Online Appendix

This online appendix provides supplementary information on the empirical results presented in the article "Sovereign Lending after Debt Relief." Please note that references to Tables and Figures in the article are represented by roman numerals whereas capitalized letters refer to Tables and Figures in this appendix.

1 Main results

1.1 Tables

The article presents the main results in Figures 1, 2, and 3. The underlying regression analyses are presented in this section.

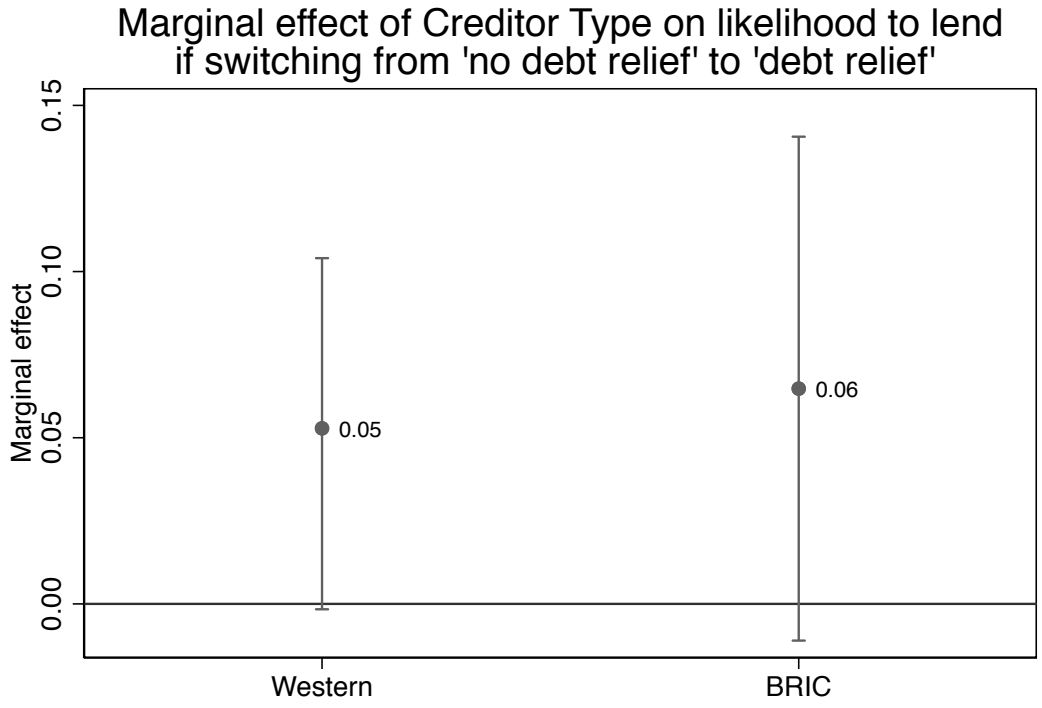
- Figure 1 differentiating between western and BRIC creditors (Hypothesis 1) is based on column (1) of Table A.
- Figure 2 distinguishes between creditors of different size (Hypothesis 2). These results are based on column (2) of Table A.
- Figure 3 examining differences across creditors conditional on their dependence on export markets (Hypothesis 3) is based on column (3) of Table A.

	(1) Hypothesis 1 (BRICs vs. West)	(2) Hypothesis 2 (Small vs. Large)	(3) Hypothesis 3 (Exporters vs. Not)
Creditor Equation			
Bilateral Debt Relief by Others	0.352	1.524*	-0.324
	(0.184)	(0.306)	(0.501)
Creditor type	0.089		
	(0.291)		
Debt relief x Creditor type	0.000		
	(.)		
Creditor GDP	0.000*	0.000*	0.000*
	(0.000)	(0.000)	(0.000)
Debt relief x Creditor GDP		-0.000*	
		(0.000)	
Creditor exports (% of GDP)			0.002
			(0.011)
Debt relief x Creditor exports			0.021
			(0.013)
Debtor Credit Rating	-0.043	-0.040	-0.046
	(0.040)	(0.037)	(0.065)
Debtor in default	-0.317	-0.349	-0.370
	(0.418)	(0.414)	(0.438)
Debtor Polity Score	-0.031*	-0.030*	-0.029
	(0.014)	(0.015)	(0.042)
Creditor current account balance	0.007	0.013	0.002
	(0.028)	(0.026)	(0.030)
Creditor private banks claims in debtor	0.000*	0.000*	0.000
	(0.000)	(0.000)	(0.000)
Debtor Natural resource exports	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.003)
Distance between debtor and creditor	0.245	0.210	0.211
	(0.241)	(0.249)	(0.275)
Constant	-1.744*	-1.770*	-1.733
	(0.695)	(0.497)	(1.284)
Debtor Equation			
Bilateral Debt Relief by Others	0.427*	0.303	0.365
	(0.213)	(0.231)	(0.208)
Debtor Moral Hazard	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
Debt relief x Debtor Moral Hazard	0.001	0.001	0.000
	(0.001)	(0.001)	(0.003)
Debtor Credit Rating	0.095	0.090	0.091
	(0.063)	(0.061)	(0.153)
Debtor in default	0.418	0.409	0.376
	(0.409)	(0.362)	(0.678)
Debtor Polity Score	0.027	0.023	0.021
	(0.022)	(0.020)	(0.085)
Potential size of loan	0.122*	0.123*	0.124*
	(0.028)	(0.029)	(0.039)
Potential grant element of loan	0.029*	0.027*	0.026
	(0.006)	(0.006)	(0.030)
Debtor Current account balance	-0.015	-0.016	-0.017
	(0.011)	(0.011)	(0.012)
Debtor GDP growth	-0.040	-0.043	-0.034
	(0.028)	(0.034)	(0.076)
Debtor Executive Party: Right	0.530	0.598	0.484
	(0.634)	(1.011)	(0.847)
Debtor Executive Party: Center	-0.323	-0.289	-0.277
	(0.222)	(0.205)	(0.727)
Debtor Executive Party: Left	-0.163	-0.125	-0.114
	(0.214)	(0.217)	(0.571)
Debtor Margin of Majority	-0.401	-0.310	-0.311
	(0.389)	(0.461)	(0.719)
Constant	-3.697*	-3.660*	-3.679*
	(0.606)	(0.552)	(1.288)
N	13501	13501	13116

Table A: Regression results of the main findings. Standard Errors in parentheses. * indicates $p<0.05$

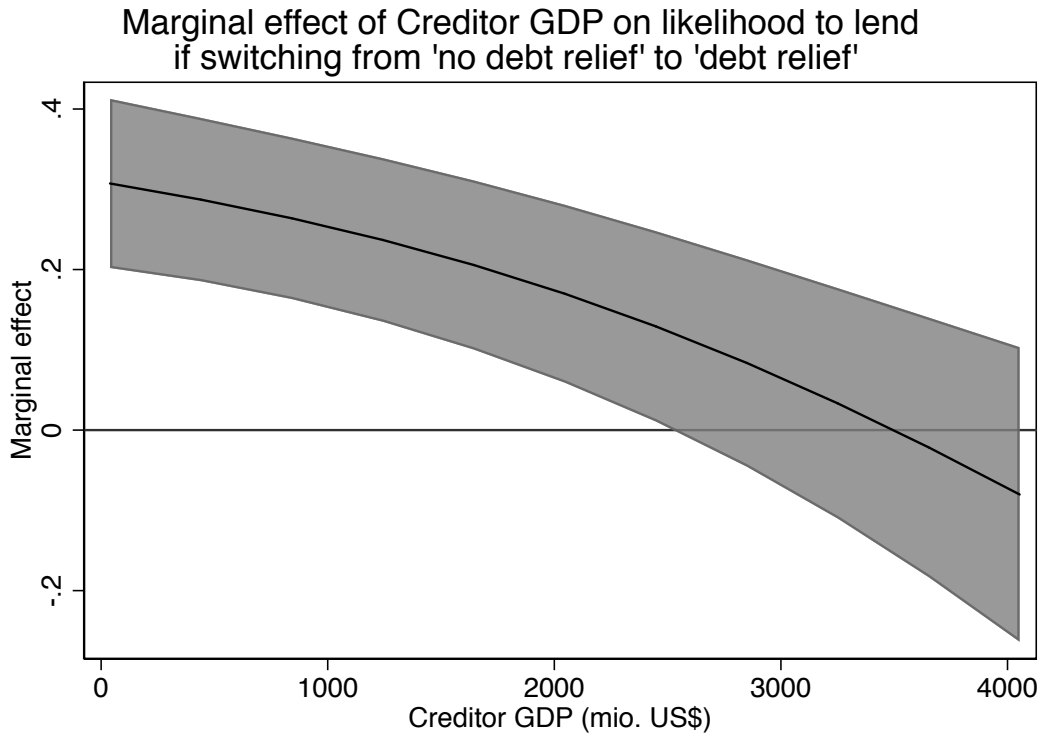
1.2 Additional figures

The article presents the findings by calculating the predicted probability of creditors extending a loan under different circumstances. In rare instances, overlapping confidence intervals do not necessarily indicate statistical insignificance. In these cases, marginal effect plots are better suited to indicate statistical differences. The Figures below provide this information. They show that marginal effect of switching from 'no debt relief' to 'debt relief' conditional on the type of creditor, size of the creditor, and creditor exports. The results are consistent with the graphs presented in the article: Only Hypothesis 2 (smaller creditors lend for influence) is statistically significant.



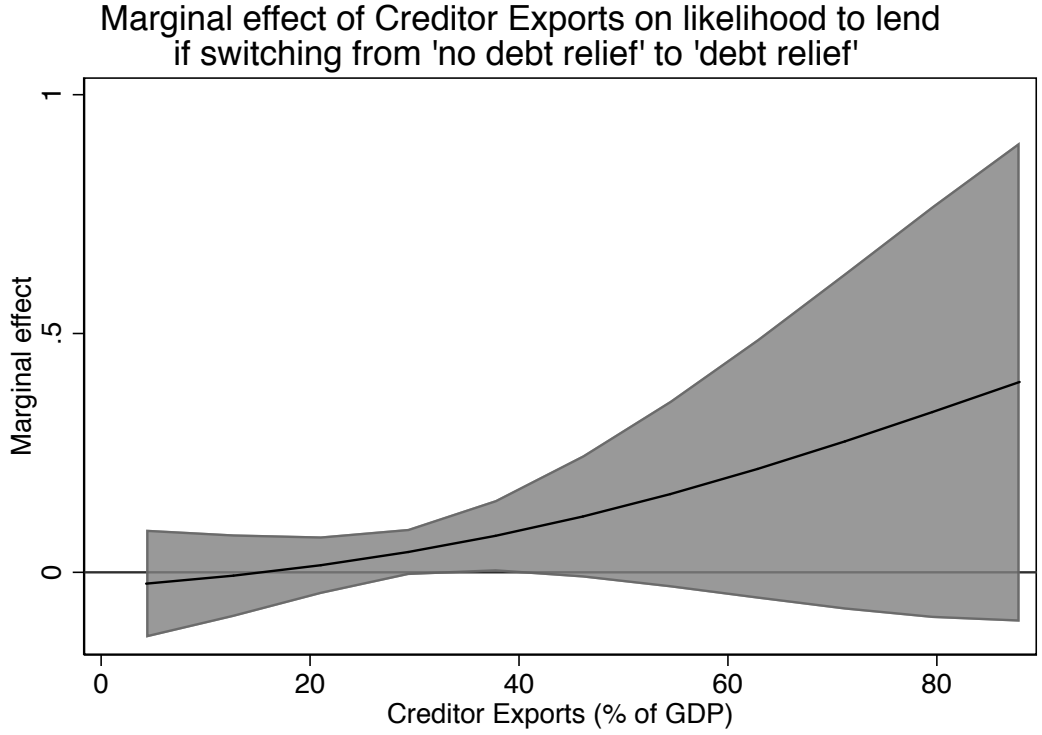
Note: The Figure illustrates that western and emerging creditors do not respond differently to debt relief.

Figure A: Marginal effect of switching from 'no debt relief' to 'debt relief' conditional on creditor type.



Note: The Figure illustrates that small creditors are more likely to lend to recipients of debt relief than large creditors.

Figure B: Marginal effect of switching from 'no debt relief' to 'debt relief' conditional on creditor size.



Note: The Figure illustrates that the degree of export-reliance does not influence creditors' decision to lend.

Figure C: Marginal effect of switching from 'no debt relief' to 'debt relief' conditional on creditor exports.

2 Robustness tests

2.1 Tables

The article presents several robustness tests. The tables containing the underlying analyses are presented in this section.

- For reference, column (1) of Table B presents the findings in support of Hypothesis 2.

- Column (2) of Table B displays the numerical results of the first robustness test, where I use multilateral instead of bilateral debt relief. Figure 4 is based on these results.

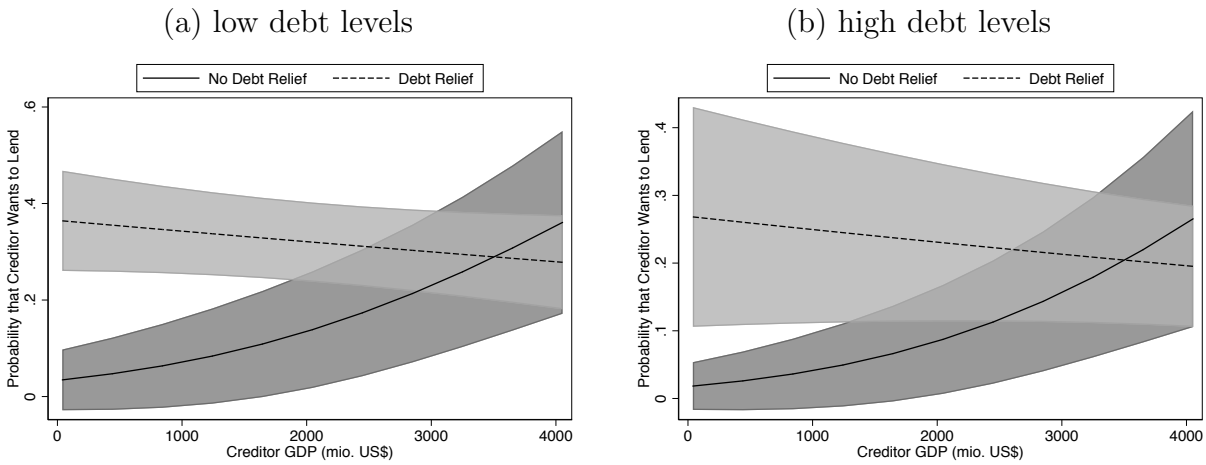
- Column (3) of Table B displays the numerical results of the second robustness test, where I use default instead of bilateral debt relief. Figure 5 is based on these results.

	(1) Original Finding Bilateral Debt Relief	(2) Robustness 1 Multilateral Debt Relief	(3) Robustness 2 Default
CREDITOR EQUATION			
Creditor GDP	0.000*	0.000*	0.000*
	(0.000)	(0.000)	(0.000)
Bilateral Debt Relief by Others	1.524*		
	(0.306)		
Debt relief x Creditor GDP	-0.000*		
	(0.000)		
Multilateral debt relief		0.021	
		(0.333)	
Multilateral debt relief x Creditor GDP		-0.000	
		(0.000)	
Default	-0.349	-0.341	0.128
	(0.414)	(0.460)	(0.343)
Default x Creditor GDP			-0.000
			(0.000)
Debtor Credit Rating	-0.040	-0.061	-0.047
	(0.037)	(0.039)	(0.037)
Debtor Polity Score	-0.030*	-0.031*	-0.031*
	(0.015)	(0.013)	(0.014)
Creditor current account balance	0.013	0.011	0.010
	(0.026)	(0.026)	(0.026)
Creditor private banks claims in debtor	0.000*	0.000*	0.000*
	(0.000)	(0.000)	(0.000)
Debtor Natural resource exports	-0.001	-0.001	-0.000
	(0.001)	(0.001)	(0.001)
Distance between debtor and creditor	0.210	0.259	0.252
	(0.249)	(0.239)	(0.217)
Constant	-1.770*	-1.492*	-1.679*
	(0.497)	(0.542)	(0.566)
DEBTOR EQUATION			
Debtor Moral Hazard	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
Bilateral Debt Relief by Others	0.303		
	(0.231)		
Bilateral Debt relief x Debtor Moral Hazard	0.001		
	(0.001)		
Multilateral debt relief		-0.178	
		(0.493)	
Multilateral debt relief x Debtor Moral Hazard		-0.000	
		(0.001)	
Default	0.409	0.416	0.626
	(0.362)	(0.399)	(0.384)
Default x Debtor Moral Hazard			-0.416
			(0.308)
Debtor Credit Rating	0.090	0.104	0.096
	(0.061)	(0.053)	(0.059)
Debtor Polity Score	0.023	0.030	0.027
	(0.020)	(0.017)	(0.022)
Potential size of loan	0.123*	0.124*	0.126*
	(0.029)	(0.025)	(0.024)
Potential grant element of loan	0.027*	0.029*	0.029*
	(0.006)	(0.007)	(0.006)
Debtor Current account balance	-0.016	-0.015	-0.016
	(0.011)	(0.010)	(0.010)
Debtor GDP growth	-0.043	-0.044	-0.043
	(0.034)	(0.028)	(0.028)
Debtor Executive Party: Right	0.598	0.456	0.519
	(1.011)	(0.587)	(0.566)
Debtor Executive Party: Center	-0.289	-0.380	-0.350
	(0.205)	(0.218)	(0.220)
Debtor Executive Party: Left	-0.125	-0.203	-0.173
	(0.217)	(0.183)	(0.213)
Debtor Margin of Majority	-0.310	-0.324	-0.358
	(0.461)	(0.352)	(0.367)
Constant	-3.660*	-3.776*	-3.715*
	(0.552)	(0.609)	(0.610)
N	13501	13501	13501

Table B: Regression results of the robustness tests. Standard Errors in parentheses. * $p<0.5$

2.2 Additional robustness tests

I also examine whether the difference between small and large creditors is robust to different reasons for which debt relief was granted.

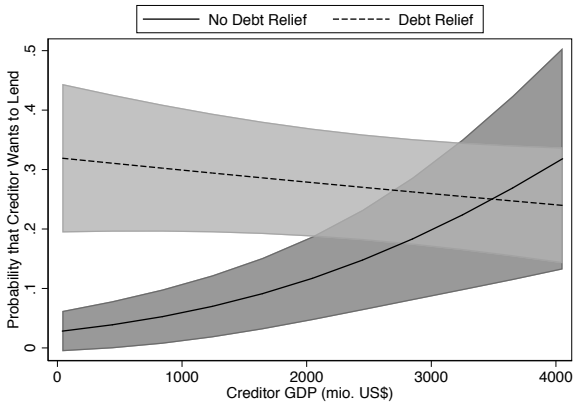


Note: Panel (a) examines lending for influence to countries with low levels of debt, while Panel (b) analyzes this effect with respect to countries with high levels of debt. Small creditors do not appear to condition their lending on the level of existing debt.

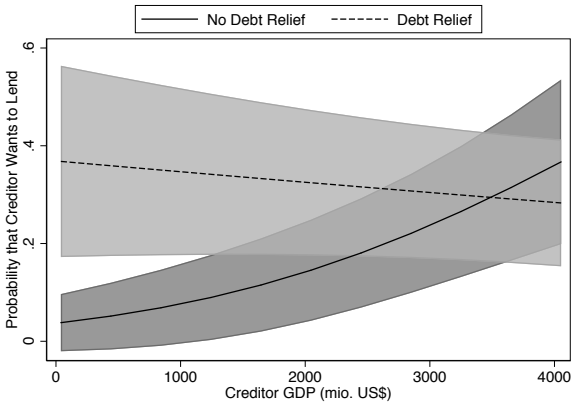
Figure D: Effect of small creditors conditional on existing debt stock

First, the incentives to lend for influence might be conditional on the level of existing debt. Assuming the existence of a 'Debt Laffer Curve (Claessens, 1990), debt relief might be beneficial for both debtors and creditors if it addresses a debt overhang effect. That is, debt relief granted to a country on the 'wrong side of the Laffer curve will likely have a positive effect on debtors efforts to reform and invest (Arslanalp & Henry, 2006). Thus, it is unlikely that all developing countries will benefit from debt relief. I examine this possibility by analyzing the incentives for creditors to lend to countries with high versus low levels of existing debt. I follow the World Bank and classify countries with a debt-to-export ratio of above 150% as highly indebted. Figure D shows that small creditors do not appear to condition their lending on existing debt levels.

(a) low levels of reserves



(b) high levels of reserves

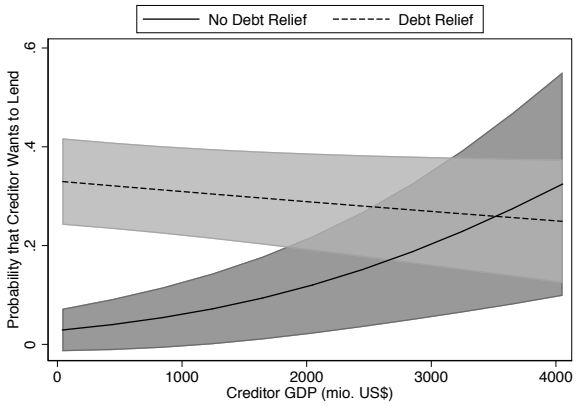


Note: Panel (a) examines lending for influence to countries with low levels of foreign exchange reserves, while Panel (b) analyzes this effect with respect to countries with high levels of debt. Small creditors do not appear to condition their lending on the level of existing debt.

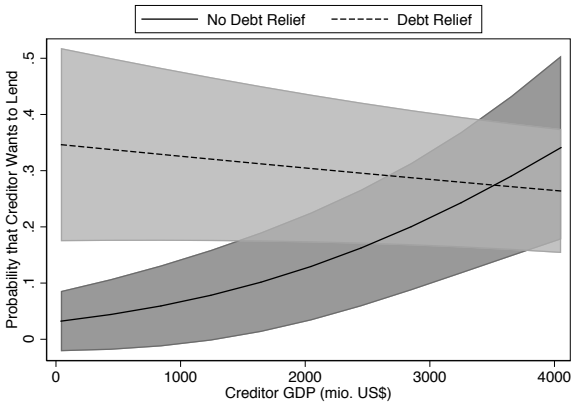
Figure E: Effect of small creditors conditional on existing reserves

It is also possible that debt relief was granted to deal with liquidity problems, rather than a large debt stock. Thus, I examine if the effect of small creditors depends on the level of reserves. I consider countries with reserves amounting to less than 50% of total external debt as vulnerable, while those above this thresholds have sufficient reserves to ward off liquidity problems. Figure E shows, however, that small creditors free-ride on debt relief, irrespective on the level of reserves.

(a) HIPC eligible



(b) HIPC ineligible

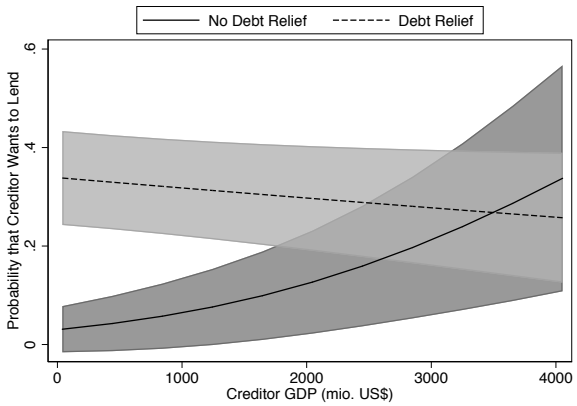


Note: Panel (a) examines lending to countries eligible to receive multilateral debt relief under the HIPC initiative, while Panel (b) analyzes countries that did are not eligible. The effect of small creditors exists in both subsamples.

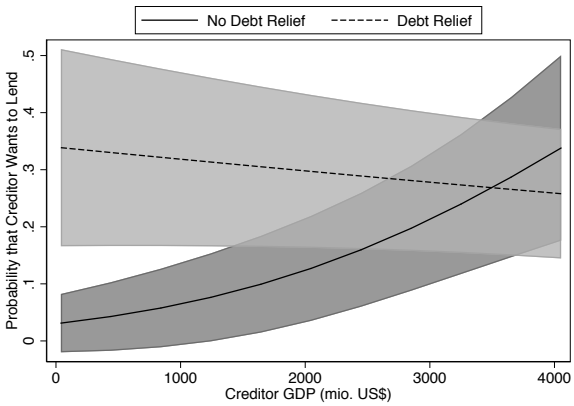
Figure F: Effect of small creditors conditional on why no debt relief was obtained

Access to multilateral debt relief might also matter. Specifically, only a subset of developing countries is eligible to benefit from the HIPC and/or MDRI initiatives. To obtain multilateral debt relief, these countries must implement significant domestic policy reforms. This might limit the room for policy concessions to specific bilateral creditors and thus shape the incentives for small creditors to lend for influence. However, Figures F and G indicate that these dynamics do not shape lending by small creditors.

(a) MDRI eligible



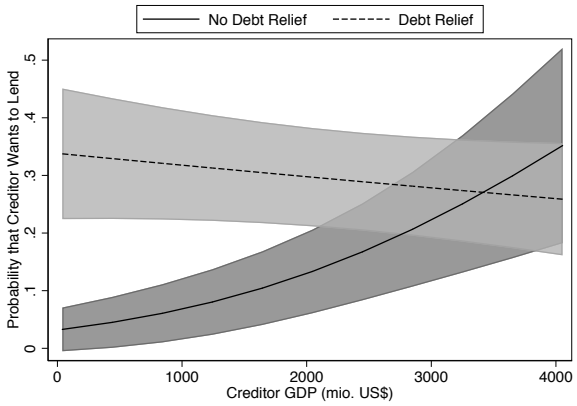
(b) MDRI ineligible



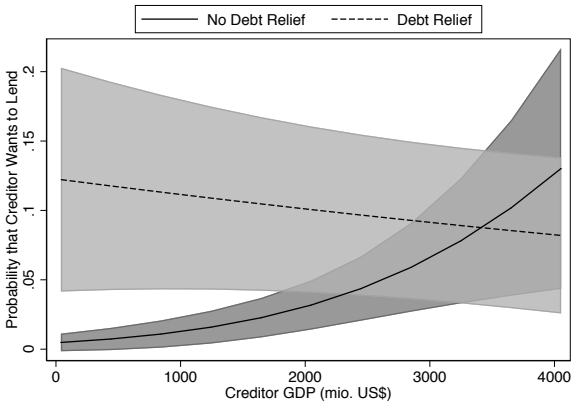
Note: Panel (a) examines lending to countries eligible to receive multilateral debt relief under the MDRI initiative, while Panel (b) analyzes countries that did are not eligible. The effect of small creditors exists in both subsamples.

Figure G: Effect of small creditors conditional on why no debt relief was obtained

(a) no relief, no need



(b) no relief, despite need

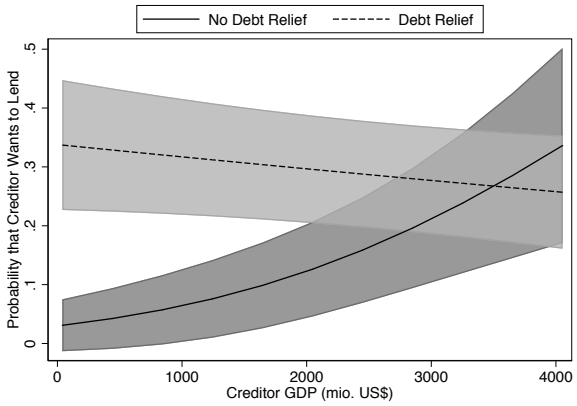


Note: Panel (a) examines lending to countries that did not receive debt relief because they did not need it, while Panel (b) analyzes countries that did not receive debt relief even though their economic situation would have welcomed it. Small creditors appear to lend for influence in either case.

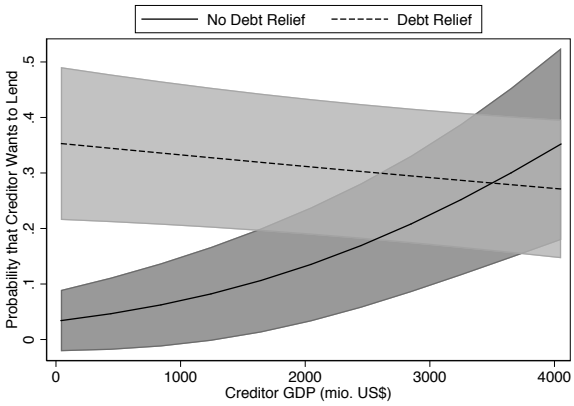
Figure H: Effect of small creditors conditional on why no debt relief was obtained

It is also possible to differentiate between countries that did not receive debt relief. Some countries might not receive debt relief because they did not require any relief, while others would have needed debt relief but did not receive it. For this reason, Figure H differentiates between non-recipients of debt relief with high and low levels of debt. I follow Reinhart & Rogoff (2009) and use a 90% debt-to-GDP ratio as a cutoff. However, the main findings are robust to these changes.

(a) no member



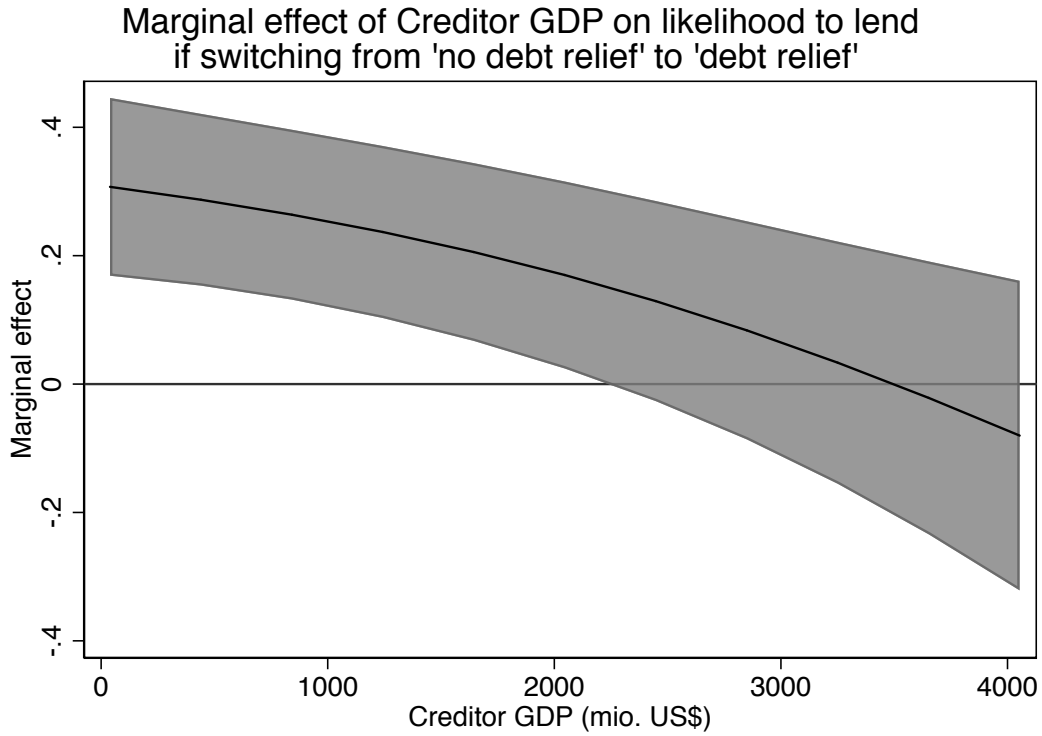
(b) UNSC member



Note: Panel (a) examines lending to countries that are currently not members of the UN Security Council, while Panel (b) analyzes lending to current members of this council. The effect of small creditors is robust to these changes.

Figure I: Effect of small creditors conditional on why no debt relief was obtained

The incentive to lend for influence might also depend on the abilities of loan recipients to act in favor of the creditor. Developing countries that are current members of the United Nations security council might be particularly attractive for lenders. Figure I differentiates between members and non-members of this council. The effect of small creditors is robust this change.



Note: The difference between this Figure and the previous Figure B is the confidence interval: While Figure B is calculated using the standard $95th$ percentile, this Figure J uses the more conservative $99th$ percentile to evaluate statistical significance.

Figure J: Marginal effect of switching from 'no debt relief' to 'debt relief' conditional on creditor size.

It might be the case that my analyses suffer from the multiple comparison problem. If this were the case, the p-values be adjusted. However, this problem occurs primarily when calculating a large number of confidence intervals simultaneously from within the same model using the same sample. However, my analysis calculates only *two* confidence intervals as the debt relief is operationalized as a binary variable taking only two values (zero or one). Thus, I do not calculate multiple contrasts against a baseline category, but only a single contrast. However, I show that my results hold even when utilizing a more conservative threshold for statistical significance. While Figure B is calculated using the

standard $95th$ percentile, Figure J uses the more conservative $99th$ percentile. As can be seen, the results are robust to this change.

3 Alternative explanations

3.1 Tables

The article examines two alternative explanations. The tables containing the underlying analyses are presented in this section.

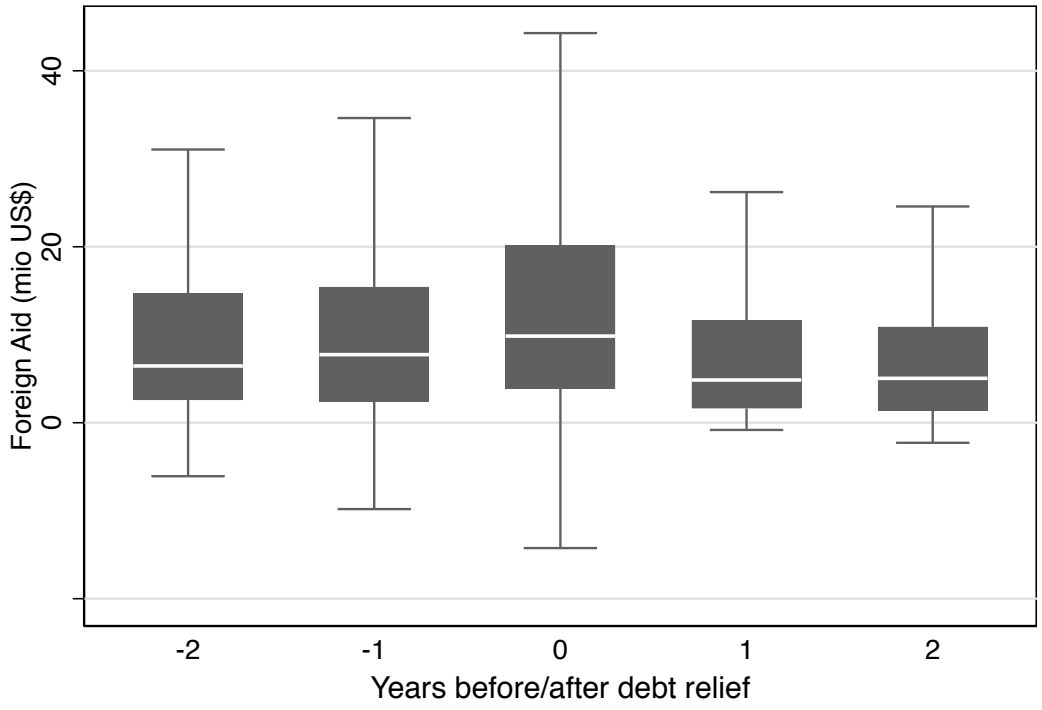
- Column (1) and (2) of Table D shows the results of a probit regression estimating the likelihood of a loan from private creditors. Figure 8(a) is based on the results in column (2).
- Column (3) and (4) of Table D shows the results of an OLS regression estimating the size of a loan from private creditors. Figure 8(b) is based on the results in column (4).

	Likelihood of Private Loan (Probit)		Size of Private Loan (OLS)	
	(1)	(2)	(3)	(4)
Debt relief within the past three years	-0.282*	-0.243	-39.943	8.069
	(0.066)	(0.226)	(47.367)	(153.401)
Debtor Moral Hazard (Future Arrears)		0.000		-0.624
		(0.000)		(0.541)
Potential size of loan		0.082*		135.854
		(0.026)		(107.375)
Potential grant element of loan		-0.020*		-67.562*
		(0.008)		(31.250)
Debtor Credit Rating		0.047		125.960
		(0.036)		(77.982)
Debtor in default		1.384*		583.874
		(0.573)		(805.511)
Debtor Current account balance (% of GDP)		-0.027*		10.592
		(0.011)		(11.559)
Debtor GDP growth		-0.005		-7.012
		(0.025)		(18.363)
Debtor Natural resource exports		0.005		0.010
		(0.003)		(5.405)
Debtor Polity Score		0.002		58.371
		(0.018)		(38.556)
Constant	-0.151*	0.551	383.223*	2955.057
	(0.058)	(0.720)	(141.170)	(2135.766)
N	2140	315	2115	306

Table C: Regression results evaluating whether private loans increase after debt relief. Standard Errors in parentheses. * $p<0.5$

3.2 Examination of additional alternative explanations

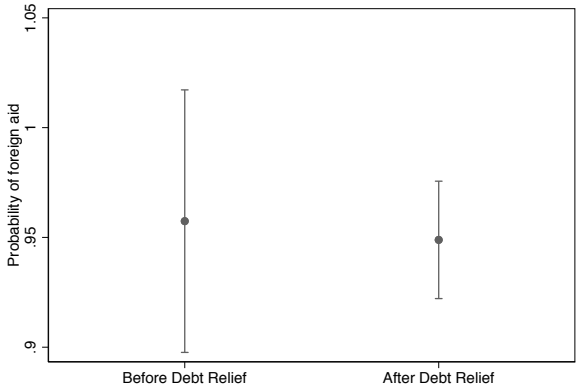
Related to the argument about solvency, creditor governments may provide more foreign aid after debt relief. Thus, it might be the case that any changes in new lending after debt relief are simply a function of prior changes in aid allocation.



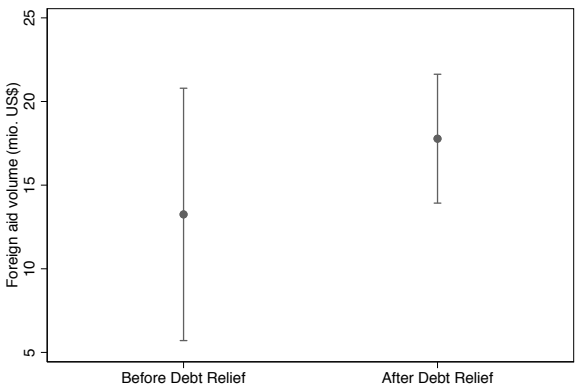
Note: The Figure illustrates that the average volume of aid provided does not increase after debt relief.

Figure K: Foreign aid before and after debt relief.

(a) Predicted Probability



(b) Predicted Aid Volume



Note: The Figure visualizes that recipients of debt relief are no more likely to receive foreign aid, or to obtain larger volumes of foreign aid, than countries without debt relief.

Figure L: Predicted Probability and Loan Volume of Private Creditors.

	Likelihood of foreign aid (Probit)		Volume of foreign aid (OLS)	
	(1)	(2)	(3)	(4)
Debt relief within the past three years	0.407*	-0.117	5.819*	4.526
	(0.142)	(0.502)	(1.428)	(3.989)
Debtor Moral Hazard (Future Arrears)		0.000		-0.002
		(0.001)		(0.004)
Potential size of loan		0.098		2.008*
		(0.099)		(0.599)
Potential grant element of loan		0.016		0.208
		(0.017)		(0.209)
Debtor Credit Rating		-0.187*		-1.270
		(0.075)		(0.881)
Debtor in default		(.)		-14.759
				(11.226)
Debtor Current account balance (% of GDP)		0.011		0.470*
		(0.026)		(0.231)
Debtor GDP growth		0.146*		0.149
		(0.056)		(0.473)
Debtor Natural resource exports		0.003		0.188*
		(0.008)		(0.075)
Debtor Polity Score		-0.004		-0.535
		(0.041)		(0.433)
Constant	1.851*	2.413	9.059*	11.294
	(0.113)	(1.615)	(2.109)	(17.335)
N	2140	280	2140	315

Table D: Regression results evaluating whether foreign aid increases after debt relief. Standard Errors in parentheses. * $p<0.5$

4 Summary Statistics

4.1 Variables used

Summary statistics of all variables used in the article are presented in Table E.

	mean	sd	min	max
Bilateral Debt Relief	.0242452	.1538154	0	1
Multilateral Debt Relief	.0526075	.2232571	0	1
Debtor Moral Hazard (Future Arrears)	89.30533	469.5839	0	3633.455
Debtor Moral Hazard (UN Security Council)	.1179475	.3225583	0	1
Western vs. BRIC creditor	.1317475	.3382289	0	1
Creditor GDP	1434.89	2520.043	36.34697	14137.75
Creditor exports (% of GDP)	54.3086	36.17019	9.821651	230.7243
External debt stocks (% of GDP)	42.639	29.4888	2.062688	198.0724
Debtor Credit Rating	9.593474	2.953761	1.333333	17.66667
Debtor in default	.0203568	.141223	0	1
Debtor Polity Score	4.719427	5.40566	-7	10
Potential size of loan	7.17957	14.77367	-7.03431	89.22247
Potential grant element of loan	45.54783	16.74017	-4.877077	102.4813
Debtor Current account balance (% of GDP)	-3.525109	8.471409	-46.71699	33.67854
Debtor GDP growth	5.09216	4.158746	-14.8	34.5
Debtor Executive Party Orientation	1.257091	1.327072	0	3
Debtor Margin of Majority	.6118109	.2029627	.0636364	1
Creditor GDP	1434.89	2520.043	36.34697	14137.75
Creditor Current account balance (% of GDP)	.6716507	5.882411	-14.4763	16.18676
Creditor private banks claims in debtor	53345.55	103920.6	17.65819	640970.6
Debtor Natural resource exports	25.32063	26.18242	0	98.2446
Distance	1.303487	.7593752	0	4.539

Table E: Summary statistics of all variables used in this study.

4.2 Countries in the sample

Debtors		Creditors
Albania	Lebanon	Australia
Argentina	Lesotho	Austria
Armenia	Macedonia	Belgium
Azerbaijan	Madagascar	Brazil
Bangladesh	Malawi	Canada
Belarus	Malaysia	China
Benin	Mali	Czech Republic
Bolivia	Mauritius	Denmark
Botswana	Mexico	Finland
Brazil	Moldova	France
Bulgaria	Mongolia	Germany
Burkina Faso	Morocco	Greece
Cambodia	Mozambique	India
Cameroon	Nicaragua	Ireland
Cape Verde	Nigeria	Italy
China	Pakistan	Japan
Colombia	Panama	Korea
Costa Rica	Papua New Guinea	Luxembourg
Ecuador	Paraguay	Netherlands
Egypt	Peru	New Zealand
El Salvador	Philippines	Norway
Fiji	Romania	Poland
Georgia	Rwanda	Portugal
Ghana	Senegal	Russian Federation
Guatemala	South Africa	Slovak Republic
Honduras	Thailand	Slovenia
Hungary	Tunisia	Spain
India	Turkey	Sweden
Indonesia	Uganda	Switzerland
Jamaica	Ukraine	United Kingdom
Jordan	Venezuela	United States
Kazakhstan	Vietnam	
Kenya	Zimbabwe	

Table F: List of countries included in the analyses.

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