Online Appendix

Accompanying "Sovereign Defaults: The Price of Haircuts" by Juan J. Cruces and Christoph Trebesch

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A1. Robustness Analysis of Sections 5 and 6

A1.1 Robustness – Bond Spread Analysis (Section IV)

This section complements our findings on haircuts and subsequent bond spreads in section IV of the paper. Table A1 shows several extensions and robustness checks building on a parsimonious specification of equation (4) above, which only includes control variables that are widely used in the related literature and which are weakly correlated among each other. As before, we include country and time fixed effects. We start by selecting various sub-samples and find results to be very robust throughout. In a first step, column (2) restricts the time frame to 1998-2010, thus dropping all Brady-era observations of 1993-1997. Next, we focus on the subsample of defaulters, defined here as countries that restructured sovereign debt at least once after 1985. In both cases we find the results to be very similar to the benchmark specification in column (1). Similarly, we find that the lagged haircut variables show large and statistically significant coefficients when restricting the sample to post-crisis periods, i.e. when using only spreads by defaulters in year one to seven after their restructuring (results available on request).

We find even stronger results for the marginal effect of haircuts when dropping three outlier countries, namely Argentina, Iraq and Russia, which all defaulted unilaterally on large volumes of debt and which imposed exceptionally high haircuts of 50% or higher. Column (4) shows that without these outliers, the coefficients on the lagged haircut variables are much higher than in the benchmark equation (for all but the first lag). The same is true when implementing an even more demanding robustness check, which excludes all countries that imposed haircuts higher than 37%. Column (5) shows that the ϕ_τ coefficients are nearly twice as high in this subsample compared to the benchmark. In addition, we find results to hold when dropping repeated defaulters, meaning those countries that feature more than one debt crisis spell (with a "final" restructuring) in this bond spread sample (Argentina, Cote d'Ivoire, and Ecuador).[1]

We next assess the results with alternative haircut measures. Column (6) shows estimates using the market haircut (H_M in equation (1)), while column (7) takes the face value reduction measure, which ignores changes in the debt's present value. In addition, column (8) shows results with lagged values of an effective haircut measure, which results from multiplying H_{SZ} by the fraction of total foreign debt

[1] Due to our focus on post-restructuring effects we exclude observations during default as declared by Standard and Poor's in the baseline specification. Therefore, the observations for the three countries that have repeated final deals in the sample are automatically excluded in the year of the default there. Here we just exclude the complete record of the three countries.

owed to private international creditors in the year just before the restructuring.[2] This last measure thus takes into account the percentage of debt affected by the haircut.

We also compute a cumulative haircut which takes into account repeated restructurings in the same debt crisis spell by one country. This cumulative effective haircut reports the compound haircut of a passive investor who held a face value-weighted basket of all of the country's securities and whose debts where therefore restructured in all the events leading up to and including a final deal. For final deal *i* this measure is:

$$\text{Cumulative effective } H_{SZ}^{i} = 1 - \prod_{j=1}^{J^{i}} WCR_{SZ}^{i,j}$$

where $WCR_{SZ}^{i,j}$ is the wealth conservation ratio in restructuring *j* and J^{i}-1 is the number of non-final deals preceding final deal *i*. $WCR_{SZ}^{i,j}$ is defined as

$$WCR_{SZ}^{i,j} = \frac{Debt\ Affected^{\ i,j}}{Total\ Debt_{t-1}^{i}}\left(1 - H_{SZ}^{i,j}\right) + \left(1 - \frac{Debt\ Affected^{\ i,j}}{Total\ Debt_{t-1}^{i}}\right) = 1 - Effective\ H_{SZ}^{i,j}$$

Note from the last equation, that the wealth conservation ratio is simply 1 minus the effective haircut described above and therefore draws on GDF data on debt to private creditors.

Overall, the results are robust, and even somewhat more pronounced, when including alternative haircut measures (columns (6)-(9)). Amongst other, it is reassuring that the results hold when using face value haircuts, because this means that our findings are not driven by the choice of the discount rate.[3] Similarly, we find results to hold with our proxies for cumulative losses, which indicates that our focus on haircuts implied in "final" restructurings does not bias the estimates in an important way.

Column (10) re-estimates the model with a yearly data frequency. As can be seen, the results are quite similar to those obtained when using a monthly frequency. [4]

[2] The data on debt to private creditors are taken from the World Bank's GDF database. The specific variables are public and publicly guaranteed debts owed to bondholders, DT.DOD.PBND.CD, to commercial banks, DT.DOD.PCBK.CD,and to other private creditors, DT.DOD.PROP.CD. In case the volume of restructured debt exceeds the debt stock reported by GDF we set the ratio of debt affected to total debt to 1 (22 cases).

[3] We have also checked results when applying a uniform 10% discount rate. The results still hold.

[4] For the robustness check, we use end-of-year data because the annual macro variables such as debt/GDP or growth are also measured at year-end. The results hold if we use mid-year or start-of-year observations.

Table A1: Robustness Checks for Haircuts and Bond Spreads

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	SUBSAMPLES (Using SZ Haircut)					**OTHER HAIRCUT MEASURES**				**YEARLY DATA**
	Main Model	Post-1998 Only	Defaulters Only	Without Argentina, Iraq, Russia	Excluding High H cases (H>0.37)	With Market Haircut	With Face Value Haircut	With Effective Haircut	With Cumulative Haircut	Using Yearly Data
Haircut, 1 year lag	2.31	2.51	2.13	0.17	21.52***	2.87	0.49	0.67	0.68	-1.90
	(3.53)	(3.96)	(3.35)	(3.54)	(8.04)	(3.52)	(3.03)	(3.94)	(4.39)	(4.25)
Haircut, 2 year lag	0.72	-0.40	0.78	4.78*	15.56**	1.83	2.60	1.37	1.20	1.72
	(2.56)	(2.64)	(2.33)	(2.88)	(7.20)	(2.67)	(3.67)	(3.28)	(3.40)	(2.84)
Haircut, 3 year lag	4.94**	3.21*	4.21**	10.04***	18.79***	6.34***	9.10***	8.19***	6.57***	8.34**
	(2.11)	(1.73)	(1.87)	(2.74)	(5.32)	(2.05)	(2.99)	(2.12)	(2.17)	(3.83)
Haircut, 4 & 5 year lag	5.44***	5.69***	4.25***	6.12***	17.62***	6.53***	4.54**	6.00***	6.38***	6.27**
	(1.65)	(1.82)	(1.64)	(2.20)	(5.98)	(1.74)	(2.16)	(1.98)	(2.36)	(3.02)
Haircut, 6 & 7 year lag	6.29***	6.51***	5.58***	7.07***	16.64***	6.54***	6.71***	6.90***	9.00***	7.72***
	(1.57)	(1.49)	(1.63)	(1.84)	(5.68)	(1.71)	(1.83)	(1.56)	(1.91)	(2.69)
Restructuring Dummy, 1 year lag	159.74	179.92	123.27	225.53	-170.37	110.05	219.61*	203.57	189.01	280.06
	(182.82)	(213.52)	(179.83)	(200.79)	(238.82)	(201.92)	(127.35)	(172.51)	(211.93)	(226.31)
Restructuring Dummy, 2 year lag	88.84	155.76	57.66	-3.22	-205.52	20.77	54.20	48.41	46.43	13.22
	(139.32)	(152.82)	(133.54)	(148.36)	(215.75)	(153.80)	(108.67)	(133.29)	(154.89)	(124.26)
Restructuring Dummy, 3 year lag	-160.26*	-111.80	-161.91*	-279.11***	-467.28***	-258.48***	-132.08**	-229.67***	-234.66**	-319.85**
	(92.64)	(92.38)	(90.44)	(96.84)	(138.59)	(92.39)	(63.18)	(80.23)	(93.62)	(140.40)
Restructuring Dummy, 4 & 5 year lag	-146.43*	-182.63*	-118.48	-148.96	-395.92**	-226.52**	-23.64	-127.23	-186.23*	-171.14
	(85.97)	(98.79)	(86.74)	(97.49)	(158.52)	(95.52)	(63.71)	(83.62)	(110.37)	(161.03)
Restructuring Dummy, 6 & 7 year lag	-230.77***	-259.57***	-223.88***	-245.58***	-452.63***	-294.48***	-118.28**	-222.78***	-361.32***	-333.55**
	(77.08)	(73.17)	(76.30)	(84.26)	(148.05)	(85.29)	(52.46)	(68.11)	(88.28)	(139.72)
Rating (Residual)	-40.72***	-50.36***	-53.85***	-40.90***	-49.90***	-41.28***	-39.84***	-41.22***	-41.39***	-49.97***
	(9.06)	(10.11)	(10.36)	(10.12)	(10.85)	(8.00)	(8.47)	(8.31)	(8.25)	(18.72)
Public Debt to GDP	6.44***	5.55***	8.59***	5.55***	5.00***	8.31***	8.83***	7.88***	8.50***	4.79***
	(1.21)	(1.09)	(2.37)	(1.23)	(1.59)	(1.07)	(1.16)	(1.19)	(1.18)	(1.52)
GDP real growth	-9.59***	-8.44***	-12.17***	-8.96***	-8.64***	-8.85***	-9.64***	-8.53***	-8.02***	-4.74
	(3.07)	(3.21)	(3.49)	(3.32)	(3.21)	(2.94)	(3.17)	(3.06)	(3.05)	(3.24)
Political Risk (ICRG)	-2.86	-2.19	-4.83	-2.29	-0.53	-2.18	-1.48	-2.38	-3.93	-3.53
	(2.50)	(2.71)	(3.23)	(2.66)	(2.68)	(2.41)	(2.49)	(2.46)	(2.48)	(4.75)
High-yield bond spread	59.40***	59.62***	65.09***	57.16***	56.77***	59.54***	59.51***	59.51***	59.64***	53.54***
	(5.20)	(5.24)	(6.99)	(5.36)	(5.42)	(5.17)	(5.17)	(5.16)	(5.16)	(7.88)
Constant	-209.17	-378.20*	-142.15	-229.57	-431.07**	-10.07	-54.06	11.29	98.45	-112.85
	(194.09)	(207.39)	(267.56)	(195.06)	(192.32)	(184.74)	(194.92)	(191.84)	(187.37)	(384.07)
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,082	3,623	2,817	3,810	3,481	3,987	3,987	3,917	3,917	333
R2	0.510	0.519	0.551	0.535	0.533	0.509	0.504	0.508	0.508	0.627
Adjusted R2	0.506	0.515	0.546	0.531	0.529	0.505	0.499	0.504	0.504	0.590

This table shows variations of the same regression in Table 4 in the paper. The market haircut is H_M in equation (1). The face value haircut captures the percent of debt written off, but ignores changes in the debt's present value. The effective haircut multiplies H_{SZ} by the fraction of total debt owed to private creditors that is affected by the restructuring, while the cumulative haircut compounds losses of each debt-crisis spell (see text for details). Note that the coefficients of the lagged restructuring dummies cannot be interpreted as unconditional marginal effects, but only conditional on the size of the haircut in the respective restructuring. The key message from our main results in Table 4 is largely unchanged when performing these robustness checks.

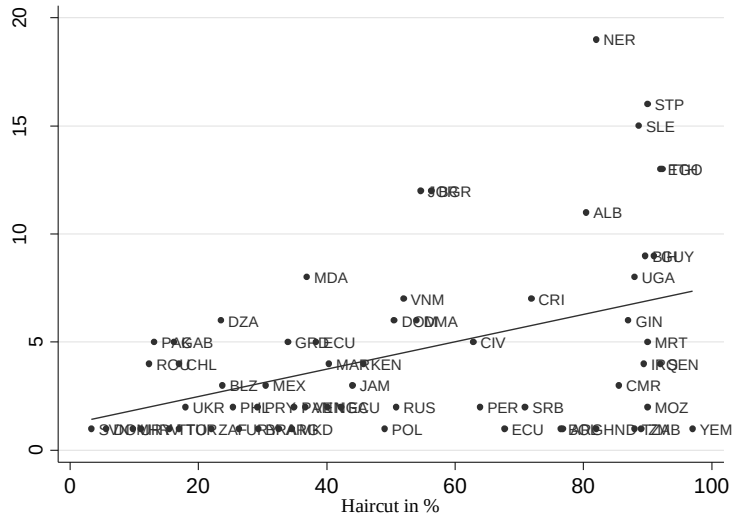
Finally, we implement a series of further robustness checks whose results are available upon request. First, we assess the role of government changes. The binary "new government" variable is clearly insignificant and including it does not affect the results, not even when interacting it with lagged haircuts. The same is true when

using a variable on the government's years in office. We therefore conclude that government changes play no role for the relationship between haircuts and subsequent borrowing costs. Next, we include a dummy variable for ongoing holdout and litigation events using data from Trebesch (2008). We thereby take into account instances like in Argentina post-2005 or Peru post-1997 in which countries did come to a final restructuring but continued in disputes with holdout creditors. We find that the dummy variable for litigation is insignificant and the haircut coefficients are largely unchanged. Lastly, we split our sample in countries with high and low income. Specifically, we estimate an equation which only includes countries with a 1993 GDP per capita that is higher than 4000 US$ in purchasing power parity terms (sample median). Again, the results remain little affected.

A1.2 Robustness – Exclusion Duration (Section V)

This section builds on section V above and reports additional data, as well as a series of robustness checks on our analysis of exclusion duration. We start by showing a scatter plot of H_{SZ} and exclusion time (Figure A1), as well as detailed data on reaccess years after all 67 final restructuring events listed in Table A2.

Figure A1: Haircut Size and the Duration of Exclusion



This figure plots the relationship between H_{SZ} and the years of exclusion from capital markets after the respective restructurings. The sample goes from 1980 until 2009, see Table A2 for the list of cases. Reaccess here is defined as the first of the following two events: (i) issuance of a syndicated loan or bond in international markets that leads to an increase in indebtedness and/or (ii) a positive net transfer of foreign bond or bank credit to the public sector. The figure shows that restructurings resulting in higher haircuts tend to be associated with longer times until reaccess.

Table A2: Overview of Restructuring Cases and Reaccess Years

				Main Definition (Flows to PUBLIC sector)		**Robustess Check** (Flows to PUBLIC or PRIVATE sector)
				Partial Reaccess (Flows > 0)	Full Reaccess (Flows > 1% of GDP)	Partial (> 0), including flows to private sector
Nr	Country	HIPC	Year of Restructuring	Year of Reaccess	Year of Reaccess	Year of Reaccess
1	Albania		1995	2006	2008	2004
2	Algeria		1996	2002		2002
3	Argentina		1993	1994	1994	1994
4	Argentina		2005	2006		2006
5	Belize		2007			
6	Bolivia	1	1993	1994		1994
7	Bosnia & Herzegov.		1997	2006	2006	2001
8	Brazil		1994	1995	2000	1995
9	Bulgaria		1994	2006	2006	1996
10	Cameroon	1	2003	2006		2006
11	Chile		1990	1994	1998	1991
12	Costa Rica		1990	1997	1998	1992
13	Cote d'Ivoire	1	1998	2003	2003	2003
14	Cote d'Ivoire	1	2010			
15	Croatia		1996	1997	1997	1997
16	Dominica		2004			
17	Dominican Rep.		1994	2000	2001	2000
18	Dominican Rep.		2005	2006	2006	2006
19	Ecuador		1995	1997	1997	1997
20	Ecuador		2000	2005	2005	2001
21	Ecuador		2009			
22	Ethiopia	1	1996	2009	2009	2009
23	Gabon		1994	1999	2007	1999
24	Gambia	1	1988			
25	Grenada		2005			
26	Guinea	1	1998	2004		2004
27	Guyana	1	1999	2008	2009	2008
28	Honduras	1	2001	2002	2004	2002
29	Iraq		2006			
30	Jamaica		1990	1993	1998	1993
31	Jordan		1993	2005	2005	2005
32	Kenya		1998	2002	2009	2002
33	Macedonia		1997	1998	2003	1998
34	Malawi	1	1988			1989
35	Mauritania	1	1996	2001		2001
36	Mexico		1990	1993	1993	1991
37	Moldova		2002			2003
38	Morocco		1990	1994	2003	1993
39	Mozambique	1	1991	1993		1992
40	Niger	1	1991			
41	Nigeria		1991	1993	2008	1993
42	Pakistan		1999	2004	2006	2004
43	Panama		1996	1998	1998	1997
44	Paraguay		1993	1995	1999	1994
45	Peru		1997	1999	1999	1998
46	Philippines		1992	1994	1994	1993
47	Poland		1994	1995	1995	1995
48	Romania		1986	1990	1992	1990
49	Russia		2000	2002	2002	2002
50	Sao Tome & Principe	1	1994			
51	Senegal	1	1996	2000	2009	1997
52	Serbia and Monten.		2004	2006		2005
53	Sierra Leone	1	1995			
54	Slovenia		1995	1996	1996	1996
55	South Africa		1993	1994	1994	1994
56	Tanzania	1	2004	2005		2005
57	Togo	1	1997			
58	Trinidad & Tobago		1989	1990	1992	1990
59	Turkey		1982	1983	1983	1983
60	Uganda	1	1993	2001		2001
61	Ukraine		2000	2002	2002	2001
62	Uruguay		1991	1992	1994	1992
63	Uruguay		2003	2004	2004	2004
64	Venezuela		1990	1992	1992	1992
65	Vietnam		1997	2004	2005	2004
66	Yemen		2001	2002		2002
67	Zambia	1	1994	1995		1995

This table shows all 67 final restructurings in our sample. These are the basis for the capital market exclusion tests. HIPC stands for highly indebted poor country. Partial reaccess is defined as the first year with an international loan or bond placement resulting in an increase in indebtedness and/or if the public sector receives net transfers from private foreign creditors, so that new borrowing minus debt service is positive. The measure of full reaccess is based on the same data, but imposes a threshold of 1% to GDP on the volume of flows. The last column is the same as the partial reaccess column but also takes into account capital flows to the private sector. See text for further details.

Next, we assess the robustness of our findings from the survival models estimated in section V. To do so, we settle on a baseline specification which strikes a balance between parsimony and performance of the model (see column (1) in Table A3). The most important robustness check is to alter the definition of market access, with results being surprisingly stable. Column (2) shows that the coefficient on H_{SZ} is very similar when using the full reaccess measure. Likewise, in column (3), we find H_{SZ} to remain significant when we follow the narrower access definition by Gelos et al. (2011), which focuses on primary market issuance only. In line with Richmond and Dias (2009), we also extend the definition to include capital flows to the private sector, which translates into significantly shorter periods of exclusion, as illustrated in column (4). Even for this specification the coefficient on haircut remains at about -0.02, although it is only significant at the 10% level.

We conduct a further series of robustness checks, most of which are not directly reported but are available on request. Column (5), (7) and (8) show that there is no major change when using H_M instead of H_{SZ}, or when including our measures of effective haircuts or cumulative haircuts described in the previous section. However, the haircut coefficient is clearly statistically insignificant when considering the face value reduction measure (in column (6)). This is in line with the insignificant result of Richmond and Dias (2009, p. 19, partial reaccess), who use the face value haircut estimates of Benjamin and Wright (2009). These non-findings may be attributed to the fact that nominal debt relief is an imprecise proxy for the true creditor loss in present value terms. As before, we also get similar results when dropping outlier cases like Argentina, Iraq and Russia, or when focusing on the post-Brady period since 1997. Furthermore, to assess the potential bias due to right-censoring, we drop the last 5 years in our sample, without any notable effect on the results. We also check the role of government changes, as in section A1.1, and also include a measure of government stability from the ICRG dataset. Again, we find no significant effects, while our main result remains the same. Finally, we checked our main results by applying a flexible parametric alternative to the Cox model, the Royston-Parmar survival model, fitted on the log cumulative hazard scale. The results were robust to this change in model choice.

Table A3: Robustness Analysis of Exclusion Duration

	Benchmark	Different Definitions of Market Access			Different Haircut Measures			
	SZ haircut, Partial access	Full Access (flows > 1% of GDP)	Primary Market Access only (Gelos et al.)	Incl. Access by Private (Richmond and Dias)	With Market Haircut	With Face Value Haircut	With Effective Haircut	With Cumulative Haircut
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Haircut (in %)	-0.025***	-0.022***	-0.019**	-0.021*	-0.026***	-0.013	-0.031***	-0.022***
	(0.009)	(0.007)	(0.009)	(0.012)	(0.008)	(0.009)	(0.009)	(0.007)
Rating (Residual)	0.012	0.000	0.044**	0.095***	0.009	0.022	-0.005	0.001
	(0.031)	(0.024)	(0.022)	(0.032)	(0.031)	(0.031)	(0.031)	(0.030)
Population (log)	0.361**	0.210**	0.588***	0.275*	0.389**	0.338**	0.342**	0.351*
	(0.155)	(0.096)	(0.182)	(0.152)	(0.163)	(0.171)	(0.154)	(0.179)
GDP per capita (log)	0.928***	1.089***	0.956***	0.245	0.988***	1.016***	1.035***	1.084***
	(0.246)	(0.293)	(0.302)	(0.254)	(0.251)	(0.249)	(0.273)	(0.292)
Public Debt (in % to GDP)	-0.004	-0.021***	-0.006	-0.005	-0.003	-0.008	-0.005	-0.008
	(0.008)	(0.008)	(0.011)	(0.010)	(0.009)	(0.010)	(0.007)	(0.008)
Growth (real, p.a.)	0.025	-0.015	0.024	-0.058	0.022	0.024	0.005	0.000
	(0.053)	(0.057)	(0.063)	(0.051)	(0.053)	(0.056)	(0.052)	(0.058)
Inflation (real, p.a.)	0.002	0.000	0.002	0.010	0.002*	0.003*	0.003	0.003*
	(0.001)	(0.002)	(0.002)	(0.016)	(0.001)	(0.001)	(0.002)	(0.002)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of Observations (Time at Risk)	249	403	338	187	249	249	247	246
# of Subjects (Episodes)	57	60	58	56	57	57	57	57
Log-Likelihood	-83.22	-86.60	-84.41	-99.42	-83.14	-84.95	-75.03	-73.08
BIC	315.41	341.18	326.04	350.54	315.25	318.87	293.31	289.30

This table shows variations of the analysis in Table 5 using different measures of market access and different haircut estimates. The alternative access measures are reviewed in the caption to Table A2 while the alternative haircut measures are discussed in the main paper (and in the caption to Table A1). The main message of this table is that the link between haircut size and exclusion is quite robust across specifications.

A2. Case Selection and Sample

A2.1 Case Selection Criteria

We analyze the entire universe of sovereign debt restructurings with foreign commercial creditors (banks/bondholders) in the period 1970 to 2010. Five key criteria define our selection of cases:

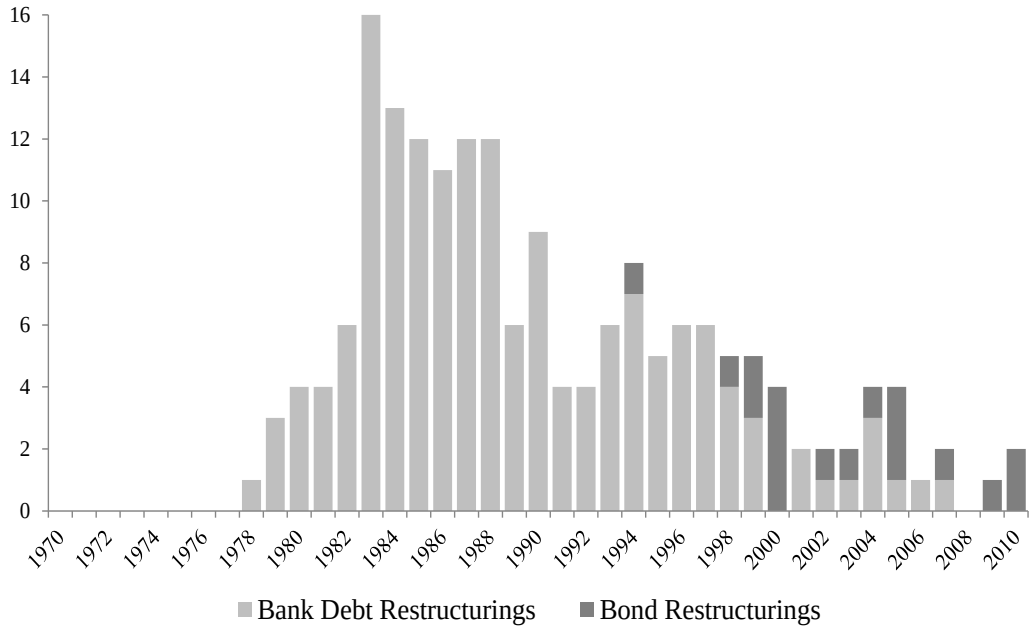
- We focus on sovereign debt restructurings, defined as restructurings of public or publicly guaranteed debt. Restructurings of private-to-private debt are not taken into account even when large-scale workouts of private sector debt were coordinated by governments, such as in Korea 1997 or Indonesia 1998.
- We include restructurings with foreign private creditors only, thus excluding debt restructurings that predominantly affected domestic creditors and those affecting official creditors, including those negotiated under the chairmanship of the Paris Club. Foreign creditors include foreign commercial banks (i.e. "London Club"[5] creditors) as well as foreign bondholders. For recent deals, we follow the categorization into domestic and external debt exchanges of Sturzenegger and Zettelmeyer (2006, p. 263). We therefore explicitly include two domestic debt restructurings but only because they mainly involved external creditors: Russia's July 1998 GKO exchange and Ukraine's August 1998 exchange of OVDP bonds.
- We focus on distressed debt exchanges, defined as restructurings of bonds (bank loans) at less favorable terms than the original bond (loan). We thereby follow the definition and data provided by Standard and Poor's (2006, 2011). Restructurings that are part of routine sovereign liability management such as debt swaps and buy backs in normal times are disregarded.
- We restrict the sample to medium and long-term debt restructurings only. We thus disregard short-term agreements, such as 90-day debt rollovers or the maintenance of short-term credit lines (e.g. trade credit). We also exclude agreements with maturity extension of less than a year. We do include, however, cases in which short-term debt is exchanged into debt with a maturity of more than one year.
- We only regard restructurings that are actually implemented, thus ignoring cases in which negotiations where never concluded or in which an agreement in principle or an exchange offer were never finalized.

[5] The term "London Club" is often used to describe negotiations conducted under the chairmanship of a bank advisory committee (or steering committee). These committees of five to twenty major banks met regularly with government representatives of defaulting countries to negotiate the restructuring terms on behalf of all affected banks. Most bank debt restructurings of the 1980s and 1990s were arranged in a London Club framework (see Rieffel 2003, chapter 6, for an excellent account).

A2.2 Final Sample

Based on these selection criteria, we identify 182 sovereign debt restructurings with private creditors since 1970, in 68 countries. Note that we were able to gather sufficient data to compute haircuts for all of these cases, except for the cases of Togo 1980 and 1983. This means that our final sample of cases covers 180 debt restructurings with banks and bondholders since 1970. Figure A2 provides an overview of cases by year from 1970 until 2010.

Figure A2: Sovereign Debt Restructurings with Private Creditors, 1970-2010



This figure shows the number of sovereign debt restructurings by year involving bank and bond debt. The 1980s were prolific in bank debt restructurings which often involved the same debt that was renegotiated over and over again. Bond debt restructurings became more prevalent in the latter part of the sample.

The graph shows that there were no restructurings in the early and mid-1970s. Furthermore, it illustrates that sovereign bond restructurings have reentered the sovereign debt universe only after the Brady plan of the early 1990s, which exchanged bank loans into new bond instruments. Since 1998, there have been 17 distressed sovereign bond exchanges with foreign bondholders, in 13 countries. This does not mean, however, that bank debt restructurings are a phenomenon of the past. Recent loan restructurings include a number of debt buy-backs in low-income countries, but also bank debt restructurings such as in Pakistan 1999, in Serbia and Montenegro 2004, in the Dominican Republic 2005, or in Iraq 2006.

A2.3 Cases Not Included

Going through the list of restructuring events, an expert reader might wonder why a specific default or debt exchange operation is not included (e.g. the financial crisis in Indonesia 1998, or technical defaults such as Peru 2000, or Venezuela 2004). To be as transparent as possible, we compiled a detailed list of all cases that are not included in our final database of 180 restructurings, but which are sometimes mentioned in other sources or academic papers.

To summarize, the list contains 87 cases that do not fulfill our case selection criteria, because they either (i) do not qualify as medium-term sovereign debt restructuring, (ii) affect domestic creditors only, or (iii) were never concluded. In addition, we identify 26 default episodes that did not involve a debt restructuring with private international creditors. Of these, 19 defaults were cured by repaying debt and arrears (no debt exchange), while 7 countries remain in default as of December 2011.

The list can be downloaded from
https://sites.google.com/site/christophtrebesch/research/Haircuts-Appendix-B.pdf

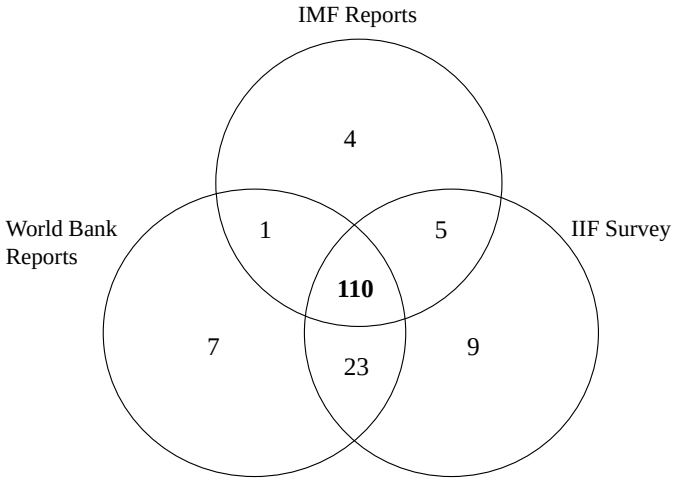
A3. Data Sources and Data Quality

A3.1. Data Sources on Restructuring Terms

When starting this project, there was no single standardized source providing the degree of detail, reliability and completeness necessary to set up a satisfactory database of cash flow and haircut estimates for the period after World War II. We therefore gathered data from all publicly available lists on restructuring terms and from many further sources, including articles in the financial press and the IMF archives.

Overall, our information set is based on 29 documents containing systematic lists with debt restructuring terms, as well as more than 160 additional sources such as books, academic articles, policy reports, offering memoranda, and press articles. Among the many sources, some are much more important than others. In particular, we build heavily on three publication series, in descending order of relevance: (i) a series of reports providing detailed and high-quality coverage on debt restructuring terms from the IMF (1986, 1987, 1989, 1990a, 1990b, 1991, 1993, 1995), (ii) a detailed survey collected by the Institute of International Finance (IIF) (2001) and (iii) various issues of World Debt Tables and Global Development Finance (GDF hereafter) published by the World Bank between 1991 and 2007.

Figure A3: Case Coverage across Main Sources



Our three main sources, the IMF restructuring lists, IIF 2001 and the World Bank restructuring lists cover 159 cases out of 180. The remaining 21 restructurings are covered by various other sources, including Sturzenegger and Zettelmeyer (2006), financial press, offering memoranda, country specific IMF reports, case studies etc.

Figure A3 depicts the number of cases covered by each combination of our three main sources and shows that there is a considerable overlap, with 110 cases covered by all three of them. However, a total of 21 cases are not covered by the main lists, so that we had to rely on additional sources.

For the more recent period, a key source was Sturzenegger and Zettelmeyer (2006, 2007, and 2008, referred collectively as SZ hereafter). These authors generously shared their database of bond-by-bond haircut calculations covering restructurings in eight countries since 1998. For the earlier part of our sample, a valuable archive was the list of debt restructuring terms in Stamm (1987) covering the period from 1956 to 1985.[6]

In addition, we gathered information from the financial press, from the IMF Archives, from published IMF country reports, from case studies by various authors and from offering memoranda or press releases on debtor government websites. To identify many of these sources we draw extensively on the qualitative information collected by Enderlein, Trebesch and von Daniels (2010) and Trebesch (2011). Their data collection is based on 20,000 pages of crisis related press articles[7], as well as numerous policy reports, academic articles and books.

[6] The list provided in Stamm (1987) was originally assembled for a book draft by Ulrich Pfister and Christian Suter, which, however, was never published (see Suter 1992).

[7] The press search in these papers was conducted using the online news database *Factiva* and entailed a standardized search in six flagship media sources: The Financial Times, Reuters, The Wall Street Journal, Dow Jones News Service, The New York Times and Associated Press. To identify relevant articles the search algorithm "countryname w/10 debt" was used.

While we collected many sources, we generally relied on only one primary source and, sometimes, one or two additional sources for the final calculations. Table A4 provides an overview.

Table A4: Overview of Sources as Used in the Calculations

Primary Source	IMF	IIF	SZ	Press	WB	Stamm	Other	Sum
	99	46	14	7	6	0	8	180
Secondary Sources								
IMF	--	8	0	0	1	5	0	14
IIF	11	--	0	0	0	0	0	11
SZ	0	0	--	0	0	0	0	0
Press	5	4	0	--	0	0	6	15
WB	4	3	0	0	--	0	0	7
Stamm	5	0	0	0	0	--	0	5
Other	5	4	1	5	3	0	--	18

SZ stands for Sturzenegger and Zettelmeyer (2006, 2007, 2008), Stamm stands for Stamm (1987). The IMF, IIF and Word Bank (WB) provide detailed lists with restructuring terms.

A3.2. Data Quality and Scope of Information

With no single reliable dataset available, we adopted several strategies to minimize errors and guarantee high data quality and completeness. First, we systematically collected and compared the available information across all our sources. Second, we also report a data quality index for each restructuring, to be as transparent as possible with regard to the quality of our calculations.

Comparing Data Sources

For each restructuring deal, we gathered information from at least two, but mostly from three or more independent sources. To minimize errors, we started by merging the information contained in the main lists of restructuring terms by the IMF, IIF and World Bank, as well as by Stamm (1987) and SZ. We then compared restructuring details as provided by each source, in particular the information on agreement dates, maturity, grace period, interest rate, repayment schedule, and any further key characteristics of the debt restructured. In case we faced contradictory information across sources, we collected as much additional information as possible, especially from the financial press and from the IMF archives. This detailed comparison exercise enabled us to fill most data gaps and correct many minor inaccuracies contained in the individual sources. It also revealed notable differences in the content and scope of the available sources.

For the 1980s and 1990s, the IMF and IIF reports were more detailed than the other available sources.[8] They are therefore used as primary source for coding in most restructurings (together 145 cases). For the more recent period, the most reliable source is the data by SZ, which we use whenever available (14 cases). We also found detailed information in Finger and Mecagni (2007), in IMF country reports, offering memoranda and in the International Financing Review, a weekly investor magazine.

To our surprise, the information contained in GDF reports by the World Bank are sometimes incomplete, imprecise, or outright wrong.[9] This is relevant, because GDF data on debt restructurings are widely used in the literature, amongst others, by Arteta and Hale (2008), Benjamin and Wright (2009), Detragiache and Spilimbergo (2001) and Pescatori and Sy (2007). For a non-negligible number of cases, we found the World Bank lists to miss restructuring deals, to omit important details, to provide wrong figures on the amount of debt restructured, or to identify a date as restructuring date, when it was only an agreement in principle. Therefore, the World Bank reports are used as primary source for only 6 out of 180 cases in our sample.

Data Quality Index

We create an index of data quality, capturing the depth and validity of information available for each restructuring. The index consists of five components, each coded as a binary variable. The result is a composite index with a maximum of 5 (excellent scope of information) and a minimum of 0 (no criterion fulfilled, only basic information available).

The five indicators are:

1. Knowledge of when the restructuring is implemented. This includes the exact month of the agreement and whether a deal was ultimately implemented or not (fulfilled in all cases).
2. Knowledge of the key characteristics of the new debt issued, including the type of debt and the amounts restructured, as well as the maturity, grace period and interest rate of the new instruments (fulfilled in 175 cases, 97%);
3. Knowledge of the key characteristics of the old debt being restructured. This includes knowledge on which parts of the outstanding debt had fallen due at the time of restructuring or, for parts still to mature, main characteristics such as the interest rate, maturity and redemption profile (fulfilled in 122 cases, 68%);

[8] An exception is the subset of Brady deal restructurings, for which the GDF lists provide very detailed information.

[9] The errors and omission became evident after comparing the details in the World Bank reports with the restructuring lists by the IIF and IMF, and re-checking that information with details from the press, case studies, official debtor country websites or offering memoranda.

4. Full consistency of information across all available sources. This includes all key characteristics, in particular the date, volumes, interest rate and repayment schedule (fulfilled in 93 cases, 52%);
5. Whether restructuring terms are available by instrument, i.e. loan-by-loan or bond-by bond (fulfilled in 49 cases, 27%);

The coding of these indicators for each case reveals interesting patterns. Table A5 reports the data quality index over time, showing a clear upward trend. The maximum index value of 5 is fulfilled in only 24 restructurings of the 1990s and 2000s.

Table A5: Data Quality Across Time

Data Quality Index Value (1-5)	1970s	1980s	1990s	2000s	Nr. of Restructurings
1	0	0	0	0	0
2	1	21	2	0	24
3	0	52	20	5	77
4	3	21	25	6	55
5	0	0	11	13	24
Nr. of Restructurings	4	94	58	24	180
Average Data Quality	3.5	3	3.8	4.3	3.4

The table shows the distribution of our Data Quality Index by decade. The index is calculated for each of the 180 debt restructurings. The average data quality has increased notably over time.

More specifically, the terms of new debt instruments could be collected for almost all restructurings. The same is true for information on the date and implementation of agreements (partly taken from Trebesch 2008). Knowledge of the terms of the old debt was harder to come by, with details being available in only 68% of the cases. This means that, for about a third of the cases, we have to make simplifying assumptions to calculate H_{SZ} (see section A4.1). Similarly, we could gather bond-by-bond and loan-by-loan information for only about one fifth of debt restructurings, including all bond restructurings of recent years and most Brady deals. Finally, it is striking that a full consistency across sources is fulfilled for only about one half of the sample. This underlines the necessity to collect (and compare) data from more than one source.

A4. Haircut Computation Methodology

We next review in detail the methodology used to compute haircuts. We first discuss our approach to compute cash flows of the old and new debt, and end with a detailed account of our computation of discount rates specific to each restructuring.

A4.1. Computation of Cash Flow Streams: Details and Assumptions

Timing: We use the month of the final agreement for bank loan restructurings or the date of the debt exchange for bond debt restructurings as a baseline date to compute cash flow streams and to identify the discount rates applied. This is the beginning of year 1 in the event timeline. From there, all cash flows are computed on an annual basis, so within-year interest and principal repayments are added up. Accordingly, we compute the first due amount in the cash flow stream to occur exactly 12 months after the final agreement –which would be the end of year 1 in event time.

Principal Repayment - Grace Period and Maturity: Information on grace periods and maturity is readily available for all restructurings. For many deals we also know the exact repayment timeline, i.e. which percent of the principal is due in every future month. When the exact redemption timeline is unknown we assume repayment in equal yearly tranches between the end of the grace period and the year of maturity. This assumption, which applies mostly to deals of the 1980s and 1990s, is in line with the terms of most commercial restructurings during the time and also follows standard Paris Club practice until the late 1990s (see Rieffel 2003, p. 87).

Interest / Coupon Payments: In case of fixed interest rates, the amount of annual interest payments can be easily computed. During the 1980s and 1990s, however, interest payments where typically the sum of a floating reference rate (such as the US London Interbank Offered Rate, Libor) and a spread above this rate. In this latter case it is necessary to assume an expected path of those future rates at the time that the debt instrument is being valued. To do this, we construct Libor forward rates using the settlement price of Eurodollar contracts traded at the Chicago Mercantile Exchange at the end of each month. The price data were obtained from the Futures Industry Institute and from Bloomberg.

At each point time, we fitted a cubic polynomial through all the available 90-day implicit Libor futures rates. From the estimated Libor futures curve, we extracted the rates prevailing for day 90 and for all of its multiples until the farthest futures contract available at that point in time (180 days, 270, 360, 450, 540, etc.). Since our valuation methodology computes annual interest payments, we next computed the average of the future Libor rates prevailing during the first year, the second year, etc. When the valuation horizon exceeded the farthest available futures contract, we

assumed a flat yield curve thereafter.[10] These future rates would have been the fixed rate of an interest rate swap if the debt holder wanted to trade his right for variable coupons for a fixed rate on the restructuring month.

Aggregation: Whenever disaggregated information on the old and new debt is available loan-by-loan and bond-by-bond we take advantage of it. However, such information is not always available, particularly in the early part of our sample. In the 1970s and early 1980s, for example, restructurings often imposed the same terms on a bundle of loans with no information on the composition and detailed characteristics of the instrument exchanged. In these cases we simply compute a single discounted cash flow stream and haircut for all of the debt. In the late 1980s more and more deals imposed differing terms across (aggregated) subcomponents of restructured debt. The same is true for the Brady deals of the 1990s, which typically allowed creditors to choose from a menu of three or four different instruments. For these cases, we calculate the haircut that would be inflicted upon a creditor that held a value-weighted portfolio of the country's debt –see section A4.4 for specific examples. Also for two more recent restructurings (Argentina 2005 and Uruguay 2003) we aggregate instruments for ease of calculation so as to get summary debt service streams for subsets of similar bonds being exchanged. Aggregating across instruments is unlikely to have a major impact on the results, but simplifies our calculations significantly.[11]

Computing *PV Old*: Computing H_{SZ} type haircuts from equation (2) requires calculating *PV Old*, which is computed analogously to *PV New*, i.e. using the same set of assumptions, the same Libor forward rates and the same discount rates. For consistency, we also use the same US dollar reference amounts to derive payment streams of the new and the old debt, except for cases with face value reduction or debt forgiveness. Note also that, for simplicity, we only discount cash flows on the old instruments if their remaining maturity exceeds one year. We thus disregard negligible, intra-year differences between discounted and face value.

Due to data constraints, especially for the 1970s and 1980s, the detailed characteristics of old instruments are not always available. If this is the case, we derive approximate principal and interest payments in the following way.

- For principal payments, we derive an approximate redemption timeline by taking advantage of readily available information on consolidation periods. The consolidation period of a restructuring is the time window in which the debt being exchanged would have originally fallen due. For example, a

[10] For debts whose interests are tied to 180-day Libor, we proceeded in the same way though in this case we previously compounded the future 90-day Libor rates to obtain 180-day rates. Before the inception of Eurodollar futures contracts in December 1982, we assumed a flat Libor yield curve fixed at the one year spot. We took the latter from the IMF's International Financial Statistics.

[11] Sturzenegger and Zettelmeyer (2008, p. 789) acknowledge that the difference between "mean haircuts", i.e. the average of haircuts computed for each instrument in the deal (weighted by debt volumes), and "aggregate haircuts", derived from summary cash flow streams across instruments, is small in most cases, often "with differences of less than a percentage point."

restructuring deal in July 1987 might have a consolidation period of January 1985 to December 1989, so that all principal due in this period is subject to the exchange. In line with the above, we assume a linear repayment pattern over the consolidation period and discount only those principal amounts coming due after the restructuring date (here, between July 1987 and December 1989). Payments due before the restructuring month, including unpaid interest tranches, are taken at face value and added to the sum of discounted future debt. Penalties for missed payments are ignored.

- To compute interest payments on unmatured parts of the old debt, we construct a series of past sovereign interest rates by country (spread above US Libor).[12] Specifically, we calculate past average spreads from primary market loan data in the five year period prior to the default.[13] To avoid bias, we use the full universe of US dollar denominated public and publicly guaranteed loans issued by each developing country and weight the average spreads by volume of the individual issuances. For the 1970s, loan-by-loan data on sovereign debt issuances is from Borrowing in International Capital Markets, a World Bank publication, as collected by Benczur and Ilut (2009). The data covers more than 1000 sovereign syndicated loans issued by developing countries in the period 1973-1979, including information on volume, currency and interest rate spread (spreads range from 0.125 to 2.5 percentage points). For the 1980s and 1990s we rely on the full sample of more than 7000 US dollar sovereign syndicated loans by developing countries as reported by the comprehensive Dealogic database.

Accounting for Previously Restructured Debt: 61 restructuring events out of the 179 in our sample affect debt that had been previously restructured, meaning that the same original debt is exchanged more than once.[14] A benefit of computing haircuts from equation (2) is that it allows accounting for such restructurings that include portions of previously restructured debt (PRD). Previously restructured loans or bonds can in fact be treated the same way as other old instruments. The relevant future payment streams can be easily computed given the detailed knowledge on the terms of previous restructurings. As with other instruments, we take those parts of PRD that have already fallen due at face value, while future payments are computed using the updated Libor forward rates and are discounted from the date of the restructuring on using the most recent discount rate.

Treatment of "New Money": 25 restructurings in the sample involve so called new money or concerted lending, most of them in the early and mid-1980s. At the time, a

[12] We focus on spread data because this set of assumptions is applied only on bank debt restructurings prior to 1998, a period when interest on sovereign debt was predominantly linked to the Libor rate. Given the much better knowledge on the characteristics of restructured bonds, we do not need to apply a similar procedure to any of the recent bond restructurings.

[13] To identify the five-year period prior to default, we use S&P data on default years.

[14] For example, the government of Venezuela restructured $20 bn of outstanding debt in a multi-year restructuring agreement in February 1986, then amended the terms of this agreement in September 1988 and then re-restructured the debt again in its Brady deal in December 1990.

main rationale of issuing new money to distressed debtors was to allow governments to continue servicing interest payments so as to avoid loan-loss write offs in the creditor bank's balance sheet. In principle, debt rescheduling and new lending can be seen as functionally equivalent as they both provide payment relief to debtors. Despite this, we do not include new money loans or bonds in the baseline haircut calculations. First, the volumes of new money are low: For the 25 relevant deals, the amounts account for an average of just 20% of total debt affected. Second, the results do not differ markedly. When we compare our haircut estimates with and without new money for these 25 cases we find that the mean absolute deviation in haircuts is just 0.7 percentage points. Finally, there is a conceptual reason for not including new money loans: These instruments tend to have a short maturity as compared to the "regular" new instruments, so that including them tends to bias the overall haircut estimate downwards.[15]

Treatment of Holdouts, Litigation and Penalty Interest: There have been a few prominent cases of creditor litigation in the context of sovereign debt restructurings, for example Elliot vs. Peru after 1997 and the "run to the courthouse" following Argentina's most recent default of 2001. Our haircut computations aim to capture the loss of the average creditor participating in the restructurings. We therefore do not take into account the losses or gains of holdout creditors, e.g. due to successful settlements or penalty interest in the years following the main exchange. This decision is unlikely to have any notable effect on our estimates. First, the share of holdouts is usually very low (below 5%), with the exception of Argentina (see data in Table 2). Second, a new database by Enderlein, Schumacher and Trebesch (2012) shows that the number of holdouts who end up litigating in courts is surprisingly low in the context of sovereign debt restructurings. Specifically, they find that only 31 of the 180 restructurings since 1970 were affected by a legal dispute. Most cases, especially before the mid-1990s did not involve a single lawsuit in London or New York. Moreover, only about two-thirds of cases filed get to the point of a court ruling and much fewer cases result in the debtor government actually paying principal and/or penalty interest. In addition, they find that litigation cases typically involve a maximum of 50 million US dollars, mostly less than that (Argentina is an exception). This means that the sums are small when compared to total debt restructured. To summarize, we disregard the gains or losses of a small group of creditors occurring in a few prominent recent cases. For most restructurings in our sample and for the very large majority of creditors we conclude that litigation was not an option. Despite this, we account for holdout litigation as a confounding factor in the regressions (see section A1.1 above).

Treatment of State Contingent Debt: 12 out of the 180 restructuring operations in the dataset involved new debt that was state contingent, e.g. via "value recovery"

[15] More specifically, the haircut will be biased downward (i) when the maturity of the new money debt is shorter than the average maturity of other new debt instruments and (ii) when the discount rate exceeds the interest/coupon rate on the new debt. Both conditions are met in the large majority of cases.

clauses, GDP-linked instruments, or warrants.[16] However, the portion of state contingent payments is usually not very large compared to total deal size. For example, Bulgaria's GDP kickers foresaw a maximum additional coupon payment of 0.5% annually and only mattered for the Discount Bonds, which accounted for 35% of the new debt.[17] More importantly, these instruments are very hard to value. Evans and Allen (2011) explain that bankers during the 1990s had difficulties to assess the relevance of value recovery clauses in the Brady deals, also because the clauses had different underlyings in each case. Some were linked to oil prices, some to GDP, some to specifically designed indices, e.g. to a terms of trade basket. Today, we know that some clauses paid (e.g. those in individual Mexican and Venezuelan bonds) and others did not (e.g. in Uruguay). After the Bradies the only relevant case is Argentina 2005, whose GDP warrants have paid substantial amounts. However, at the time of the restructuring in 2005, only very few investors expected Argentina to recover so quickly and robustly as it did since then, which is reflected in the extraordinary return that these warrants had since they were issued. Relatedly, Fernandez et al. (2006, Ch. 5) explain that there was no common view among practitioners on how to value these instruments. In addition, they were not a widely known feature of the exchange, either.[18] Against this backdrop, and to avoid bias, we decided to disregard state contingencies in our haircut calculations.

A4.2. Methodology to Estimate Discount Rates for Each Restructuring

The value of sovereign debt at the exit from default is subject to both aggregate credit market and specific country conditions prevailing at that time. The procedure explained below reconstructs these conditions for each country-month from 1978 until 2010. To our knowledge, no set of discount rate estimates used in the literature spans such a large sample of countries and years. To summarize briefly, the estimation method starts by using the secondary market yield to maturity on low-grade US corporate bonds, a truly free market price. For each credit rating category we then estimate the average spread between US corporate and EMBI sovereign yields. We then add this spread to the original corporate yield series to obtain an estimated time series of sovereign secondary market yields for each credit rating category. In the last step, we use the country credit rating in each semester to obtain a discount rate reflecting both global financial market conditions and the specific country situation. The procedure is carried out in four steps that we next describe.

[16] More specifically, state contingent debts were issued in the following 12 agreements: Honduras 1989, Costa Rica 1990, Mexico 1990, Venezuela 1990, Uruguay 1991, Nigeria 1991, Bolivia 1993, Bulgaria 1994, Ecuador 1995, Bosnia and Herzegovina 1997, Cote D'Ivoire 1997 and Argentina 2005.

[17] The provision said that "if for a certain calendar year N, the Bulgarian GDP is equal or higher to 125% of the GDP in 1993, and if the GDP for the next year N+1 is larger than that of the previous year, there will be an additional annual interest of ½% on the unpaid principal for the Discount Bonds." Argentina is an outlier as the warrants were linked to most of the new bonds.

[18] The investor magazine Euromoney summarizes the situation as follows: "hidden deep in the 808 page restructuring document were the terms for a series of warrants linked to Argentina's GDP growth that were largely ignored by the markets" (Euromoney, "Argentine GDP Warrants", January 25, 2006).

Step 1: Constructing a full time series of low grade US corporate bond yield

In this step we use an extrapolation routine to obtain a full time series of speculative grade US corporate bond yields to maturity from 1978 until 2010 by credit rating. Low-grade yield data for the 1978-1990 period is only available for the aggregate US market but not by individual credit grades. Altman (1987 and 1989) and Asquith, Mullins and Wolff (1989) are the only sources that report these yields for the early 1980s –a market that was very thin at the time. We chose the Altman (1987) figures for they have the widest coverage and are similar to those of the other papers. Unfortunately, Altman (1987) provides only a single average yield per year for this market.[19] Starting in 1987, Lehman Brothers began computing the yield to maturity on its US corporate high-yield index on a monthly basis.[20] We merge the two series into a single aggregate market index yield combining Altman for 1980-1986 with Lehman for 1987-1991.[21] Starting in January 1991 Moody's provides monthly median secondary market yields on intermediate term US corporate bonds by credit grade.[22]

Using the yields from Moody's and from the Barclays-Lehman Brothers index for the overlapping years, for each credit rating grade we run a linear time-series regression of the former on the latter. [23] Table A6 reports the results for the complete sample period and for two split samples.

The table shows a high correlation between the two variables as the adjusted R2 is between 0.65 and 0.94. Both the fit and the slope coefficient increase almost monotonically as the credit quality deteriorates so the lower the credit rating, the more sensitive and volatile are yields to a given change in market conditions. These

[19] Altman (1989) does provide a breakdown of yield by credit rating. However the series are incomplete and stop in 1987. Since we have the same problem for the 1988-1990 period, in this step we apply a common method to the aggregate market yield (both from Altman and from the Lehman Brothers index introduced next) to estimate the breakdown of yield by credit grade back to 1978.

[20] Although the return history of the index was backfilled until earlier years, the yield to maturity series start in 1987 (Fridson, 2007, and Horan, 2007). Other index providers are Credit Suisse, KDP and Merrill Lynch, but the Lehman one has earliest information about yields. The correlation among all of these indices is very high. Altman (1987) and the Lehman index overlap during 1987. The average yield from the two sources is 12.67 and 12.99 respectively, so they seem quite consistent with one another. In 2008 Lehman was taken over by Barclays Capital and the index was relabeled accordingly. We will refer to it as the Barclays-Lehman Brothers US corporate high-yield index hereafter.

[21] In part as a result of the difficulties of compiling first-hand information on the low-grade public debt market, a number of studies (e.g. Fons, 1987, Fridson and Gao, 1996) also rely on aggregate market index yields for this period.

[22] To be included in the index, bonds must be regular coupon type (no zero coupons or floating-rate), have maturities between six and eight years, have outstanding values of more than $50 million and be rated by Moody's. Each observation is unweighted in the sample, and the yields are calculated for end-of-month values. All yields are yield-to-maturity calculated on a semi-annual basis and Moody's reports the simple median yield for each credit rating grade. Typically, the index will have 1000-1200 bonds each month.

[23] We also tested a quadratic version of the model but it produced minor differences so we use the linear model for simplicity.

lower ratings are our primary focus of interest since defaulting countries will typically be in the lower categories upon completion of a restructuring process –even within the speculative ratings considered here.

Table A6: Regression of US Corporate Secondary Market Yields on the High-Yield Index

$$Yield_t^i = \alpha^i + \beta^i \; Yield_t^{Barclays} + \varepsilon_t^i, where \begin{array}{l} i = Ba1, Ba2, Ba3, B1, B2, B3, Caa \\ t = \text{Jan}-1991, \text{Feb}-1991, ..., \text{Dec}-2010 \end{array}$$

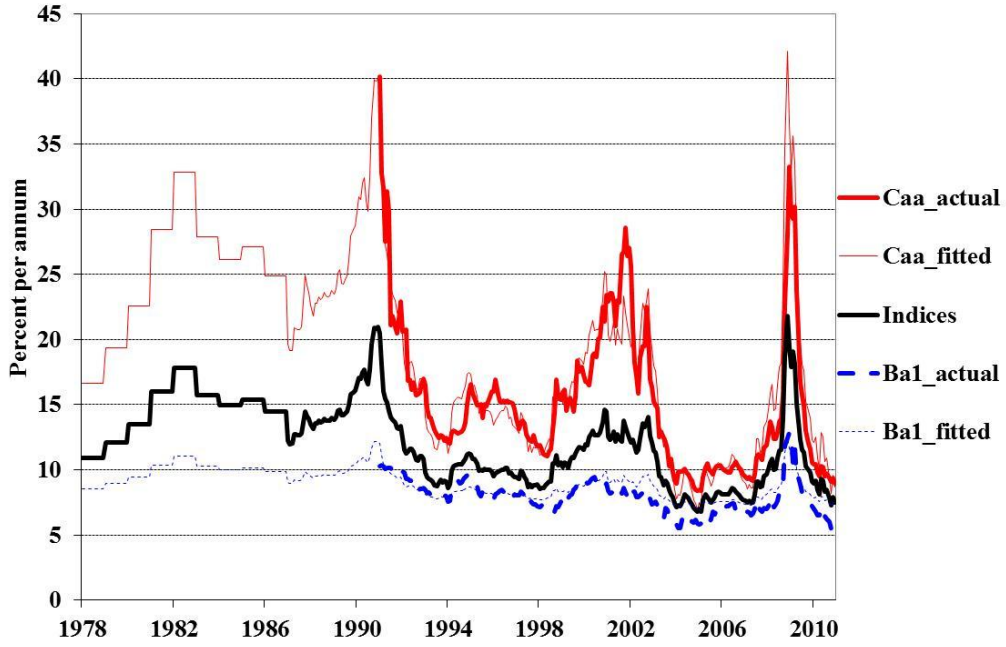
i	1991-2010			1991-1999			2000-2010		
	α^i	β^i	Adj. R2	α^i	β^i	Adj. R2	α^i	β^i	Adj. R2
Ba1	3.39	0.43	0.75	4.60	0.36	0.65	2.89	0.45	0.88
Ba2	3.08	0.51	0.79	4.59	0.41	0.75	2.47	0.54	0.89
Ba3	3.38	0.52	0.77	3.41	0.58	0.82	3.24	0.49	0.92
B1	3.80	0.54	0.73	4.32	0.55	0.78	3.46	0.51	0.92
B2	3.28	0.65	0.78	2.70	0.77	0.86	3.32	0.59	0.94
B3	1.48	0.93	0.87	1.06	1.03	0.88	1.50	0.89	0.94
Caa	-5.90	2.02	0.85	-8.82	2.33	0.90	-4.99	1.89	0.84
N	240			108			132		

This table shows the coefficient estimates of a regression of US corporate secondary market yields from Moody's on Barclays-Lehman Brothers US Corporate High-Yield Bond Index since the start of the disaggregated Moody's data. A separate regression is done for each credit rating level. Since Chow tests indicate that all coefficients are significantly different across decades, we use the coefficient estimates from 1991-1999 to generate a yield series by credit rating for 1978-1990. All coefficient estimates are significant at 1 percent level or better.

Chow tests on the split sample revealed that the coefficients during the 1990s were significantly different from those during the 2000s for all ratings. Therefore, we use the estimated coefficients for 1991-1999 to obtain imputed yields for the years 1978 through 1990 for bonds in each credit rating category. The explanatory variable is the Barclays-Lehman Brothers index yield for 1987-1990 and the Altman (1987) average annual yields for 1978-1986.

The output of this step is a full time series of corporate bond yields for the 1978-2010 period where the series up to 1990 result from the extrapolation just discussed and the series for 1991-2010 are taken from Moody's. Figure A4 shows the actual and estimated secondary market yields for the two extreme rating categories (Ba1 and Caa) together with the index yields. The good fit of the linear models is apparent in the figure. This is true even out of sample into the 2000s which we do not use. More importantly, the imputed yields for the period before 1987 closely correspond to actual yields by category directly computed off market data by Altman (1989) for the few years and categories for which the latter are available.

Figure A4: Yield to Maturity on US Low-Grade Corporate Bonds



This figure shows that yields on low grade US corporate bonds differ markedly by credit rating level over the period 1978 to 2010. The risk premium between the Ba1 and Caa ratings is also notably volatile. The solid thick middle line shows average sub-investment grade US corporate bond yield as reported by Altman (1987) from 1978 until 1986 and the yield on the Barclays-Lehman Brothers US Corporate High-Yield Bond Index thereafter. The top and bottom thick lines show the yields at the end of each month which are available since 1991 from Moody's. The thin lines report the extrapolated series for the Ba1 and the Caa credit ratings based on the coefficients from the 1991-1999 regression. The thin lines show a precise tracking of the actual yields in sample (1991-1999) as would be expected, but also out of sample (2000-2010). The thin lines for 1978-1990 show the extrapolation of yields for the two extreme non-investment grade categories based on the yield of the aggregate index at each point in time.

Step 2: From US corporate yields to sovereign yield

In this step, we convert the corporate yields from step 1 into discount rates on sovereign debt by estimating the spread that the market typically adds to corporate yields for a given credit rating. We use three data inputs in this step:

i. The corporate median yield spreads over US Treasury from Moody's which are part of the same data package used in step 1.

ii. JP Morgan's Emerging Markets Bond Index (EMBI) Global stripped yield spread prevailing for each country at the end of each month from December 1991 until December 2010. Since the Global index is not available for 1991-1993, we take spreads from the plain EMBI index for those years.[24] This set includes 45 countries that were in the index at some point or another.

[24] The original EMBI index focused only on Brady bonds. As countries later began issuing non-Brady bonds, JP Morgan constructed two broader indices: the EMBI+ and the EMBI Global which start in December 1997. The EMBI Global has less stringent liquidity criteria for the included bonds than the EMBI+ and so covers more securities and a wider set of countries. We focus on the EMBI Global to maximize the sample coverage as many of the defaulting countries lack a highly liquid secondary market.

iii. For each country-month in JP Morgan's sample, we take the long term foreign currency sovereign debt issuer rating from Moody's and focus on those in the speculative grade categories (Ba1 and under).[25]

We next match, for each month and credit rating category, the median sovereign and corporate spreads, and take the difference thereof.[26] Table A7 shows statistics of these differences for the whole sample and by decade.

There was more than twice the number of observations across the different rating grades during the 2000s than during the 1990s, which reveals that the market was much less developed in the earlier years.[27] During the full sample, there was a median sovereign minus corporate difference of about 110 basis points per annum for bonds of a given grade. So typically, for a given credit rating category, sovereign yields were larger. However, the 5^{th} and 95^{th} percentiles in the table show that the distribution shifted to the left during latter decade. Moreover, the positive gap that prevailed during most of the sample reversed during the 2008-2009 crisis in the US so that, for the higher ratings, sovereign bonds actually had lower median yields during the last decade.[28]

[25] We neglect country-months rated by Standard and Poor's and not by Moody's as recent evidence suggests that investors differentiate between the two rating agencies and assign more weight to the ratings from Moody's, the more conservative rating agency (Livingston, Wei and Zhou, 2011).

[26] Since the lowest category in Moody's US corporate yields data is Caa (without a qualifying number), we blend all country-months in the Caa1 and Caa2 categories in a single both to match the corporate Caa one, and we discard all country-months rated Caa3 and lower.

[27] A polar case is the Caa category for which there were only three months in the 1990s for which EMBI countries were in this range compared to 125 such cases during the 2000s.

[28] If we cut the sample in December 2007, the median difference across all ratings is about 41 basis points larger.

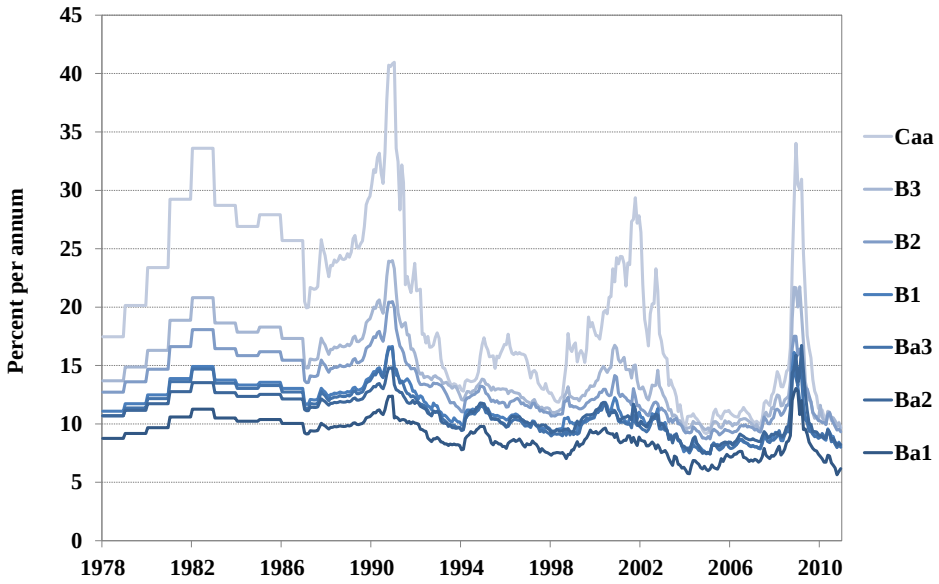
Table A7: Statistics of the Sovereign minus Corporate Bond Yield Differential

Credit rating	Period	N	5th pct.	Median	95th. Pct.
Ba1	All	193	-2.76	0.21	5.86
	1991-1999	61	1.16	2.55	7.93
	2000-2010	132	-3.16	-0.92	1.78
Ba2	All	177	-2.27	1.61	5.34
	1991-1999	58	1.41	3.24	7.40
	2000-2010	119	-2.51	0.29	3.55
Ba3	All	207	-2.93	0.99	9.45
	1991-1999	76	0.36	2.24	11.64
	2000-2010	131	-3.24	-0.44	2.51
B1	All	204	-2.19	0.72	7.18
	1991-1999	81	0.20	2.59	8.31
	2000-2010	123	-2.29	-0.22	4.03
B2	All	199	-1.23	1.55	7.14
	1991-1999	67	0.39	3.15	8.49
	2000-2010	132	-1.39	0.35	3.69
B3	All	159	-1.72	1.41	26.76
	1991-1999	32	1.41	19.55	37.59
	2000-2010	127	-1.72	0.88	6.05
Caa	All	128	-7.84	0.80	24.07
	1991-1999	3	19.32	22.79	25.70
	2000-2010	125	-7.84	0.73	23.76
All ratings	All	1267	-2.50	1.10	8.57
	1991-1999	378	0.42	3.09	19.32
	2000-2010	889	-2.82	-0.04	4.29

This table shows statistics of the sovereign over corporate premium for a given credit rating category (figures in percentage points). More specifically, the base variable is the gap between the median EMBI/EMBI Global sovereign stripped yield spread over US Treasury and the median US corporate bond spread over US Treasury reported by Moody's. The figures show that the risk premium for sovereign over corporate debt of a given creditworthiness was much higher in the 1990s when this market started to develop than in recent years. The median gaps for each credit rating grade during the whole sample are added to the corporate yields from step 1 to generate the imputed sovereign yields by credit rating from 1978 until 2010 shown in Figure A5.

Because we seek to impute secondary market sovereign spreads for the whole sample, we use the overall sample median difference hereafter. We next add the median all sample difference for each rating category to the median US corporate secondary market yield for that category from step 1. The output of step 2 is thus a time series of imputed secondary market sovereign yields for each credit rating grade from 1978 until 2010 as shown in Figure A5.

Figure A5: Imputed Sovereign Discount Rates for Long Term US Dollar Debt by Different Issuer Credit Ratings



This figure shows the evolution over time of a market-based imputed yield to maturity on medium-term US dollar denominated sovereign bonds for the different Moody's speculative credit rating categories. Both the levels of yields and the gaps between yields for different ratings vary substantially over time.

Step 3: Correspondence between Moody's sovereign credit grade and the Institutional Investor country credit ratings

Very few countries had agency credit ratings during the 1980s and early 1990s so we cannot rely on Moody's ratings to assess discount rates that vary depending on defaulters' conditions. However, as early as 1979, Institutional Investor (henceforth *II*), a trade magazine, started publishing country credit ratings for an initial list of 93 countries, which grew to over 178 nowadays. The ratings are the average of the credit score assigned to governments by the credit rating teams of a pool of about 100 internationally active banks. Because of their ample coverage, the *II* ratings have been widely used in the international finance literature (Feder and Ross, 1982, Feder and Uy, 1985, Lee, 1993, Ul-Haque, Kumar, Mark and Mathieson, 1996, Erb, Harvey and Viskanta, 1995 and 1997, later jointly with Bekaert, 1997, Ferson and Harvey, 1997, Reinhart and Rogoff, 2009, see Cruces, 2006, for a review). Since a large part of our restructurings are not covered by Moody's or Standard and Poor's, we rely on *II* for a set of credit ratings that are consistent both in the time series and in the cross sectional dimension.[29] However, given that the yield data from step 2 are for Moody's credit rating categories, in this step we convert the *II* country credit ratings into their Moody's equivalents.

[29] Since our ultimate object of interest is the haircut imposed by a country compared to that imposed by other similar countries, or to that imposed by the same country in other time periods, in case there is a systematic bias in the computation of discount rates, this would presumably affect all restructurings in a similar fashion.

Our goal is to have a good prediction for countries undergoing restructuring. All of the countries in our sample that are rated by Moody's have a speculative grade rating at the time of restructuring. The maximum *II* credit rating for countries contemporaneously rated by Moody's as speculative grade is 65. Because we want to estimate the distribution of Moody's ratings conditional on a given *II* rating, we discard all country-semesters with an *II* rating greater than 65.[30] We next take the prevailing Moody's credit rating as of January and July of each year, starting in mid-1979, and convert it to a numerical scale going from 21 for the A category all the way down to 2 for the Ca category.[31] We match these country-month ratings to those of the March and September *II* surveys for the same years.[32] Table A8 reports the results of a linear projection of the Moody's ratings on those from *II*,[33]

Table A8: Linear Projection of Moody's on Institutional Investor Ratings

$$Moody'sCCR_{jt} = \alpha + \beta\, Institutional\ Investor CCR_{jt} + v_{jt}$$

Sample	α	β	*N*	*Adj. R2*
Full sample	1.232	0.215	1,867	0.67
	(7.71)	(61.93)		
1980s	8.580	0.154	74	0.20
	(5.14)	(4.42)		
1990s	1.885	0.216	603	0.77
	(8.56)	(45.53)		
2000s	0.705	0.212	1,190	0.80
	(4.93)	(67.91)		

This table shows the results of a linear regression of country credit ratings from Moody's on those from Institutional Investor. We run one separate regression for each decade and one for the whole sample. Very few countries were actually rated by Moody's in the 1980s (less than 4% of the sample). These countries had better unobservable characteristics than those that Moody's began rating in later decades. This is shown by the reduction of the intercept from 8.6 in the 1980s to 1.9 in the 1990s and to 0.71 in the 2000s. The slope is markedly stable after 1990. As the output of step 3 we use the full sample estimates to generate an estimated Moody's rating for each country-semester with an Institutional Investor rating. This imputed rating is matched with the yields from step 2 to generate a country-month specific discount rate in step 4.

The table shows a strong positive relation between ratings from the two sources. The slope coefficient for the whole sample is 0.215 so that it takes 4.65 *II* credit points to raise one notch in the Moody's scale. The table shows that this slope coefficient is quite similar for the 1990s and the 2000s. The lower slope coefficient for the 1980s

[30] Note that *II* does not distinguish between investment and non-investment or speculative grade. The 65 point cutoff is the maximum *II* rating among all country-semesters below investment grade on the Moody's scale.

[31] This conversion of categorical to ordinal scales is standard in the literature; see Cantor and Packer (1996) for references.

[32] Cruces (2006) documents that the Institutional Investor surveys whose results are published in March and September of each year are conducted about two to three months before publication.

[33] We also try a quadratic specification but the significance of the quadratic term is very unstable over time.

sample results from some outliers which kept high Moody's ratings even as the country situation deteriorated substantially. For example, Venezuela had an Aa rating issued in 1983 and kept it until Moody's lowered this by nine rating notches to Ba2 in mid-1987 (see Moody's 2011). In the meantime, its *II* rating fell monotonically each semester from 57.2 points in 1983 to 36.9 in mid-1987.

The intercept represents heterogeneity that is not captured by the *II* ratings: it is larger for the earlier period and it falls as time progresses. In fact Moody's focused on the subset of most developed countries in the 1980s and it incorporated less developed countries as the years went by, hence the secular reduction in the intercept.

Given the stability of the slope coefficients over time and because we are analyzing countries with credit difficulties and at different levels of development during the three decades, in the next step we use the full sample specification to impute a Moody's equivalent credit rating for each country-semester Institutional Investor rating.

Step 4: Individual country discount rates at each point in time

From step 2 we have imputed secondary market yields for sovereign bonds in each of Moody's speculative grades (Fig. A4). Step 4 uses the sovereign rating for each country-month in the sample from step 3 and imputes a market discount rate for that rating-month combination by linear interpolation of rates from step 2. When the imputed Moody's rating falls in the investment grade range, we avoid computing a discount rate as our procedure is designed for countries facing debt problems. These are the final discount rate sequences from 1978 until 2010 from which we pick the specific rates prevailing after each restructuring.

While very comprehensive, the *II* report provides no ratings for a small set of poor countries in the 1980s and 1990s. As a result, we are not able to estimate country-specific discount rates for 13 restructurings. As a proxy, we use the respective monthly rates of the nearest country in the region that was also in default or implemented a restructuring during the time. The cases together with their surrogate countries (in parentheses) are: Madagascar - 1981/11 (Tanzania), Niger - 1984/3 (Sudan), Madagascar - 1984/10 (Ethiopia), Niger - 1986/4 (Sudan), Mozambique - 1987/5 (Tanzania), Madagascar - 1987/6 (Tanzania), Gambia - 1988/2 (Sierra Leone), Guinea - 1988/4 (Sierra Leone), Togo - 1988/5 (Liberia), Madagascar - 1990/4 (Tanzania), Macedonia, FYR - 1997/3 (Albania), Bosnia & Herzegovina - 1997/12 (Georgia), Dominica - 2004/9 (Dominican Republic). For Jamaica's 1978 restructuring, we backward extrapolated linearly the rates in 1979.

The discount rates so computed are used in 161 of the 180 cases. 18 of the remaining cases consist of buybacks of all fallen due debt for which no discount rate is needed

(*PV New* is the buyback price and *PV Old = FV Old*).[34] The remaining case is Russia 1999 which is a complicated local currency denominated exchange for which we borrow the rate from Sturzenegger and Zettelmeyer (2008) who went through the painstaking job of estimating it as an exit yield was not readily available.

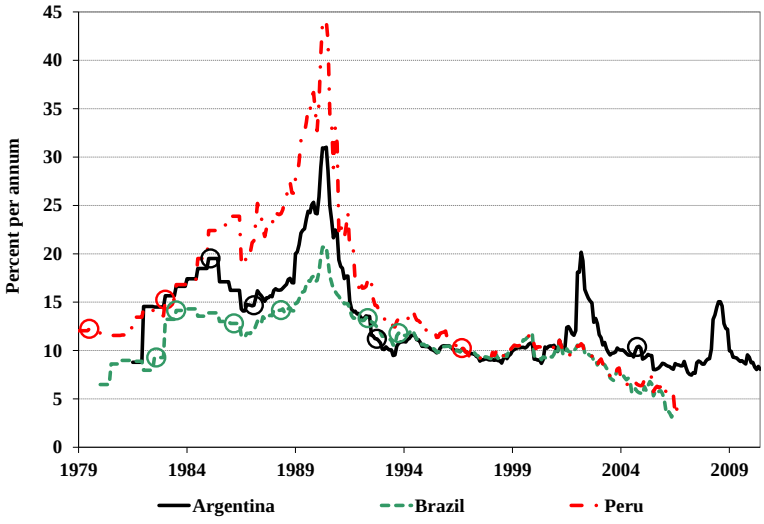
The unbiasedness and the timeliness of credit ratings have been subject of much debate in recent years. While some authors argue that agencies add fundamental value above and beyond market prices (e.g. Cavallo, Powell and Rigobon 2008, Sy 2004), others have criticized them for reacting to public information with delay (see Kaminsky and Schmukler 2002, among others). Despite this, we think that the Institutional Investor ratings are the most reliable and useful source of information on sovereign risk across countries and time for our purposes: First, they arise directly from the credit analysis teams of large internationally active banks who were the players in the sovereign debt market, hence the agents who would potentially trade these assets in primary or secondary markets. Second, they span a much larger number of countries and cover a wider time period than any alternative source of data on sovereign risk (including bond or loan spreads). Furthermore, we use semester data, which will be less prone to agency rating delays and bias compared to rating data on a daily or weekly basis.

A4.3. Resulting Discount Rates: Overview and Benchmarking

For illustration purposes, Figure A6 shows the time series of discount rates for six selected countries with circles highlighting the rates that are actually used (i.e. restructuring cases) along each country's series.

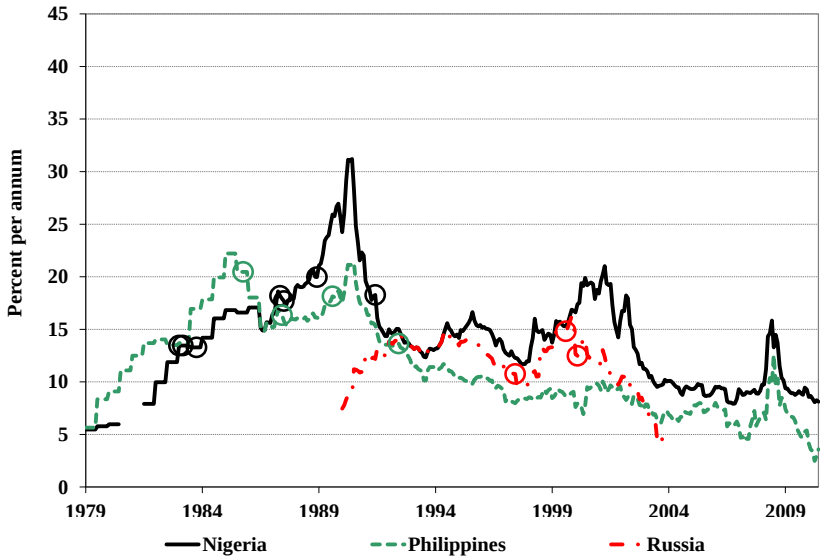
Figure A6: Imputed Discount Rates for Selected Countries

Panel A:



[34] A few other buybacks involve yet to mature debt and are among the 161 cases.

Panel B:



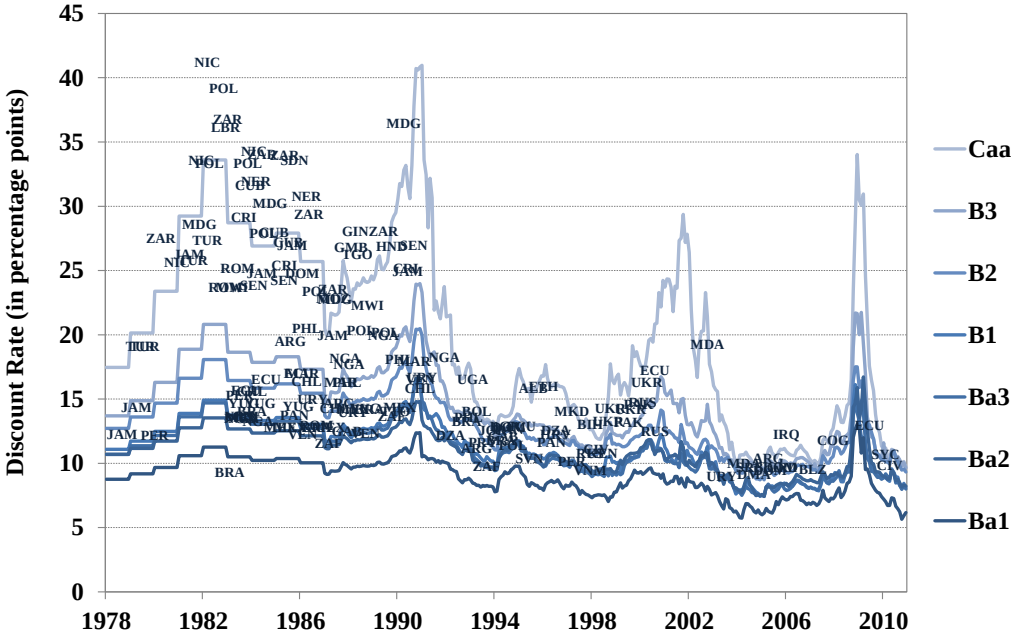
This figure shows the discount rates imputed to six countries over the sample period and highlights that yields respond to changing country and world market conditions. The circles along each series correspond to those rates that are actually used in computing haircuts. Some lines are discontinued, because we no longer compute yields when a country's imputed credit rating graduates to investment grade (Baa), e.g. Russia after 2004.

The figure clearly shows that there are very volatile common movements in discount rates which make them swing together between about 7% and 25%. It also underscores that there are important specific country conditions above and beyond the common movements: the upswing of Argentina and Nigeria around 2001 is not accompanied by Brazil, Peru, Philippines or Russia. Last, while country and world conditions change over time, it could be the case that countries restructure at times when discount rates reach a certain fixed level (e.g. 10% as used by some authors), which would make this whole discount rate estimation procedure futile. The example of the six countries in Figure A6 shows that although the discount rates actually used for these six countries are less volatile than the underlying series, they still range from about 9% to slightly over 20% so that it seems appropriate to have restructuring-specific discount rates in order to compute haircuts.

Figure A7 provides even stronger evidence of the relevance of this exercise by showing the discount rates actually used in each restructuring by the different countries and their breakdown over time.

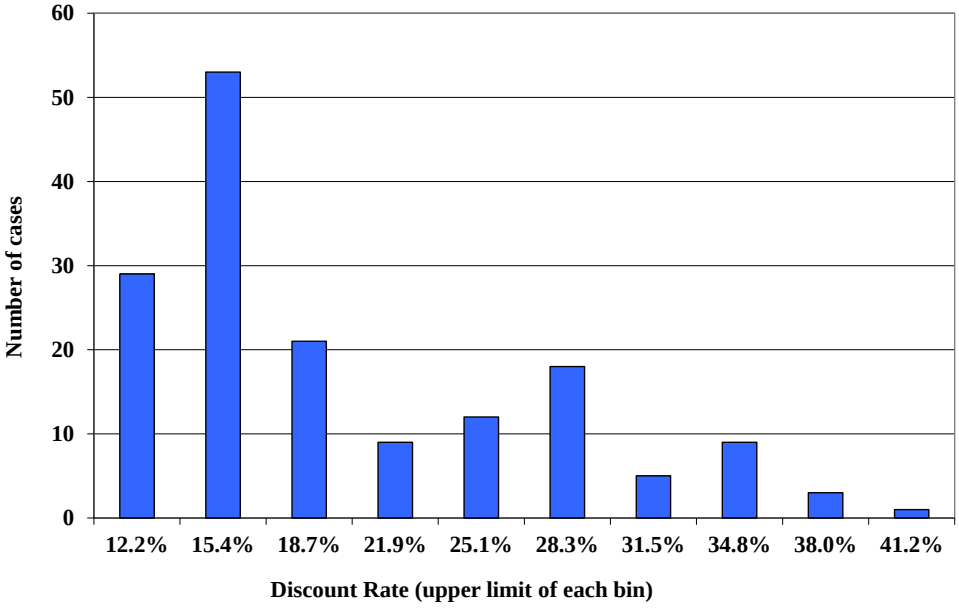
To complete our description of the imputed discount rates actually used in estimating investor losses, Figure A8 presents a histogram thereof. The median discount rate is 15%, while the mean is 18.39% and the standard deviation is 7.64%. As noted above, there is material dispersion in the imputed discount rates so that it seems sensible to control for country and world conditions when pricing both the old and new debt instruments in order to compute haircuts.

Figure A7: Discount Rates Actually Used in Computing Haircuts



This figure shows the discount rates actually used in computing haircuts and the time and country to which they correspond. The first half of the sample shows the largest discount rates.

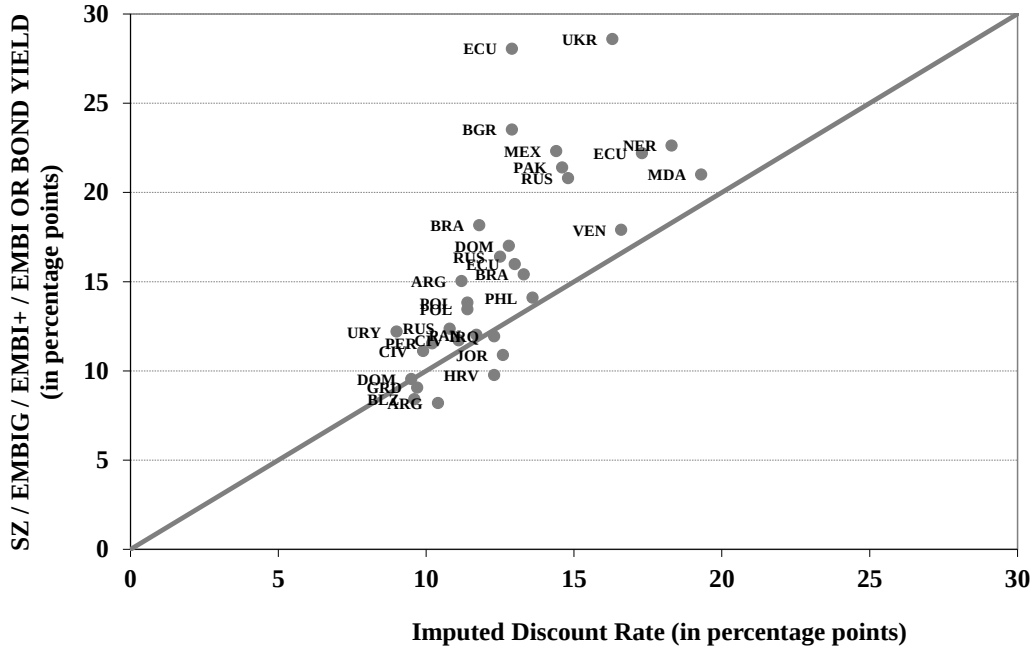
Figure A8: Histogram of Discount Rates Actually Used in Computing Haircuts



This figure shows a histogram of the discount rates actually used in computing haircuts. The range goes from 9% to 41.2% while the median is 15%. The first and third quartiles are 12.8% and 24.3% respectively.

Finally, we provide two acid tests of the validity of our discount rate imputation procedure. For a set of 31 recent restructurings, exit yields are available from SZ (2006, 2008), from the EMBI or EMBI Global indices and/or from major bonds whose yields are reported by Morgan Markets. Figure A9 compares these data with our discount rates and superimposes a 45º line.

Figure A9: Benchmarking Imputed Rates against Actual Exit Yields: 1990s/2000s



This figure contrasts our discount rates (x-axis) with the exit yields from SZ (2006, 2008), EMBI/EMBIG and MorganMarkets (y-axis) for 31 recent restructurings for which these latter data are available. While the methodology presented in this paper seems to underestimate exit yields at levels above 15%, the correlation coefficient between the two series is 0.73.

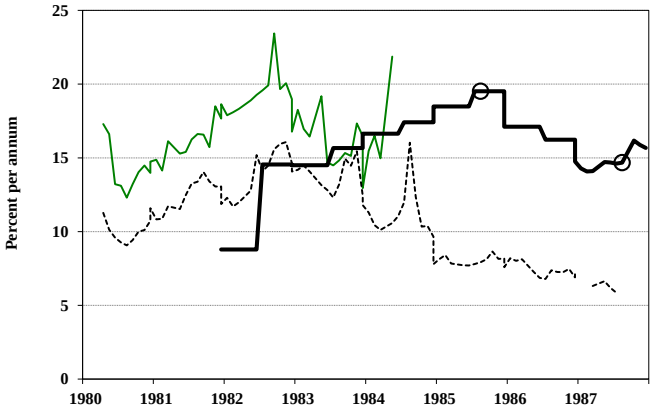
As evident from the figures, our imputed rates are largely consistent with actual exit yields whenever they are available. The correlation coefficient is a high 0.73. Yet, there are a few cases above 12% for which our procedure underestimates the exit yields. As shown in Figure 3 in the paper, exit yields drop considerably in the few months after the new bonds begin circulating. It is then natural to ask whether holders of old debt instruments will sell their claims immediately after the new bonds begin circulating or if they will wait a few months until the situation normalizes (and their haircuts are reduced as the exit yields taper off).

Our last acid test compares discount rates at the other extreme of the sample, the 1980s. Folkerts-Landau (1985) and Edwards (1986, ft.25) report emerging country bond yields from the International Herald Tribune. This newspaper has continuous series for very few emerging countries, most notably Argentina, Brazil and Mexico. We retrieved those yields, following the same bonds over time, and computing the average thereof on the first Monday of each month from 1980 until they ceased to be listed. Figure A10 shows the average among US dollar and Deutsche mark bonds together with our discount rates (thick line).[35] The circles on the thick line highlight the discount rates that are actually used in computing haircuts.

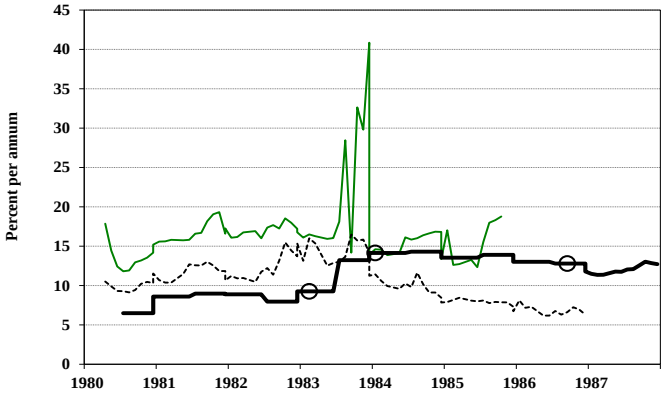
[35] Our discount rates are constant within a semester up to 1986 due to the fact that the corporate yields from step 1 are only available by year for that early period while country credit ratings vary by semester.

Figure A10: Benchmarking Imputed Rates against Secondary Market Yields: 1980s

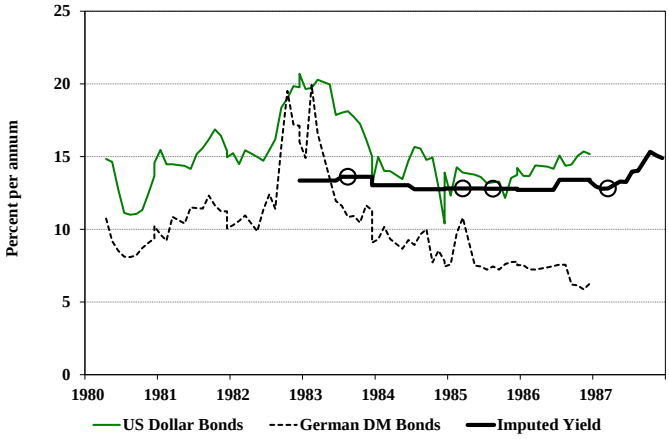
Panel A: Argentina



Panel B: Brazil



Panel C: Mexico



A few emerging countries floated hard currency bonds which were traded in very thin international markets in the 1980s. This figure shows the average yield at the beginning of each month on the US dollar and the Deutsche mark bonds for the very few countries that had continuous reporting of their yields by the International Herald Tribune. It also shows our imputed discount rates which for the pre-1987 period varied only by semester. The circles highlight the yields that are actually used in computing haircuts. It is apparent from this figure that the imputed discount rates are broadly consistent with the levels and changes of these secondary market yields.

Again, while the data are noisy, due in part to the thinness of these markets, it is apparent from the figure that the imputed discount rates are broadly consistent with the levels and changes over time in these secondary market yields even for the 1980s.

A4.4. Computing Haircuts: Four Examples

Sovereign debt markets have evolved considerably over time, and so have debt restructuring techniques. The following paragraphs illustrate our haircut computation approach for four representative restructurings during the 1980s, 1990s and 2000s.

Poland's April 1982 Rescheduling

Poland's 1982 debt agreement was a landmark case, being the first restructuring of the 1980s debt crisis with "a broader systemic significance" (Rieffel 2003, p. 102). It also was a typical deal of the early 1980s, in that it featured consolidation periods of one or two years only and affected debt that had already fallen due or that was about to mature in the very short-term. Poland and its creditor banks signed the restructuring agreement in April 1982. The deal rescheduled 95% of principal that had fallen due in 1981 ($1.95 billion, bn) into a new loan with maturity of seven years, grace period of four years and a 1.75 interest spread above Libor. The relevant 180-day Libor forward rate computed for April 1982 is 14.75% and remains flat for the entire horizon of the new loan. Based on this basic information, we derive the following repayment schedule: Annual interest payments of 16.5% on the outstanding principal from year one to seven, disbursed in end March of each year. Principal repayment in equal amounts after the end of the grace period, with 33% being paid back at the end of March of 1987, 1988 and 1989 respectively.

The discount rate applied is a very high 33.45%, which reflects the exceptionally low country credit rating of Poland and a low appetite for high-risk debt at the time. Specifically, Poland had a country credit rating of 13 on the Institutional Investor (IICCR) scale. This rating is tantamount to 4.03 on an ordinal scale in which 4 corresponds to a Moody's rating of Caa and 6 to B3. At the time, the yield on medium term US corporate bonds rated Caa was 32.81%, a price of credit risk only surpassed in late 1990 and 2008.

The resulting present value of the discounted debt servicing stream is 1.16 bn US$, yielding an overall market haircut of 40.6% (roughly: 1- 1.16/1.95). Because all of the old debt had already matured at the time of exchange, this H_M is equal to H_{SZ}, which is a typical pattern of restructuring deals in this period.

Chile's 1987 Baker Plan Deal

The mid and late 1980s saw a new type of debt restructurings, which were coined "Multi Year Restructuring Agreements" (MYRAs) or as Baker Plan restructurings (see Chuhan and Sturzenegger 2005 for details). MYRAs restructured unmatured

debt coming due in a period of up to five years in the future, and resulted in new loans with a maturity of up to 25 years. The newly negotiated interest rates were more concessional than in the early 1980s, with spreads above Libor of around 1% or less. Overall, these agreements were both more comprehensive and more complicated to assess, because they involved previously restructured debt and often resulted in more than one new debt instrument.

An exemplary case for the period is Chile's June 1987 restructuring, which had three main elements: Part one restructured $1.41 bn of maturing new money loans that had been issued in June 1984 and April 1986 into a new loan with five years maturity, three years grace period and a 1.125% spread. Part two exchanged $2.95 bn of debt that had been previously restructured in agreements of November 1983 and January 1984. The PRD falling due between January 1988 and December 1990 is exchanged into a new loan with a maturity of 15.5 years, a grace period of five years and a spread of 1%. The same terms applied for part three, which restructured $1.53 bn of previously unrescheduled debt falling due between January 1988 and December 1991 into a new loan with 15.5 years maturity, five years grace and 1% spread. The imputed 180-day Libor forward rate for June 1987 increases from 7.67% in year one to 9.16% in year 10 (as a reference, the yield to maturity on 10-year US Treasury bonds was 8.4% at the time). The imputed country specific discount rate applied to all three parts is 14.32%. Chile's IICCR was 26, which was tantamount to about a B2 on Moody's scale. The return on US corporate bonds rated B2 was about 12.51% at the time.

For the restructured new money loans of part one of the deal we compute interest rate payment streams that increase from 8.67% (7.67% + 1%) in year one, to 10.3% at the end of year five. 50% of principal is redeemed at the end of the fourth year, the other half in year five. The resulting present value of this new instrument is $1.21 bn, compared to $1.42 bn in face value. Parts two and three of the deal also foresee annual interest payments going from 8.7% in year one to a maximum of 10.3%. Principal payment occurs linearly at a rate of 9.52% from year six to 15 and 4.75% in the last six months (July to December 2002). The resulting present value is $2.26 bn for part two, and $1.18 bn for part three, compared to $2.95 bn and $1.53 bn in face value, respectively. Overall, this yields a weighted market haircut H_M of 21.2% (roughly: 1- (1.21+2.26+1.18)/ (1.42+ 2.95+1.53)).

Calculating H_{SZ} for this restructuring builds on two approaches. For parts one and two of the deal, *PV Old* can be computed using the known terms of the new money and PRD of 1983 and 1984. For the old instruments of part one we apply an average interest rate spread to of 2.06% above Libor, which is the weighted average spread of the 1.3 bn of new money of November 1983 (with a spread of 2.25%) and the 780 m of new money of June 1984 (with a spread of 1.75%). For part two we apply a 2.25% spread, as all relevant parts of the 1983 and 1984 restructuring agreements had this spread. With reference to the original terms, the relevant principal

repayment of both parts are plotted in equal annual tranches until the end of 1990. The reference Libor forward rates and the discount rate applied are the same as for the new debt, i.e. using those relevant in June 1987. The result is *PV Old* of $1.31 bn for part one and of $2.74 bn for part two of the deal, which is significantly less than their face value of $1.42 bn and $2.95 bn of their face value, respectively.

Computing *PV Old* for part three of the deal is more complicated, as this part does not affect PRD and because we have little further information on the old loans being restructured. As discussed in section A4.1, we therefore derive an approximate payment schedule and assume linear redemption across all years of the relevant consolidation period (01/1988-12/1990). To derive interest payments we apply the weighted average interest rate spread on all of Chile's public and publicly guaranteed loans issued between 1978 to 1982 using loan by loan data from Dealogic and the Borrowing in International Capital Markets publication series (see A4.1). This retrospective average spread amounts to 1.07%, while the Libor forward rates and the discount rate applied are those of June 1987. The resulting *PV Old* for part three is $ 1.37 bn compared to 1.53 bn of its face value. When summing up the present value of all three parts, we get $ 5.31 bn and a H_{SZ} haircut of only 14.3% (roughly: 1-(1.21+2.26+1.18)/(1.31+ 2.74 +1.37)), about two-thirds of its H_M counterpart.

Mexico's 1990 Brady Deal

Mexico was the first country to reach a restructuring agreement under the Brady initiative, which implied outright debt reduction and the exchange of bank debt into bonds. Mexico's February 1990 agreement was a typical Brady exchange in that it allowed creditors to choose from a menu of options so as to accommodate differences in business goals and regulatory environment across banks. Specifically, Mexico's deal had four parts: Under option one (chosen for $20.55 bn) banks exchanged outstanding principal with a 35% discount into new 30 year bonds with bullet maturity and a spread of 0.8125%. Option two (chosen for $22.43 bn) implied interest reduction, as debt was exchanged into 30-year bullet bonds with a fixed interest rate of 6.25%. For both of these 30-year bonds, principal payments were collateralized with US Treasury zero-coupon bonds while interest payments were backed by an 18-month rolling interest guarantee. Collateralization was supported through a special Brady deal funding facility set up by the IMF and the World Bank. Option three (chosen for $5.1 bn) did neither foresee principal nor interest reduction, but exchanged debt at par if creditors where willing to provide new money (in the form of new lending or trade finance) equivalent to 25% of eligible debt. The bonds exchanged in option three had a maturity of 15 years, a grace period of seven years and a spread of 0.8125% above Libor. Beyond these three options, the deal foresaw the restructuring of $6.4 bn of debt coming due from previous new money packages (of 1983, 1984 and 1987) without debt and debt-service reduction. The resulting bonds also had a maturity of 15 years, a grace period of 7 years and a spread of 0.8125% above Libor. The imputed forward Libor rate of February 1990 increases

from 8.59% in year one to 9.29% from year 10 on. As a reference, the yield to maturity on 10-year treasuries was 8.47% at the time.

Debt payments on all uncollateralized bonds are discounted at the exit yield of 14.42%. Mexico had an IICCR of 32.6 at the time, which was tantamount to 8.24 on Moody's ordinal scale in which 8 corresponds to B1 and 9 corresponds to Ba3. The yield on medium-term US corporate bonds rated B1 was 13.76 and on those rated Ba3 was 13.25 at the time. A different rate has to be applied to the 30-year bullet bonds, as they are collateralized with US Treasuries. Specifically, we discount the principal repayment of these bonds in year 30 (February 2020) using a discount rate derived from the US Treasury yield curve of February 1990 (8.45%). The interest payments are discounted at the 15.35% country rate, except for the first 18 months, which are guaranteed and thus discounted using a rate derived from the US Treasury yield curve (8.12% in the first year and 8.43% for months 13 to 18). As to the repayment schedule, the bonds of option three as well as the additional bond on previous new money have annual principal repayments of 12.5% from year eight to 15 as well as yearly interest disbursements, which are linked to the (forward) Libor.

To compute the overall haircuts, we discount the debt streams of each of the instruments as described above and add their present values to get *PV New*. This results in an overall H_M of 43.7%. *PV Old* is easy to compute here, as in March 1987 all outstanding sovereign loans (including previously restructured ones) had been exchanged into to two new instruments with a spread of 0.8125% above Libor and maturities of 10 and 20 years. To derive cash flows streams, we can therefore simply use the terms of these two instruments, as well as the terms of four new money loans issued at that time (same spread and maturities of eight, 12 and 15 years). Due to the long remaining maturity, the present value of the outstanding debt instruments amounts to a low $43.97 bn, compared to the face value of $54.3 bn. The resulting H_{SZ} is 30.5%, which is significantly smaller than the market haircut. The face value haircut is even lower, 13.1%, because only part one of Mexico's Brady deal menu implied principal reduction.

Ecuador's 2000 Bond Exchange

Ecuador's 2000 exchange is an exemplary case of a modern-era bond restructuring. In 1999, Ecuador was the first country to default on its Brady bonds. The government launched an exchange offer on six outstanding bonds in July 2000, which was successfully closed on August 17 with a participation rate of nearly 99%. The deal affected four bonds resulting from the country's 1996 Brady deal, as well as a $350 m bullet Eurobond maturing in 2002 and a $150 m bullet Eurobond maturing in 2004. The Brady instruments had an outstanding face value of $1,655 m (Brady Par bonds), 1,435 m (Bray Discount bonds), 2,781 m (Brady Past Due Interest bonds) and 143.25 m (Brady Interest Equalization bonds). Their maturities are 2025, 2025, 2015 and 2004 respectively. The Brady bonds have an interest rate of 0.8125%

above Libor except for the Par bond, which has a step up coupon rate increasing from 3% to 5% annually.

All six old bonds were exchanged into a new 30 year bullet bond maturing in August 2030 with annual coupon rates increasing from 4% in year one to 10% from year nine on. Besides a lengthening of maturities, the exchange implied a cut in principal of 60% for the Brady Par bonds, of 42% for the Brady Discount bonds and of 22% for the Brady PDI bonds (this yields an overall weighted cut in principal of 33.88%). Note, however, that this cut in principal was accompanied by a sweetener, as holders of Brady PDI and Brady Discount bonds that agreed to the exchange became eligible to a cash payment of 23.5% of principal outstanding. Furthermore, the deal foresaw the capitalization of a total of $185.3 m of overdue interest payments on all of the six old instruments. This accrued interest was exchanged into a new bullet Eurobond maturing in 2012 and paying a fixed 12% annual coupon. Future payments are discounted with the imputed country specific discount rate of 17.3%. At the time Ecuador had an IICCR of 18.3 which is tantamount to 5.16 on Moody's ordinal scale in which 4 corresponds to Caa and 6 corresponds to B3. The yield on medium-term US corporate bonds at the time was 13.3 for B3 bonds and 20.04 for Caa bonds as computed directly by Moody's.

In this case, we can compute *PV Old* precisely, given the detailed knowledge on all of the old instruments, including their exact principal redemption schedule. We apply the same country-specific discount rate of 17.3%, except for the collateralized Brady bonds which are discounted based on the prevailing US 30-year Treasury yield curve). To get the total present value of the old instruments, we compute present value estimates for each of the six outstanding bonds and add to this the total accrued past interest. This results in a total present value of the old debt of $43.58 bn, compared to $66.99 bn in outstanding face value. Next, we compute the present value of the two new bonds and add to this the cash payment sweetener on the Brady PDI and Discount bonds. The result is a total *PV New* of $26.91 bn. Overall, we thus get a market haircut of 59.8% (roughly: 1- 26.91/66.99) and a SZ haircut estimate of 38.3% (roughly: 1- 26.91/43.58). This large discrepancy between H_M and H_{SZ} can mainly be explained by the long remaining maturity of the old outstanding Brady debt instruments. Finally, it should be mentioned that the agreement also had a sizable face value haircut of 33.88%, due to the substantial write-off on three of the six outstanding instruments.

A5. Detailed List of Restructuring Cases

Table A9 provides the complete list of all 180 restructurings 1970 to 2010. The table also provides details on key features of each restructuring agreement, in particular:

1. The volume of debt restructured in million US dollars. This is the total face value of old debt restructured, not eligible debt (i.e. excluding holdouts),
2. If the restructuring involves bond debt only,
3. If the deal implies a reduction in face value of outstanding debt,
4. If the deal is a buy-back,
5. If the restructuring is a Brady deal,
6. If the deal is donor funded or supported by bilateral or multilateral money, e.g. via funds by International Development Association Debt Reduction Facility (World Bank 2007, 2010),
7. If all the old debt being restructured had fallen due at the time of the restructuring,
8. If the exchange includes previously restructured debt (PRD),
9. If the agreement includes the provision of new money or concerted lending,
10. If the agreement also affects short-term debt, e.g. trade credits, and
11. The Data Quality Index, reflecting the scope of information available.

Figure A10 provides a more condensed overview. The graph underlines the high frequency of restructurings, both within and across countries. On average, defaulting countries restructured their debt two and a half times since 1970. Especially the 1980s saw a large number of successive restructurings, which were often linked to each other. The country with the largest number of completed debt exchanges was Poland with eight deals, followed by Mexico, Congo (Dem. Rep.), Jamaica and Nigeria with seven deals each and then by Argentina, Brazil and Mexico with six deals each. These figures reconfirm the notion of serial defaults highlighted by Reinhart and Rogoff (2009). In addition, it is noteworthy that some renegotiations took very long to complete. Peru, for example, was in default for as long as 14 years before reaching its Brady plan agreement in 1997.

Finally, we add a list of sources for each debt restructuring case.

Table A9: Sovereign Debt Restructurings 1970-2010

Case Nr	Country	Date	Debt Restruct. in m USD	Bond Exchange	Reduct. in Face Value	Buy Back Deal	Brady Deal	Donor Funded	All Fallen Due	Affects PRD	New Money Incl.	Short-Term Debt Incl.	Data Quality Index
				(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	Albania	08 / 1995	501		1			1	1				2
2	Algeria	03 / 1992	1,457										3
3	Algeria	07 / 1996	3,200							1			2
4	Argentina	08 / 1985	9,900						1		1	1	2
5	Argentina	08 / 1987	29,515						1		1	1	3
6	Argentina	04 / 1993	28,476		1		1			1			3
7	Argentina (Global)	04 / 2005	60,572	1	1					1			5
8	Belize	02 / 2007	516	1									5
9	Bolivia	03 / 1988	473		1	1			1				2
10	Bolivia	04 / 1993	171		1	1		1	1				3
11	Bosnia & Herzeg.	12 / 1997	1,300		1	1				1			4
12	Brazil	02 / 1983	4,452						1		1	1	2
13	Brazil	01 / 1984	4,846								1	1	2
14	Brazil	09 / 1986	6,671						1			1	2
15	Brazil	11 / 1988	62,100								1	1	2
16	Brazil	11 / 1992	9,167						1				4
17	Brazil	04 / 1994	43,257		1		1			1			3
18	Bulgaria	06 / 1994	7,910		1		1		1				3
19	Cameroon	05 / 2002	600		1	1		1	1				3
20	Cameroon	08 / 2003	796		1	1		1	1				3
21	Chile	11 / 1983	2,169								1	1	2
22	Chile	01 / 1984	1,160						1				3
23	Chile	04 / 1986	6,007							1	1	1	3
24	Chile	06 / 1987	5,901							1		1	3
25	Chile	12 / 1990	6,494							1	1	1	3
26	Congo, DR (Zaire)	04 / 1980	402						1				3
27	Congo, DR (Zaire)	01 / 1983	58										3
28	Congo, DR (Zaire)	06 / 1984	64										3
29	Congo, DR (Zaire)	05 / 1985	61										3
30	Congo, DR (Zaire)	05 / 1986	65										3
31	Congo, DR (Zaire)	05 / 1987	61										3
32	Congo, DR (Zaire)	06 / 1989	61							1			3
33	Congo, Rep.	12 / 2007	2,100		1			1	1				2
34	Costa Rica	09 / 1983	609									1	2
35	Costa Rica	05 / 1985	440									1	2
36	Costa Rica	05 / 1990	1,384		1		1			1			4
37	Cote d'Ivoire	03 / 1998	6,462		1		1	1		1			4
38	Cote d'Ivoire	04 / 2010	2,940	1	1					1			4
39	Croatia	07 / 1996	858							1		1	5
40	Cuba	12 / 1983	130						1			1	3
41	Cuba	12 / 1984	103						1			1	2
42	Cuba	07 / 1985	90						1			1	2
43	Dominica	09 / 2004	144	1	1								4
44	Dom. Rep.	02 / 1986	823						1				2
45	Dom. Rep.	08 / 1994	1,087		1		1			1			3
46	Dom. Rep. (Bonds)	05 / 2005	1,100	1									5
47	Dom. Rep. (Loans)	10 / 2005	180										2
48	Ecuador	10 / 1983	970						1		1	1	2
49	Ecuador	08 / 1984	350						1			1	2
50	Ecuador	12 / 1985	4,224								1	1	2
51	Ecuador	02 / 1995	7,170		1		1			1			4
52	Ecuador	08 / 2000	6,700	1	1					1			5
53	Ecuador	06 / 2009	3,190	1	1	1				1			4
54	Ethiopia	01 / 1996	226		1	1		1	1				3
55	Gabon	12 / 1987	39										2
56	Gabon	05 / 1994	187						1				3
57	Gambia,The	02 / 1988	19						1				3
58	Grenada	11 / 2005	210	1									4
59	Guinea	04 / 1988	43						1			1	2
60	Guinea	12 / 1998	130		1	1		1	1				2

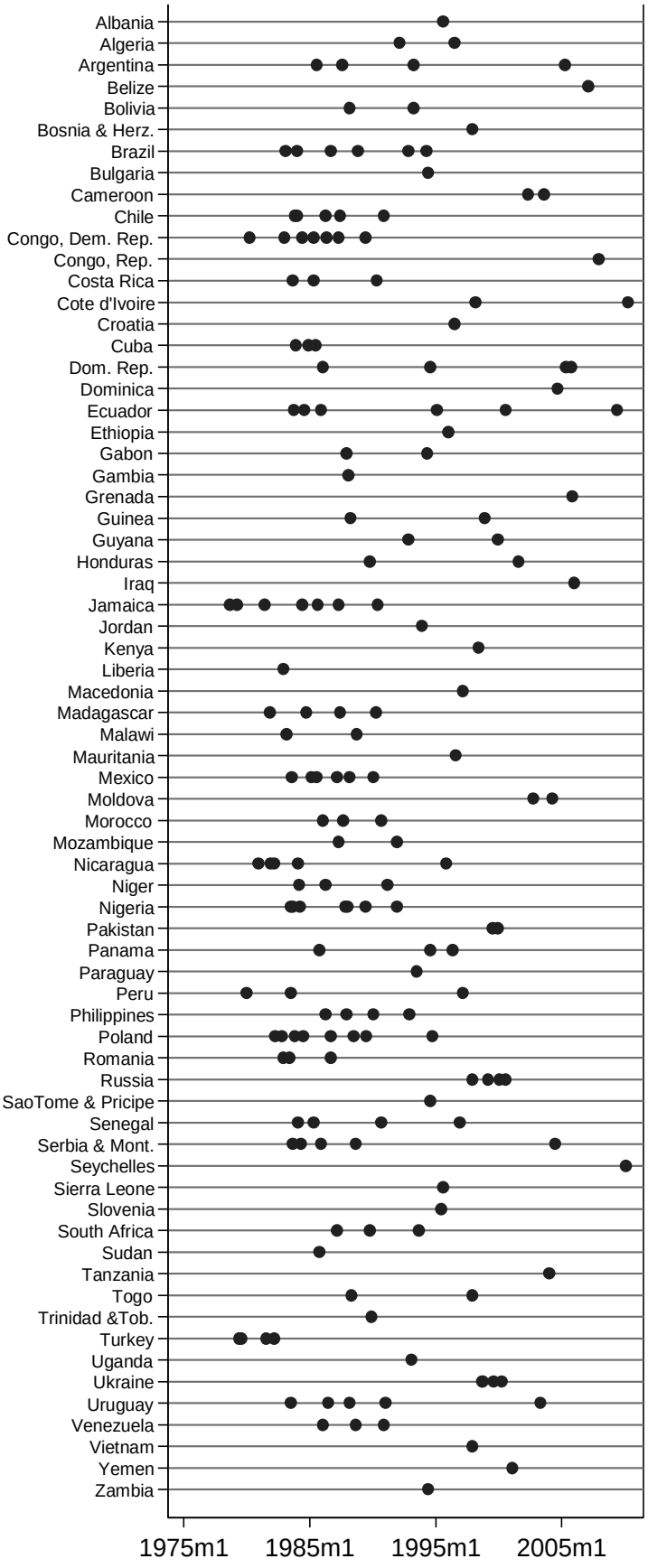
Table A9: Sovereign Debt Restructurings 1970-2010 (Cont'd)

Case Nr	Country	Date	Debt Restruct. in m USD	Bond Exchange	Reduct. in Face Value	Buy Back Deal	Brady Deal	Donor Funded	All Fallen Due	Affects PRD	New Money Incl.	Short-Term Debt Incl.	Data Quality Index
				(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
61	Guyana	11 / 1992	93		1	1		1	1				3
62	Guyana	12 / 1999	56		1	1		1	1				3
63	Honduras	10 / 1989	132						1				3
64	Honduras	08 / 2001	13		1	1		1	1				3
65	Iraq	01 / 2006	17,710		1	1			1				4
66	Jamaica	09 / 1978	63						1				3
67	Jamaica	04 / 1979	149										2
68	Jamaica	06 / 1981	89								1		2
69	Jamaica	06 / 1984	165						1				3
70	Jamaica	09 / 1985	369							1			3
71	Jamaica	05 / 1987	285							1			3
72	Jamaica	06 / 1990	332							1			3
73	Jordan	12 / 1993	1,289		1		1		1	1			3
74	Kenya	06 / 1998	91		1				1				4
75	Liberia	12 / 1982	30										2
76	Macedonia, FYR	03 / 1997	229							1			5
77	Madagascar	11 / 1981	147						1				3
78	Madagascar	10 / 1984	195						1			1	3
79	Madagascar	06 / 1987	60							1			4
80	Madagascar	04 / 1990	49							1			3
81	Malawi	03 / 1983	57										3
82	Malawi	10 / 1988	35						1				3
83	Mauritania	08 / 1996	53		1	1		1	1				3
84	Mexico	08 / 1983	18,800								1	1	3
85	Mexico	03 / 1985	28,600							1			3
86	Mexico	08 / 1985	20,100							1			3
87	Mexico	03 / 1987	52,300							1	1		3
88	Mexico	03 / 1988	3671		1				1				3
89	Mexico	02 / 1990	54,300		1		1			1		1	4
90	Moldova (Eurobonds)	10 / 2002	40	1					1				5
91	Moldova (Gazprom)	04 / 2004	115		1	1			1				5
92	Morocco	02 / 1986	538						1			1	3
93	Morocco	09 / 1987	2,444						1	1		1	2
94	Morocco	09 / 1990	3,200						1	1			2
95	Mozambique	05 / 1987	253						1			1	3
96	Mozambique	12 / 1991	124		1	1		1	1				2
97	Nicaragua	12 / 1980	582						1			1	2
98	Nicaragua	12 / 1981	192						1			1	2
99	Nicaragua	03 / 1982	100						1			1	2
100	Nicaragua	02 / 1984	145						1	1			2
101	Nicaragua	11 / 1995	1100		1	1		1	1				3
102	Niger	03 / 1984	27										2
103	Niger	04 / 1986	52										2
104	Niger	03 / 1991	111		1	1		1	1				2
105	Nigeria	07 / 1983	1350						1			1	2
106	Nigeria	09 / 1983	585						1			1	2
107	Nigeria	04 / 1984	925						1			1	2
108	Nigeria	11 / 1987	4,249						1		1	1	2
109	Nigeria	01 / 1988	1,213						1				3
110	Nigeria	06 / 1989	5,829							1		1	2
111	Nigeria	12 / 1991	5,883		1		1			1			2
112	Pakistan (Bank debt)	07 / 1999	777						1			1	4
113	Pakistan (Bond debt)	12 / 1999	610	1									5
114	Panama	10 / 1985	579								1	1	2
115	Panama	08 / 1994	452	1					1				4
116	Panama	05 / 1996	3,936		1		1			1			3
117	Paraguay	07 / 1993	20			1			1				3
118	Peru	01 / 1980	340							1			3
119	Peru	07 / 1983	380						1		1	1	2
120	Peru	03 / 1997	10,600		1		1		1				3

Table A9: Sovereign Debt Restructurings 1970-2010 (Cont'd)

Case Nr	Country	Date	Debt Restruct. in m USD	Bond Exchange	Reduct. in Face Value	Buy Back Deal	Brady Deal	Donor Funded	All Fallen Due	Affects PRD	New Money Incl.	Short-Term Debt Incl.	Data Quality Index
				(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
121	Philippines	04 / 1986	3,242						1			1	2
122	Philippines	12 / 1987	9,690							1		1	2
123	Philippines	02 / 1990	2,120		1					1	1		3
124	Philippines	12 / 1992	4,471		1		1			1	1		3
125	Poland	04 / 1982	1957						1				3
126	Poland	11 / 1982	2,225						1			1	3
127	Poland	11 / 1983	1,192						1			1	2
128	Poland	07 / 1984	1,390									1	2
129	Poland	09 / 1986	1,970							1		1	2
130	Poland	07 / 1988	8,441							1		1	2
131	Poland	07 / 1989	206							1			2
132	Poland	10 / 1994	13,531		1		1			1	1	1	3
133	Romania	12 / 1982	1,598						1			1	3
134	Romania	06 / 1983	567						1				2
135	Romania	09 / 1986	800							1			2
136	Russia	12 / 1997	30,500						1				4
137	Russia (GKOs)	03 / 1999	4,933	1	1								5
138	Russia (MinFin3s)	02 / 2000	1,307	1						1			5
139	Russia (Prins, IANs)	08 / 2000	31,943	1	1					1			5
140	Sao Tome and Principe	08 / 1994	10.1		1	1		1	1				3
141	Senegal	02 / 1984	77						1				2
142	Senegal	05 / 1985	20										3
143	Senegal	09 / 1990	37						1				3
144	Senegal	12 / 1996	80		1	1		1	1				2
145	Serbia and Montenegro	07 / 2004	2700		1					1			3
146	Seychelles	02 / 2010	320	1	1								3
147	Sierra Leone	08 / 1995	235		1	1		1	1				2
148	Slovenia	06 / 1995	812							1			3
149	South Africa	03 / 1987	10900						1	1		1	3
150	South Africa	10 / 1989	7500						1	1			3
151	South Africa	09 / 1993	5000						1	1		1	4
152	Sudan	10 / 1985	920						1	1		1	3
153	Tanzania	01 / 2004	155.8		1	1		1	1				2
154	Togo	05 / 1988	49						1				3
155	Togo	12 / 1997	75		1	1		1	1				3
156	Trinidad and Tobago	12 / 1989	446							1			3
157	Turkey	06 / 1979	429						1		1	1	3
158	Turkey	08 / 1979	2,269						1			1	3
159	Turkey	08 / 1981	100						1				3
160	Turkey	03 / 1982	2269							1			3
161	Uganda	02 / 1993	153		1	1		1	1				3
162	Ukraine (OVDPs)	09 / 1998	420	1									5
163	Ukraine (Chase loan)	10 / 1998	109						1				5
164	Ukraine (ING loan)	08 / 1999	163		1				1				5
165	Ukraine (Global)	04 / 2000	1,598	1	1								5
166	Uruguay	07 / 1983	575								1	1	3
167	Uruguay	07 / 1986	1,958							1			4
168	Uruguay	03 / 1988	1,770							1			3
169	Uruguay	01 / 1991	1,610		1		1			1	1		4
170	Uruguay	05 / 2003	3,127	1						1			5
171	Venezuela, RB	02 / 1986	20,307										2
172	Venezuela, RB	09 / 1988	20,338							1			3
173	Venezuela, RB	12 / 1990	19,585		1		1			1	1		4
174	Vietnam	12 / 1997	782		1		1		1				3
175	Yemen, Republic of	02 / 2001	607		1	1		1	1				2
176	Yugoslavia	09 / 1983	950						1		1	1	2
177	Yugoslavia	05 / 1984	1,250						1				2
178	Yugoslavia	12 / 1985	3,600							1			3
179	Yugoslavia	09 / 1988	6,895							1	1	1	2
180	Zambia	06 / 1994	570		1	1		1	1				2

Figure A10: Sovereign Restructurings by Country 1970 - 2010



A6. List of Sources for Each Debt Restructuring

The following list reports the sources we considered for each deal. Note:

- GDF stands for Global Development Finance (see World Bank in ref. list)
- WDT stands for World Debt Tables (see World Bank in ref. list)
- IFR stands for International Financing Review

Albania 08/1995
Sources: GDF (2002, 2003), WDT (1996: 77), World Bank (2007), IMF (1995b: 12f. and Table A3)

Algeria 03/1992
Sources: IIF (2001), GDF (2002, 2003), IMF (1992): Management of the Debt Situation: Supplement 1, EBS/92/52, August 17, Washington, D.C., p. 3.

Algeria 07/1996
Sources: IIF (2001), GDF (2002, 2003), WDT (1996: 76), IMF (1995b: 11f. and Table A12)

Argentina 08/1985
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Sources: IMF (1986: Tables 47-49), IIF (2001), GDF (2002, 2003), Stamm (1987)

Zaire (DR Congo) 05/1985
Sources: IMF (1986: Tables 47-49), IIF (2001), GDF (2002, 2003), Stamm (1987)

Zaire (DR Congo) 05/1986
Sources: IMF (1986: Tables 47-49), IIF (2001), GDF (2002, 2003), Stamm (1987)

Zaire (DR Congo) 05/1987
Sources: IMF (1990a: Table A27), IIF (2001), GDF (2002, 2003)

Zaire (DR Congo) 06/1989
Sources: IMF (1990a: Table A27), IIF (2001), GDF (2002, 2003)

Zambia 06/1994
Sources: IMF (1995a: Tables A3-A4), IIF (2001), WDT (1994-1995:76), Lindner (2003b: 14f.), World Bank (2007)

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