Sovereign vs. Corporate Debt and Default: More Similar Than You Think

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Abstract

Sovereign and corporate bonds are more similair than you think. We collect rich new data and conduct the first granular comparison of risks and returns of emerging market sovereign bonds and US corporate high yield bonds, covering the past two decades. We find that investor outcomes in the two asset classes are alike in many ways, despite the fact that sovereign debt has no bancruptcy mechanism and is much harder to enforce. Specifically we document that high yield US corporate and emerging market bonds have (i) similair excess returns, (ii) similair risk-return patterns (Sharpe ratios), (iii) a similair default frequency, (iv) a similair bond price recovery after default, and (v) comparable haircuts. One notable difference is that the yield of sovereign bonds increases more strongly in periods of distress and for lower-rated issuers. Moreover, there are a few outlier sovereigns, such as Argentina and Venezuela, with unusually lengthy defaults and high haircuts.

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Long Abstract

1 Introduction

A main tenet in international finance is that sovereign debt is unique, and fundamentally different from other debt classes such as corporate bonds (see e.g. Eaton and Gersovitz, 1981; Panizza et al., 2009). This is because sovereign debt has no bankruptcy mechanism and there is no supranational legal authority to enforce payments to creditors. Consequently, a large theoretical literature has examined various rationales for the very existence of sovereign lending (see e.g. Aguiar and Amador, 2013), and in parallel an empirical literature has documented the unique features of sovereign debt and default over time (see e.g. Mitchener and Trebesch, 2023). Moreover, the policy world continues to explore contractual clauses and statutory mechanisms to improve the functioning of sovereign debt markets so as to bring it closer to corporate bond markets (e.g. Krueger, 2002; IMF, 2013). In light of this, it is surprising that there is almost no empirical evidence that contrasts the basic characteristics and the performance of sovereign debt markets to other debt markets such as corporate bonds.

This paper fills this gap in the literature by conducting the first in-depth comparison between corporate and sovereign bonds and associated default risks. We do so by leveraging granular bond-level data on emerging market sovereign bonds as well as on US high yield corporate bonds - two asset classes that see frequent defaults. For emerging markets, we rely on the dataset compiled by Meyer et al. (2022) which replicates and extends JP Morgan's Emerging Market Bond Index (EMBI) from the ground up, i.e. bond by bond and monthy by month. In total we cover 882 emerging market sovereign bonds issued by 79 countries with a total of 56,251 monthly pricing observations between 2002 and 2021 (all of them US dollar denominated). We combine this dataset from our previous work with newly compiled data on high-yield corporate bonds and related bancruptcies. To get to a representative picture on corporate HY bonds, we had to combine information from three datasets: the WRDS Bond Database which provides corporate bond data, in particular bond prices and returns from TRACE (Trace Reporting and Compliance

Engine). For bond and issuer characteristics, as well as brankruptcy details we complement the bond-level data with information from the Mergent Fixed Income Securities Database (FISD). Third, we fill large gaps in the bond price data, in particular during periods of distress, by adding information from JP Morgan (morganmarkets). The resulting sample includes 8,238 high-yield US corporate bonds issued by 2,660 unique firms with a total of 319,501 monthly pricing observatings between 2002 and 2021.

Our main insight is that the two markets are remarkably similair when it comes to investment outcomes, despite the fact that one market is governed by enforceable, statuory bancruptcy rules and the other is not. More specifically, we show that sovereign EM and corporate HY bonds have:

- similair average excess bond returns (with strong co-movement in monthly returns between the two asset classes)
- similair Sharpe ratios
- similair default rates (frequency and probability of default)
- comparable price-based haircuts (1- the recovery rate upon default), with haircuts on corporate HY bonds being a few percentage points *higher*, on average.

We also observe differences, in particular:

- sovereign yields increase more steeply in situations of distress and for lower rating categories compared to corporate bond yields
- the average default duration is higher for sovereigns, mostly driven by outlier cases such as Argentina and Venezuela

Taken together, it is puzzling how similair the outcomes in the two markets are. A priori, one can think of many reasons why the outcomes in the two markets would differ other than due to the differences in debt default and restructuring. For example, the shocks that drive emerging market bond risks and default can differ from that of corporate bonds, e.g. in case of commodity price or exchange rate swings (think of an oil price shock).

Sovereigns can never be liquidated unlike corporates and can therefore be prone to serial defaults as has been the case in some countries. Also the discount factor of investors in the two markets may differ (endogenously). The next versions of this paper will explore these channels in more depth.

Related literature: To our knowledge, there is no systematic study comparing investor performance in high-risk corporate and high-risk sovereign bond markets with representative data. A small recent literature compares sovereign and corporate bond yields of the same country, but wthout delving into defaults or investor returns (e.g. Bevilaqua et al., 2020; Jappelli et al., 2022; Gilchrist et al., 2022). The literature on corporate defaults seems generally less developed than that on sovereign defaults. For example, there is no standardized, granular dataset of corporate bond haircuts. There are also suprisingly few studies focusing on investor performance and default outcomes in the HY US corporate bond market. On a more general level, however, there is a notable shift towards using rich bond-level data, just like in this study (Bessembinder et al., 2009; Lin et al., 2011; Jostova et al., 2013; Bai et al., 2019). This paper adds to the literature by drilling into the HY US corporate markets and comparing it to the EM sovereign bond market on a bond level.

2 Data sources

Our aim was to analyze both markets with the broadest sample of bonds possible, so as to get a representative picture. For each bond, we then collect basic bonc haracteristics such as coupon, maturity, currency etc as well as monthly bond yields, total returns, bond prices, defaults and their details, as well as credit ratings. We start in June 2002, when data on corporate bonds become easily available, and end in September 2021. In our analysis we focus on investor outcomes.

We rely on the emerging market bond dataset compiled by Meyer et al. (2022) and extent this dataset to 2021 using US dollar bonds covered by JP Morgan's EMBI. We use S&P bond-level credit ratings from 2013 onwards and S&P country rating for the period 2002 to 2012.

To collect US HY corporate bond data we use the WRDS Bond Database as main source,

since it claims to cover the universe of all US corporate bonds traded in US markets. We define HY corporate bonds as bonds without investment grade rating, i.e. below the BBB- S&P rating, or below Ba3 Moody's rating. To construct our dataset and the resulting HY corporate bond index we closely follow the elligiblity and inclusion criteria that JP Morgan uses for its J.P. Morgan Domestic High-Yield Index (JPDO) (J.P.Morgan, 2013) - a benchmark of the US dollar domestic high-yield corporate debt market.

We complement this data on a bond-level by adding S&P credit ratings, default information, and details on brankruptcy outcomes from the Mergent Fixed Income Securities Database (FISD). We also fill data coverage gaps using JP Morgan data (from morganmarkets), which was essential during periods of distres, when WDRS data is often missing. Just like for sovereign bonds, we thus trace each corporate bond over its lifetime, including during periods of distress and default.

2.1 Overall return performance

Portfolio returns are calculated as follows: Equation 1 reports the monthly weighted global average across all bonds i in month m:

$$R_m^{portfolio} = \sum_{i=1}^{N} R_{i,j,m} * \frac{w_i, j, m}{\sum_{i=t}^{N} w_{i,j,m}} \tag{1}$$

where $w_{i,j,m}$ denotes the amount issued of bond i. Following Equation 2 monhtly returns of month m and year t are accumulated:

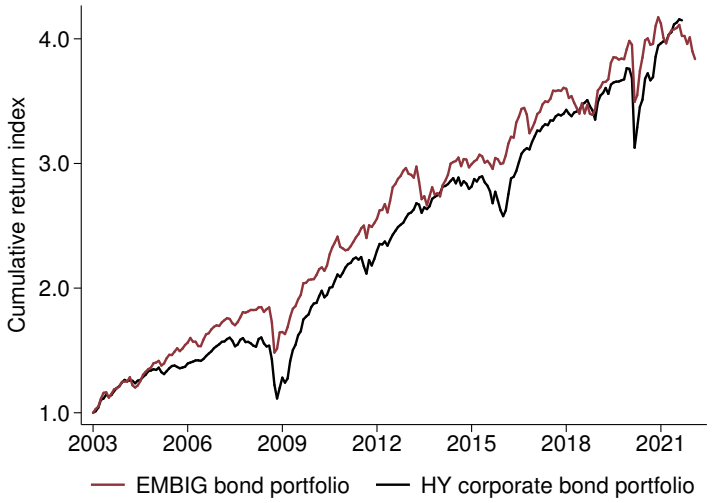
$$R_{yearly}^{portfolio} = \prod_{m=1}^{12} (1 + R_m^{portfolio}) - 1 \tag{2}$$

This section compares the overall return performance by computing "global" portfolios according to Equation 1 and 2. We use pre-calculated return series of bonds selected into the EMBIG of Morgan Markets. We also use pre-calculated returns of WRDS, which are winsorized at the top and bottom one percent.

Figure 1 compares our cumulative total return index for HY corporate bonds with our

constructed EMBIG total return index. Monthly total portfolio returns are computed based on Equation 1. As Figure 1 shows, both series co-move strongly. The correlation coefficient is 0.99.

Figure 1: Cumulative total return index



Note: Market capitalization (product of amount issued/offered and $price_{t-1}$). All returns reported in nominal values.

Table 1 reports summary statistics for the HY corporate bond and the EMBIG bond portfolio. Annual average EMBIG bond returns are roughly 1.5 percentage lower than for HY corporate bond returns. But average returns are almost the same if we take out investment-grade EMBI bonds, i.e. if we compare high-yield bonds in both markets. Throughout, the differences are not statistically significant.

Table 2 shows excess returns for different rating categories.For lowe rating casses we see For lower-taed issuers, we see higher excess returns for the EMBIG bond portfolio in comparison to the HY corporate bonds sample. This is also true if we zoom into distress or default episodes, during wich sovereign yields increase more sharply.

Table 1: Summary statistics HY corporate & EMBIG portfolio returns, 2003-2020

	Arithmetic mean	Median	Min	Max	SD	Skewness	Geometric mean	Difference in mean, p-value of t-test
Yearly returns								
Corporate HY returns	9.32	7.12	-23.64	54.53	15.85	0.92	8.28	0.768
EMBIG returns	8.04	9.43	-9.32	26.87	9.76	0.05	7.62	
EMBIG Investment Grade	6.71	7.79	-7.48	18.47	7.07	-0.40	6.48	
EMBIG non-Investment Grade	8.69	9.68	-17.20	36.03	12.94	0.32	7.96	
Yearly excess returns								
Corporate HY excess returns	4.90	3.00	-37.88	68.64	21.36	1.15	2.97	0.863
EMBIG excess returns	3.89	3.68	-25.10	38.09	13.12	0.59	3.12	
EMBIG Investment Grade	2.53	1.75	-19.03	30.31	9.55	0.74	2.11	
EMBIG non-Investment Grade	4.60	3.05	-31.61	49.13	16.85	0.68	3.34	
Monthly returns								
Corporate HY returns	0.69	0.79	-14.41	10.95	2.56	-1.60	0.66	0.871
EMBIG returns	0.64	0.83	-14.25	8.57	2.38	-1.69	0.61	
EMBIG Investment Grade	0.55	0.65	-10.77	9.76	2.07	-0.85	0.52	
EMBIG non-Investment Grade	0.69	0.98	-18.84	7.74	3.03	-2.37	0.64	
Monthly excess returns								
Corporate HY excess returns	0.34	0.48	-18.46	14.49	3.62	-1.14	0.28	0.824
EMBIG excess returns	0.29	0.47	-15.78	8.49	2.71	-1.55	0.26	
EMBIG Investment Grade	0.20	0.29	-10.96	7.12	2.11	-1.26	0.17	
EMBIG non-Investment Grade	0.34	0.73	-22.85	10.34	3.54	-1.96	0.27	

Note: Market capitalization (product of amount issued/offered and $price_{t-1}$. All returns reported in nominal values. We use as benchmark the *Refinitiv US Benchmark 10-year government total return index*. Excess return is the difference between the monthly portfolio return and the 10-Treasury bond return

Table 2: Monthly excess portfolio returns by credit rating, 2003-2020

	EMBIG bonds					HY corporate bonds					Difference in mean p-value of t-test
	Mean	Median	SD	Min	Max	Mean	Median	SD	Min	Max	
Investment Grade ratings											
AA-	0.01	0.14	1.52	-5.10	4.09	.	.	.	.	.	.
A+	-0.06	0.05	1.68	-5.50	4.62	.	.	.	.	.	.
A	-0.01	0.02	1.36	-4.16	3.05	.	.	.	.	.	.
A-	0.06	0.15	1.81	-8.06	5.80	.	.	.	.	.	.
BBB+	0.13	0.18	2.08	-10.99	6.21	.	.	.	.	.	.
BBB	0.29	0.32	2.26	-15.18	9.97	.	.	.	.	.	.
BBB-	0.23	0.33	2.10	-8.59	6.68	.	.	.	.	.	.
Non-Investment Grade ratings											
BB+	0.55	0.60	2.21	-6.12	6.49	0.31	0.35	3.06	-15.94	12.57	0.359
BB	0.33	0.46	2.58	-14.99	10.19	0.28	0.24	2.70	-12.53	11.84	0.828
BB-	0.43	0.46	3.08	-14.56	12.84	0.29	0.32	2.97	-14.95	13.51	0.641
B+	0.70	0.53	4.64	-17.09	25.16	0.31	0.35	3.17	-14.91	13.34	0.327
B	0.21	0.54	4.90	-30.21	15.64	0.33	0.37	3.53	-16.73	13.26	0.786
B-	0.43	0.60	4.60	-30.90	15.16	0.39	0.44	3.72	-19.07	17.64	0.919
CCC+	1.18	1.50	7.91	-25.70	36.83	0.48	0.58	4.62	-27.76	15.25	0.327
CCC	0.59	1.64	9.99	-33.26	27.00	0.17	0.34	6.05	-32.67	27.68	0.688
CCC-	-6.17	-2.61	15.39	-56.41	17.27	0.85	0.59	8.42	-45.83	45.80	0.001
CC	4.27	6.37	16.61	-36.81	25.88	0.23	1.16	9.31	-40.65	35.17	0.131
C	.	.	.	.	.	-1.33	0.34	16.72	-60.82	58.50	.
D	0.35	0.74	10.38	-37.90	38.09	-1.83	-1.87	13.72	-43.18	84.16	0.135

Note: Market capitalization (product of amount issued/offered and $price_{t-1}$). All returns reported in nominal values. We use as benchmark the *Refinitiv US Benchmark 10-year government total return index*. Excess return is the difference between the monthly portfolio return and the 10-Treasury bond return. Credit ratings for EMBIG bonds start in 2013. We use S&P country ratings before 2013. This relationship also hold for using market capitalization as weights.

2.2 Risk profiles: volatility and sharpe ratios

Figure 2 shows a scatter plott of the mean annual return for the period 2003 to 2019 as well as the standard deviation of different portfolios and sub-samples. Overall, the risk-return pattersn look similair across corporat and sovreign markets. The crisis period 2006 to 2009 reveals the biggest difference in the return-volatility for the HY corporate and EMBIG bond portfolio.

Figure 2: Return and volatiltiy

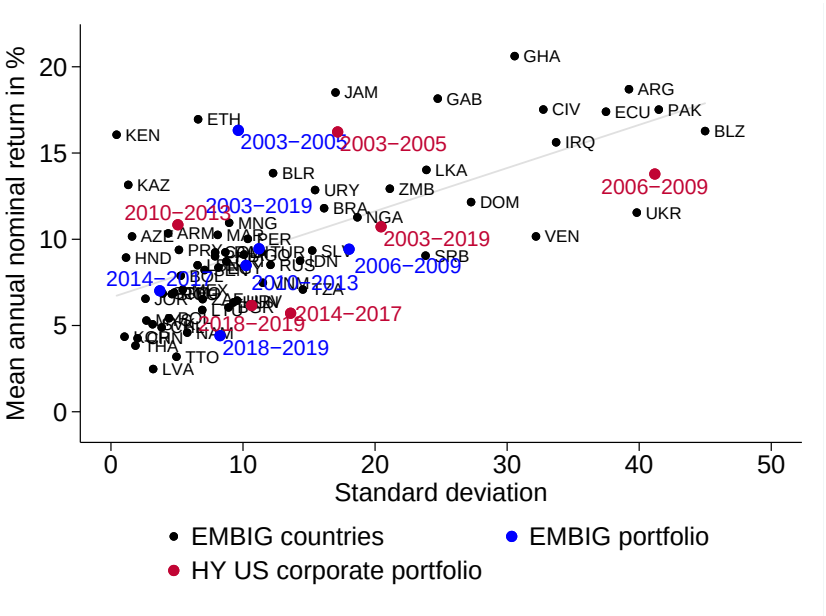
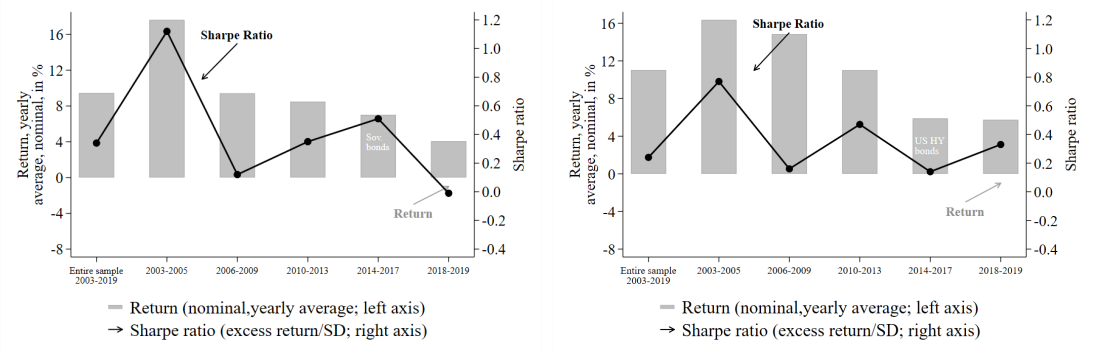


Figure 3 compares the Sharpe ratios for the HY corporate and EMBIG bond portfolio and different sub-periods.

Figure 3: Sharpe ratio

(a) EMBIG annual sharpe ratios **(b)** HY corporate bond annual sharpe ratios



Note:

2.3 Default and recovery

This section compares both asset classes' behavior in and around default.

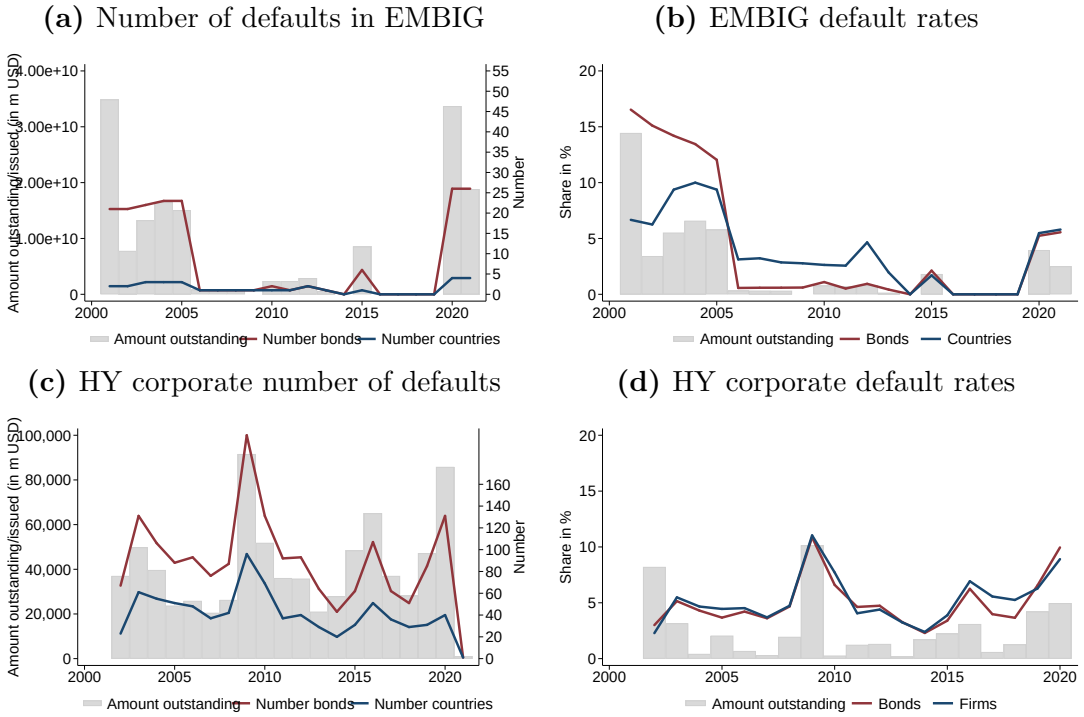
Default rates

We first zoom into realized default rates for both markets by computing the ratio of the sum of the default bonds' face value and the face value of total active bonds:

$$\text{Default rate}_t = \frac{\text{Defaulted bonds}_{t,t-T}}{\text{Outstanding bonds}_{t,t-T}} \tag{3}$$

Figure 4 shows that the EMBIG default rate reaches a new high in 2020, covering a total of six sovereign defaults (Argentina, Belize, Ecuador, Lebanon, Suriname, Zambia). Table 3 provides summary statistics.

Figure 4: Yearly number of defaults and default rates, 2000-2021



Note: Sample of Figure 4 includes following defaults: Argentina (2001, 2017, 2020), Belize (2012, 2020) Cot d'Ivoire (2000, 2010), Dominican Republic (2004), Ecuador (2006,2020), Lebanon (2020), Russia (1998), Suriname (2020), Ukraine (1998, 2015), Uruguay (2003), Venezuela (2017), Zambia (2020). This figure does not include the external default of Antigua and Barbuda 2009, Barbados 2018, Chad 2014, Rep. of Congo 2016, Dominica 2003, Gabon 1999, Greece 2011, Indonesia 1998, Mali 2012, Moldova 1998, Solomon Islands 1998, St. Kitts and Nevis 2011, Tajikistan 2010, Zimbabwe 1999. The EMBIG does not include any external bonds of these countries at this point in time.
Sources: Defaullt events from Meyer et al. (2022), Farah-Yacoub et al. (2020), Asonuma and Trebesch (2016), Cruces and Trebesch (2013).

Table 3: Yearly default rates, 2002-2019, in %

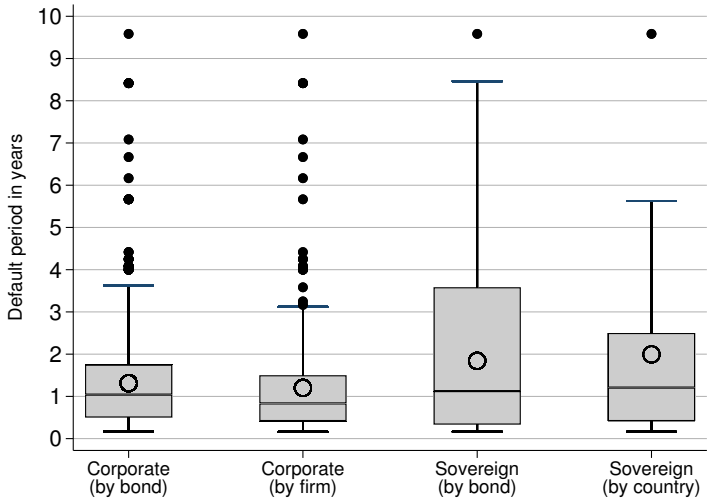
	Mean	Median	Min	Max	SD	Skewness
EMBIG default rates						
Bonds (number)	4.8	0.9	0.4	15.1	6.2	0.9
Countries (number)	4.7	3.1	1.7	10.0	3.0	0.9
Amount outstanding	2.2	0.8	0.1	6.6	2.4	0.8
HY US corporate default rates						
Bonds (number)	4.7	4.3	2.3	10.9	1.9	1.8
Firms (number)	5.0	4.6	2.3	11.0	2.1	1.4
Amount outstanding	2.4	1.5	0.2	10.1	2.7	1.8

Note: See Note of Figure 4 for sovereign defaults included.

Default duration

Figure 5 compares default duration for HY corporate bonds/issuer and sovereign bonds/issuer defaults. The average default duration is longer for sovereigns (2.7 years) in comparison to HY corporate bond defaults (1.2 years). However, this difference is mainly driven by three outlier cases with messy defaults in politically unstable countries: Argentina, Venezuela and Lebanon. Median default duration is similair for sovereigns and corporates (around 1 year).

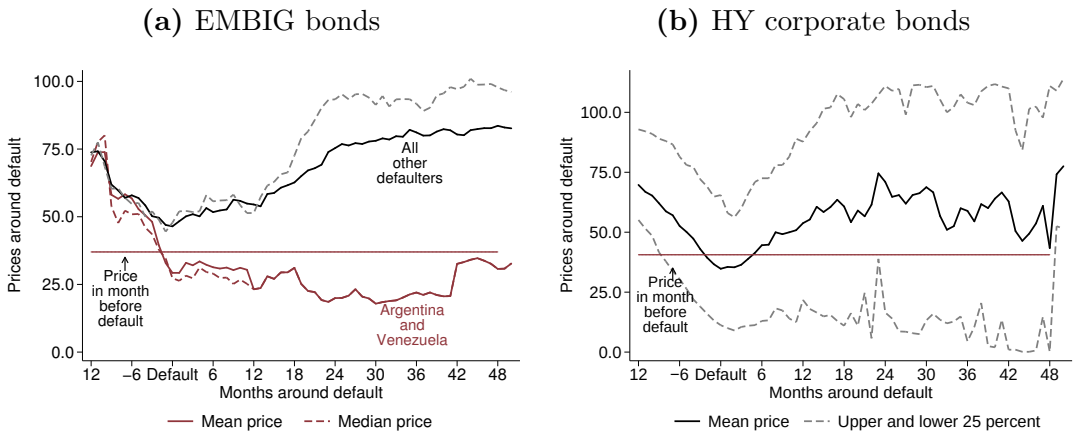
Figure 5: Default duration in years



Price recovery after default

Figure 6 tracks bond prices aroudn events of default. We compute the weighted average and median prices for all bonds in default and trace them over time. The average price in month $t-1$ is 32 for sovereign bonds in comparison to 36.5 for the HY corporate sample. In both markets there is considerable variation in the price recovery paths for HY corporate and EMEs. Once we drop Argentina and Venezuela, price recovery in the sovereign market is quicker than that of the average corporate bond default.

Figure 6: Prices around default



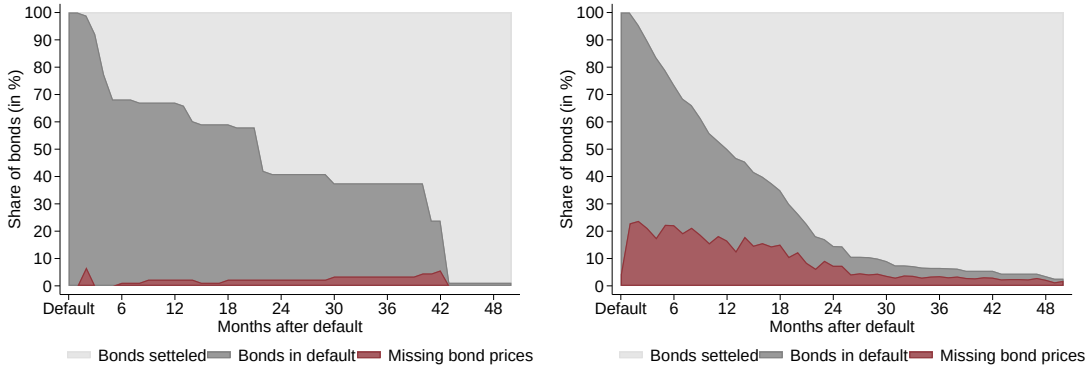
Note: EMBIG bond sample includes 68 bonds of 13 countries. HY corporate bond sample is decreasing in issuer and issue number after the second month of default. WRDS bond price sample ends with the default month. We add Morgan Market price data for the post-default event period.

Figure 6 might be distorted due to market illiquidity or the liquidation of firms. In the next step, we therefore look at the composition of the price data. Figure 7a shows the share of bond prices missing relative to all bonds that went in to default. The HY corporate market has a much higher share of bond prices missing at the onset of the default. To examine this pattern further Figure 7b differentiates between stare and missing prices around default. According to Figure 7b there is already a share of bonds that has to struggle with liquidity problem in the HY corporate market. Around 30 percent of the bonds that default see missing prices on year before the default. The share of missing prices doubles within 24 months after default. In comparison, the EM bonds also face liquidity issues. This does not find expression in non-traded bonds, i.e. missing prices, but in an increasing share of stare prices.

Figure 7: Price composition around default

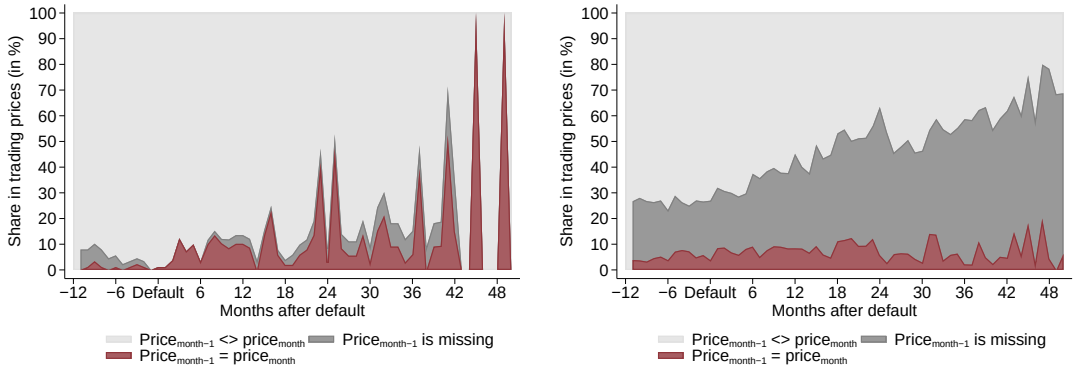
EMBIG bond sample **HY corporate bond sample**

(a) Share of bonds in default and missing prices



Note: The base (100 percent) of Figure 7a refers to the 68 bonds in the EMBIG bond sample and 761 bonds in the HY corporate bond sample.

(b) Trading price composition: stale and missing prices



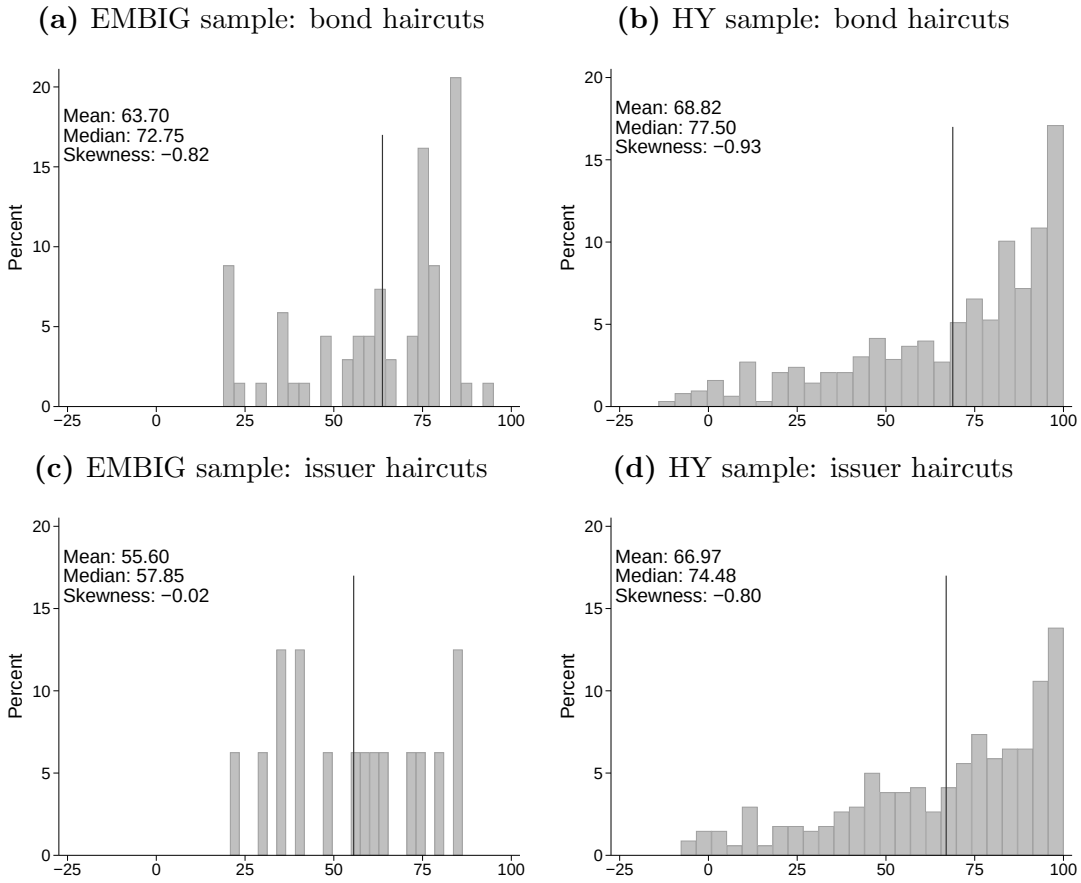
Note: The base (100 percent) of Figure 7b refers to to the gray and red shaded area of Figure 7a.

Haircuts

To estimate the size of haircuts, we follow the standard approach in the finance iterature and by rating agencies Moody's (2011) and use market bid prices shortly after the start of default (specifically: 30 days after the default date). This serves as the market's estimate of the expected recovery rate. Figure 8 shows the distribution of issue-weighted price haircuts and value-weighted price haircuts by issuer and default event. Table 4 provides the respective summary statistics for Figure 8. We first compute for each bond the issue-specific haircut. We then compute issuer-specific haircuts (by firm or country) as value-weighted haircuts for each issuer-default event pair. We show unweighted averages but also weighted averages using the amount outstanding at the default as weights. Value-

weighted average haircuts can be interpreted as an approximation of losses for a market portfolio.

Figure 8: Distribution of price based haircuts



Note: All haircuts unweighted.

Table 4 reports average haircuts of around 67 percent for HY corporate bonds. This is in line with Moody's (2011) who reports average haircuts ranging between 64 to 70 percent for the years 1982 to 2010.

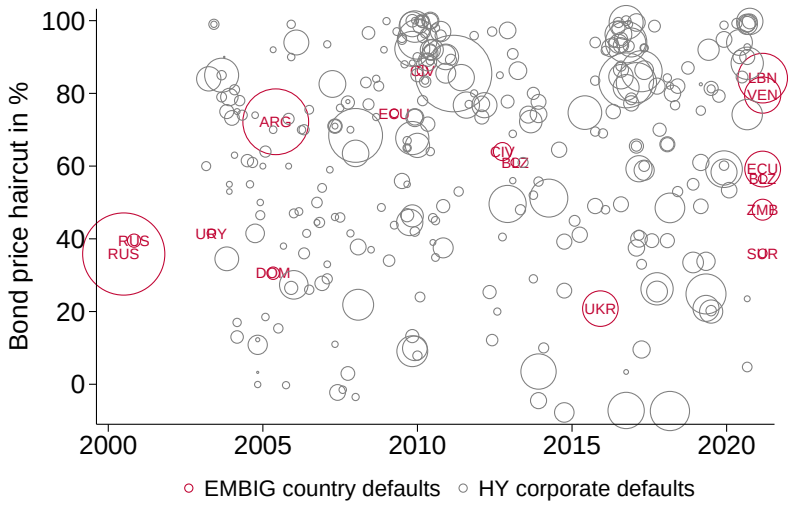
Table 4: Summary statistics of bond price based haircuts

	No Bonds/ deals	Mean	Median	Min	Max	SD	Skewness
By bonds							
Sovereign (unweighted)	68	63.70	72.75	18.87	95.00	20.94	-0.82
HY corporates (unweighted)	625	68.86	77.50	-14.00	100.00	28.45	-0.94
Sovereign (face value-weighted)	68	55.46	55.00	18.87	95.00	21.81	-0.82
HY corporates (face value-weighted)	625	67.99	77.75	-14.00	100.00	28.48	-0.93
By Country/Firm							
Country (unweighted)	16	55.60	57.85	20.80	86.25	20.34	-0.02
Firm (unweighted)	340	66.97	74.48	-7.75	100.00	27.97	-0.80
Country (face value-weighted)	16	55.40	59.19	20.80	86.25	21.88	-0.02
Firm (face value-weighted)	340	67.78	74.08	-7.75	100.00	26.77	-0.80

Note: See Note of Figure 4 for sovereign defaults included .WRDS bond price sample ends with the default month. We add, therefore, Morgan Market price data for the post-default event period and cover circa 70 percent of all HY corporate bond defaults.

Figure 9 shows price-based haircuts computed for each issuer-default event. The size of the bubbles represent the default amount outstanding. Argentina 2001 and Russia 1998/1999 were the largest defaults for the sovereign bond sample. With regard to the HY corporate sample, General Motors, Harrah's Oper, and Citigroup were the largest defaults in terms of debt size.

Figure 9: Price-based haircuts by country/company default



Note: Bubbles represents amount outstanding in current USD at time of default.

2.4 Market shocks and risk pass through

In future versions of this paper we will explore how the sovereign and HY corporate bond markets react to a wide set of financial and macroeconomics shocks. In a first step towards this gaol, this section introduces a set of shock event variables around which we will study the market reaction of emerging market bonds vs. US high yield corporate bonds

Risk-on episodes: Recent contributions have distinguished between risk-on risk-off epiodes. The former take place when investors engage in high-risk investments, i.e. high-yield markets, mostly when global risk is perceived as low. We use the VIX that is well acknowledged to capture investor's risk perception (for example Rey (2015) We capture the onset of risk-off episodes when the VIX is ten percentage points higher than its 60-day backward-looking moving average.

Commodity price shocks: We also rely on commodity price series as well as event dummies commodity price busts of Reinhart et al. (2016). The authors use Harding and Pagan (2002) to detect turning points, i.e. declines and inreases in global commodity prices. We follow their identification strategy and extend their commodity price bust dummy from 2016 to 2021.

US monetary policy shocks To identify US monetary policy shocks, we use a variety of proxies used in the literature. As a baseline, we follow Romer and Romer (2004) using an extended series for recent years. Romer and Romer (2004) define exogenous movements in the federal funds rate as the difference between observed and intended changes in the rate. Intended changes are dervied on the forcasts of inflation, output, and unemployment contained in the Greenbook reports published for the FOMC meetings.

3 Conclusion

To come

References

Aguiar, M. and M. Amador (2013). Sovereign debt. *Handbook of International Economics 4*, 647–687.

Asonuma, T. and C. Trebesch (2016). Sovereign Debt Restructurings: Preemptive or Post-default. *Journal of European Economic Association 14*(1), 175–214.

Bai, J., T. G. Bali, and Q. Wen (2019). Common risk factors in the cross-section of corporate bond returns. *Journal of Financial Economics 131*(3), 619–642.

Bessembinder, H., K. M. Kahle, W. F. Maxwell, and D. Xu (2009). Measuring Abnormal Bond Performance. *The Review of Financial Studies 22*(10), 4219–4258.

Bevilaqua, J., G. B. Hale, and E. Tallman (2020). Corporate yields and sovereign yields. *Journal of International Economics 124*, 103304.

Cruces, J. J. and C. Trebesch (2013). Sovereign Defaults: The Price of Haircuts. *American Economic Journal: Macroeconomics 5*(3), 85–117.

Eaton, J. and M. Gersovitz (1981). Debt with potential repudiation: Theoretical and empirical analysis. *Review of Economic Studies 48*(2), 289–309.

Farah-Yacoub, J., C. Graf von Luckner, and C. M. Reinhart (2020). Sovereign Debt Crises Database.

Gilchrist, S., B. Wei, V. Z. Yue, and E. Zakrajšek (2022). Sovereign risk and financial risk. *Journal of International Economics 136*(05), 103603.

Harding, D. and A. Pagan (2002). Dissecting the cycle: a methodological investigation. *Journal of Monetary Economics 49*(2), 365–381.

IMF (2013). *Sovereign Debt Restructuring. Recent Developments and Implications for the Fund's Legal and Policy Framework*. Washington D.C.: IMF.

Jappelli, R., L. Pelizzon, and A. Plazzi (2022). The Core, the Periphery, and the Disaster: Corporate-Sovereign Nexus in COVID-19 Times. Swiss Finance Institute Research Paper 21-30, Swiss Finance Institute.

Jostova, G., S. Nikolova, A. Philipov, and C. W. Stahel (2013). Momentum in Corporate Bond Returns. *The Review of Financial Studies 26*(7), 1649–1693.

J.P.Morgan (2013). J.P. Morgan High-Yield Bond Indices. Technical report.

Krueger, A. (2002). *A New Approach to Sovereign Debt Restructuring*. Washington D.C.: IMF.

Lin, H., J. Wang, and C. Wu (2011). Liquidity risk and expected corporate bond returns. *Journal of Financial Economics 99*(3), 628–650.

Meyer, J., C. Reinhart, and C. Trebesch (2022). Sovereign Bonds since Waterloo. *Quarterly Journal of Economics 137*(3), 1615–1680.

Mitchener, K. J. and C. Trebesch (2023). Sovereign debt in the 21st century. *Journal of Economic Literature (forthcoming)*.

Moody's (2011). Corporate Default and Recovery Rates, 1920-2010. Special Comment, Moody's Investors Service.

Panizza, U., F. Sturzenegger, and J. Zettelmeyer (2009). The Economics and Law of Sovereign Debt and Default. *Journal of Economic Literature 47*(3), 651–698.

Reinhart, C. M., V. Reinhart, and C. Trebesch (2016). Global Cycles: Capital Flows, Commodities, and Sovereign Defaults, 1815-2015. *American Economic Review 106*(5), 574–580.

Rey, H. (2015). Dilemma not Trilemma: The Global Financial Cycle and Monetary Policy Independence. Working Paper 21162, National Bureau of Economic Research.

Romer, C. D. and D. H. Romer (2004). A New Measure of Monetary Shocks: Derivation and Implications. *American Economic Review 94*(4), 1055–1084.