

Unpleasant surprises? Debt relief and risk of sovereign default

Unpleasant
surprises

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Abstract

Purpose – The Covid-19 pandemic has rekindled interest in sovereign debt crises amidst calls for debt relief for developing and emerging countries. But has debt relief lessened the debt burdens of emerging and developing economies? The purpose of this paper is to empirically address this question. In particular, the focus is on the implications of debt relief and institutional qualities for sovereign debt in emerging and developing economies.

Design/methodology/approach – The model extends the framework on the probability of default by incorporating the receipt of debt relief by a debtor country. Doing so allows to better explain movements of sovereign defaults relating to debt relief. The model is estimated via the regular probit regression.

Findings – The analysis shows that the debt relief provided, thus far, failed to ease the debt overhang problems of developing and emerging countries and reduced investment. The current debt relief schemes may underscore the prospects of self-enforcing and self-fulfilling sovereign debt crises rather than eliminating the dilemma completely. Regarding the forms of debt relief, the analysis shows that debt forgiveness offers favourable prospects in terms of debt sustainability and economic outcomes than debt rescheduling. Perhaps, the sovereign debt crises, particularly in low-income countries, hinge on insolvency problems rather than transitory illiquidity issues.

Practical implications – Any debt relief mechanism should consider seriously the potential incentive effect that reinforces expectations of future debt-relief initiatives. Importantly, solving the sovereign debt problem requires a programme for sustained investment and economic growth, while not discounting the critical role of prudent debt management policies and institutions.

Originality/value – This study contributes a different angle to the debate on sovereign debt distress. Aside from the structural and economic factors, this study investigates the role of debt management policy in the debtor nation and the implications of debt relief benefits for sovereign risk. The framework also focuses on whether the different forms of debt relief exert distinctive impacts.

Keywords Debt relief, Debt forgiveness, Debt rescheduling, Sovereign default

Paper type Research paper

1. Introduction

The Covid-19 pandemic has rekindled interest in sovereign debt crises amidst calls for debt relief for developing and emerging countries. The World Bank and the International Monetary Fund (IMF) have called for the Debt Service Suspension Initiative (DSSI) [1]. The International Debt Statistics (IDS) 2021 report indicates that many countries entered the pandemic with elevated debt levels. The total external debt of the low- and middle-income

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countries rose by 5.4% to \$8.1tn at end-2019. In many low- and middle-income countries, the ratio of external debt stocks to gross national income (GNI) has increased over the past decade. Almost one-third of low- and middle-income countries had external debt-to-GNI ratios above 60% at end-2019, compared with 23% in 2010, and in 9% of the countries, the ratio exceeded 100%. According to the IDS 2021 report, the total external debt stocks of low-income countries eligible for the DSSI rose by 9% in 2019 to \$744bn, equivalent on average to one-third of their combined GNI. It appears debt burdens are at unsustainable levels just at the back of two decades of debt relief initiatives championed by the World Bank, in partnership with the IMF and the international community. The covid-19 pandemic may leave in its wake a new generation of sovereign debt crises. But has debt relief lessened the debt burdens of emerging and developing economies? The objective of this paper is to empirically address this question. In particular, the focus is on the implications of debt relief and institutional qualities for sovereign debt in emerging and developing economies. Emerging and developing economies are confronted with a substantial risk of being awakened by the unpleasant surprise of a wave of debt crisis and it is important to understand which countries are more likely to be affected. An empirical investigation of debt relief in terms of the dynamics of sovereign defaults is also a necessary effort for the policy reaction to be as effective as possible.

Eaton and Gersovitz (1981) in their seminal paper, point out the distinction between the “ability to pay” and the “willingness to pay” in the sovereign debt discussion. In furtherance, Verma (2002) emphasises the distinction between the “ability to pay” and the “willingness to pay” in the research of the determinants of sovereign defaults. Country-specific economic and structural factors influence the ability to honour sovereign debts while political and institutional factors explain the willingness to repay sovereign loans. Thus, various studies examine whether debt and fiscal variables, investments, gross domestic product (GDP) growth, reserves, interest rates and measures of a country’s political and institutional environment play an important role in explaining sovereign defaults (see, for example, Kraay and Nehru, 2006; Cuaresma *et al.*, 2010; Ordoñez-Callamand *et al.*, 2017; Ghulam and Derber, 2018; Balima and Sy, 2021; Augustin *et al.*, 2022 and the other studies cited therein). After the global financial crisis, global risk factors and external developments have also become more dominant in explaining sovereign risk (for instance, Gómez-Puig *et al.*, 2014; Amstad *et al.*, 2016). Some part of the sovereign default literature evaluates the determinants of market perceptions of default risk rather than the actual default episodes. These studies proxy the default risk using bond prices and investor surveys (Reinhart *et al.*, 2003; Uribe and Yue, 2006; Catão and Kapur, 2006). Other topics examined within the sovereign risk literature include the financial sector and vulnerability and crisis-related determinants of sovereign defaults (Reinhart, 2002; Ebner, 2009; Mody, 2009; Borensztein and Panizza, 2009; Caceres *et al.*, 2010). This strand of the literature dwells on the simultaneous occurrence of banking and currency crises (the so-called twin crises). Among these covariates in the sovereign risk equation, the extent and composition of external debt play a central role as an explanatory variable and is usually the object of analysis of most empirical contributions to the determinants of sovereign default. Although the extant studies find some empirical regularities [2], they by no means settle the debate over the stable and significant determinants of sovereign defaults. Aside from the structural and economic factors, this study investigates the role of political and institutional circumstances in the debtor nation and the implications of debt relief benefits for sovereign risk. My framework also focuses on whether the different forms of debt relief exert distinctive impacts [3].

The rising debt distress in some developing and emerging countries is a testament to the lingering concern that despite massive debt relief efforts, the sovereign debt crisis is still

unfolding and sovereign debt markets need close monitoring. [Dailami \(2010\)](#) identifies the hidden dynamics between sovereign and corporate debt and contends that rising sovereign risks represent a major source of policy concern and market anxiety, due to the risk of a negative feedback loop once investors lose confidence in the government's ability to use public finances to provide a safety net to corporations in distress or stabilize the economy. [Manasse and Roubini \(2009\)](#) indicate that the evaluation of the macroeconomic and structural weaknesses leading to sovereign defaults remains unexhaustive and most economists and practitioners struggle to properly appreciate the underlying mechanisms of sovereign defaults. It appears sovereign defaults require to be fully endogenized to produce comparable and more insightful results, and the contribution of this paper is valuable. Also, this paper contributes to the literature on the effects of debt reduction. Existing research documents somehow contrary results. [Cassimon et al. \(2015\)](#) find that the heavily indebted poor countries (HIPC) initiative increased domestic revenue and investment in Africa. The multilateral debt relief initiative (MDRI) exerted similar effects but to a lesser degree. [Romero-Barrutieta et al. \(2015\)](#) analyse Ugandan data for the period 1982–2006 and report that the investment-to-GDP ratio is 60% lower in the presence of debt relief while long-run debt and consumption-to-GDP ratios are about twice as high with debt relief than without it. In a later study, [Gamel and Van \(2018\)](#) find that debt reduction increases GDP per capita growth rates and household consumption. They show that debt reduction leads to higher investment in physical capital in both the short run and the long run. I contribute a different angle – I evaluate the possible impacts of the different forms of debt relief on the sovereign debt crises.

In analysing the impacts of debt relief on the debt problems of developing and emerging economies, I rely on the intervention theory that debt relief may exert direct and indirect effects on sovereign risk. Directly, debt relief may decrease the size of the debt stock, which may lead to a reduction of the debt overhang and lessen recurring debt payments. Indirectly, debt relief may produce a positive impact on economic growth to ease the sovereign debt crises via the following channels: renewed access to international private capital and the release of resources for improved investments. The improved conditions and public debt reduction should increase public spending and coupled with the inflow of private capital, increase investment, stimulate economic growth and impact the sovereign debt conditions of the debtor country. This study is structured around two major themes: firstly, understanding the forces affecting sovereign defaults and the dynamics of sovereign debt; and secondly, assessing the implications of the debt relief initiatives, in their different forms, for sovereign debt and risk in different groups of countries.

My model extends the framework on the probability of default by incorporating the receipt of debt relief by a debtor country. Doing so allows us to better explain movements of sovereign defaults relating to debt relief. I estimate the model via the regular probit regression since the test of exogeneity shows the absence of endogeneity problems in the sample. The framework delivers the joint incidence of debt relief and defaults. I establish that default events are associated with debt reliefs. The analysis shows the persistence of defaults in emerging and highly indebted poor countries. Instructively, the evidence suggests that sovereign debt crises and associated policy response of debt relief may just underscore self-fulfilling debt crises. Debt relief dampen the creditworthiness of debtor nations and may fuel expectations of the inability to honour sovereign commitment and result in a lower flow of private capital and a worsening of investments and output. This raises questions regarding the optimality of debt relief alone in response to debt crises. The analysis shows that growth is fundamental to the debt problem resolution and sound debt management policies and institutions are essential to ensuring debt sustainability and

deflating sovereign risks. The framework successfully delivers key empirical features of sovereign default: risk of sovereign default correlates negatively with output and investment and exhibits a positive correlation with the debt burden and cost of funds. I analyse the impacts of the different forms of debt relief and show that debt burdens have become less unsustainable with debt forgiveness than with debt rescheduling. This may suggest that the sovereign debt crises in emerging and developing countries may be a lack of solvency problem rather than a lack of liquidity problem.

The remainder of the paper appears in the following layout: Section 2 surveys the literature while Section 3 presents some historical statistics on sovereign defaults and debt relief. I discuss the empirical framework in Section 4 and next turn to Section 5, which presents the quantitative analysis and empirical results. Section 6 concludes.

2. Related literature: Sovereign debt and the risk of sovereign defaults

This study builds on a large body of literature on sovereign debts. Several attempts have been made in the literature to identify the risk factors associated with sovereign defaults (Aguar and Amador, 2014, for the survey of the literature). Typically, the analysis in the literature has focused on the effects and determinants of sovereign debt crises. A strand of the literature models the sovereign debt analysis as a bargaining game between a sovereign debtor and its creditors (e.g., Bai and Zhang, 2012; Yue, 2010; Pitchford and Wright, 2012; Bai and Arellano, 2014; and Hatchondo *et al.*, 2014). In a related study, Asonuma and Trebesch (2016) focus on the pre-emptive implementation of sovereign debt restructurings – sovereign debt restructuring before a payment default. Prior to the work by Asonuma and Trebesch (2016), Duggar (2013) and Erce (2013) empirically examined the pre-emptive and post-default sovereign debt restructurings based on case studies.

The implementation of debt relief programmes occasioned another thread of the literature on sovereign debt. The literature has typically focused on the welfare-enhancing abilities of debt relief initiatives. Bird and Milne (2003) investigate the economic growth and poverty reduction abilities of debt relief while Omotola and Saliu (2009) explore the development prospects of debt relief. Arslanalp and Henry (2005) question the efficiency of the Brady debt reduction deals and conclude that debt relief can generate large efficiency gains when the borrower suffers from debt overhang. Reinhart and Trebesch (2016) ascertain the economic impacts of debt relief and indicate that higher economic growth is associated with debt relief operations, only if these involve debt write-offs. Here, I focus on the potential of debt relief to underscore self-fulfilling debt crises. I separate debt write-offs and debt restructuring and empirically assess their potential to resolve the sovereign debt crises.

Is debt relief beneficial or not? The theory is ambiguous. Krugman (1988), Sachs (1989) and Obstfeld and Rogoff (1996) emphasize the potential welfare benefits of debt relief in a situation of debt overhang. A reduction in the debt level should support higher growth since an excessive debt stock and the prospect of large future debt repayments act as a tax on domestic investment and subdue the present value of investors' claims. However, related literature suggests that a restructuring can cause reputational damage and trigger sanctions and output losses (Eaton and Gersovitz, 1981; Bulow and Rogoff, 1989; Cole and Kehoe, 1998; Aguiar and Gopinath, 2006; and Arellano, 2008). In addition, Easterly (2002) suggests that debt relief may reduce the incentives to implement economic reforms.

Marchesi and Masi (2021) explain that debt relief could affect a country's prospects in at least two alternative ways. Default involving higher haircut/restructuring may entail more severe reputational costs. On the other hand, the channel of debt relief operates in the opposite direction. Since higher haircuts reduce the level of government's debt more

substantially, such debt reduction may allow countries to exit a debt overhang improving in this way economic prospects, as described by [Krugman \(1988\)](#). The overall impact of a debt restructuring on a country's economy is then theoretically ambiguous and remains an empirical question. My results illustrate this trade-off.

3. Public debt in crises and debt relief: historical statistics

The ongoing Covid-19 pandemic poses unprecedented consequences for government finances and may yet trigger a wave of sovereign defaults. Even before the pandemic, sovereign debts have reached significant heights. According to the IDS 2021 report, external debt stocks at end-2019 for 120 low- and middle-income countries passed the \$8tn mark. Long-term external debt rose by 7% from 2018 to \$6tn, equivalent to 73% of total external debt stock. The IDS 2021 report observes that the developments in the external debt of low- and middle-income countries in 2019 took place against the backdrop of a synchronized downturn in the global economy as the pace of GDP growth in low- and middle-income countries decelerated to about 3.5% in 2019 from 4.3% in 2018. Thus, it appears the explosion in the supply of public debt is happening at a time when sovereign issuers may be experiencing liquidity problems.

The data shows that the number of sovereigns has increased from 126 in 1960 to 215 in 2019 ([Figure 1a](#)) while the number of sovereigns in default has increased by over a 100% over the same period, reaching 88 at end-2019. The default rates (as percent of all sovereigns) stood at about 41% in 2019 compared to the rate of 13% in 1960. Between 1988 and 2005, at least 50% of sovereigns were in default. Despite the rising number of sovereign defaults, the ratio of sovereign defaults to World GDP has declined substantially from the considerable high of 2.1% in the 1980s to 0.3% in 2019 [[Figure 1\(b\)](#)] as the global economy expanded.

The total amount of sovereign debts in defaults burgeoned in 1982 and has since remained above US\$200bn, reaching a high of US\$526bn in 2013 [[Figure 2\(a\)](#)]. Sovereign defaults up-ticked significantly in 2012 and 2013 on the account of the debt crises in advanced economies, highlighted by the Greek sovereign debt default. The data shows that

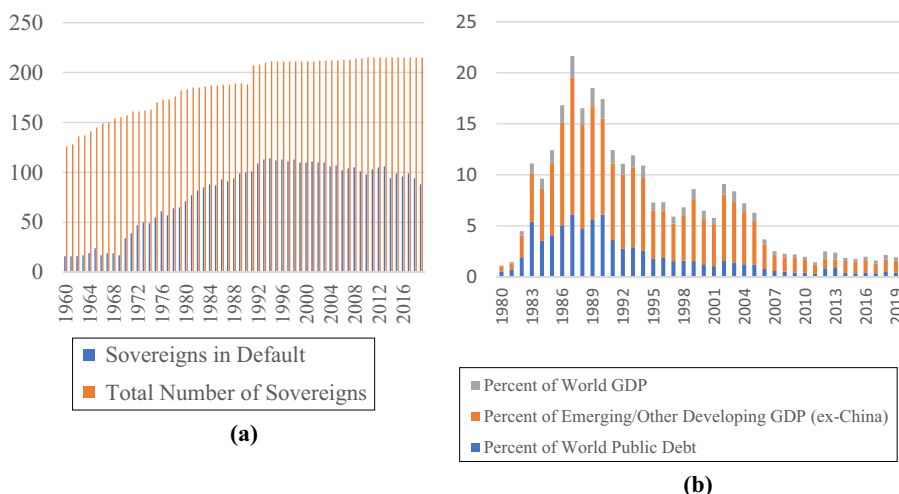
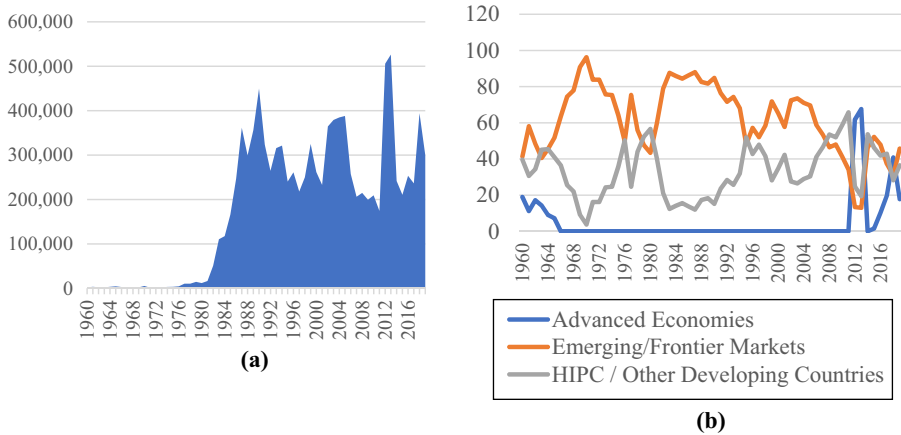


Figure 1.
 (a) Number of sovereigns and sovereigns in defaults
 (b) sovereign defaults (rates)

Source: Bank of Canada and Bank of England Sovereign Default Database

**Figure 2.**

(a) Total debt in default (US\$mil)
 (b) total sovereign debt in default (US\$mil) by economies

Source: Bank of Canada and Bank of England Sovereign Default Database

problematic debt has persisted since the 1980s [Figure 2(b)]. Emerging markets accounted for over 90% of sovereign defaults in the early 1970s and at least 80% of sovereign debts in defaults were from emerging economies in the 1980s. Generally, sovereign debt crises have involved debts from developing and emerging economies. Advanced economies disappeared from the sovereign debt stress scene in 1966, only to appear again in 2012.

The financial crisis of 2008–09 was perhaps one of the worst crises since the great depression and triggered grave consequences for the global economy and government finances. Notwithstanding, it appears the financial crises did not produce a wave of sovereign defaults, as was feared. Have debt relief initiatives moderated the sovereign debt burdens? Or perhaps most vulnerable countries were insulated from the turbulence due to low access to financial markets. Cuaresma *et al.* (2010) contend that most emerging economies, especially in East Asia and Latin America, entered the global financial crisis with substantially reduced debts, consolidated fiscal positions and accumulated buffer of reserves.

Surprisingly, middle-income economies were the greatest beneficiaries of debt relief, both in terms of debt forgiveness and rescheduling [Figures 3(b) and 4(b)]. Low-income economies appeared to have benefitted more from debt forgiveness than debt rescheduling. This may suggest that the debt problem in low-income countries was diagnosed as a problem of persistent insolvency rather than a question of temporary illiquidity. The highest amount of sovereign debt written off was recorded in 2005. Countries within Sub-Saharan Africa benefitted the most from debt forgiveness, while countries within Europe and Central Asia and East Asia and Pacific regions counted less among debtor nations that received debt forgiveness [Figure 3(a)]. In terms of debt rescheduling, Latin America and Caribbean nations were the greatest beneficiaries [Figure 4(a)]. The East Asia and Pacific region featured less among the recipients of debt relief, while Sub-Saharan Africa and Latin America and Caribbean countries received the greater considerations for debt relief.

4. Empirical frameworks

4.1 Methods

The usual econometric approach used to assess sovereign default determinants is to start by defining a binary variable (y) that takes the value of 1 at default periods ($y = 1$) and 0 in

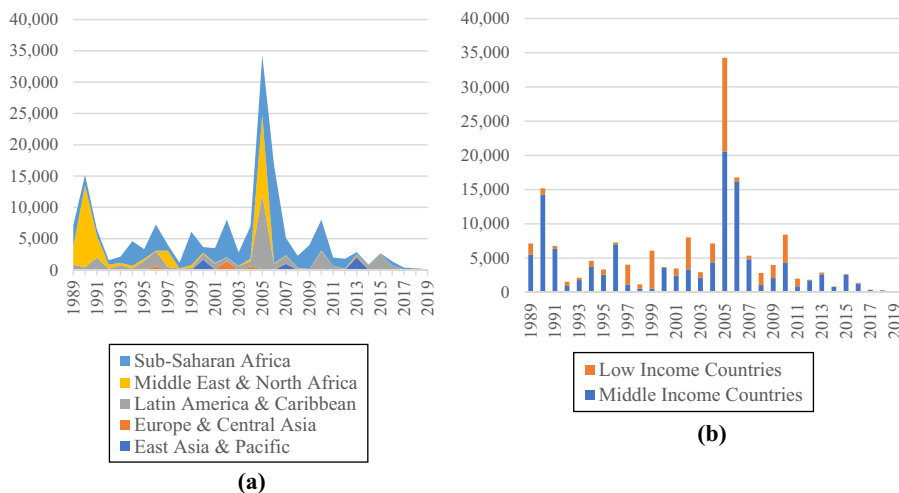


Figure 3.
(a) Debt forgiven (US\$mil) by region
(b) debt forgiven (US\$mil) by income group

Source: International Debt Statistics (IDS). High income countries are excluded from the data for the various regions

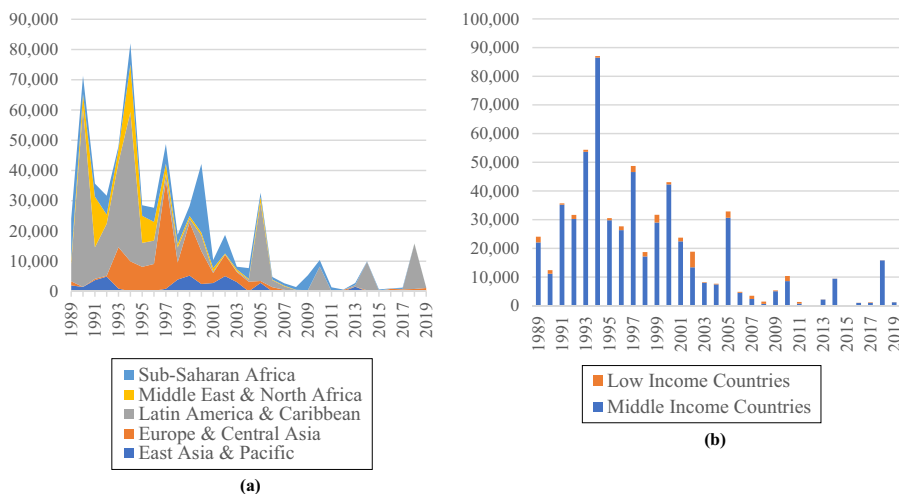


Figure 4.
(a) Debt rescheduled (US\$mil) by region
(b) debt rescheduled (US\$mil) by income group

Source: International Debt Statistics (IDS). High income countries are excluded from the data for the various regions

the rest of the sample ($y = 0$). Thus, the dependent variable is taken to be the probability of default. My probit model assumes that the probability of default is related to a vector of variables, X_i ($i = 1, \dots, K$) and if X_k denotes a group of $k \leq K$ variables from the set X_i , then the model explaining default with this group of covariates is given by [4]:

$$P(y = 1 | X_k) = \Phi(X_k\beta) \quad (1)$$

Where $\Phi(\cdot)$ is a Gaussian distribution function and β is a vector of parameters to be estimated.

I define the sovereign risk outlook as a function of nine (explanatory) variables. I trace the time path of default episodes relating to debt relief by including a measure of debt relief on the right-hand side of [equation \(1\)](#). I gauge that a debtor country received debt relief if the interest or/and principal was forgiven or rescheduled in any given year. The sum of debt forgiven, and debt rescheduled constitutes total debt relief. In the core specifications, debt relief is a binary variable: it is equal to 1 if incidences of debt relief occurred in a given year and 0 otherwise. Some other most common covariates are included, consistent with [Manasse and Roubini \(2009\)](#) and the other studies cited therein. I include external debt/GNI as a summary of the overall debt burden of a country. The growth rate of GDP per capita and total investment (gross fixed capital formation as a ratio of GDP) are included as measures of the repaying capacity of the debtor country. [Kraay and Nehru \(2006\)](#) indicate that including a measure of GDP crudely helps to capture the various shocks, both exogenous and endogenous, that countries experience. The country policy and institutional assessment (CPIA) debt policy rating is used to gauge the debt management environment. Political risk is estimated by an index of political stability and absence of violence and is included as a measure of the debtor country's willingness to repay loans. External solvency is linked to a sustainable level of external indebtedness, and this motivates our inclusion of trade openness (proxied by the ratio of exports plus imports to GDP). The average interest rate on new external debt commitments is included as a measure of the cost of borrowed funds. Finally, I include the average maturity on new external debt commitments (in years) as a measure of the refinancing risk or increased uncertainty about the debtor country's ability and wiliness to repay.

Endogeneity issues have generally undermined efforts to identify risk factors associated with sovereign defaults. Most sovereign default models violate the requirement of strict exogeneity as most measures of default risk may influence some frequently included determinants. I suspect that unobservable shocks affecting the probability of default may also affect the decision to offer debt relief. Therefore, I treat debt relief as endogenous and estimate the model via the Instrumental Variable Probit technique (ivprobit). However, the Wald test of the exogeneity of the instrumented variable shows there is not sufficient information in the sample to reject the null hypothesis of no endogeneity. Thus, a regular probit regression is appropriate for the model. I take cognizance of the possible correlation in the observations and utilise the generalized estimating equation (GEE) population-average estimators to produce consistent estimates [\[5\]](#). According to [Ghisletta and Spini \(2004\)](#), the GEE is a convenient and general approach to the analysis of several kinds of correlated data. The primary advantage of GEE resides in the unbiased and consistent estimation of population-averaged regression coefficients even when the correlation structure is mis-specified.

4.2 Data

Emerging market and developing economies have historically been more vulnerable to debt crises than higher-income countries, thus the analysis is based on a data set of 86 emerging market and developing economies [\[6\]](#), comprising annual observations for the period 1990–2019. The sample consists of unbalanced and irregularly spaced observations of debt reliefs and default episodes.

I rely on the Bank of England and Bank of Canada (BoC–BoE) Sovereign Default Database [\[7\]](#) for the data on sovereign defaults. On the regressors' side, I include proxies for

the most important determinants of sovereign defaults considered in the literature. Explanatory variables are sourced from IMF's World Economic Outlook, and the World Bank's IDS and World Development Indicators databases [8]. The measure of political risk was obtained from the International Country Risk Guide.

My sample excludes the default episodes occurring in the 1980s. This is because the data on debt reliefs was constructed from the IDS data on debt forgiveness and rescheduling, which were not available for those periods. However, it appears that the sample contains most of all defaults. The data on defaults and debt reliefs did not distinguish between creditors, private or official. Unsurprisingly, the summary statistics (Table 1) show that default episodes occurred more frequently in HIPC and developing economies than in emerging economies. Emerging economies were offered more debt rescheduling than debt forgiveness while the reverse occurred for HIPC and developing economies. Overall, HIPC and developing economies benefited more from debt reliefs. Emerging economies were less indebted and performed better in terms of trade openness, investments, debt management, economic growth and political stability. Emerging countries paid higher interest on borrowed funds and for relatively shorter maturities. This is contrary to the conventional view that debtor countries usually would have to pay a higher premium on long-term debts.

5. Empirical results [9]

The results of the probit estimations are presented in Table 2. The results suggest that default events are persistent and debtor nations receiving debt relief are at greater risk of sovereign default. The current structure of debt relief may come at the cost of making it more tempting to default, which reduces the country's welfare overall. This may imply that while debt relief initiatives may be credibility-inducing [10], they can produce perverse effects contrary to expectations. Ordinarily, debt relief programmes may be a tempting action to reduce the cost of default to a debtor country. However, it appears the initiative may come at a cost of less favourable access to credit and potentially breeds further defaults. The international credit markets may perceive debt relief actions as creating an incentive for that country, as well as other countries, to default in the future, raising the interest rates charged on sovereign borrowing.

Variable	Full sample	HIPC/developing countries	Emerging economies
Sovereign default	0.89	0.95	0.81
Debt relief	0.56	0.64	0.44
Debt forgiven	0.43	0.55	0.26
Debt rescheduled	0.34	0.39	0.28
External debt/GNI	67.36	76.94	53.51
Total investment	21.94	20.98	23.40
Trade openness	70.36	68.12	73.53
GDP per capita growth	1.67	1.44	1.99
CPIA debt policy	3.36	3.35	3.47
Political risk	0.68	0.65	0.71
Average interest rate	2.90	1.88	4.31
Average maturity (years)	24.56	29.09	18.66
Number of countries	86	51	35

Table 1.
Summary statistics
(mean 1990–2019)

Note: The country classifications are based on IMF income group classifications

Table 2.
Sovereign defaults
and debt relief
(probit model)

Variable	(1)	(2)	(3)
Debt relief	1.266*** (0.318)		
Debt forgiven		1.199*** (0.319)	
Debt rescheduled			1.366** (0.607)
External debt/GDP	0.013* (0.008)	0.013* (0.008)	0.017** (0.009)
Trade openness	-0.004 (0.006)	-0.003 (0.005)	0.005 (0.058)
GDP per capita growth	-0.063* (0.033)	-0.068** (0.032)	-0.069** (0.033)
Total investment	-0.028** (0.014)	-0.029** (0.014)	-0.028** (0.013)
CPIA debt policy	-0.209 (0.189)	-0.178 (0.184)	-0.342* (0.185)
Political risk	3.359** (1.579)	3.199** (1.493)	3.469** (1.426)
Interest rate	0.04 (0.088)	0.045 (0.081)	0.065 (0.085)
Maturity	0.022 (0.017)	0.020 (0.081)	0.031* (0.017)
Wald [<i>p</i> -value]	52.92 [0.00]	54.75 [0.00]	65.15 [0.00]
<i>N</i>	86	86	86

Notes: The dependent variable is the probability of default. Standard errors are in parentheses.
***Significant at the 1% level; **significant at the 5% level; *significant at the 10% level

I separate debt forgiveness and debt rescheduling to evaluate their respective impacts on default episodes. Both debt forgiveness and debt rescheduling exhibit a strong positive comovement with sovereign defaults. However, the estimates show that debt rescheduling improves the significance of debt policy and maturity in explaining the risk of sovereign defaults. Longer maturities increase the risk of default while improved debt management reduces the sovereign risk. The link between the maturity structure of sovereign debt and debt crises has generally underscored the urge for governments to increase the maturity of their debts. It is argued that shorter and more concentrated debt maturities increase the risk of default as short-term liabilities pose greater vulnerabilities to the economy. Besides, restructuring the debt portfolio towards the shorter end of the term structure may also reduce the refinancing risk arising from the exposure to sharp increases in interest rates. However, lengthening the maturity may come at a cost since long-term debts require a higher premium that may reflect uncertainties about the debtor nation's ability and willingness to repay. Shifting the maturity structure towards the longer end of the yield curve increases repayment uncertainties and heightens the risk of sovereign default.

The empirical evidence shows that strong public debt management institutions and policies are important in public debt sustainability and mitigating the risk of sovereign defaults in low and middle-income countries. This result implies that developing and emerging countries need to strengthen crucial areas of debt management, to reduce sovereign risk and ensure debt sustainability. Wasteful policies hurt economic growth and investments and adversely impact the country's ability to repay its debts. Easterly (2002) concludes that poor policies have neutralized past debt-relief efforts and have resulted in high debt accumulation. This finding suggests that offering debt relief to countries with bad debt management policies would exert little or no impact at all on their debt sustainability.

External solvency is linked to a sustainable level of external indebtedness and factors that affect it such as trade openness. It is believed that a low degree of openness can increase the probability of external default by affecting the trade surplus. Consistent with conventional expectations, the estimation shows trade openness correlates negatively with the risk of sovereign default. Nonetheless, it is not significant in any of the regressions, casting doubt on the dominance of global factors in explaining the risk of sovereign defaults. Also, the evidence from my sample does not support the hypothesis that political stability

improves the willingness to pay and reduces the risk of default. Consistent with Verma (2002), my findings show that political considerations affect the decision to default but countries with stable democracies exhibit a greater probability of default.

Idiosyncratic factors including debt burdens, economic growth, investments and the debt management environment appear as important factors explaining sovereign risk. Macroeconomic stabilities play a key role in explaining differences in sovereign default probabilities. Based on these results, the key factors to avoiding sovereign defaults include reduced debt burdens and improved economic growth. This raises concerns that the more protracted the Covid-19 pandemic, the higher the risk of sovereign default.

5.1 Sensitivity and robustness checks

I test the sensitivity of the results using an alternative specification of the dependent variable. I used a basic log model as follows:

$$\log s_{it} = \sum_{k=1}^K \beta_k X_{it} + \varepsilon_{it} \quad (2)$$

In this representation, the dependent variable is the log of the amount in default, X is a vector of the explanatory variables, β is a vector of parameters to be estimated and ε represents the idiosyncratic errors. Again, I estimate the coefficients via the population-averaged estimator. The results of the log model are presented in Table 3. I find that the results on the debt relief variables remained unaltered. Debt relief measures are positively correlated with the risk of sovereign default. Thus, the empirical results are robust to an alternative specification of sovereign risk. This set of estimations conforms with the probit estimations, which find that global factors play a much less important role than local factors in determining the risk of sovereign defaults. An increase in the debt burden increases sovereign defaults while improved debt management policy decreases the risk of sovereign defaults, emphasising the importance of the debt management environment and sustainable debt levels in moderating the sovereign debt distress. Longer maturities increase the rate of sovereign defaults to underscore the relevance of uncertainties of future repayments in predicting the risk of sovereign defaults. The specification involving forgiveness as the form

Variable	(1)	(2)	(3)
Debt relief	0.251*** (0.069)		
Debt forgiven		0.287*** (0.069)	
Debt rescheduled			0.285*** (0.068)
External debt/GDP	0.010*** (0.002)	0.009*** (0.002)	0.008*** (0.002)
Trade openness	0.003 (0.002)	0.003 (0.009)	0.003 (0.002)
GDP per capita growth	0.004 (0.009)	0.003 (0.009)	0.003 (0.009)
Total investment	-0.003 (0.005)	-0.002 (0.005)	-0.003 (0.005)
CPIA debt policy	-0.172** (0.072)	-0.166** (0.071)	-0.157** (0.072)
Political risk	2.224*** (0.072)	2.143*** (0.502)	2.206*** (0.499)
Interest rate	0.045 (0.030)	0.051* (0.029)	0.042 (0.029)
Maturity	0.015*** (0.006)	0.015*** (0.006)	0.017*** (0.005)
Wald [p -value]	303.35 [0.00]	306.35 [0.00]	302.26 [0.00]
N	86	86	86

Table 3.
Sovereign defaults
and debt relief
(log model)

Notes: The dependent variable is the log of amounts in default. Standard errors are in parentheses. ***Significant at the 1% level; **significant at the 5% level; *significant at the 10% level

of debt relief shows a significant coefficient for interest rate, suggesting that debt forgiveness may heighten the cost of future funds from the international capital market and lead to sovereign defaults.

5.1.1 The analysis involving HIPC and other developing economies. I estimate the core specification for HIPC and other developing countries. The results of the regressions of the various forms of debt relief and the structural variables and institutional and political variables on the probability of default are summarised in [Table 4](#). The results are not qualitatively different from the analysis involving the full sample. Debt relief co-move positively with the risk of sovereign default; however, the coefficient for debt rescheduling is statistically insignificant. Debt burdens worsen the risk of sovereign default while economic growth and total investments decrease the sovereign risk. Enhanced debt policy and institutions are important in alleviating sovereign debt distress in low-income countries. The results show that political risk, interest rates and maturities co-move positively with the probability of sovereign defaults in developing countries. Concerning openness, although insignificant, the results show that openness may be associated with better economic performance and, therefore, lower sovereign defaults. The effects of debt relief, debt burdens, debt policy, shocks (proxied by GDP growth and investment), cost of funds and uncertainty of repayments (shown by maturities) are larger for HIPC and developing countries than the full sample.

The core specification is not estimated separately for emerging economies due to insufficient observations. Notwithstanding, I employed bivariate relationships to facilitate comparisons between these two groups [[Figure A1\(a\)](#) and [\(b\)](#), [Appendix](#)]. Debt relief co-move positively with sovereign default for the two groups of countries. The relationship between debt rescheduling and sovereign defaults generates largely the same slope for both emerging and developing countries. In terms of debt forgiveness, the slope is steeper for emerging economies than for developing countries. The intercepts appear much larger for HIPC and developing countries than for middle-income countries in both cases of debt forgiveness and rescheduling. This may suggest that other factors other than debt relief explain the debt distress in low-income countries than in emerging economies. Differences in the probability of sovereign debt distress may be explained largely by structural factors such as macroeconomic fundamentals, debt burdens and institutional quality indicators.

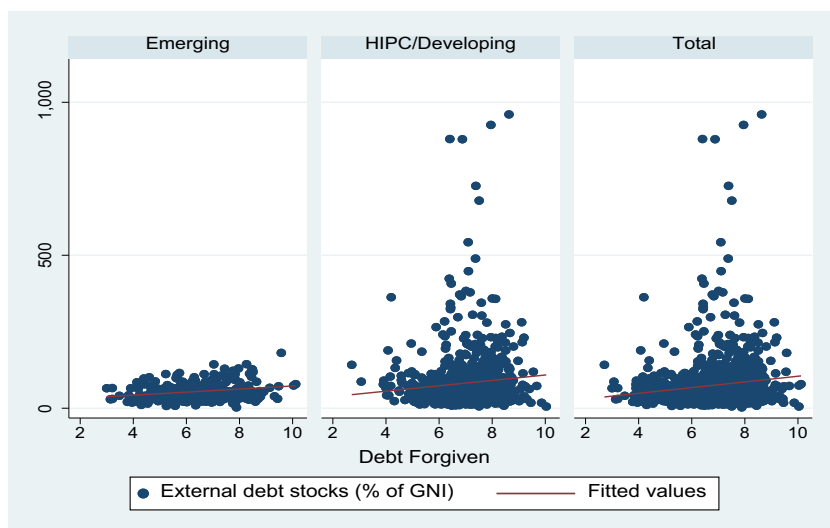
Table 4.
Sovereign defaults
and debt relief
(HIPC/other
developing countries)

Variable	(1)	(2)	(3)
Debt relief	1.385*** (0.391)		
Debt forgiven		1.303*** (0.392)	
Debt rescheduled			1.945 (1.440)
External debt/GDP	0.019* (0.010)	0.019* (0.009)	0.024** (0.011)
Trade openness	-0.007 (0.006)	-0.006 (0.006)	-0.004 (0.006)
GDP per capita growth	-0.061 (0.041)	-0.068* (0.040)	-0.070* (0.040)
Total investment	-0.035** (0.016)	-0.035** (0.015)	-0.029* (0.016)
CPIA debt policy	-0.333 (0.233)	-0.295 (0.226)	-0.516** (0.227)
Political risk	4.129** (2.001)	3.823** (1.872)	4.376** (1.777)
Interest rate	0.039 (0.110)	0.049 (0.101)	0.064 (0.105)
Maturity	0.030 (0.021)	0.030 (0.020)	0.042** (0.019)
Wald [<i>p</i> -value]	55.00 [0.00]	57.58 [0.00]	68.61 [0.00]
<i>N</i>	51	51	51

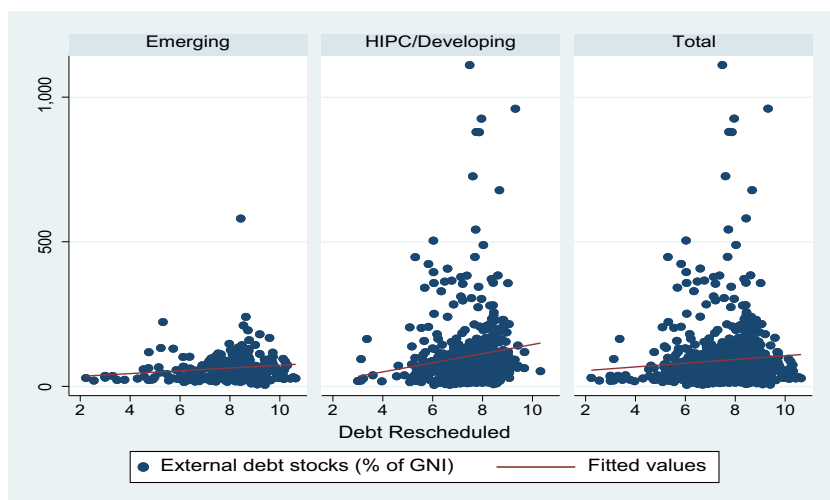
Notes: The dependent variable is the probability of default. Standard errors are in parentheses. ***Significant at the 1% level; **significant at the 5% level; *significant at the 10% level

5.1.2 *Debt Sustainability and debt relief.* Aside from the direct impacts of debt relief on the risk of sovereign defaults, I investigate the extent to which debt relief affect the debt burdens, economic growth and flow of capital to influence the risk of debt distress. Firstly, I examine the impact of debt relief on the debt sustainability situation by looking at the possible effects on debt burden and payment obligations via bivariate relationships.

Did debt relief produce large reductions in the debt burden? The data [Figure 5(a) and (b)] shows a tendency for both low- and middle-income countries to exit debt relief programmes more highly indebted. Among both groups of countries, debt forgiveness and rescheduling



(a)



(b)

Figure 5.
 (a) Debt forgiveness and debt burdens
 (b) debt rescheduling and debt burdens

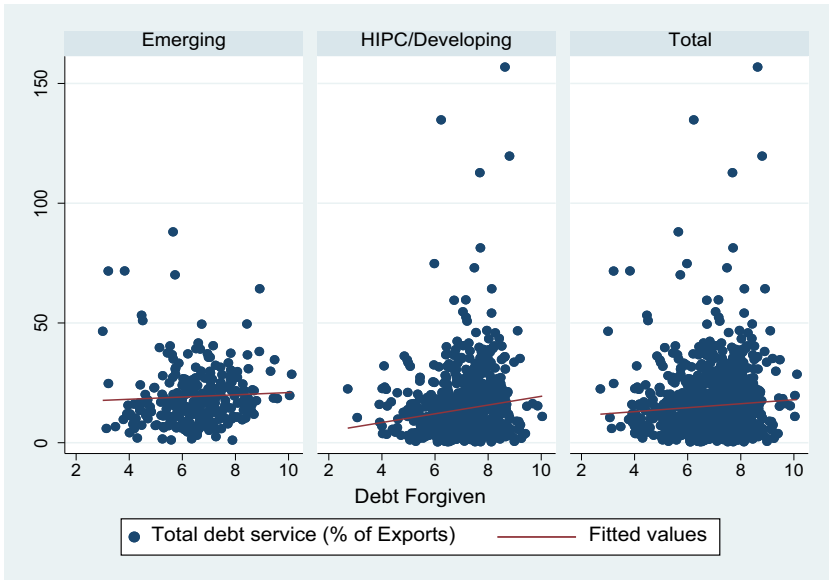
correlates positively with increases in debt to GNI ratio. The increases were especially large in HIPC and developing economies and debt rescheduling produces the biggest impact in these countries. It suggests that debt relief initiatives do not always successfully reduce a country's long-term debt burden. There is the likelihood that new loans are procured which may exceed the amount of debt forgiven. Debt relief may induce an incentive effect that broods on the knowledge that debt may be restructured which may lead to careless and inefficient borrowing by governments. The question of adverse selection problems also arises, to the extent that countries with wasteful and bad policies and economic management are offered more debt relief chiefly because of their unsustainable debt built up.

Also, debt relief did not reduce the flow of debt payments. This may imply that debt relief do not guarantee improved fiscal space and increased public spending. All things being equal, it appears debt relief improves the sustainability of debt burdens in emerging economies than HIPC and other developing economies. In both groups of countries, debt forgiveness tends to lighten the debt service obligation than debt rescheduling [Figure 6(a) and (b)]. Indeed, the evidence [Figures A2(a) and (b), Appendix] shows that debt forgiveness decreases the country's exposure to refinancing risk and allows debtor countries to lengthen their debt maturities and spread out the expiration period of their debt across an extended time. Given that maturity-choice behaviours exhibit refinancing risk concerns, debt rescheduling did not improve the countries' exposure to refinancing risk and for emerging economies, debt rescheduling heightens the refinancing risk concerns. Debt burdens have become less unsustainable with debt forgiveness than with debt rescheduling; albeit the debt stocks and payment obligations have hardly reduced because of debt relief. The prospects of debt relief ensuring long-term debt sustainability look bleak given the likelihood of new debts building up in debtor nations.

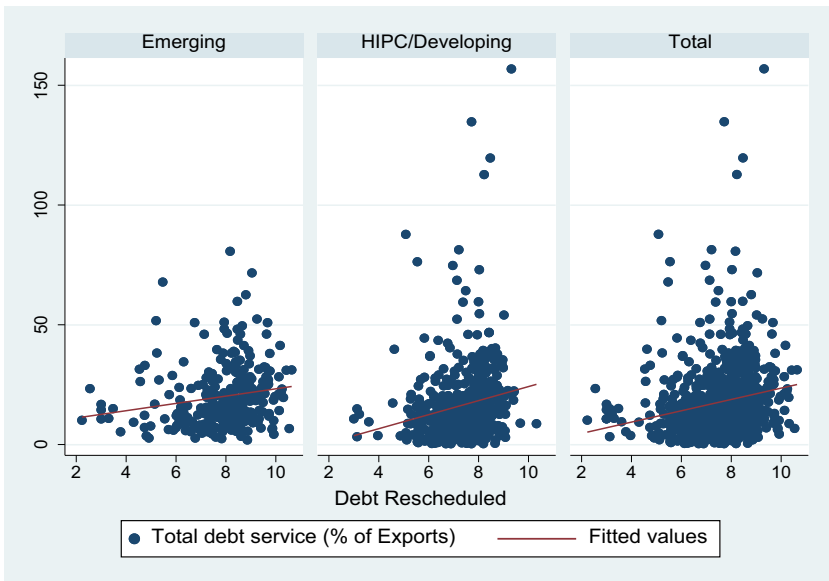
This result may give credence to the theoretical possibility of self-enforcing debt crises advocated by Calvo (1988). In this case, indebted nations build up more debts in what appears to be debt endogenously breeding more debts. This may suggest that default episodes may be self-inflicting, making the debt overhang problem persistent. Indeed, the question of moral hazard tendencies also arises – recipients of debt relief engage in irresponsible borrowing in anticipation of more debt relief. Also, the results may suggest that far fewer debt reliefs were offered to the debtor countries than they required. Perhaps, the debt problem was also inappropriately diagnosed (insolvency problem rather than temporary illiquidity problem), and the debt reliefs were offered in an inappropriate form (debt forgiveness instead of rescheduling). Overall, debt rescheduling leads to large increases in indebtedness than forgiveness in emerging and developing countries.

5.1.3 Debt relief and economic growth. I examine whether there are potential effects of debt relief traceable in the form of improved economic growth. A bivariate relationship does not attest to a positive effect of debt relief on economic growth [Figure 7(a) and (b)]. The evidence raises concerns regarding the prospects of debt relief to improve economic progress and welfare over time. The results corroborate the conclusion by Sachs (2002) that debtor nations were offered just enough reliefs to enable them to defray their obligations to primary creditors, but not enough to grow their economies. Regarding the forms of debt relief, debt forgiveness offers more favourable prospects and appears to increase with GDP per capita growth in emerging economies. Debt rescheduling on the other hand depresses GDP per capita growth in both emerging and developing economies.

It is expected that debt relief would moderate the debt overhang problem and lessen the distortions in investment decisions. I evaluate the impacts of debt relief on total investment. The data shows that total investments did not improve with debt relief [Figures 8(a) and (b)]. Both debt forgiveness and rescheduling tend to depress total investments and the effect



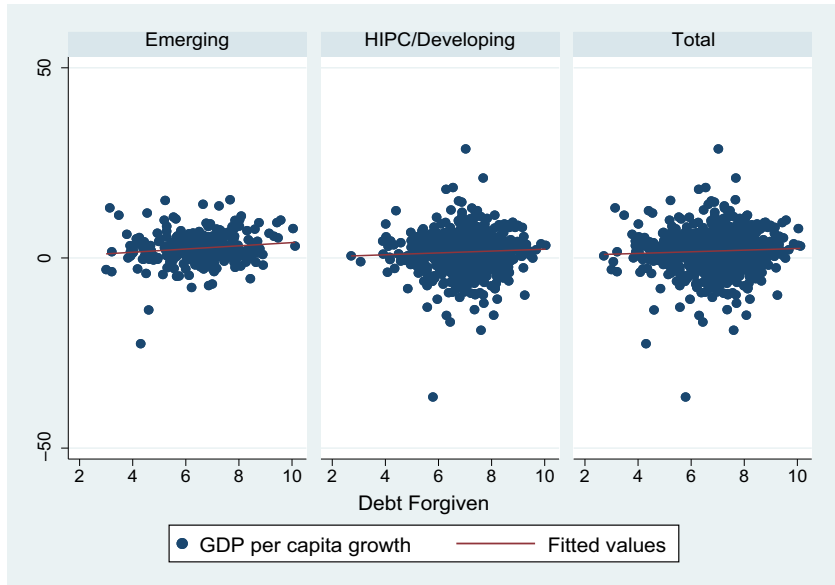
(a)



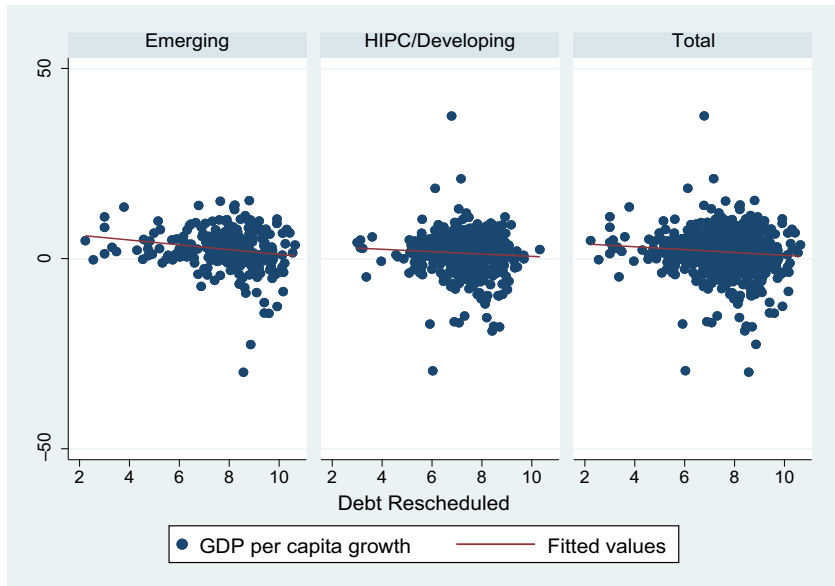
(b)

Figure 6.
 (a) Debt forgiveness and debt payments
 (b) debt rescheduling and debt payments

appears more pronounced with debt rescheduling. The evidence also shows that debt reliefs decrease investments more in emerging economies than HIPC and other developing countries. Debt relief may not result in a substantial reduction of the debt burden facing a country and the debt overhang problem may persist. Thus, volatility in debt payments may not reduce and

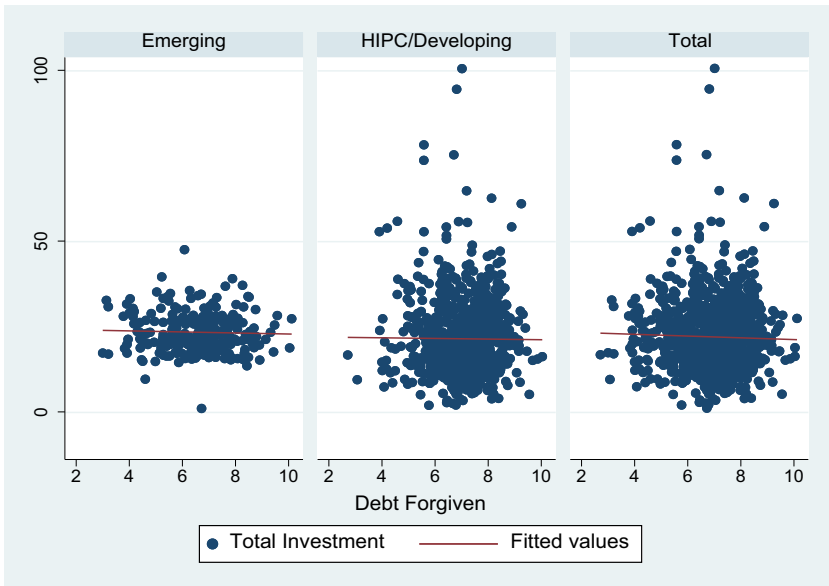


(a)

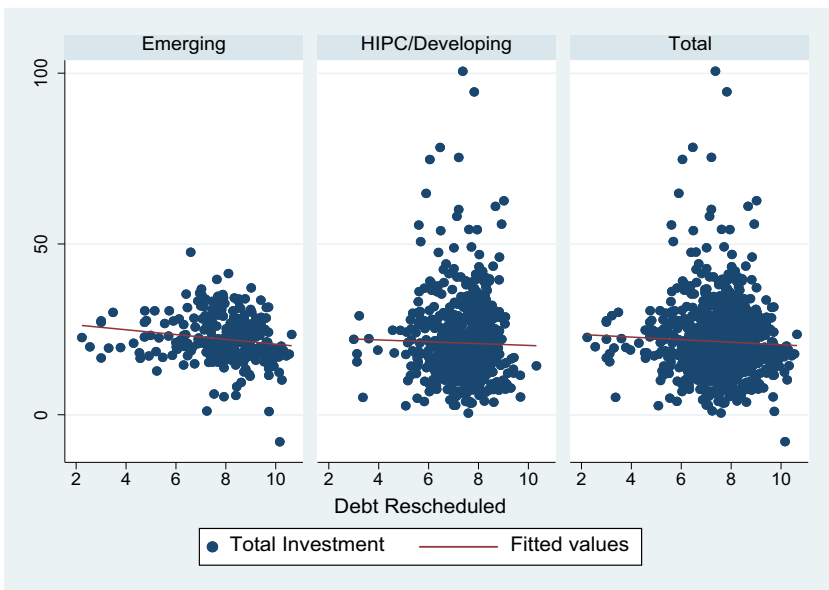


(b)

Figure 7.
(a) Debt forgiveness and economic growth
(b) debt rescheduling and economic growth



(a)



(b)

Figure 8.
(a) Debt forgiveness and total investment
(b) debt rescheduling and total investment

uncertainty regarding future payments may persist. This may lead to underinvestment in the debtor country and frustrates recovery from the debt crises.

5.1.4 Debt reliefs and access to credit. Debt overhang may inhibit access to new credit and leaves the debtor country even more vulnerable to crisis. I examine the prospect of debt relief improving credit flows to the indebted countries. The evidence shows that debt reliefs do not cause an inflow of new private capital [Figure 9(a) and (b)]. This finding casts doubts on the clout of debt relief initiatives to improve indebted countries' creditworthiness. The finding corroborates the fact that the level of indebtedness to private creditors may decline following debt relief. This does suggest that private creditors are usually able or/and the first to detect the insolvency problems of debtor nations. The reduction in private capital flows is graver in HIPC and other developing countries while greater reductions in the private capital flow are associated with debt forgiveness than debt rescheduling. For emerging economies, private credit flows tend to increase if the debt relief takes the form of rescheduling.

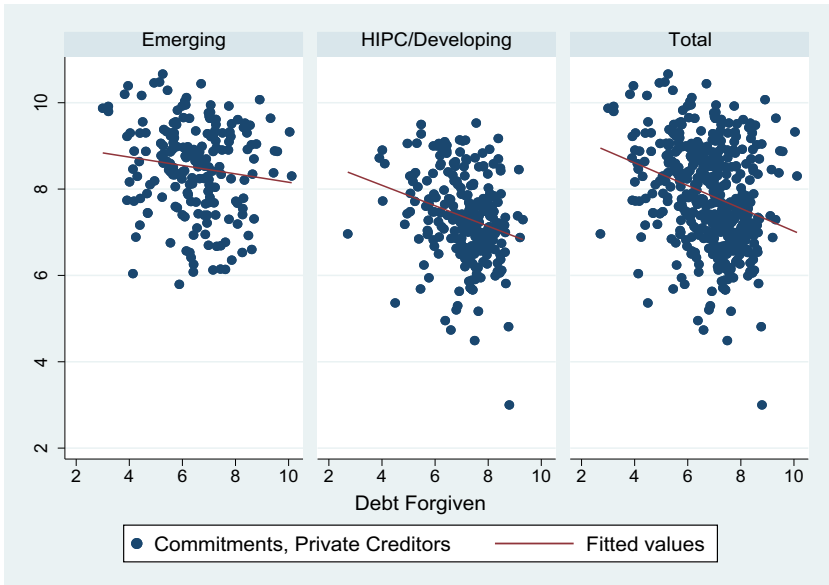
New creditors are not just reluctant to lend to a country receiving debt relief, it appears new funds are offered at a higher cost [Figure A3(a) and (b), Appendix]. Consistent with Eaton and Gersovitz (1981), I find that debt relief may damage the debtor's reputation for repayment and hike its future cost of funding from international capital markets. Greater increases in the cost of new funds are associated with debt rescheduling than debt forgiveness. These results appear to underscore a self-fulfilling debt crisis. In what Calvo (1988) describes as the perverse outcome of a snowball effect, the endogenous fear that debt can become unmanageable leads to unmanageable debts. Debt reliefs hurt the creditworthiness of debtor nations and increase the uncertainty of future repayments and result in a lower flow of private capital which consequently worsens investments and output to increase the risk of sovereign default.

These results suggest that the risk of debt distress is greatly considered by private creditors in the decision of resource transfers to middle- and low-income countries. The scale-down of capital flows should be of particular concern since it may lead to a slowdown in productive investments in debtor countries and potentially compound the debt crises. The reduction in flows from private capital should be associated with official lending (more importantly, concessional financing) to low-income countries to forestall any shortfall in resources for investments and worse cases of debt distress.

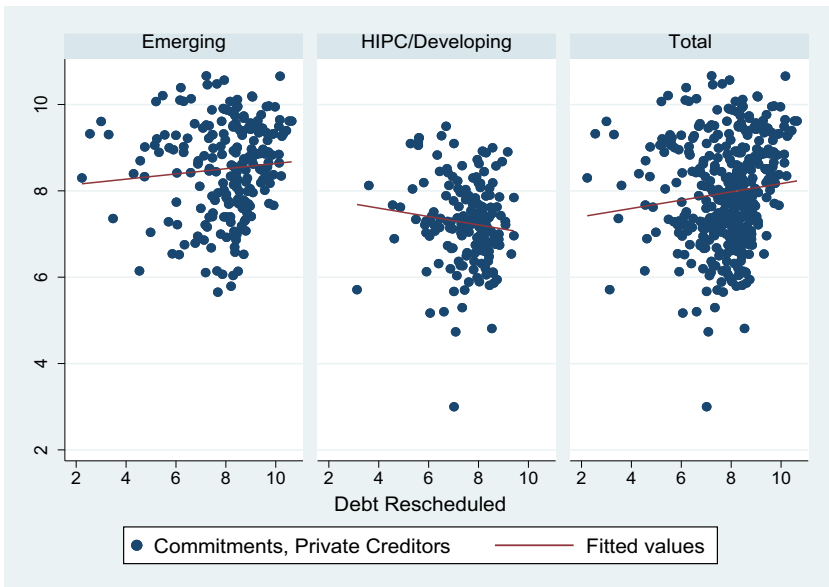
6. Conclusion

Understanding the impacts of debt relief on sovereign risk, investment and growth is pivotal to appreciating the circumstances under which debt relief can be expected to yield welfare gains. This study shows a strong positive co-movement of sovereign defaults with debt relief. The empirical analysis shows that debt relief over the period failed to lessen the debt overhang problems as it appears the amount of debt creditors are willing to write off is limited. Even if debt relief eases the debt-overhang problem, it may only represent a partial solution since the already heightened debt build-up continues to distort investment decisions in the debtor nation. Debt reliefs increase investors' perceptions of sovereign debt problems in emerging and developing economies and translate into higher costs of capital. Debt reliefs do not improve creditworthiness as private credit flows decline and investment reduces. Thus, debt reliefs hardly improve economic growth.

There appears to be an incentive effect that tends to reinforce expectations of future debt-relief initiatives, and this should be critically considered in any debt-relief mechanism. Regarding the forms of debt relief, the analysis shows that debt forgiveness offers more favourable prospects in terms of impacts on debt sustainability and economic growth than



(a)



(b)

Figure 9.
(a) Debt forgiveness and private credit flows (b) debt rescheduling and private credit flows

debt rescheduling. This may suggest that the sovereign debt crises in developing and emerging economies may be a permanent payment (lack of solvency) problem rather than a temporary repayment (lack of liquidity) problem.

Overall, my model specifications point toward a strong relationship between debt relief and the risk of sovereign defaults in emerging and developing economies. However, other factors such as debt burdens, shocks (proxied by economic growth and investments), the debt policy environment, repayment uncertainties (shown by maturities), cost of funds, political stability and trade openness may also affect the sovereign risk given their potential impact on the ability and willingness of governments to repay sovereign loans. Countries with a high debt burden, low GDP growth, low investments and high cost of funds are more likely to experience debt distress episodes. The evaluation shows that shortening the maturity of debts reduces the risk of sovereign default. Lengthening the maturity can reduce the refinancing risk but may not shrink the crisis zone, since it increases uncertainty

One concrete conclusion from the analysis is that strengthening debt management capacity in developing and emerging countries, will be an indispensable tool in preventing and mitigating debt crisis effects. The macro-management of the sovereign debt crises should consider efforts to improve creditworthiness at the sovereign level and reassure investors by focusing on the policymakers' ability to address and recover from economic downturns and ensure debt sustainability. Ultimately, a comprehensive programme to promote economic growth and efficient investments remains central to solving the sovereign debt problem.

The findings of this study may be indicative and raise doubts regarding the impacts of debt relief even as a welfare-improving intervention. Notwithstanding, it is uncertain if the results can be used to forecast the potential impacts of debt relief on developing and emerging economies. At some levels, these results should not be too surprising; nonetheless, they have important implications for debt restructuring and debt relief programmes.

Do creditors offer debt relief only if they expect to benefit from it? [Ochino \(2010\)](#) postulates that creditors can benefit from forgiving a portion of the debt in instances of a severe debt-overhang problem. Forgiving a portion of the debt and lowering the debt burden may reduce the risk of default and improves the market value of the remaining debt. If this effect is strong enough, the market value of the total debt in the absence of debt forgiveness can be lower than the market value of the remaining debt in the wake of debt forgiveness. Also, [Arslanalp and Henry \(2005\)](#) suggest that in instances of debt overhang both borrowers and lenders can benefit from debt relief as the stock market appreciates to increase shareholder value. It will be interesting to evaluate the relative impact of debt relief on both borrowers and creditors.

Notes

1. See [Lang et al. \(2021\)](#) for a detailed description of the DSSI.
2. The probability of sovereign debt distress is explained by the debt burdens, institutional quality indicators, monetary conditions, and macroeconomic fundamentals, such as economic growth and trade openness. The empirical analysis also shows strong relationship between sovereign bond spreads and macroeconomic fundamentals such as debt and debt-related variables, trade openness, risk-free rates and political risk.
3. This is imperative as [Reinhart and Trebesch \(2016\)](#) show that the form of the relief is crucial in assessing its consequences.

4. In our framework, we restrict ourselves to linearities in the relationship between sovereign default and its determinants. [Manasse et al. \(2003\)](#) argues that the nonlinearities in the relationship between debt crises and their determinants is better captured by binary recursive tree analysis. Consistent with [Kraay and Nehru \(2006\)](#), our interest is primarily the incidence of distress episodes and debt relief rather than their precise timing. Thus, the simple probit specification is adequate.
5. Estimates via the random-effects estimator (a cluster-specific estimator) are not qualitatively different from the population-averaged estimates.
6. [Table A1 \(Appendix\)](#) presents the details of the countries.
7. Refer to [Beers et al. \(2020\)](#) for details of the methodology used to construct the database. The BoC–BoE Sovereign Default Database considers that “a default has occurred when debt service is not paid on the due date or within a specified grace period, when payments are not made within the time frame specified under a guarantee or, absent an outright payment default, and in circumstances (*as follows*) where creditors incur material economic losses on the sovereign debt they hold”. These circumstances include agreements between governments and creditors that reduce interest rates and/or extend maturities on outstanding debt; government exchange offers to creditors where existing debt is swapped for new debt on less economic terms; government purchases of debt at substantial discounts to par; government redenomination of foreign currency debt into new local currency obligations on less economic terms; swaps of sovereign debt for equity (usually relating to privatization programs) on less economic terms; retrospective taxes targeting sovereign debt service payments; conversion of central bank notes into new currency of less-than-equivalent face value; government domestic arrears not paid on their due dates.

The BoC–BoE database is distinct from and complements the datasets measuring the creditor losses involving private creditors and Paris Club official creditors and nominal value of sovereign debt restructuring agreements published by [Das et al. \(2012\)](#) and [Cruces and Trebesch \(2013\)](#), respectively.

8. WEO – Total investment; IDS – External debt/GNI, debt relief, interest rate, maturity; WDI – Trade openness, GDP per capita growth, CPIA debt policy.
9. Lagging debt relief measures by one period leaves the results qualitatively unchanged, so we report the contemporaneous relationships. A test of granger causality between sovereign default and debt relief shows the standard reverse causality problem.
10. The public good nature of debt relief means that the offered debt relief by a creditor reduces its claims on a debtor country, thus, improving the value of all other claims.

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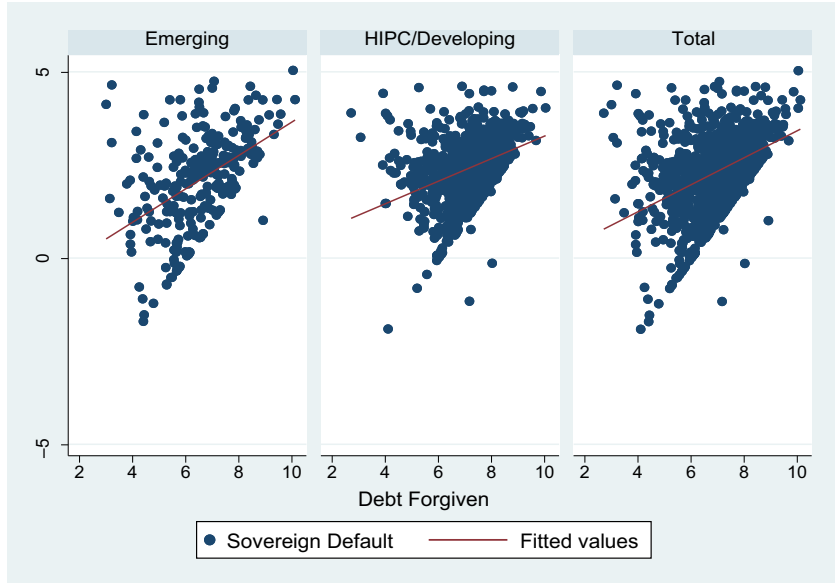
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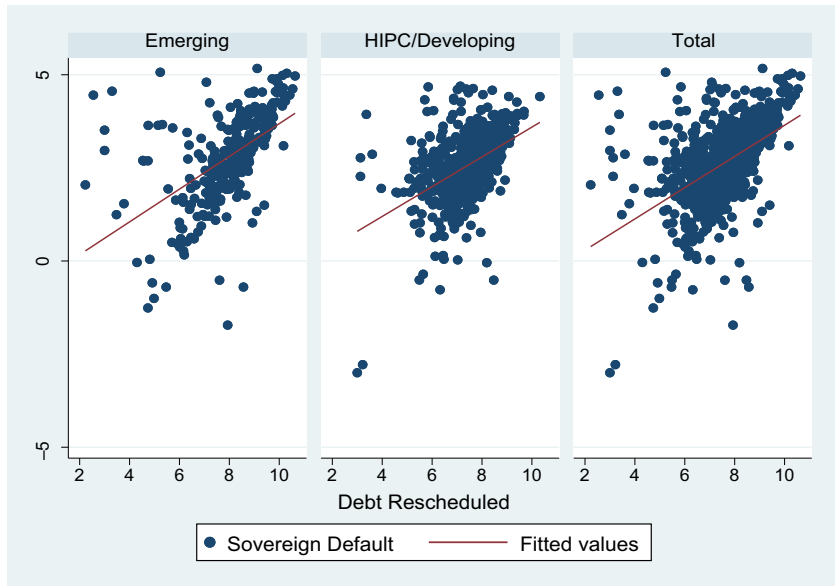
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Economy type	Countries
HIPC/other developing economy (51)	Afghanistan; Bangladesh; Benin; Bolivia; Burkina Faso; Burundi; Cambodia; Cameroon; Central African Republic; Chad; Comoros; Congo, Dem. Rep.; Congo, Rep; Côte d'Ivoire; Djibouti; Ethiopia; The Gambia; Ghana; Guinea; Guinea-Bissau; Guyana; Haiti; Honduras; Kenya; Kyrgyz Republic; Liberia; Madagascar; Malawi; Mali; Mauritania; Moldova; Mozambique; Nepal; Nicaragua; Niger; Nigeria; Rwanda; São Tomé and Príncipe; Senegal; Sierra Leone; Solomon Islands; Sudan; Tajikistan; Tanzania; Togo; Uganda; Uzbekistan; Vietnam; Yemen; Zambia; and Zimbabwe
Emerging economy (35)	Albania; Algeria; Angola; Argentina; Brazil; Bulgaria; Cabo Verde; Costa Rica; Dominica; Dominican Republic; Ecuador; Egypt; El Salvador; Fiji; Gabon; Georgia; Grenada; Guatemala; Indonesia; Jamaica; Jordan; Kazakhstan; Morocco; North Macedonia; Pakistan; Paraguay; Peru; Philippines; Russian Federation; Serbia; Sri Lanka; Tunisia; Turkmenistan; Ukraine; and Venezuela

Note: The country classifications are based on IMF income group classifications

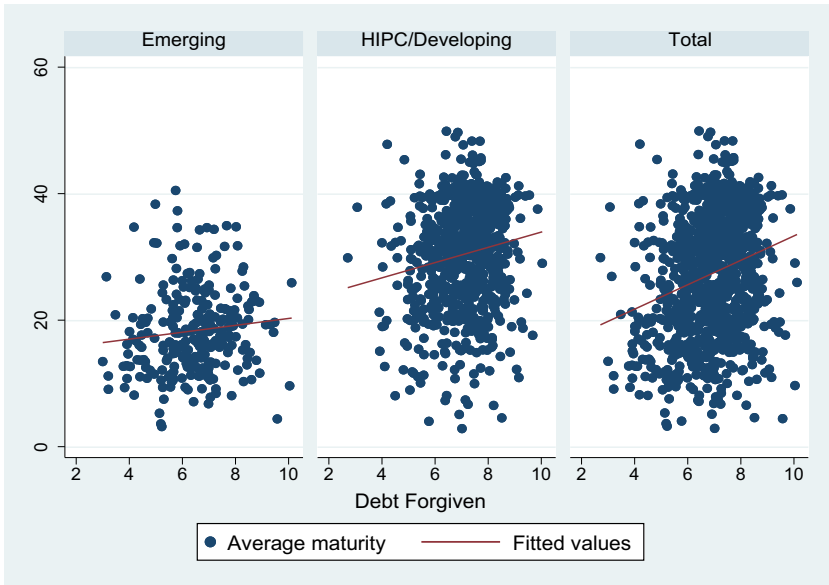


(a)

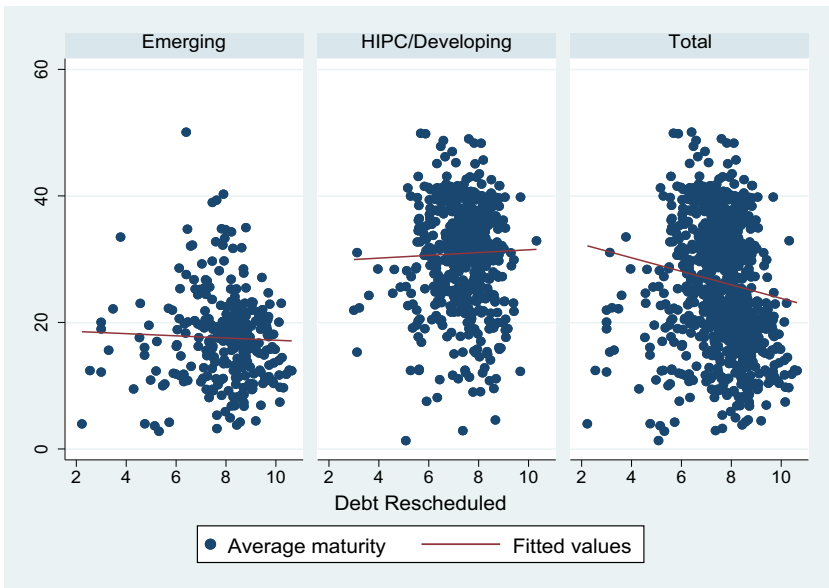


(b)

Figure A1.
(a) Debt forgiveness and sovereign default
(b) debt rescheduling and sovereign default

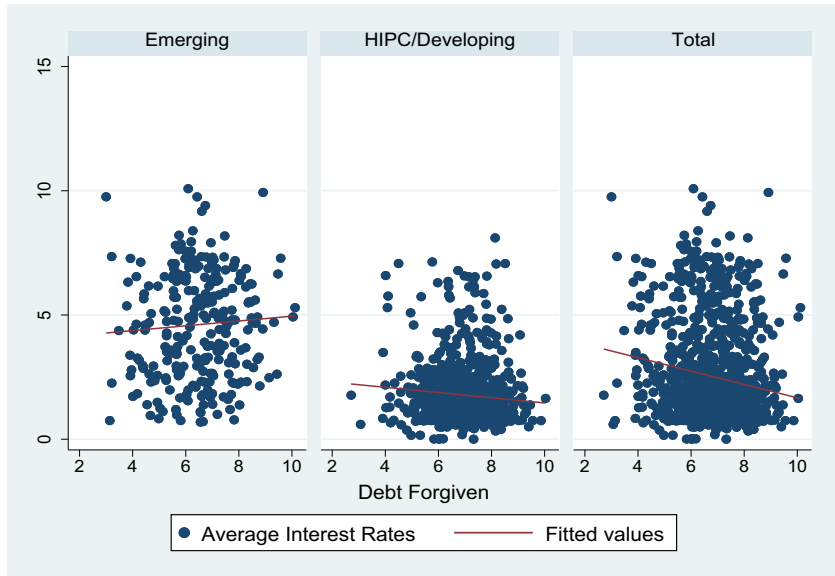


(a)

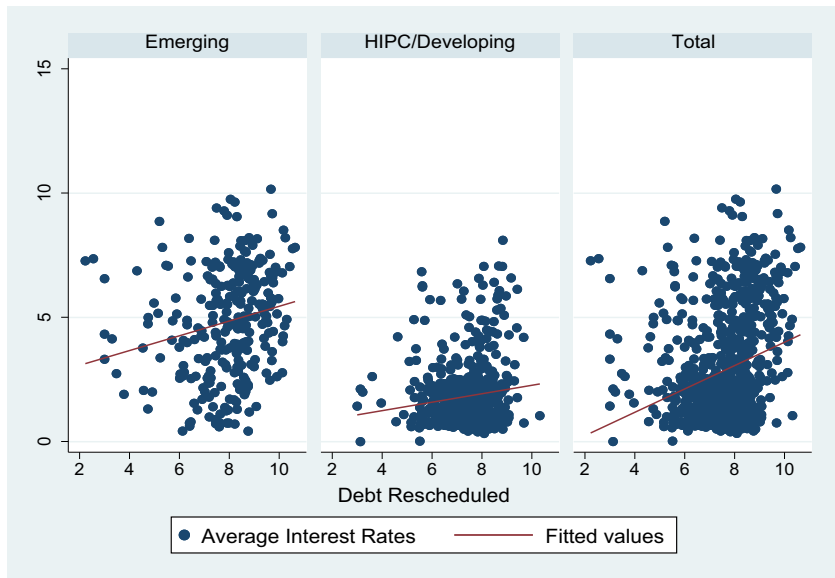


(b)

Figure A2.
(a) Debt forgiveness and average maturity
(b) debt rescheduling and average maturity



(a)



(b)

Figure A3.
(a) Debt forgiveness and average interest rates (b) Debt rescheduling and average interest rates