Corporate Yields: Effect of Credit Ratings and Sovereign Yields

By Julia Bevilaqua, Galina Hale, and Eric Tallman*

Pricing of corporate bonds is well studied in a context of a single country, but much less is known about pricing of corporate bonds that are sold in international markets. When the economic distance between the investor and the borrower is large due to geographical distance, language barriers, legal and institutional differences, or barriers to capital flows, obtaining firm-specific information becomes more complicated.[1] It is, therefore, likely that public information available to all investors, plays a more important role. In this paper we evaluate the importance of two sources of public information: bond ratings provided by rating agencies and sovereign yields of the issuer's country.

While credit ratings exist for informing bond investors, it is not *a priori* obvious why sovereign yields would be informative of private bond creditworthiness. Empirical studies, however, found that sovereign risk measures affect pricing of corporate bonds (Eichengreen and Mody, 2000; Bedendo and Colla, 2015; Bevilaqua, Hale and Tallman, 2019). There are a number of reasons for this effect. In case of fiscal distress, the sovereign has the ability to divert resources from the corporate sector to cover its fiscal needs, which implies that corporate borrowers' performance and thus their borrowing costs are linked to the fiscal situation of the country (Agca and Celasun, 2012). Conversely, foreign private debt might be implicitly guaranteed by the government (Corsetti, Pesenti and Roubini, 1999; Acharya, Drechsler and Schnabl, 2014), which again means that sovereign risk is material to the risk of corporate bonds. Finally, low sovereign yields might in-

dicate a good economic outlook, as perceived by the market, which would suggest a good outlook for performance of individual firms thus lowering their borrowing costs.

Using bond-level data on corporate bonds issued in international markets for 20 emerging and 22 advanced economies between 1993 and 2017, we show that sovereign yields explain a much larger share of variation in corporate bond yields than corporate ratings. In fact, for emerging economies the marginal contribution of credit rating to explaining variation in bond yields is negligible. Consistent with Bevilaqua, Hale and Tallman (2019), we find that the importance of sovereign yields declines when sovereign yields are high. In these high-yield states, we find that for advanced economies the sensitivity of bond yields to their ratings doubles. For emerging economies, on the other hand, the sensitivity of bond yields to their ratings in high-yield states is even lower than in low-yield states. In terms of long-term dynamics, we find a small upward trend in the importance of corporate bond ratings in corporate bond pricing.

Our findings contribute to the literature on pricing of corporate bonds on global markets as well as to the importance and information content of credit ratings. Given high information frictions in global investing, value of publicly available information is likely high. However, we find that sovereign bond yields rather than bond credit ratings fulfill this information role. Bevilaqua, Hale and Tallman (2019) show in a simple information model how investors' reliance on sovereign yields for public signal on creditworthiness of corporate borrowers affects corporate bond pricing. The model implies that when the rating signal is imprecise, sovereign yield will have a higher weight in the pricing of corporate bond. Conversely, when the role of sovereign yield declines in high-yield states, we would expect a relative increase in the importance of the ratings, as is the case for advanced economies in our data.

Taken together, our results suggest that the information value of corporate bond ratings is low for international investors, especially with respect to emerging market bonds. In fact, even when the infor-

* Bevilaqua: The Wharton School of the University of Pennsylvania, 3733 Spruce Street Philadelphia, PA 19104, jmbev@wharton.upenn.edu. Hale: Federal Reserve Bank of San Francisco, University of California at Santa Cruz, CEPR, gbhale@ucsc.edu. Tallman: Federal Reserve Bank of San Francisco, 101 Market St, San Francisco, CA 94105, ebtallman@gmail.com. The views in this paper are solely the responsibility of the authors and should not be interpreted as reflecting the views of the Board of Governors of the Federal Reserve System or any other person associated with the Federal Reserve System.

[1]Portes and Rey (2005) and Veldcamp and Van Nieuwerburgh (2009) demonstrated that information frictions are high across national borders.

mation value of sovereign yields declines, ratings do not become more valuable for emerging market bond pricing.

I. Data Sources

We collect data on private bonds and ratings from Dealogic's DCM Analytics, which covers new bond issues placed on international markets. Our analysis is limited to bonds placed by private companies in foreign markets in home currency. We use the following variables, available at the deal level: bond issue date, the name and nationality of the bond issuer, currency denomination, bond yield, and bond ratings. We encode the ratings on a numeric scale ranging from 1 (AAA) for the lowest credit risk to 21 (D) for default.[2] We first use the ratings of Standard & Poor's, then Moody's, and then Fitch ratings to fill in missing data.

In total our sample spans 137,717 individual private bonds issued from 1993 to 2017. The countries included in our analysis represent those that have more than one private bond issue per year–or more than 24 observations in our panel. After excluding bonds with missing yields or ratings, we are left with 79,332 bonds issued by firms from 22 advanced economies and 22 emerging economies, the same sample used in Bevilaqua, Hale and Tallman (2019).

To get information on sovereign yields, we obtain from Global Financial Data (GFD) yields for each country's 10-year government bonds denominated in local currency. For countries and years for which GFD data are missing, we fill the gaps with median yields on sovereign local currency bonds issued in the foreign markets during a given month. We use the last observed median yield for months without bond issue.

II. Empirical analysis

Bevilaqua, Hale and Tallman (2019) show that corporate yields tend to move together with sovereign yields, unless sovereign yields are unusually high. The data also show that when sovereign credit risk is low, most corporate ratings are worse than the sovereign. However, as the sovereign rating worsens, some corporate bond issuers are able to obtain a better rating than their sovereign.[3] Thus, one possibility is that corporate yields simply reflect corporate ratings and there is not much information in sovereign yields regarding the creditworthiness of corporate borrowers. Indeed, Figure **??** shows that a substantial mass of corporate bond ratings is better than the rating of their sovereigns across our entire sample of bonds. This finding is at odds with Almeida et al. (2017), Adelino and Ferreira (2016), Borensztein, Cowan and Valenzuela (2013), Ferri, Liu and Majnoni (2001), Klein and Stellner (2014), and Williams, Alsakka and Gwilym (2013), who empirically document the presence of a sovereign ceiling.[4]

We test for the contribution of sovereign yields and bond ratings to the dynamics of corporate bond yields. We conduct our analysis separately for advanced and emerging economies' bond issuers. Because we are interested in the dynamics of bond yields, rather than their dispersion across firms, we control for firm fixed effects and focus on the *within* R^2. Since sovereign yields only vary by country and year, we cluster standard errors by country-year in all regressions. The results are reported in Table 1. We find that both bond ratings and sovereign yields have an impact on corporate bond yields, even when included in the regression together. However, the explanatory power of bond ratings is much smaller than that of the sovereign yields. We also confirm the finding of Bevilaqua, Hale and Tallman (2019) that the effect of sovereign yields on corporate yields weakens as sovereign yields increase.[5]

A potential concern with these results is that ratings vary mostly across firms, and might be quite stable over time, while sovereign yields only vary over time and countries and not across firms within one country. To give the best chance possible to credit ratings, we reestimate the regressions of Table 1 without firm fixed effects, but keep time fixed effects. We find that even in this setting, sovereign yields explain substantially more overall and within variance in corporate yields for both advanced and emerging economies.[6]

Next, we test whether in times when sovereign

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[2]This is consistent with the convention used in Borensztein, Cowan and Valenzuela (2013).

[3]See Online Appendix for sample charts.

[4]We believe the differences are due to a larger sample of bonds in our data.

[5]See Online Appendix for regression results.

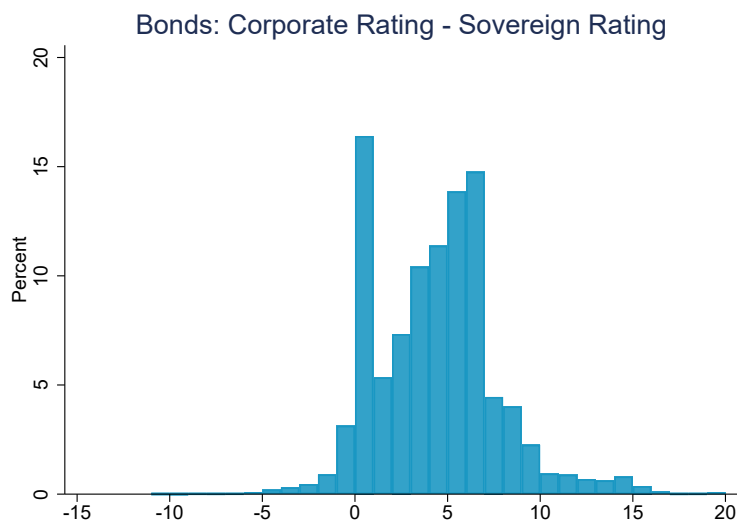[6]See Online Appendix for regression results.

Figure 1. : Distribution of the difference between corporate and sovereign ratings

yields are high, ratings play a more important role because the role of sovereign yields is lower. To do so, we use the definition of high sovereign yield state in Bevilaqua, Hale and Tallman (2019). First, we split our bond sample into those issued in low-yield and high-yield states and estimate the effect of ratings on bond yields. Since ratings vary by firm, we also want to learn about the cross-section informational content of ratings, thus we estimate the regression with and without firm fixed effects.[7] We find that for emerging market issuers, bond ratings are informative of corporate spreads when sovereign yields are low, but contain nearly no information when sovereign yields are high, contrary to our expectations. For advanced economies' issuers, bond ratings are, indeed, more informative when sovereign yields are high. We confirm this finding by estimating full sample regressions with an interaction term of the bond rating with the high-yield state. The results are reported in Table 2. They show that when sovereign yields are high, bond ratings are less informative for emerging market borrowers, but are twice as informative, compared to the low-yield state, for advanced economies' borrowers.

Finally, we test whether there is a trend in the information content of bond credit ratings. We find that for both emerging and advanced economies there is an upward trend in the impact of corporate bond rat-

ings on corporate bond yield.[8] We do not find such a trend in the impact of sovereign bond yields on corporate bond yields.

III. Interpretation

Bevilaqua, Hale and Tallman (2019) present an information model that could be interpreted in terms of the contribution of information contained in bond ratings as well as sovereign yields to the pricing of corporate bonds in global markets. The mean of investors' common prior in the absence of sovereign yield information τ can be interpreted as bond rating, because it is a variable observed by all investors and specific to the bond. The precision of the common prior γ could be interpreted as the quality of the bond rating — a higher information value of bond rating will correspond to a higher τ.

One can easily show that sovereign yield y will have a higher weight in the bond pricing equation when their information is more valuable than the information value of the rating, that is, the precision of the public signal, α, is higher than that of the rating: $\alpha > \gamma$. This is because the mean of investors' common prior, which we interpret as credit rating rating, and a public signal, such as sovereign bond yield, enter the bond pricing equation symmetrically with the weight equal to their precision: the more precise the

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[7]See Online Appendix for regression results.

[8]See Online Appendix for Figures.

Table 1—: Yield regressions

	Emerging markets			Advanced economies		
	(1)	(2)	(3)	(4)	(5)	(6)
Bond rating	0.14***		0.069*	0.079***		0.073***
	(0.043)		(0.037)	(0.0090)		(0.0086)
Sovereign yield		0.96***	0.95***		0.42***	0.41***
		(0.037)	(0.038)		(0.056)	(0.056)
Adjusted R^2	0.89	0.92	0.92	0.76	0.76	0.77
Adjusted within R^2	0.0099	0.28	0.28	0.018	0.054	0.069
Observations	6693	6693	6693	34252	34252	34252

Unit of observation is individual bond. All regressions include firm and time fixed effects.

Dependent variable is the yield of the bond.

Robust SEs clustered on country-year in all regressions.

*(P<0.10), **(P<0.05), ***(P<0.01).

Table 2—: Yield regressions: interactions with the state of sovereign yields

	Emerging markets		Advanced economies	
	(1)	(2)	(3)	(4)
I(High sovereign yield)	3.81***	0.16	-0.095	-0.44***
	(1.02)	(0.57)	(0.37)	(0.16)
Bond rating	0.68***	0.14***	0.068***	0.072***
	(0.066)	(0.046)	(0.024)	(0.0086)
Bond rating * I(High sov. yield)	-0.30***	-0.0049	0.095**	0.076***
	(0.11)	(0.057)	(0.041)	(0.022)
Firm fixed effects	No	Yes	No	Yes
Observations	6922	6616	35897	34537
Adjusted R^2	0.62	0.89	0.26	0.76
Adjusted within R^2	0.44	0.010	0.028	0.020

Unit of observation is individual bond. All regressions include time fixed effects.

Dependent variable is the yield of the bond.

Robust SEs clustered on country-year in all regressions.

*(P<0.10), **(P<0.05), ***(P<0.01).

signal, the higher weight it will have.

Thus, in the context of the information model, we can interpret our empirical results as showing that for corporate bonds traded in global markets, investors view corporate bond ratings as not very informative, with bond rating providing a very noisy signal about the unobserved creditworthiness of a borrower. Moreover, bond ratings are particularly uninformative for emerging market bonds. This is supported by two empirical observations. First, our regressions show that the share of variance in bond yields explained by ratings is smaller for emerging market bonds. Second, the role of the rating for emerging economies does not increase in high-yield states, when the role of sovereign yields falls.

IV. Conclusion

We show empirically that the yields on globally traded corporate bonds are not very well explained by bond ratings, but do co-move substantially with sovereign bond yields. When sovereign yields are high, they are less informative of corporate bond yields and, for advanced economies' bonds, this increases the information value of credit ratings. This is not the case for emerging markets' bonds, which we believe is due to the fact that bond ratings for these bonds are especially uninformative. We do find that, over time, sensitivity of bond yields to ratings increases slightly.

Our findings shed light on the sources of information investors rely on when pricing corporate bonds traded on global markets. The importance of sovereign yields in corporate bond pricing highlights the widespread benefits of sound fiscal policies. At the same time, lower sensitivity of corporate bond yields to sovereign when sovereign yields are unusually high reduces the costs of debt crises.

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