel C** estimates display coefficients when POST.HIPC<sub>i,t</sub> is interacted with the number of lawsuits faced by a HIPC *i* over 2005–2015 while **Panel D** do the same but in a given year *t*. Commercial lawsuits are distinguished between those being still ongoing at time *t* and those having been settled in year *t*. F-Statistic and joint significance for the POST.HIPC<sub>i,t</sub> variable and its interaction term are not reported in order to save space but are all statistically significant at the 5% level. Robust standard-errors in parentheses (clustered at both the country- and year-level). \*\*\*, \*\* and \* denote significance at 1%, 5% and 10% levels.

were finally settled in that year. The existence of one or more lawsuits therefore appears to be a disincentive for private lenders, but only over the very short run, i.e. in the year of that particular lawsuit. Indeed, Panel A and C estimates suggest that over the entire period of study, HIPCs that faced commercial lawsuits (and those that faced a large number of them) did not borrow to a lesser extent than other HIPCs. These findings thus highlight the rather short memory of investors, the absence of reputational penalties following legal sanctions, and the “this time is different” syndrome discussed

in the introduction and emphasized by [Reinhart and Rogoff \(2009\)](#). To some extent, they also corroborate the [Bulow and Rogoff \(1989\)](#) conclusion that “to forgive is to forget”, even if the creditors are not always convinced of the merits of these cancellations.

## 5.2. Global credit cycles

As the track record of commercial lawsuits does not seem to have affected investors' attitudes toward HIPC governments, a fur-

**Table 4**  
Global credit cycles and private capital flows to developing countries.

Control group: All DCs POST-HIPC	(1)	(2)	(3)	(4)
	Post-interim period (at least +6 years after)			
Dep. Var. (% of GDP)	Priv..Bk. <sub>i,t</sub>			
	VIX		LIBOR	
CYCLE <sub>t</sub>	Asc. Phase	Desc. Phase	Asc. Phase	Desc. Phase
<b>OLS-DiD</b>				
POST-HIPC <sub>i,t</sub>	0.537** (0.198)	0.340** (0.150)	0.476** (0.176)	0.364* (0.177)
POST-HIPC X CYCLE <sub>i,t</sub>	−0.198* (0.107)	0.274** (0.107)	−0.097 (0.097)	0.119 (0.099)
Observations	1433	1433	1433	1433
Number of country	88	88	88	88
Controls	Yes	Yes	Yes	Yes

Notes: Columns (1) and (2) expose effect of debt relief conditional on the VIX index's financial cycle (ascending vs. descending phase) while columns (3) and (4) do the same with respect to the LIBOR (3 months) rate. We study changes in disbursements to private foreign banks around the interim period. Note that CYCLE<sub>t</sub> is common to all countries included in the sample and therefore not included to the regression since its contribution to unconventional borrowing from private banks is captured by year-fixed effects. Fixed effects and control variables are similar to those used so far (as in Table 1). F-Statistics and tests of joint significance are not reported in order to save space but are all significant at the 5% level. Robust standard-errors in parentheses (clustered at both the country- and year-level). \*\*\*, \*\* and \* denote significance at 1%, 5% and 10% levels.

ther explanation of private capital flight to HIPCs might be found in the financial turmoil that OECD economies underwent in the late 2000s. In view of the two financial crises that severely impacted high-income countries in 2008 and 2012 (albeit less severely in the case of the latter), it might be supposed that precautionary behaviors and low capital returns in high-income countries motivated private investors to seek more profitable investments and to redirect lending toward HIPCs. The contribution of such “push” factors to credit market access has so far been captured by time-fixed effects, included in every regression. In this section, we attempt to go further by identifying whether HIPCs which, according to our findings, have accessed financial markets starting from the MDRI onwards, contracted most of their debts to private foreign banks during bearish financial periods in OECD economies. To do so, we collect annualized data on the VIX index and the LIBOR rate (3 months)<sup>18</sup> and look at their evolution in the wake of the MDRI, i.e. after 2005. Fig. A.5 in the appendix shows that both the VIX and the LIBOR experienced an ascending phase prior to the global financial crisis and the sovereign debt crisis of European countries before this trend reversed in 2010 for the VIX and in 2007 for the LIBOR. We believe these indicators of global credit cycles approximate to the attractiveness of low-income countries, since low levels of VIX and LIBOR denote low market returns in OECD economies.<sup>19</sup>

To identify the role played by the development of financial markets in high-income economies on this renewed market access of HIPCs, we interact our variable capturing years in the post-interim period with a binary variable capturing years in the descending period of the financial indicators, or alternately identifying years in the ascending period (the CYCLE variable). This allows us to observe whether HIPC borrowing from foreign banks occurred mostly during the expansion or contraction of international financial markets. Results in Table 4 first suggest that global credit cycles, when measured by the evolution of the LIBOR (columns (3) and (4)), do not seem to have affected the way HIPC governments gained access to lending by foreign banks. However, when using the VIX index as a proxy for global credit cycles (columns (1) and (2)), we see that governments that benefited from the debt relief initiatives dispro-

portionately borrowed from private foreign banks when the VIX was trending downward.

Indeed, after 2005, many of the HIPCs in our sample benefited from both the HIPC initiative and the MDRI, building up a substantial borrowing capacity. Yet the few years following the MDRI were characterized by increasing returns and financial volatility in OECD economies, a situation that did not lead private investors to seek higher returns and immediately lend to developing countries, HIPCs in particular. However, when the situation started to worsen in high-income countries, diminishing financial returns probably motivated private investors to look for higher returns in developing countries, among which HIPCs seem having been favored in view of their renewed debt sustainability and borrowing capacity. Results of Table S.C9 in the supplementary appendix also show a larger increase in debt commitments to private creditors during bearish dynamics of financial markets, suggesting that HIPCs, once debt relief was granted, were able to engage more with private creditors when the latter were faced by unappealing returns in high-income countries. These findings underline the short-term horizon of private investors (Santiso, 2003) who, in a highly competitive industry, are encouraged to favor profitable assets over debtors' reputation and their default track record, and ultimately help expose one of the main drivers underlying the market re-access of HIPCs.

### 5.3. Economic performances in benefiting countries

We then investigate heterogeneity in international credit market access among benefiting countries. Additional results in the supplementary appendix suggest that the decision of private creditors to lend to HIPCs has not been significantly driven by the distinctive economic or institutional developments in these countries. Interacting the post-interim period variable with economic and institutional characteristics of debtor countries such as economic growth, natural resource rents, political durability or the average haircuts on defaults to private creditors prior to 2000 (using data from Cruces and Trebesch (2013)) does not reveal any heterogeneity in market access among HIPCs with respect to these characteristics (see Table S.C10 in the supplementary appendix). However, private creditors do tend to be slightly less inclined to opt for politically stable countries (which are often less democratic), a fact that might reveal the importance of the political environment of the countries they lend to. Furthermore, we do not find any negative effect of the magnitude of prior haircuts on debt disbursements from foreign banks which, like the results for commercial law-

<sup>18</sup> Data have been retrieved from the Federal Reserve Economic Data (FRED) website.

<sup>19</sup> Financial volatility is often associated with bubbles and inflated market returns. Yet high volatility can also be of concern to private investors when they expect a financial bubble is about to burst.



suits, emphasizes the absence of lenders' recall and of reputational effects.

In addition, in order to account for the potential conditionality effect that might have helped benefiting countries to improve their macroeconomic outlook during the interim period, we also run estimations in which the effect of having benefited from debt relief throughout the interim period is differentiated according to macroeconomic improvements recorded during the debt relief process. To this end, the POST-HIPC variable is interacted with the growth rate of several macroeconomic indicators (often at the core of the macroeconomic stabilization programs jointly designed with the IMF), averaged over the entire interim period. The set of indicators considered therefore includes the growth rate of gross domestic product, private gross fixed capital formation, tax resources (expressed as the tax-to-GDP ratio), inflation, foreign exchange reserves (expressed in months of imports), and inflows of foreign direct investment (measured as a percentage of GDP). This specification enables us to observe whether HIPCs that most improved their macroeconomic outlook during the debt relief process disproportionately borrowed from private creditors subsequently. Results of Table S.C11 in the supplementary appendix suggest that private creditors did not significantly discriminate among HIPCs in favor of those with substantial economic improvements achieved through the interim period, suggesting the absence of conditionality effects. We notice only slightly larger borrowing for HIPCs having recorded a higher growth rate in private investment, although this effect is significant only at the 10% level.

#### 5.4. ODA shortage and financing flows substitutability

Lastly, it may be wondered whether the increasing resort to external private financing simply reflects a gradual withdrawal of official creditors from HIPCs, which could have been an important "push factor". Considering the large amounts of debt cancelled through the HIPC initiative by bilateral lenders and through the MDRI by multilateral donors, official creditors could have redirected financing flows toward LICs which did not benefit from these programs, especially in a context of public finance tensions for most of the traditional bilateral donors. Debt relief would not be additional and HIPCs, which still lack sufficient domestic financial resources to further their development, would thus have no other choice than seeking unconventional financing sources such as private creditors, now potentially interested because of the renewed borrowing capacity of HIPCs.

We test this hypothesis by running Eq. (6) and adding as an explanatory variable the net aid transfers from official donors as well as an interaction term with the POST-HIPC variable to capture the effect of debt relief conditional on the provision of official development assistance (ODA). Using data from the OECD-DAC, we follow Roodman (2006) and correct the net aid variable (NAT) for debt relief flows.<sup>20</sup> This variable is expressed as a percentage of the recipient country's GDP. Table S.A4 in the supplementary appendix provides descriptive statistics for this variable, as well as its sub-components by creditors (bilateral or multilateral donors). Table S.C14 in the supplementary appendix shows the effect of debt relief on our measure of market access with respect to ODA provision. It can be seen that the positive effect of debt relief on debt flows contracted from private creditors remains strongly significant. However, the coefficients associated with the interaction term do not suggest any disproportionate effects for HIPCs hav-

ing recorded a shortage in official development assistance (either overall or differentiating bilateral and multilateral creditors) in the aftermath of debt relief.

But when looking at results from Table S.C15 in the supplementary appendix, where debt commitments to private creditors represent the dependent variable, we see a negative and significant coefficient associated with the interaction term between POST-HIPC and overall ODA. This result implies that HIPCs registering a reduction in official aid flows in the wake of their completion point tend to contract more debt to foreign private creditors. The breakdown between bilateral and multilateral aid suggests that the overall effect is mostly driven by official development assistance provided by multilateral creditors. This result captures (to some extent) the "MDRI-netting out effect" implemented by IDA in the aftermath of the MDRI, which amounts to reducing official development assistance to countries having already benefited from the HIPC initiative in favor of non-HIPC countries (low-income countries in particular). Overall, this last set of results highlights another potential "push" factors that might have prompted HIPCs to look for new external financing sources, namely private ones.

## 6. Conclusion

Building on a difference-in-differences specification this paper investigates the effect of debt relief initiatives on unconventional borrowing and credit market access. By drawing comparisons with non-HIPC developing countries, our results support a positive correlation between debt relief provision and new HIPC debt disbursements toward private creditors. Findings indeed suggest that having benefited from the Enhanced HIPC initiative led HIPCs to turn to unconventional financing sources, namely foreign private banks. In addition, our results show that financing from private creditors did not occur at a greater cost for countries that benefited from the debt relief initiatives, as compared with other developing countries. Complementary results show that HIPCs turned to external private financing sources once they had been granted debt cancellations under the MDRI (i.e. once all their remaining multilateral debt stock had been cancelled). Yet investigation of the potential factors favoring this renewed access to international markets led us to observe that private creditors were somewhat reluctant to resume lending during the years when HIPCs faced legal disputes with former private creditors. They nevertheless did not seem to very much sanction HIPCs based on their lawsuit history (or on their own prior haircuts) over the long run, thus indicating the rather short memory of private lenders. We then show that the "this time is different" syndrome might have been favored by financial markets dynamics in OECD countries. Indeed, according to our results, HIPCs managed to borrow more from private foreign banks when financial markets in high-income countries were experiencing bearish financial dynamics. In the same vein, results also emphasize the absence of effects stemming from the conditionality associated with these debt relief programs, leading us to suppose that private creditors only considered the borrowing capacity of the countries they lent to (as well as the higher associated capital returns relative to those prevailing in OECD economies). Lastly, additional findings support reduction in multilateral financing flows as one of the potential "push" factors that might have encouraged HIPCs to look for new financing and contract with private creditors.

In a nutshell, it appears that these initiatives have driven up the financing opportunities by making borrowing on international credit markets accessible for countries historically excluded from them and to some extent relieved the "double original sin" weighing on HIPCs prior to these initiatives. These findings thus suggest that a new wave of debt relief in response of the Covid-19 crisis

<sup>20</sup> We thus remove debt forgiveness grants from official grants, and rescheduled debt from ODA loans. The net aid transfers (NAT) as defined in Roodman (2006) are therefore the sum of corrected measures of grants and ODA loans (net of repayments).

would not be a major impediment for subsequent external borrowing. According to the economic forecasts, OECD economies are expected to face the greatest recession since the Second World War. This would result in a situation similar to the aftermath of the 2008 global financial crisis, characterized by historically low interest rates. Hence such developments would lead private investors to look for appealing returns and again turn toward countries with borrowing capacity, as in the wake of the 2000s debt relief initiatives.

Nevertheless, sustained attention needs to be paid to the borrowing dynamic in order to avoid unsustainable debt levels, as we recently observed. LIC debt to private creditors is indeed often associated with high interest rates, which can easily lead to repayment problems. The IMF *Regional Economic Outlook* recently reported that some HIPC countries such as Zambia, Senegal, Ghana, Gambia and Malawi had reached worrying debt-to-GDP ratios (in 2016 their indebtedness ratio was twice as high as just after the MDRI).

Further research needs to investigate the factors that lead this enlarged access to international finance to weaken the debt sustainability of HIPC countries and particularly the connection between the debtor's economic "fundamentals" and the risk premiums that low-income countries face when borrowing from private creditors (Olabisi and Stein, 2015). Before the Covid-19 crisis, some countries, such as Senegal, reported an encouraging economic outlook with sound public finance, robust economic growth, and state sta-

bility, which can hardly explain the spreads offered on international financial markets. Developments in interest rates associated with private borrowing thus need to be carefully investigated since they (among other factors) might threaten the debt sustainability of these countries.

### Conflict of interest

The authors declare that there is no conflict of interest.

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### Appendix

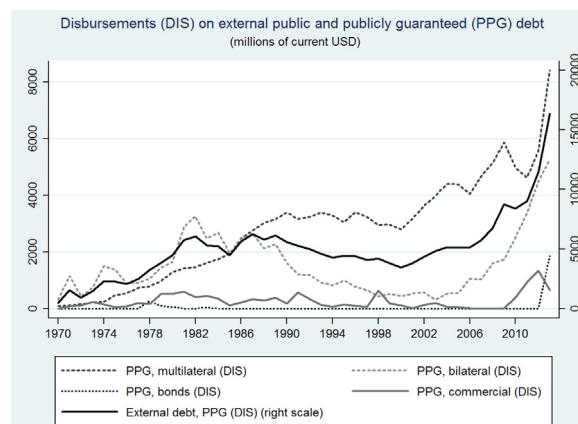


Fig. A.1. Debt disbursements in LICs. Sources: International Debt Statistics Database – World Databank.

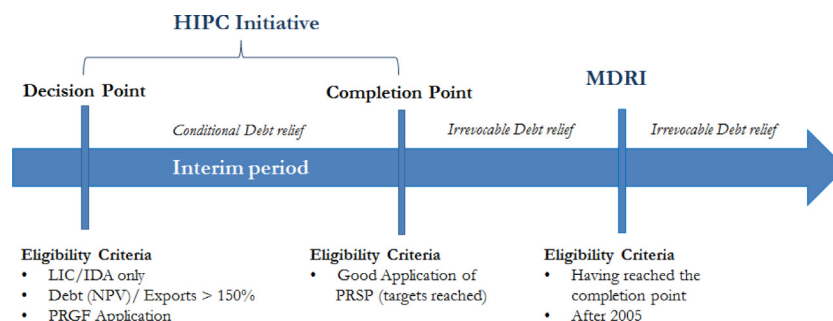


Fig. A.2. Debt relief initiatives for LICs.

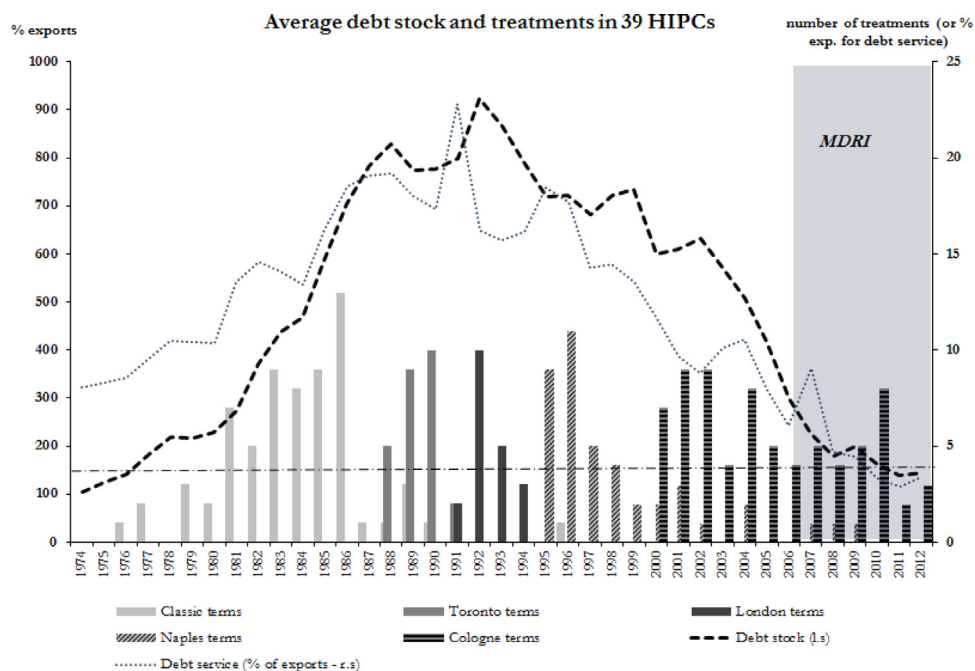


Fig. A.3. Debt relief treatments in HIPCs. Sources: International Debt Statistics Database – World Databank. Paris Club website for debt treatments.

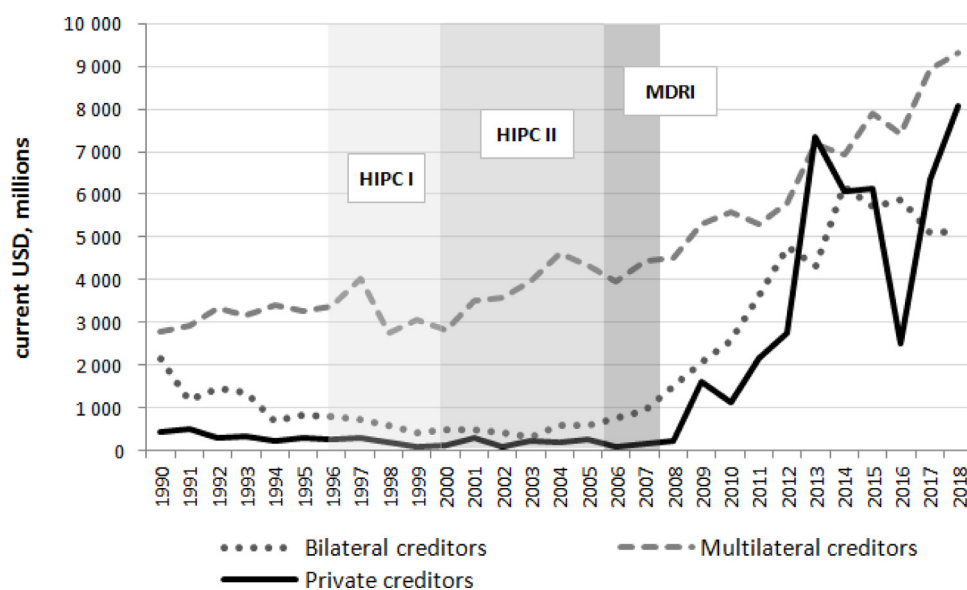
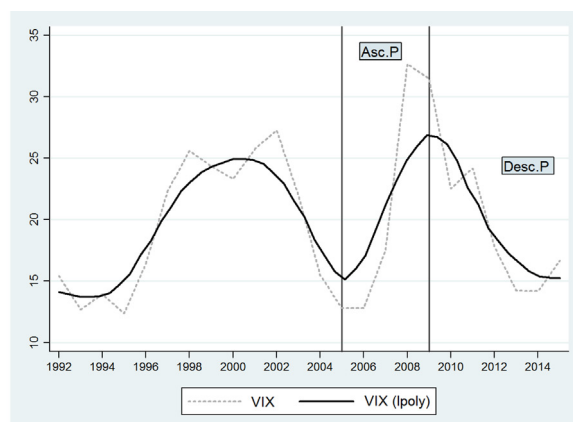
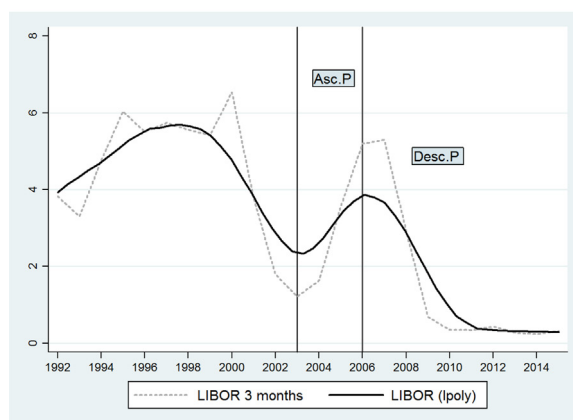


Fig. A.4. Total PPG debt disbursements for 24 HIPCs (from various creditors types). Sources: International Debt Statistics Database – World Databank. Notes: Shaded areas represent periods under which debt relief has been provided. HIPC I refers to the original HIPC initiative while HIPC II stands for the Enhanced HIPC initiative.



(a) VIX (Financial volatility index)



(b) LIBOR rate (3 months)

**Fig. A.5.** Financial volatility and market returns in high-income countries. *Notes:* Both graphs show the raw variation of the financial index as well as its smoothed evolution stemming from weighted local polynomial estimates which have been calculated using a classic kernel function. Asc.P denotes the ascending phase of the index while Desc.P the descending one.

**Table A.1**

Heavily indebted poor countries and sample restrictions.

Countries	Decision point	Completion point	MDRI
	Entry	Exit	
Decision point reached no later than 2007 and completion point attained prior to 2010			
Uganda	2000	2000	2005
Mozambique	2000	2001	2005
Bolivia	2000	2001	2005
Tanzania	2000	2001	2005
Burkina Faso	2000	2002	2005
Mauritania	2000	2002	2005
Benin	2000	2003	2005
Mali	2000	2003	2005
Guyana	2000	2003	2005
Sao Tome & Principe	2000	2003	2005
Senegal	2000	2004	2005
Nicaragua	2000	2004	2005
Niger	2000	2004	2005
Madagascar	2000	2004	2005
Honduras	2000	2005	2005
Rwanda	2000	2005	2005
Zambia	2000	2005	2005
Cameroon	2000	2006	2006
Malawi	2000	2006	2006
Ethiopia	2001	2004	2005
Ghana	2002	2004	2005
Sierra Leone	2002	2006	2006
The Gambia	2000	2007	2007
Burundi	2005	2009	2009
Central African Republic	2007	2009	2009



Table A.1 (Continued)

Countries	Decision point	Completion point	MDRI
Decision point reached no later than 2007			
Guinea Bissau	2000	2010	2010
Guinea	2000	2012	2012
Chad	2001	–	–
Democratic Republic of Congo	2003	2010	2010
Republic of Congo	2006	2010	2010
<i>Haiti</i>	2006	2009	2009
Decision point reached after 2007			
<i>Afghanistan</i>	2007	2010	2010
<i>Liberia</i>	2008	2010	2010
<i>Togo</i>	2008	2010	2010
<i>Côte d'Ivoire</i>	2009	2012	2012
<i>Comoros</i>	2010	2012	2012

Note. Sources: HIPC and MDRI Status of Implementation – International Monetary Fund. HIPCs in italic type are excluded from the sample. Only HIPCs in bold type are considered for the impact of the whole HIPC process. Sao Tome & Principe is excluded from the analysis because of too many missing values on control variables.

Table A.2

Sample of non-HIPC countries.

Albania	Colombia	Jamaica	Nigeria	Tajikistan
Algeria	Costa Rica	Jordan	Pakistan	Thailand
Angola	Djibouti	Kazakhstan	Panama	Tonga
Argentina	Dominica	Kenya	Papua New Guinea	Tunisia
Armenia	Dominican Rep.	Kyrgyzstan	Paraguay	Turkey
Azerbaijan	Ecuador	Lao PDR	Peru	Turkmenistan
Bangladesh	Egypt	Lebanon	Philippines	Ukraine
Belarus	El Salvador	Lesotho	St. Lucia	Uzbekistan
Belize	Eritrea	Malaysia	St. Vincent	Vanuatu
Bhutan	Fiji	Maldives	Samoa	Venezuela
Bosnia and Herzeg.	Georgia	Mauritius	Serbia	Vietnam
Botswana	Grenada	Moldova	South Africa	Yemen
Brazil	Guatemala	Mongolia	Sri Lanka	Zimbabwe
Cabo Verde	India	Morocco	Sudan	
Cambodia	Indonesia	Myanmar	Eswatini	
China	Iran	Nepal	Syria	

## Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <https://doi.org/10.1016/j.irle.2021.105978>.

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