

# When Ratings Don't Matter: Market Segmentation in an Age of Index Investment

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## Abstract

Under what conditions do credit rating agencies (CRAs) discipline sovereign borrowers? Using novel quantitative measures of CRA report texts and new bond spread data, we show that CRA influence is both deeper and narrower than existing International Political Economy (IPE) research suggests. It is deeper because the detailed content of rating reports moves spreads even when rating levels remain unchanged. It is narrower because that influence is conditional on market structure: the rise of index investment has segmented the bond market, and CRA risk assessments only affect spreads for unindexed sovereigns, not indexed ones. We develop and test a push-pull theory of market segmentation to make these arguments. Where no index funnels capital to a country, investors must rely on CRA assessments of country-specific "pull" factors, so these continue to move spreads; but where passive investment dominates, the "push" of index inclusion nullifies the effect of CRA risk information. In sum, (1) CRA reports convey risk information that affects bond spreads independent of ratings themselves, but (2) these effects are conditional on whether the sovereign is included in indexes. By specifying which sovereigns' borrowing costs are and are not sensitive to CRA assessments of political and economic risk, the study advances our understanding of credit ratings, bond indexes, market structure, and market discipline in the IPE of sovereign debt.

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# 1 Introduction

Sovereign borrowing costs affect governments' ability to fund popular programs, limit unpopular taxes, and avoid unsustainable debts that lead to crisis. Borrowing rates, especially for Emerging Markets (EMs), depend in large part on the information investors have about the country's political and economic characteristics (Mosley, 2003; Tomz, 2007). But most investors cannot monitor political and economic risk across EMs. Credit Rating Agencies (CRAs) have long been an information solution to this problem, and it is common wisdom that investor dependence on ratings grants CRAs power over governments because their judgments affect sovereign borrowing costs (among a large literature detailed below, see Barta and Johnston, 2023; Brooks, Cunha and Mosley, 2015; Sinclair, 2005).

Despite this near consensus that CRAs are a powerful information intermediary, International Political Economy (IPE) has underestimated the scope of CRA influence. Studies almost exclusively analyze rating levels. Yet, each time CRAs affirm or change a rating, it also publishes a detailed report explaining their assessment of the risk associated with the country's economic fundamentals, political conditions, and policy choices. These reports are widely consumed, even when the rating itself does not change. But the literature treats ratings as the primary CRA contribution to market information, ignoring this information has.

At the same time, IPE has overestimated CRA influence by overlooking changes in EM bond investment practices. The rise of benchmark indexes has introduced large-scale passive investment into sovereign debt markets. Investors increasingly allocate capital based on sovereign placement in indexes rather than actively monitoring country-specific details (Arslanalp and Tsuda, 2015; Pandolfi and Williams, 2019). By the late 2010s, over 80% of EM bond market investment could be explained by which countries are included, and how much weight those countries hold, in benchmark indexes (Arslanalp et al., 2020; Miyajima, Mohanty and Chan, 2015). For sovereigns included in these indexes, this means

most demand for their bonds is decoupled from the kind of risk information that CRAs provide (Cormier and Naqvi, 2023, 2025).

As passive index investment has come to dominate EM bond markets, what power do CRAs maintain over sovereign borrowers? We argue that CRA power is both deeper but narrower than existing research suggests. It is deeper because CRA risk assessments affect spreads through the detailed content of rating reports, beyond coarse and less-varying rating levels. However, CRA power is narrower in reach because indexes have created a *segmented* bond market, giving rise to a structural divide between sovereigns with access to index-tracking capital versus those without. In this structure, the country-specific risk information CRAs provide affects spreads only in the unindexed segment, not the indexed segment. Sovereigns whose bonds attract index-tracking capital have effectively insulated themselves from the power of CRA judgment, while those outside indexes remain subject to it.

We develop a push-pull theory of market segmentation to explain this shift. In the unindexed segment, there is no index funneling capital to these countries, so investors must rely on CRA information if they are to invest in these bonds. Accordingly, CRA assessments of country-specific "pull" factors continue to significantly affect spreads in the unindexed segment. But in the indexed segment, where passive investment dominates flows, demand for these countries' bonds is primarily dictated by index guidance rather than CRA information. Accordingly, the "push" effect of indexes nullifies the effect of CRA risk assessments.

We test for index-driven market segmentation using new bond spread data from LSEG together with novel quantitative text measures of CRA sovereign rating reports. Rather than relying on coarse, slow-moving ratings levels, we capture the detailed risk information CRAs communicate each time they affirm or change a rating. As we show, before accounting for index effects, these reports move spreads even when ratings remain unchanged. Armed with this finer measure of CRA informational effects, we then test for

and find evidence of index-driven segmentation. When a country is excluded from benchmark indexes, credit ratings and reports do affect spreads. But when a country is included in benchmark indexes, credit ratings and reports no longer affect spreads.

The study has several implications for the IPE of sovereign debt and finance. By showing that indexes alter the role and effect of traditionally powerful information intermediaries, it establishes index-driven market structure as a conditioning variable that future research on CRAs and other market actors should account for. More broadly, the theory of segmentation advances our understanding of how and why bond markets do and do not discipline sovereign borrowers. IPE has long recognized that markets do not discipline all sovereigns equally (Mosley, 2003), and identifying sources of this variation is a central aim of the literature (Ballard-Rosa, Mosley and Wellhausen, 2021; Brooks, Cunha and Mosley, 2022; Cunha, 2024; Gray, 2013). By specifying which sovereigns' borrowing costs are sensitive to political-economic risk and why, we clarify the conditions under which politics affect sovereign borrowing costs — and, by extension, which EMs have more or less policy autonomy in a global financial system assumed to exert disciplinary pressure on governments.

## 2 Information and Ratings in Sovereign Bond Markets

Sovereign bond markets discipline borrowers by charging risk premiums.<sup>1</sup> To price risk and set the rate at which governments can borrow, investors rely on updates about countries' economic and political fundamentals (Eaton and Gersovitz, 1981; Tomz, 2007). But few investors have the resources to independently monitor country-specific details across EMs (Gray, 2013; Brooks, Cunha and Mosley, 2015). Instead, they depend on third-

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<sup>1</sup>The primary source of risk in the EM bond market has historically been default, since most EM debt was denominated in foreign currency and repayment cannot be enforced (Eaton and Gersovitz, 1981). But many EMs now issue in domestic currency as much as foreign currency (Ballard-Rosa, Mosley and Wellhausen, 2022), introducing inflation (Burger and Warnock, 2007), exchange rate (Gadanecz, Miyajima and Shu, 2014), and other risks into the EM bond market (see review in Cormier and Naqvi, 2025, 7-8). Ability and willingness to repay remains a core risk, but the further risk that even repayments are devalued has also become salient in EM sovereign debt.

party sources to collect, assess, and standardize information in ways that allow investors to make efficient decisions.

CRAAs have long been core information intermediaries in the EM sovereign bond market and are central to investor risk perceptions and thus sovereign borrowing costs (Masciandaro, 2013; Cantor and Packer, 1996; Sinclair, 2005; Barta and Johnston, 2023; Paudyn, 2014). In addition to macroeconomic fundamentals, CRA rating methodologies explicitly assess how a variety of policymaking and political institutions affect risk (for example, S&P, 2017).

IPE has accordingly sought to identify how politics affect sovereign ratings. Regime type (Beaulieu, Cox and Saiegh, 2012), rule of law (Biglaiser and Staats, 2012), transparency (Cormier, 2023), partisanship (Barta and Johnston, 2018), elections of left-leaning governments (Vaaler, Schrage and Block, 2006), and open international economic policies like free trade agreements (Biglaiser and DeRouen, 2007; Tomashevskiy and Kono, 2015) have been identified as plausible political determinants of sovereign ratings. The precise effects are debated (see Archer, Biglaiser and DeRouen, 2007; DiGiuseppe and Shea, 2015; Saiegh, 2005).

IPE research on CRAAs overwhelmingly focuses on ratings levels, which overlooks other ways that CRAAs provide risk assessment information. Our main interest here is rating reports:<sup>2</sup> the narrative assessments that publicly justify ratings, providing investors with insights into risk beyond the relatively coarse final rating (Masciandaro, 2013). Research on stock (rather than bond) markets identify the effect of rating report content on equity prices and subsequent firm behavior, independent of ratings, using quantitative text analysis or other coding of rating report details (Agarwal, Chen and Zhang, 2016; Kakouris, Charalambakis and Psychoyios, 2025). While some have qualitatively assessed how reports in wealthy European countries indicate the topics that CRAAs monitor (Barta and Johnston, 2023, Ch. 5), we are not aware of empirical IPE research testing for a generaliz-

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<sup>2</sup>We also account for "outlooks" in the quantitative analysis, but economics already identifies how outlooks affect markets (Afonso, Furceri and Gomes, 2012; Ferreira and Gama, 2007; Kaminsky and Schmukler, 2002; Pukthuanthong-Le, Elayan and Rose, 2007).

able independent effect of rating report content on bond markets.<sup>3</sup>

Moreover, IPE typically studies ratings as dependent variables. Less attention has been paid to the final step of whether and under what conditions rating information ultimately affects bonds, i.e. how CRAs operate as an independent variable. There is an implicit assumption that ratings contribute to market discipline uniformly across countries and time (for exceptions, see Biglaiser, Hicks and Huggins, 2008; DiGiuseppe and Shea, 2016). But in the interdisciplinary sovereign debt literature, there is no consensus about rating effects on sovereign borrowing costs. Some do find ratings move EM interest rates in the expected direction (Cantor and Packer, 1996; Reisen and Von Maltzan, 1999), with rates perhaps especially sensitive to downgrades rather than upgrades (Afonso, Furceri and Gomes, 2012; Gande and Parsley, 2005). Yet others cast doubt on a systematic link between ratings and rates. Rating effects may be pro-cyclical insofar as they depend on global economic cycles (Kaminsky and Schmukler, 2002) or rating changes among and relative to peers (Gande and Parsley, 2005; Basu et al., 2013). Still others find rating effects vary across time, becoming insignificant in the context of low global interest rates following the 2008 global financial crisis (Baumann, Staveley-O'Carroll and Violante, 2022; De, Mohapatra and Ratha, 2020).<sup>4</sup> CRA effects on sovereign bond markets are heterogeneous, and IPE has yet to contribute to our understanding of how and why this is the case.

In sum, CRAs are EM bond market information intermediaries, central to the pricing of risk and thus market discipline. Accordingly, IPE has contributed to sovereign debt research by identifying how politics inform ratings. But this research is largely limited to investigation of ratings levels, overlooking other information CRAs provide like detailed rating reports. Furthermore, IPE implicitly assumes ratings contribute to market discipline uniformly across countries and time. But research in economics identifies heterogeneous CRA effects. It is in this context that we consider the rise of index investment.

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<sup>3</sup>The same could be said of economics. Studies leverage the timing of reports to identify immediate CRA information effects on bond markets (Cantor and Packer, 1996; Reisen and Von Maltzan, 1999; Afonso, Furceri and Gomes, 2012), but to our knowledge have not identified the effect of report content.

<sup>4</sup>These studies assess sovereign ratings effects on capital flows broadly, not yields specifically.

### 3 Indexes as the New Information Intermediary

Investment in EM bond markets has evolved to depend on information intermediaries other than CRAs. One of, if not the, most consequential are indexes. Indexes are information tools investors use to allocate capital across large subsets of an asset class (a bond market, a stock market, a commodities market). Indexes emerged in the 1970s as a way for investors to gain efficient guidance on how to invest across a large subset of the stock market, rather than picking individual stocks (Fama, 1970; Wigglesworth, 2021). Over time, certain stock indexes (S&P 500, Nasdaq Composite, FTSE Russell 100) became benchmarks, tracked by more capital than other indexes. As indexing<sup>5</sup> spread as an investment strategy, stocks included in benchmark indexes gained valuation boosts because they automatically attracted more investor demand compared to stocks excluded from indexes (Petry, Fichtner and Heemskerk, 2019).

In the EM bond market context, indexes emerged in 1993 with the development of J.P. Morgan's Emerging Market Bond Index (EMBI), focused on foreign currency EM bonds. In 2003 J.P. Morgan developed the Government Bond Index for local currency EM bonds (GBI-EM). J.P. Morgan's indexes are the EM bond market benchmarks, tracked by more capital (\$342 and \$224 billion USD in 2021, respectively) than other available indexes in the EM bond asset class (J.P. Morgan, 2021, p. 90, 117). These indexes have become so influential that the majority of EM bond market investment is dictated by the composition of indexes. The IMF and BIS estimate that index investment explains 80% and 90% of fund holdings in foreign and domestic currency EM bond markets, respectively (Arslanalp et al. 2020, 9; Miyajima, Mohanty and Chan 2015, 24). EMs included in indexes enjoy automatic demand from the large set of asset managers that rely on indexes to make investment decisions, reducing the effect of country-specific economic and political characteristics on

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<sup>5</sup>As we detail below, "passive" investment is investing by simply allocating capital to the assets included in an index. "Active" investing is picking assets beyond an index, but even active investors still use indexes to benchmark then make adjustments from the index to try to beat passive investors (Arslanalp et al., 2020, p. 4, 6, 9)

their borrowing costs. As a result, indexes serve to weaken market discipline for included countries (Cormier and Naqvi, 2023, 2025).

The scale of index investment in the EM bond market makes index provider firms, like J.P. Morgan, information intermediaries of equal importance to CRAs (Petry, Fichtner and Heemskerk, 2019, 155). But, indexes and CRAs serve two different information functions. CRAs provide information on individual EMs, while indexes provide information on how to invest across the entire EM asset class. Rating agency risk assessments strengthen market discipline by providing country-specific risk assessments for investors, while indexes detach investment and borrowing costs from country-specific features. (Cormier and Naqvi, 2023, 2025). This makes CRAs and indexes incongruous information intermediaries, with contrasting implications for how we should expect country-specific information updates to affect sovereign borrowing costs.

## **4 Market Segmentation: A Push-Pull Theory of Index Investment and CRA Information**

EM sovereign bond market flows and prices are often theorized through a "push-pull" framework (Fernandez-Arias, 1996).<sup>6</sup> Pull factors are country-specific characteristics that dictate investor appetite for that country's bonds. Strong macroeconomic fundamentals (Koepke, 2019) and institutions thought to increase the probability of strong macroeconomic fundamentals like central bank independence should reduce risk, attract capital, and lower yields (Bodea and Hicks, 2015). Political factors like regime type (Schultz and Weingast, 2003; Stasavage, 2003), partisanship (Brooks, Cunha and Mosley, 2022), or policy choices (Mosley, 2003, Ch. 4) may also move yields as they increase or decrease risk of default or other losses. A core CRA function in EM sovereign debt is to assess these pull factors in countries over time, allowing investors to efficiently learn about changes in

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<sup>6</sup>A push-pull framework is relevant to other flows, markets, and effects (Calvo, Leiderman and Reinhart, 1993; Koepke, 2019)

country-specific risk and invest accordingly.<sup>7</sup>

Push factors, in contrast, move capital in or out of EM bonds for reasons exogenous to any particular EM. One primary push factor is global interest rates, especially benchmark US interest rates. Rate decreases drive investment to EMs as investors seek higher returns, while interest rate rises drive investment back to developed markets (Fernandez-Arias, 1996; Miranda-Agrippino and Rey, 2020). Other measures of global investor risk aversion can also push capital (Koepke, 2019; Rey, 2018). Push factors may be strong enough to either condition the effect of country-specific pull factors (Ballard-Rosa, Mosley and Wellhausen, 2021) or even leave pull factors relatively insignificant (Naqvi, 2019).

Indexes are an increasingly important push factor. As detailed above, EMs included in benchmark bond indexes benefit from access to index-tracking capital, providing relative insulation from the effects of changes in country-specific pull factors. While governments are aware of the benefits of index inclusion, index providers manage index entry and composition by setting rules for eligibility and inclusion. Some indexes, like J.P. Morgan's benchmark local currency EM bond index, go further to ensure inclusion/exclusion decisions depend on their subjective judgment on a case-by-case basis (Cormier and Naqvi, 2025). Moreover, an EM's index weight is frequently altered by events external to that EM, such as index provider inclusion/exclusion decisions and weight changes regarding other EMs (see for example Romero et al., 2021; Cormier, 2025). The effect of indexes on EM bond markets is best understood as a push factor that conditions the impact of pull factors.

The relative importance of push versus pull factors in EM sovereign bond markets is a long-standing debate (Koepke, 2019). Efforts to identify the relative strength of push versus pull effects on bonds sometimes pool all EMs, implying that both push and pull factors should apply equally across them (see Presbitero et al., 2016). But others argue and find that push and pull effects are heterogeneous across EMs, depending on investor

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<sup>7</sup>This does not mean CRAs do not also account for exogenous global factors in their risk assessment of a country.

type and time periods (Cerutti, Claessens and Puy, 2019; Milesi-Ferretti and Tille, 2011).

## 4.1 EM Bond Market Segmentation

We build on literature identifying heterogeneous push/pull effects in sovereign debt. We theorize that indexes have created a segmented EM bond market, where push and pull factors have different effects in different market segments.

In finance, market segmentation refers to the idea that supply and demand for an asset (stocks, bonds) do not operate homogeneously across the entire market. For example, stock prices of an investment grade firm do not vary for the same reasons as, or as much as, a sub-investment grade firm—even when the firms' fundamentals are otherwise similar. The segmentation stems in large part from the fact that different types of investors are active in the investment grade segment versus the sub-investment grade segment (Chernenko and Sunderam, 2012). Heterogeneous investors react differently to the same information, leading stock prices in the market segment in which one investor type is pre-dominant to move differently than segments where other investor types are pre-dominant (Jia, Wang and Xiong, 2017).

In sovereign bond markets, segmentation often refers to how different investors prefer certain maturities (their "preferred habitat"). This leads to different demand for, and thus different pricing of, different maturities of the same country's bonds (Modigliani and Sutch, 1966; Vayanos and Vila, 2021). In other words, short-term and long-term bond rates do not move together because demand is heterogeneous across maturity segments. Rates in higher-demand segments are stickier, or less sensitive to information updates about risk, than in lower-demand segments (Giese et al., 2024).

We extend this segmentation logic to the EM bond market as a whole. Index investors are a particular type of investor. Many are "passive" investors who simply replicate benchmark indexes rather than monitor country-specific factors. Even "active" investors replicate indexes in the first instance, then make adjustments to try generating higher returns

than passive investors (Arslanalp et al., 2020, p. 4, 6, 9). Such investment practices give primacy to push factors over pull factors. Demand for bonds (and the corresponding cost of borrowing) become less a function of country-specific pull factors because indexed investors are not scrutinizing country-specific risk when allocating capital—they are instead replicating indexes, driving capital to indexed bonds with comparatively limited sensitivity to shifts in country-specific pull factors (Cormier and Naqvi, 2023, 2025). Accordingly, EMs included in indexes are part of a particular market segment where the push effect of indexes is pre-dominant.

In contrast, unindexed EMs by definition do not have access to indexed capital. Demand for their bonds is not driven by the composition of indexes. Instead, demand for unindexed EMs’ bonds remains sensitive to information updates about their country-specific risk profiles. Unindexed EMs are thus in a different market segment than indexed countries because they lack access to index investment. They have access to only active investors, who must rely on country-specific information updates from information intermediaries like CRAs to make investment decisions regarding these countries.

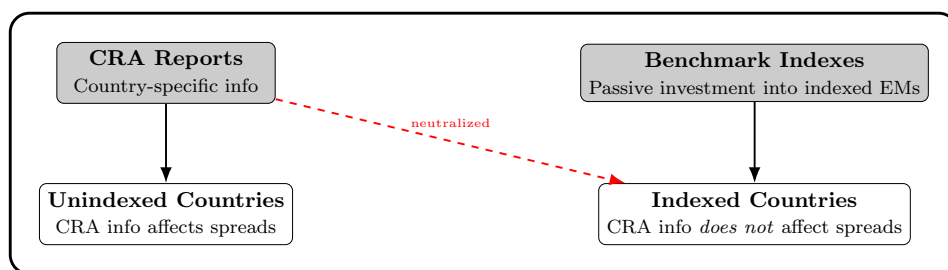


Figure 1: Information Pathways in a Segmented Bond Market

Figure 1 visualizes the theoretical mechanism. Indexes have given rise to a segmented EM bond market, bifurcated between indexed and unindexed sovereigns. These segments are distinct due to the type of investors allocating capital in each segment, and the information those investors use to invest in the EMs in each segment. Varied information mechanisms across segments have implications for how country-specific risk informa-

tion moves each segment. In the indexed segment, investors replicate indexes to allocate capital. This makes the push effect of index investment practices pre-dominant in that segment, reducing the impact of country-specific pull factors. In the unindexed segment, investors by definition do not attract index investment. Investment in unindexed EMs accordingly remains subject to updates about risk assessments of country-specific pull factors, like those provided by CRAs.

## 4.2 Hypotheses

We test our theory and arguments through two hypotheses. First, we expect that CRA rating reports affect EM sovereign bond spreads, controlling for and independent of coarse and less-varying ratings levels. Even when ratings remain unchanged, the detailed content of rating reports provides risk information updates, which we expect investors to respond to. This has been found in studies of stock markets, but not tested in sovereign bond markets. Evidence of rating report effects (independent of rating levels) would suggest that the scope of CRA influence in bond markets is underestimated by existing IPE literature.

**Hypothesis 1.** *Independent of rating levels, positive CRA reports lower spreads and negative CRA reports raise spreads.*

Second, however, we expect CRA report effects are heterogeneous across EMs. Specifically, we expect that CRA reports affect the bond spreads of unindexed countries but not indexed countries. These are observable implications of the theory that index investment has segmented the EM bond market into indexed versus unindexed countries. In the indexed segment, we expect the push effect of indexed capital to negate the effect of CRA-monitored pull factors on spreads. In the unindexed segment, we expect spreads remain sensitive to the country-specific pull factors assessed by CRAs. Since indexes do not determine investment for excluded countries, investors necessarily rely more on country-specific risk assessments to make investment decisions in this segment. Evidence of such

conditional CRA effects would suggest the bond market is indeed segmented, and that different information and thus market discipline mechanisms operate in each segment.

**Hypothesis 2.** *CRA reports affect spreads in the expected direction only when an EM is excluded from indexes; CRA reports do not affect spreads when an EM is included in indexes.*

## 5 Empirical Analysis

Our empirical analysis relies on three key variables: novel measures of CRA report sentiment, bond index inclusion data, and new sovereign bond issuance data. We detail the construction and sources of these measures before outlining control variables and modeling strategies.

### 5.1 Explanatory Variable 1: Credit Rating Report Sentiment

Governments experience CRA scrutiny as a continuous process, not just rating changes. Credit rating reports come out regularly to communicate to investors, governments, and the wider public about CRA assessments of creditworthiness. These reports are widely read and widely reported upon. For example, *Business Standard* recently reported on a Moody's affirmation of India's credit rating, while at the same time noting that Moody's flagged some fiscal risk (Rajora, 2025). News reports on credit rating reports provide summations or word-by-word depictions of the reports. Limiting our analysis to ratings would miss all of this information conveyed between a ratings change. These reports communicate detailed risk assessments regardless of whether the rating itself changes.

To capture this report information, we construct a quantitative text measure of sentiment in the CRA reports that justify ratings decisions. Moody's is the most transparent of the three major rating agencies (compared to S&P and Fitch), providing public access to sovereign rating reports since 1994. We downloaded all available sovereign rating action reports from Moody's archives, yielding 2,655 sovereign rating reports from 1994-2024.

The timing of these reports varies and is not limited to rating changes. Forty-two percent of reports affirm ratings, while 53% of reports have “stable” rather than positive or negative outlooks. CRAs constantly monitor, assess, and communicate about sovereigns, and our sentiment measure captures the textual content of these communications.

Each report reflects the collective judgment of a Moody’s rating committee, which determines ratings by majority vote based on the lead analyst’s recommendation and deliberation among committee members (Moody’s, 2019).<sup>8</sup> Moody’s reports typically open by announcing the rating decision and prospective outlook. The report then articulates the key factors behind the rating decision. These factors include current macroeconomic fundamentals and forecasts, policy choices, international economic linkages, global market conditions, and political-institutional factors that are all likely to affect current and future sovereign risk.<sup>9</sup>

We use a dictionary-based quantitative text sentiment analysis to create a sentiment measure for each report. We tokenize each report into individual words then apply the AFINN sentiment lexicon to identify whether these words indicate positive or negative sentiment (Nielsen, 2011), a tool frequently used in social science (Loureiro, Alló and Coello, 2022; Corti et al., 2022; Sapkota, 2022). We then summarize these scores for each document, providing a continuous overall sentiment score for each rating report.

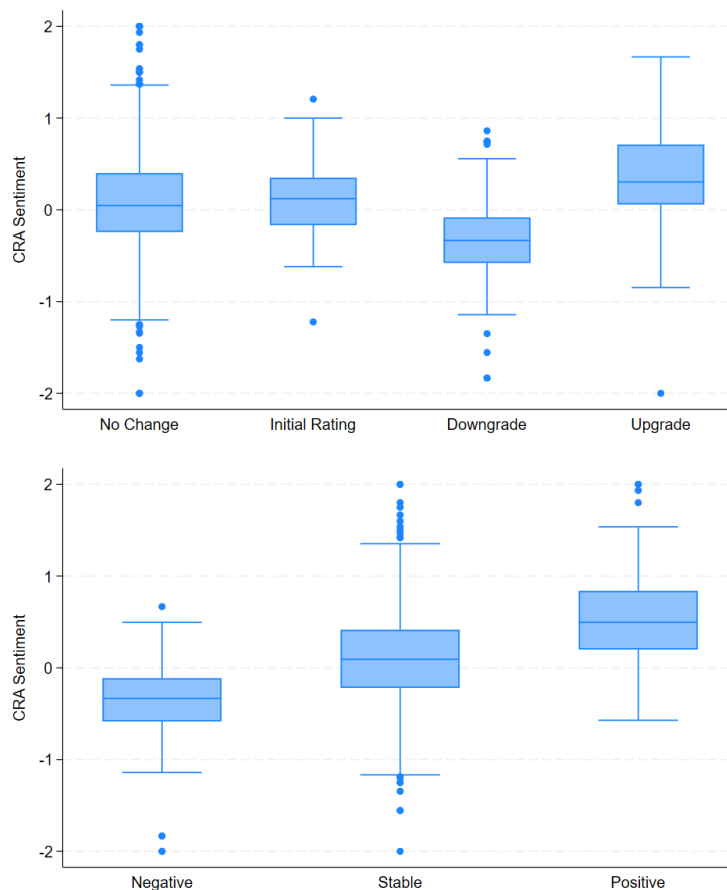
The measure behaves as expected. Figure 14 shows sentiment aligns with rating actions and outlooks in the predicted directions—downgrades and negative outlooks are associated with negative sentiment, upgrades and positive outlooks with positive sentiment—while varying widely within each category, confirming that reports carry risk assessment detail beyond discrete changes. We report the distribution of sentiment scores, along with detailed face validity comparisons across rating actions and outlook categories in the appendix.

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<sup>8</sup>An example of a report on Costa Rica from 2025 can be found [here](#).

<sup>9</sup>In most cases (not for unsolicited ratings), Moody’s provides the rated country with a draft of the report prior to publication, but solely to identify factual errors or inadvertent disclosure of confidential information. This preview window is short, typically 12-24 hours.

Figure 2: Relationship Between Sentiment and Rating Actions

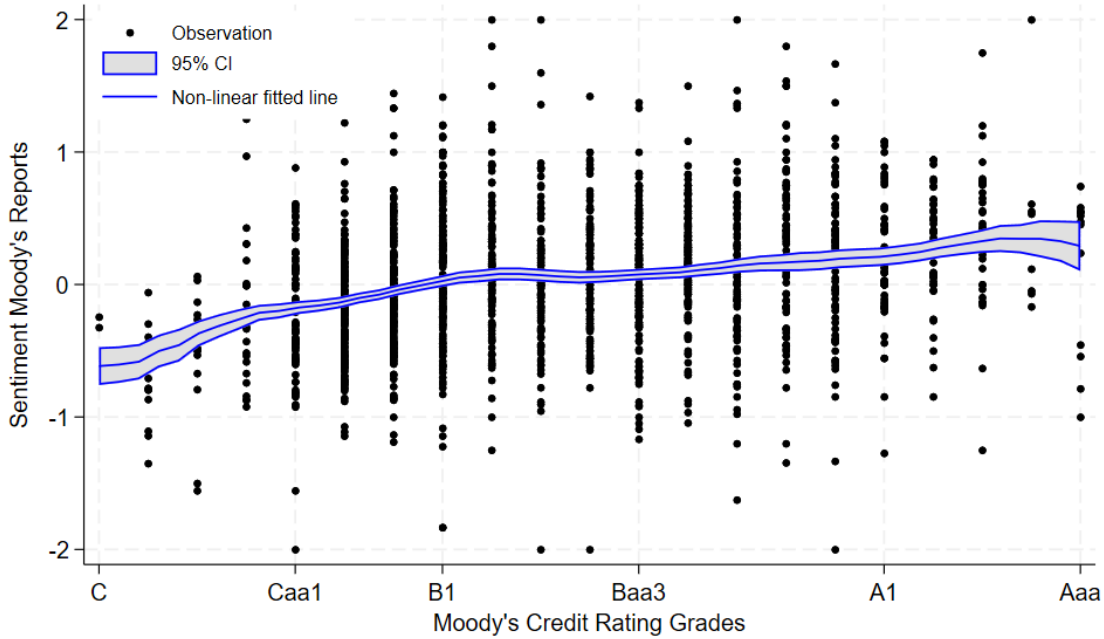


Report sentiment is not simply a function of rating levels. As Figure 3 shows, sentiment scores are widely distributed at every rating level. A local polynomial smooth reveals only a weak positive relationship between the two.

The distinction between ratings and sentiment also has direct implications for identification. Rating levels are comparatively sticky, often unchanged within countries over short and medium time-frames. As a result, their variance is predominantly between-country. Sentiment exhibits more within-country variation. We decompose the variance of both measures in Table 1.<sup>10</sup> Only 15.9% of the total variation in rating levels occurs within countries over time; for sentiment, that figure is 72.2%.

<sup>10</sup>For each variable  $x_{it}$ , we compute the between-country component  $\bar{x}_i = T_i^{-1} \sum_t x_{it}$  and the within-country component  $\hat{x}_{it} = x_{it} - \bar{x}_i$ . The reported percentages are  $R^2$  values from regressing  $x_{it}$  on  $\hat{x}_{it}$ , representing the share of total variance attributable to within-country changes over time.

Figure 3: Relationship Between Sentiment and Rating Levels



Note: Scatter plot of sentiment measure and credit ratings, with a local polynomial smooth function. Ratings at Baa3 and above are classified as investment grade by Moody's.

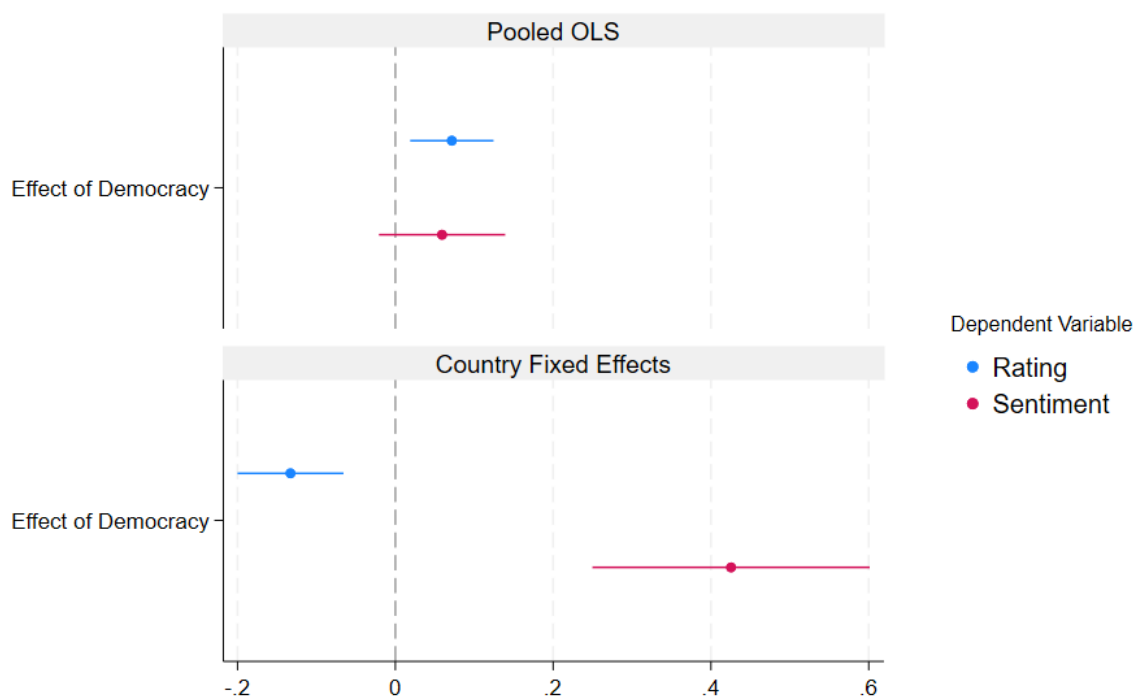
We illustrate the consequences in Figure 4 using perhaps the most established relationship in the sovereign debt literature: the effect of democracy on creditworthiness (Beaulieu, Cox and Saiegh, 2012; Ballard-Rosa, Mosley and Wellhausen, 2021). Democracy is an explicit factor in Moody's rating methodology (Moody's Investors Service, 2022), and its effect on rating levels is robust across specifications. Yet the sign and significance of that effect depend on whether the model exploits between-country or within-country

Table 1: Variation in Credit Variables

Variable	Type of Variation	Standard Deviation	Percent of Overall Variance
CRA Ratings	Overall	4.502	
	Between	4.103	84.07
	Within	1.797	15.93
CRA Sentiment	Overall	0.536	
	Between	0.284	27.85
	Within	0.455	72.15

variation.<sup>11</sup>

Figure 4: Democracy's Effect on Ratings and Sentiment



This validation motivates our empirical strategy. Like many other IPE analyses, our estimation strategy uses country fixed effects to identify whether CRA report content affects bond market outcomes within countries over time. A measure that varies predominantly between countries—as rating levels do—would be poorly suited for this design. Sentiment, in contrast, exhibits the within-country variation necessary for within-country identification. This does not mean that sentiment matters more than ratings. Sentiment complement ratings and carries information that Moody's communicates in every report, regardless of whether a rating action occurs.

<sup>11</sup>We control for logged GDP per capita, real GDP growth, inflation, debt service as a share of GDP, foreign reserves, and leadership changes. Full estimation tables are in the appendix.

## 5.2 Explanatory Variable 2: Sovereign Bond Indexes

H1 expects that CRA report content affects bond spreads independent of ratings levels. H2 then expects this relationship to be conditional on index inclusion. As detailed earlier, the benchmark indexes in the EM sovereign bond market are provided by J.P. Morgan. The EMBIG index is the benchmark index in the foreign currency EM bond market while the GBI-EM is the benchmark index in the local currency bond market. We use historical index inclusion data for both indices (Cormier and Naqvi, 2025) to create dummy variables, coded as 1 if a country is in that respective index that year and 0 if not.

## 5.3 Dependent Variable: Sovereign Borrowing Costs

Both H1 and H2 seek to explain the interest rate governments pay to borrow. We specifically focus on bond spreads, the differential between a bond's interest rate and US Treasury bonds. Using spreads strips out system-level variation in interest rates, standardizing them to allow for comparison over time. Higher spreads correspond to higher relative interest rates and thus greater perceived risk, while lower spreads correspond to lower interest rates and thus reduced perceived risk.

Much research relies on JP Morgan's EMBIG spreads, obtained through the World Bank database (Sy, 2002; Dell'Erba, Hausmann and Panizza, 2013). For example, Arellano and Kocherlakota (2014) use these spreads to identify default probabilities, while Ferry and Shea (2025) use them to proxy future borrowing costs. However, these data have several limitations for our purposes. First, EMBIG coverage is a foreign currency bond index, which captures only foreign currency issues and omits a substantial volume of domestic currency borrowing. Second, the data includes only those sovereigns included in the index—precisely the countries we theorize to be relatively insulated from CRA discipline. Analyzing only EMBIG spreads would not allow us to test our segmentation argument, since it omits the unindexed sovereigns over which we expect CRAs to retain the most influence. Finally, while EMBIG spreads provide a useful proxy for borrowing

costs, they reflect secondary market trading rather than the actual interest rates sovereigns pay when issuing new bonds. We initially use this data to match the literature when testing H1, but to fully test both our hypotheses, we gather new data that addresses these limitations.

We collect primary market sovereign bond issuance data from LSEG covering 1980-2024.<sup>12</sup> Primary market data captures the terms at which governments borrow, should they choose to issue new bond debt. We collect the coupon rate (interest rate) of every sovereign bond issued in this period recorded by LSEG, then strip out US benchmark rates at the time of issue to create spreads. We also collect bond issue volume (in USD), maturity, and currency denomination information for each bond.

This yields 64,280 sovereign bond issues from 123 non-OECD countries between 1980 and 2024. The coverage increases after the mid-1990s as EM bond issuance expanded (see appendix for temporal distribution). There are 9,570 issues denominated in foreign currency and 54,710 in domestic currency (85% of issues are domestic currency). We include only fixed-coupon bonds (33,708 issues, by far the modal bond type in the data) to ensure comparable pricing across countries and time. We aggregate bond-specific data to the country-month level for analysis.

## 5.4 Control Variables

We control for credit ratings as well as macroeconomic and political factors that may confound our hypotheses that the relationship between sovereign bond spreads and credit ratings is (1) a function of CRA report sentiment as much as rating levels and (2) that this is conditional on whether or not a sovereign is included in a benchmark EM sovereign bond index.

First, we include the issuing sovereign's Moody's rating at the time of bond issuance, coded numerically so that greater values are better ratings. We hypothesize that rating

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<sup>12</sup>Data collected from LSEG Datastream in October 2025.

report sentiment provides additional information beyond the rating itself, and find initial evidence of this based on the descriptive statistics in the data section above (Figure 3 ). By controlling for ratings levels, we are evaluating the independent effect of the detail in CRA report assessments on spreads while accounting for the level of ratings themselves. This is an important distinction, as Figure 3 above shows and the surrounding discussion explains. There is significant variation in report sentiment across rating levels. Ratings and report sentiment are not a function of one another, giving reason to probe the independent effect of information in reports while controlling for ratings levels themselves.

Economic controls include GDP per capita (log), capturing a country's level of economic development. GDP growth should improve debt sustainability and likely lower spreads. Inflation may signal monetary policy pressures or fiscal choices likely to increase spreads. Total trade (% of GDP) captures economic openness and integration with global markets. Debt service accounts for debt repayments in the period. Foreign reserves (months of imports) should facilitate meeting foreign currency debt obligations and defending the exchange rate against depreciation that would increase the local currency debt burdens. All economic data come from the World Bank (World Bank, 2025).

We then control for political and institutional characteristics commonly found to affect bond market access. Democracy is the V-Dem liberal democracy index (Coppedge et al., 2025). Left equals 1 if the Database of Political Institutions codes the current government as having a left-leaning economic policy program (Beck et al., 2001). Central Bank Independence (CBI) captures credibility of monetary policy (Garriga, 2025). Finally, Moody's bond rating methodology explicitly states that they use the World Bank's World Governance Indicator for political stability in their risk assessments (Moody's, 2021, p.8). We include this as a control, pulling forward observations until they change to cover within-country gaps.

We control for temporal variation in EM bond market liquidity and risk appetite. Since we use benchmark US interest rates to strip bond coupons in the dependent variable, we

account for relative global risk appetite by measuring the month-over-month change in global bond issuance volume with data from the Bank of International Settlements (Bank for International Settlements, 2026).

## 5.5 Estimation Approach

Our unit of analysis is country-month. Bond-specific data are aggregated to the country-month level, taking the mean coupon spread across all issues in a given month where multiple bonds are issued. CRA report data are similarly recorded at the country-month level, with the most recent report used where multiple reports occur in the same month. To test H1, we estimate OLS models in the general form:

$$\text{Spread}_{it} = \beta_1 \text{Sentiment}_{it-1} + \beta_2 \text{Rating}_{it-1} + \mathbf{X}_{it-1}\gamma + \alpha_i + \delta_y + \varepsilon_{it} \quad (1)$$

where  $\text{Spread}_{it}$  is the mean spread for country  $i$  in month  $t$ ,  $\text{Sentiment}_{it-1}$  is the sentiment score from the most recent Moody's report, and  $\text{Rating}_{it-1}$  is the numerical credit rating level.  $\mathbf{X}_{it-1}$  is the vector of macroeconomic and political controls described above. All right-hand-side variables are lagged one month. We include country fixed effects ( $\alpha_i$ ) and year fixed effects ( $\delta_y$ ).

To test H2, we augment Equation 1 with the relevant index inclusion dummy and its interaction with sentiment:

$$\begin{aligned} \text{Spread}_{it} = & \beta_1 \text{Sentiment}_{it-1} + \beta_2 \text{Rating}_{it-1} + \beta_3 \text{Index}_{it} + \beta_4 (\text{Sentiment}_{it-1} \times \text{Index}_{it}) \\ & + \mathbf{X}_{it-1}\gamma + \alpha_i + \delta_y + \varepsilon_{it} \quad (2) \end{aligned}$$

where  $\text{Index}_{it}$  is a dummy variable equal to one if country  $i$  is included in the relevant benchmark index in month  $t$ .<sup>13</sup> In Equation 2,  $\beta_1$  captures the effect of CRA sentiment

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<sup>13</sup>Results are robust to lagging index one period

for unindexed countries, while  $\beta_4$  estimates how that effect changes when a country is included in the index.

## 6 Results

### 6.1 H1: Secondary Market Spreads

We first establish that CRA report sentiment has significant market effects (H1) by using secondary market data widely used in previous studies. Table 2 presents estimates of the relationship between Moody's ratings, report sentiment, and J.P. Morgan EMBIG bond spreads from 1994-2020.

Model 1 omits CRA report sentiment to show the expected relationship between ratings levels and bond markets: better credit ratings reduce secondary market yields, with a one-grade rating improvement associated with an 80 basis point spread reduction. Model 2 introduces the sentiment measure and demonstrates that market actors respond to more than just formal rating changes. Even with controlling for the rating level itself, sentiment statistically affects yields. A one-unit increase in report sentiment (more positive language) reduces spreads by approximately 217 basis points. Bond investors pay attention to the substance of CRA reports, not just the headlines.

Models 3-5 then restrict the sample to cases where formal ratings provide less new information. Model 3 includes only reports that affirmed ratings, excluding upgrades or downgrades. Model 4 restricts to stable outlooks, where Moody's indicates that they do not expect any changes to credit ratings in the near future. Model 5 combines both restrictions, analyzing only reports with no rating change and stable outlooks. In each specification, sentiment is statistically significant. Moreover, Models 3-5 estimate sentiment actually has the greatest substantive effect on spreads when ratings levels and outlooks are respectively unchanged and stable— i.e. when these coarse measures would suggest there should be no change in spreads.

Table 2: CRA Sentiment Effects on Secondary Market Bond Yields, 1994-2020

	(1)	(2)	(3)	(4)	(5)
CRA Sentiment		-2.342*	-2.712*	-2.713*	-4.475*
		(0.136)	(0.169)	(0.209)	(0.295)
CRA Rating	-0.952*	-0.904*	-0.880*	-0.864*	-0.469*
	(0.054)	(0.052)	(0.063)	(0.074)	(0.114)
Democracy	2.843*	3.240*	7.657*	2.936*	17.957*
	(0.927)	(0.903)	(1.213)	(1.340)	(1.937)
Left	0.606*	0.462*	-1.740*	0.174	-3.064*
	(0.230)	(0.224)	(0.286)	(0.297)	(0.425)
CBI	2.403*	2.907*	1.476	1.517	-2.049
	(0.799)	(0.778)	(0.887)	(1.110)	(1.190)
Political Stability	0.341	0.652*	-0.178	0.701*	-3.491*
	(0.237)	(0.232)	(0.276)	(0.347)	(0.456)
log GDP per cap	2.828*	2.806*	5.031*	2.401*	5.020*
	(0.658)	(0.640)	(0.697)	(0.866)	(0.976)
Growth	-0.366*	-0.322*	-0.449*	-0.320*	-0.564*
	(0.025)	(0.026)	(0.035)	(0.037)	(0.047)
Inflation	0.065*	0.076*	0.024*	0.112*	0.053*
	(0.009)	(0.008)	(0.012)	(0.013)	(0.024)
FX Reserves	0.333*	0.352*	0.042	0.372*	-0.193*
	(0.042)	(0.041)	(0.051)	(0.060)	(0.086)
Trade (% of GDP)	0.044*	0.030*	0.077*	0.004	0.040*
	(0.008)	(0.008)	(0.011)	(0.012)	(0.020)
Debt Service	0.065*	0.059*	0.051	0.085*	0.279*
	(0.016)	(0.015)	(0.028)	(0.024)	(0.048)
Global Bond Issues USD	-0.014*	-0.014*	-0.028*	-0.039*	-0.016
	(0.006)	(0.006)	(0.007)	(0.008)	(0.010)
Constant	-15.070*	-15.066*	-31.358*	-16.693*	-35.740*
	(5.305)	(5.163)	(5.403)	(7.640)	(7.849)
R2	0.25	0.30	0.40	0.31	0.51
N	5744	5721	2788	3520	1509

\* $p < 0.05$ ; Unit and year-fixed effects are included in each model. All covariates lagged one month. Standard errors are reported in parentheses. Dependent variable is JP Morgan's Emerging Market Bond Index ( Pooled Analysis spreads. Models 1-2 are full sample where data available. Model 3 restricts sample to countries where previous Moody's rating action was no change. Model 4 restricts sample to countries where previous Moody's rating outlook was stable. Model 5 combines models 3 and 4 restrictions. CBI: central bank independence.

The results in Table 2 support H1. Investors respond to CRA report content independent of ratings levels, using secondary market EMBIG data most frequently used in previous studies. This data allows for a helpful initial test to match the literature but, as detailed above, this data is sub-optimal for our purposes. First, it captures secondary

market trading responses rather than true government borrowing costs at the time of issue. Second, the data is by definition limited to foreign currency bonds of countries included in the EMBIG index. This typical data does not allow us to test for effects in both local and foreign currency bond markets, nor does it allow us to identify unindexed bond spreads and test our theory that CRA effects vary across unindexed versus indexed market segments (H2).

## **6.2 H1 and H2: Local Currency Bond Spreads**

We begin the primary market analysis by replicating the secondary market tests from Table 2 using local currency bond coupon spreads from LSEG. Table 3 presents these results. Model 6 omits sentiment to establish the baseline relationship between ratings and local currency borrowing costs. Model 7 introduces report sentiment alongside ratings and confirms H1 in the primary market context: CRA report content significantly reduces local currency bond spreads independent of rating levels. As in the secondary market results, Models 8–10 restrict the sample to cases where formal rating actions provide less new information — rating affirmations, stable outlooks, and the combination of both. Sentiment remains significant across these restricted samples.

For our main tests, Model 11 Table 4 re-tests H1 by estimating the independent effect of CRA report sentiment while controlling for ratings and Domestic Index inclusion. As in Tables 2 and 3, the results support H1. Positive CRA report content lowers spreads independent of and with a greater magnitude than simply rating levels. A one-point increase in sentiment is associated with a 1.7 percentage point reduction in borrowing costs.

To test H2, we interact CRA report sentiment with the local currency bond index inclusion dummy. We expect a significant interaction where CRA report information has disciplinary effects on the spreads of unindexed countries, but not indexed countries. Model 12 introduces the interaction and estimations support H2. The constituent CRA

Table 3: CRA Sentiment Effects on Primary LC Market Bond Coupon Spreads, 1994-2023

	(6)	(7)	(8)	(9)	(10)
CRA Sentiment		-1.725*	-2.760*	-0.452*	-0.654*
		(0.134)	(0.201)	(0.133)	(0.243)
CRA Rating	-0.384*	-0.380*	-0.637*	-0.215*	-0.022
	(0.056)	(0.056)	(0.088)	(0.056)	(0.121)
Democracy	-5.768*	-5.099*	-10.149*	-5.001*	-5.652*
	(0.930)	(0.926)	(1.464)	(0.926)	(2.191)
Left	-1.044*	-0.914*	0.227	-0.586*	1.287*
	(0.243)	(0.242)	(0.372)	(0.216)	(0.424)
CBI	-10.679*	-10.726*	-5.992*	-1.881	0.201
	(1.137)	(1.131)	(1.492)	(1.073)	(1.499)
Political Stability	-0.333	0.039	-0.723*	-0.095	-1.312*
	(0.231)	(0.232)	(0.348)	(0.233)	(0.432)
log GDP per cap	-3.451*	-3.037*	-2.800*	0.236	1.105
	(0.655)	(0.652)	(0.928)	(0.595)	(0.967)
Growth	-0.049*	-0.022	0.036	-0.077*	0.047
	(0.024)	(0.024)	(0.039)	(0.022)	(0.039)
Inflation	0.033*	0.030*	-0.022	0.017	-0.066*
	(0.009)	(0.009)	(0.016)	(0.009)	(0.023)
FX Reserves	-0.090*	-0.055	0.125*	-0.027	0.224*
	(0.039)	(0.039)	(0.056)	(0.035)	(0.062)
Trade (% of GDP)	0.055*	0.057*	0.099*	0.041*	0.078*
	(0.007)	(0.007)	(0.010)	(0.006)	(0.012)
Debt Service	-0.167*	-0.184*	-0.178*	-0.021	0.049
	(0.015)	(0.015)	(0.037)	(0.014)	(0.039)
Global Bond Issues USD	0.019*	0.018*	0.025*	0.004	0.005
	(0.005)	(0.005)	(0.008)	(0.005)	(0.008)
Constant	42.868*	39.262*	31.627*	8.746	-4.796
	(5.168)	(5.154)	(9.084)	(4.712)	(7.746)
R2	0.12	0.14	0.17	0.08	0.10
N	8815	8739	4254	5507	2536

\* $p < 0.05$ ; Unit and year fixed effects are included in each model. All covariates lagged one month. Standard errors are reported in parentheses. The dependent variable is the mean coupon price for domestic issues in a given month, minus 10-year US treasury price in that month. Models 1-2 are full sample where data available. Model 3 restricts sample to countries where previous Moody's rating action was no change. Model 4 restricts sample to countries where previous Moody's rating outlook was stable. Model 5 combines models 3 and 4 restrictions.

sentiment term captures the effect of CRA sentiment for unindexed countries (where index inclusion equals 0). Under these conditions, CRA sentiment has the same effects as in previous models: positive (negative) sentiment lowers (raises) spreads. However, the interaction term, which estimates the effect of CRA report sentiment when the country is

included in the index, is *positive*. CRA reports do not have the expected disciplinary effect on spreads when countries are included in the index.

Figure 5 illustrates this pattern using marginal effects, adjusted for the covariates' means. For unindexed countries, sentiment significantly affects local currency bond spreads in the expected direction. For indexed countries, the relationship is null. CRA reports do not have disciplinary effects on spreads when countries are included in the index. This is strong evidence in support of H2, and thus our theory of a segmented bond market. Sovereign spreads in the unindexed segment of the bond market are affected by country-specific CRA risk assessments. But in the indexed segment, the push effect of index inclusion insulates bond spreads from the effect of CRA information updates.

Finally, we assess how long the effect of new information updates on unindexed spreads lasts. We expect these effects to dissipate over time, until further CRA information updates are provided in subsequent months and years. The sentiment effect on unindexed sovereign spreads is strongest when bonds are issued within 12 months of the last CRA report (Model 3). The effect is weaker but still significant if the last CRA report was between 12 and 24 months before the bond issue. If the last CRA report on a sovereign was more than two years prior to a bond issue, the effect of that report's sentiment becomes null. Figure 6 shows this informational decay effect.

### **6.3 H2: Foreign Currency Bond Spreads**

We now turn to primary market bond spreads for foreign currency issues. As detailed above, the majority of EM bonds in our primary market data are domestic currency. Only 15% are foreign currency bonds. Moreover, J.P. Morgan's benchmark index for foreign currency EM bonds is easier to enter than the local currency bond index. The foreign currency EMBIG automatically includes bonds of a relatively small size (\$500 million) if they are denominated in USD (Cormier and Naqvi, 2023). In contrast, inclusion in the local currency index is not automatic and depends on J.P. Morgan's subjective, case-by-

Table 4: CRA Sentiment Effects on Local Currency Bond Spreads, 1994-2020

	Additive Effect (11)	Conditional Effect (12)	Less than 12 Months (13)	More than 12 Months (14)	More than 24 Months (15)	More than 36 Months (16)
CRA Sentiment	-1.694*	-2.060*	-2.522*	-1.351*	0.127	-0.192
	(0.135)	(0.149)	(0.214)	(0.195)	(0.203)	(0.338)
CRA Rating	-0.430*	-0.422*	-0.554*	-0.224*	0.111	-0.256
	(0.058)	(0.058)	(0.080)	(0.082)	(0.075)	(0.181)
Dom Index	1.141*	0.864*	1.703*	-0.588	-2.611*	1.649*
	(0.326)	(0.328)	(0.452)	(0.459)	(0.379)	(0.741)
Sentiment × Dom Index		2.066*	1.986*	2.158*	-0.241	0.320
		(0.355)	(0.513)	(0.457)	(0.346)	(0.446)
Democracy	-5.163*	-5.549*	-6.999*	-3.776*	-2.096	-0.986
	(0.932)	(0.933)	(1.442)	(1.184)	(1.345)	(1.702)
Left	-0.955*	-1.002*	-0.858*	-1.228*	-3.081*	-1.511*
	(0.244)	(0.243)	(0.351)	(0.310)	(0.274)	(0.486)
CBI	-10.492*	-9.648*	-13.656*	-1.512	2.407	-3.972
	(1.138)	(1.145)	(1.771)	(1.407)	(1.359)	(2.707)
Political Stability	-0.043	-0.060	0.517	-1.372*	-0.782*	-0.221
	(0.235)	(0.235)	(0.330)	(0.320)	(0.311)	(0.528)
log GDP per cap	-2.548*	-2.519*	-3.188*	-0.235	1.844*	3.334
	(0.673)	(0.671)	(0.942)	(0.888)	(0.902)	(3.493)
Growth	-0.030	-0.024	-0.016	-0.067*	-0.090*	0.002
	(0.024)	(0.024)	(0.035)	(0.030)	(0.019)	(0.025)
Inflation	0.030*	0.028*	0.021	0.060*	0.055*	0.033
	(0.009)	(0.009)	(0.012)	(0.018)	(0.018)	(0.025)
FX Reserves	-0.071	-0.049	-0.028	-0.022	0.250*	-0.272*
	(0.039)	(0.040)	(0.057)	(0.049)	(0.046)	(0.104)
Trade (% of GDP)	0.055*	0.060*	0.077*	0.038*	0.040*	-0.025
	(0.007)	(0.007)	(0.010)	(0.008)	(0.008)	(0.016)
Debt Service	-0.178*	-0.182*	-0.295*	-0.097*	0.013	0.036
	(0.015)	(0.015)	(0.025)	(0.019)	(0.016)	(0.028)
Global Bond Issues USD	0.019*	0.018*	0.025*	0.006	0.009*	0.003
	(0.005)	(0.005)	(0.008)	(0.006)	(0.004)	(0.005)
Constant	36.097*	35.198*	43.865*	10.297	-14.956*	-14.246
	(5.280)	(5.272)	(7.395)	(6.995)	(7.180)	(26.497)
R2	0.14	0.14	0.18	0.15	0.28	0.35
N	8694	8694	5287	3407	1361	623

\* $p < 0.05$ ; Unit and year fixed effects are included in each model. All covariates lagged one month. Standard errors are reported in parentheses. The dependent variable is the mean coupon price for domestic issues in a given month, minus 10-year US treasury price in that month. Models 1-2 are full sample where data available. Samples in models 8-11 are divided by time since the last CRA report.

case judgment. This is why more EMs are included in J.P. Morgan's foreign currency index (over 80% of eligible issuers by the end of the 2010s) than are included in the local currency index (under 20% of eligible issuers by the end of the 2010s) (Cormier and Naqvi, 2025, 5).

We accordingly take a different approach to estimating index effects in the foreign currency bond market. We leverage the specific currency of bonds issued. Bonds are automatically included if they are denominated in USD, but cannot be included if they are issued in other foreign currencies (EUR, GBP, CHF, JPY, RMB). We compare the effect of CRA report sentiment on bonds worth at least \$500 million USD versus bonds denomi-

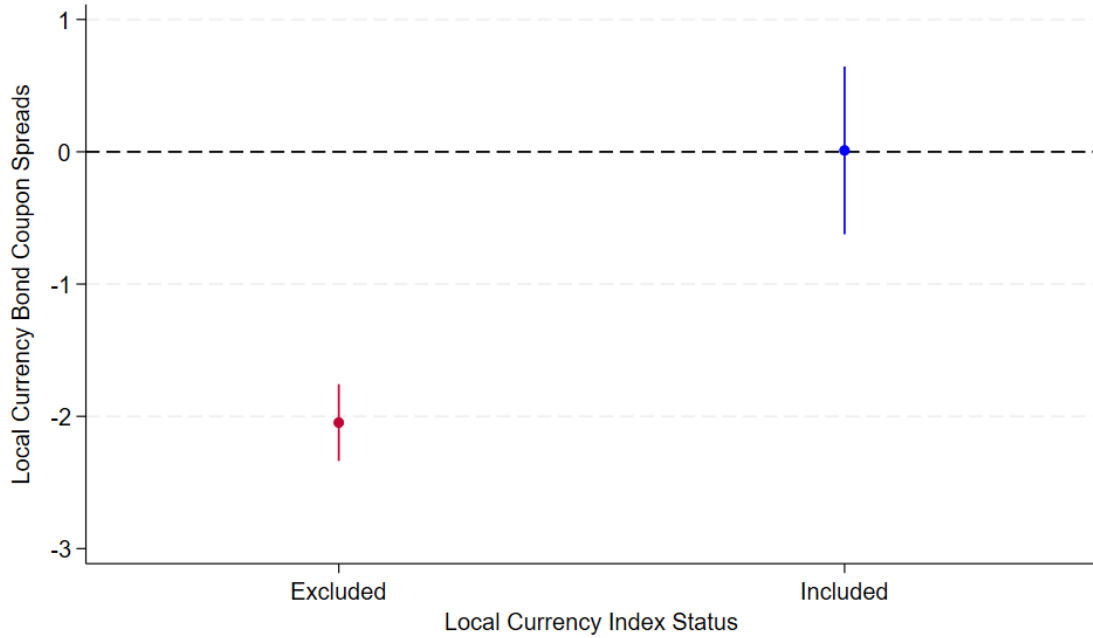


Figure 5: CRA Report Sentiment Effect on Local Currency Bond Spreads by Index Status

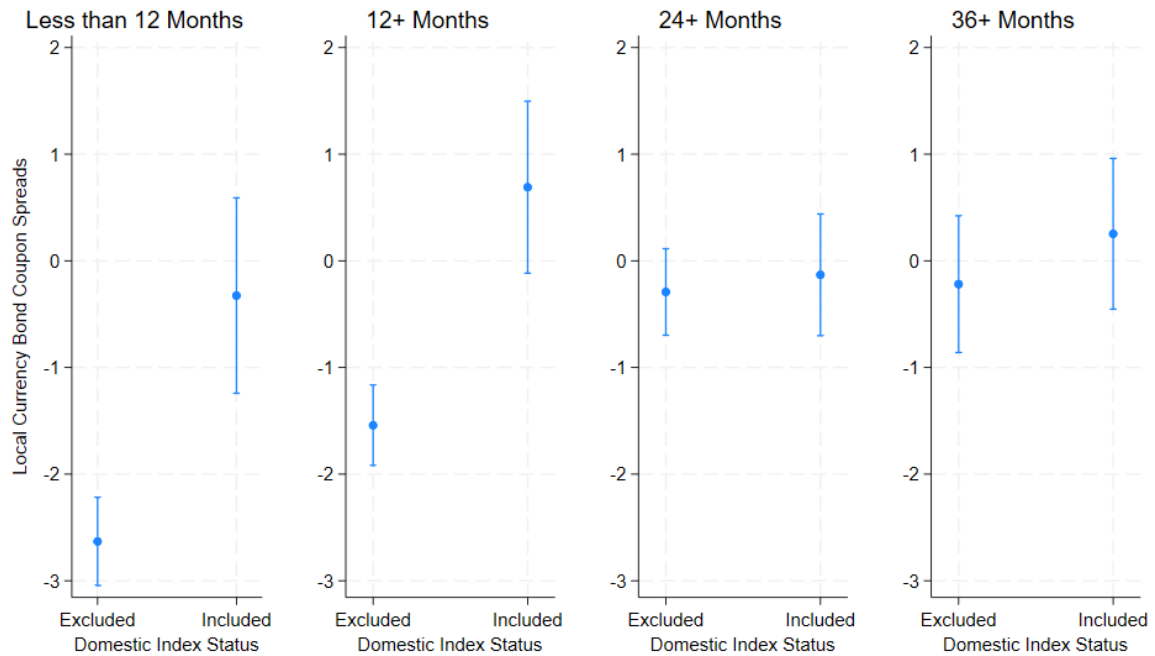


Figure 6: CRA Report Sentiment Effect Duration (Time Since Last CRA Report)

nated in other foreign currencies equivalent to at least \$500 million USD. This allows us to test the effect of index inclusion across foreign currency bonds where the only substantive

difference is the currency denomination.

Model 17 in Table 5 examines bonds that meet EMBIG inclusion criteria: US dollar-denominated issues over \$500m. Sentiment has a small, negative effect on these bonds' coupon prices, but is not statistically distinguishable from zero. This is similar to our finding in the local currency market: the spread on bonds included in the index are not significantly affected by CRA sentiment.

Model 18 then examines issues where the country chose to issue more than \$500m worth of foreign currency bonds, but in a foreign currency other than USD. These bonds are ineligible for inclusion. Results show that, in contrast to the automatically indexed USD bonds, the spreads on non-USD foreign currency bonds are significantly affected by CRA report sentiment. This is evidence in favor of H2. Since these issues do not gain entry into the benchmark foreign currency index, spreads remain sensitive to CRA assessments. Figure 7 shows how these two types of bond issues, even from the same country, are conditionally affected by CRA sentiment. A test of coefficient differences using seemingly unrelated estimation confirms statistical difference between the two estimations in Figure 7.<sup>14</sup>

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<sup>14</sup> $\chi^2 = 6.76$ ,  $\text{prob} > \chi^2 = .0093$

Table 5: CRA Sentiment Effects on Foreign Currency Bond Coupon Spreads, 1994-2020

	Foreign Currency Index Eligible (17)	Foreign Currency Index Ineligible (18)
CRA Sentiment	-0.021 (0.064)	-0.299* (0.087)
CRA Rating	0.006 (0.026)	-0.279* (0.058)
Democracy	-4.798* (0.717)	-5.319* (1.624)
Left	-0.314* (0.096)	-0.396* (0.174)
CBI	-0.622 (0.399)	-14.840* (2.814)
Political Stability	-0.006 (0.121)	-1.142* (0.216)
log GDP per cap	2.445* (0.241)	1.897 (1.236)
Growth	-0.076* (0.012)	0.046* (0.019)
Inflation	-0.012* (0.005)	-0.059* (0.008)
FX Reserves	-0.050* (0.019)	0.249* (0.049)
Trade (% of GDP)	-0.012* (0.004)	-0.054* (0.014)
Debt Service	-0.045* (0.012)	-0.068* (0.017)
Global Bond Issues USD	0.006* (0.002)	0.000 (0.003)
Constant	-13.530* (1.964)	3.689 (9.865)
R2	0.30	0.73
N	2886	808

\* $p < 0.05$ ; Sample of countries included in foreign currency index. Unit and year fixed effects are included in each model. All covariates lagged one month. Standard errors are reported in parentheses. The dependent variable is the coupon price for foreign currency issues, minus the price of 10 year US treasury bills. Sample only includes countries included in JP Morgan foreign currency index. Model 1 are US Dollar issues of at least 500 million, automatically eligible to be included in the index. Model 2 are non-US dollar, foreign currency issues worth at least 500 million USD, which are ineligible for the index.

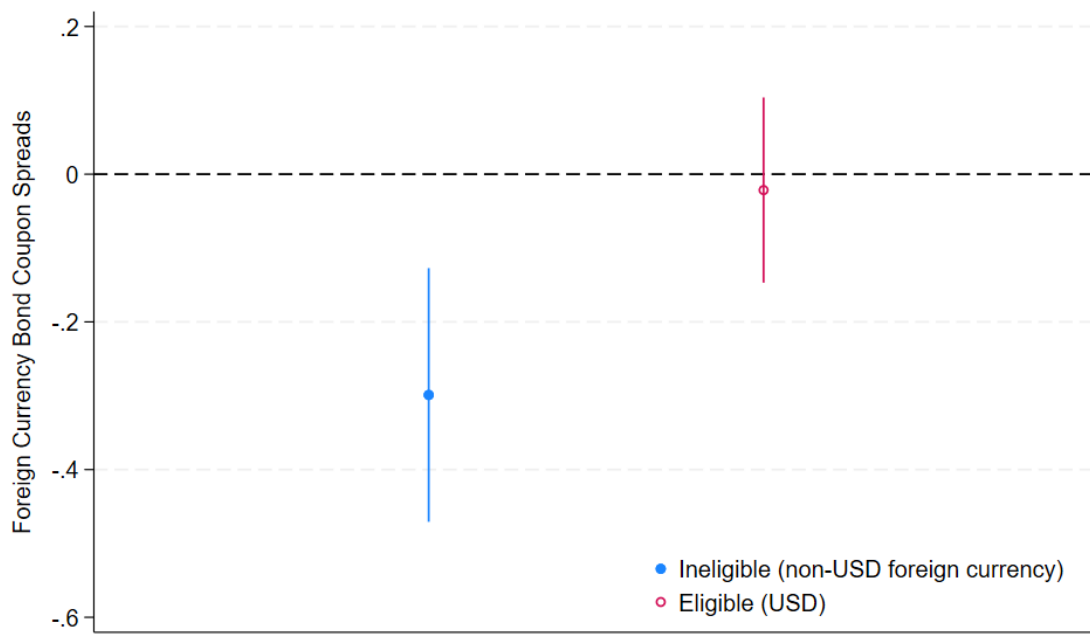


Figure 7: CRA Report Sentiment Effect on Foreign Currency Bond Spreads by Foreign Index Eligibility

## 7 Conclusion

This study demonstrates that IPE research simultaneously underestimates and overestimates the influence of credit rating agencies in sovereign debt markets. It underestimates CRAs by focusing almost exclusively on rating levels, missing the independent information conveyed in rating report texts. It overestimates CRAs by assuming their risk assessments affect all sovereigns equally. Index investment has segmented the EM bond market, creating a structural divide where the disciplinary effects of CRA risk assessments operate unevenly across sovereigns.

These findings have implications for how IPE understands market discipline in sovereign debt. The rise of index investment has not eliminated the role of country-specific risk information, but it has confined its market-moving effects to a particular segment of the bond market. For indexed sovereigns, the push effect of benchmark-tracking capital largely displaces the pull of country-specific assessments, insulating borrowing costs from the political and economic factors that CRAs monitor. For unindexed sovereigns, CRA assessments retain real disciplinary bite. Recognizing this segmented structure clarifies longstanding debates about the heterogeneity of rating effects on bond markets and reframes CRA power as conditional on the market structure in which it operates.

The study implies several paths for further research. On CRAs, research should further investigate the distinction between rating levels and report content. Our findings suggest these two channels of CRA communication carry different types of information with different variance structures. More research is needed to understand the nature of the information markets receive through each channel and when rating levels and report content convey similar versus divergent signals. For example, are the detailed assessments embedded in CRA reports early indicators of risk that lead markets, while coarse rating categories lag markets? More generally, the market segmentation framework developed here could be extended to assess how other information intermediaries and market structures condition how country-specific political and economic risk factors do and do not

move contemporary sovereign bond markets.

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## **Appendix: When Ratings Don't Matter: Sovereign Risk Information in the Age of Index Investment**

# A Descriptive Statistics

## A.1 Credit Rating Reports

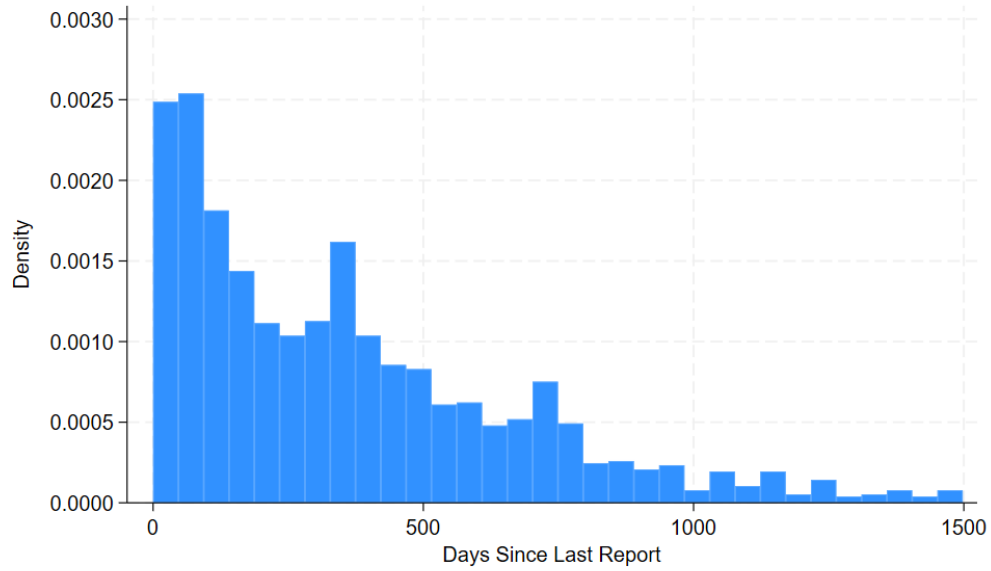


Figure 8: Timing of Moody's Rating Reports

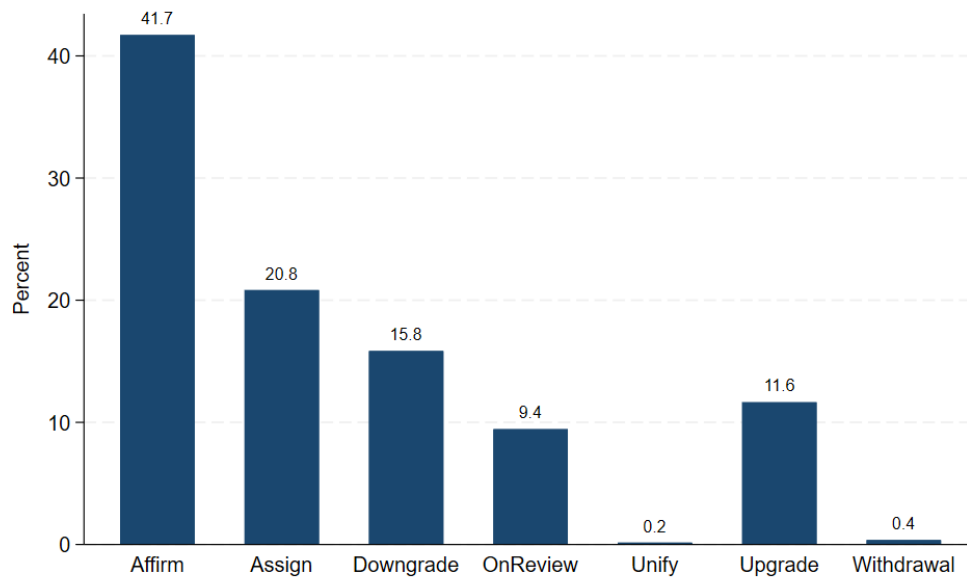
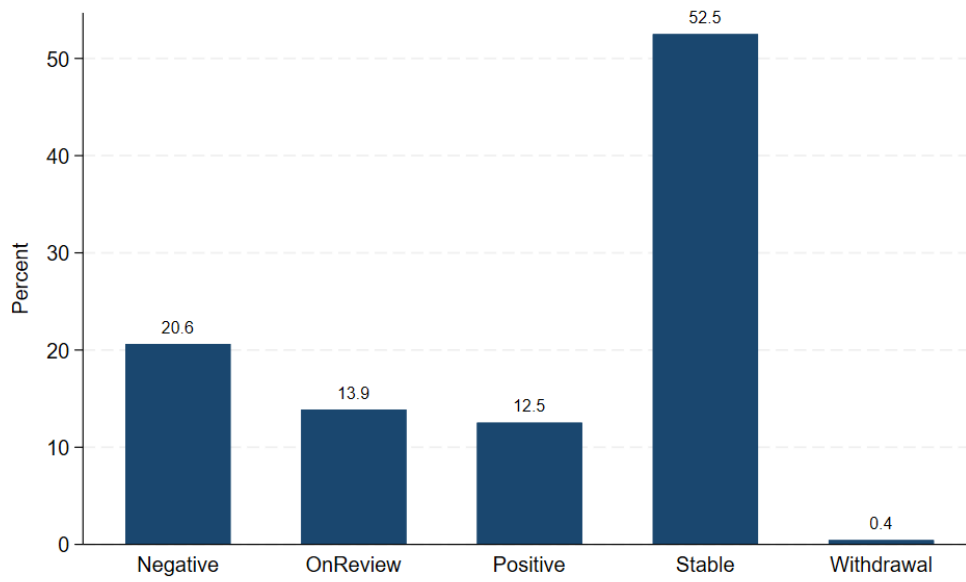


Figure 9: Moody's Rating Report Actions



**Figure 10: Moody's Rating Report Outlooks**

Figure 11: Relationship between Sentiment and Rating Outlook

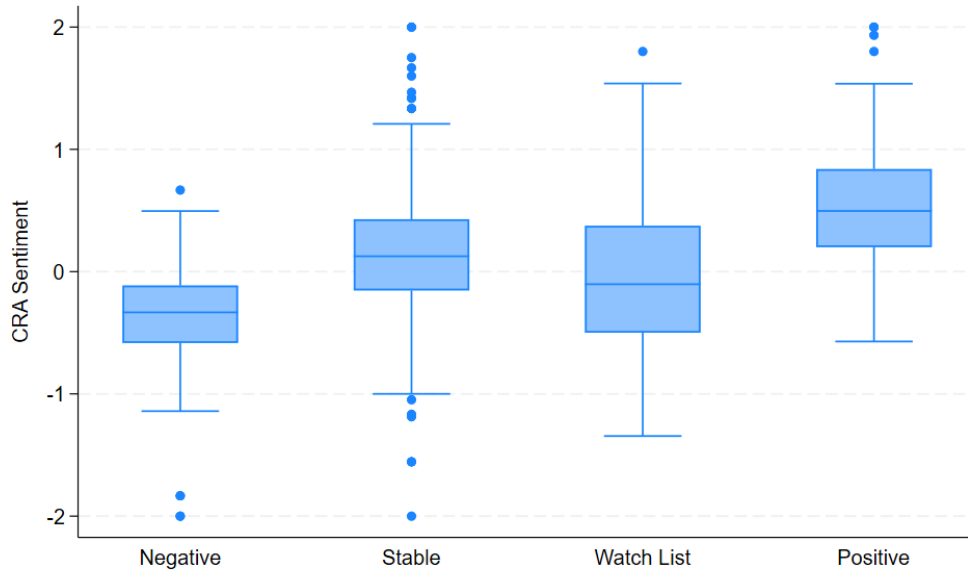
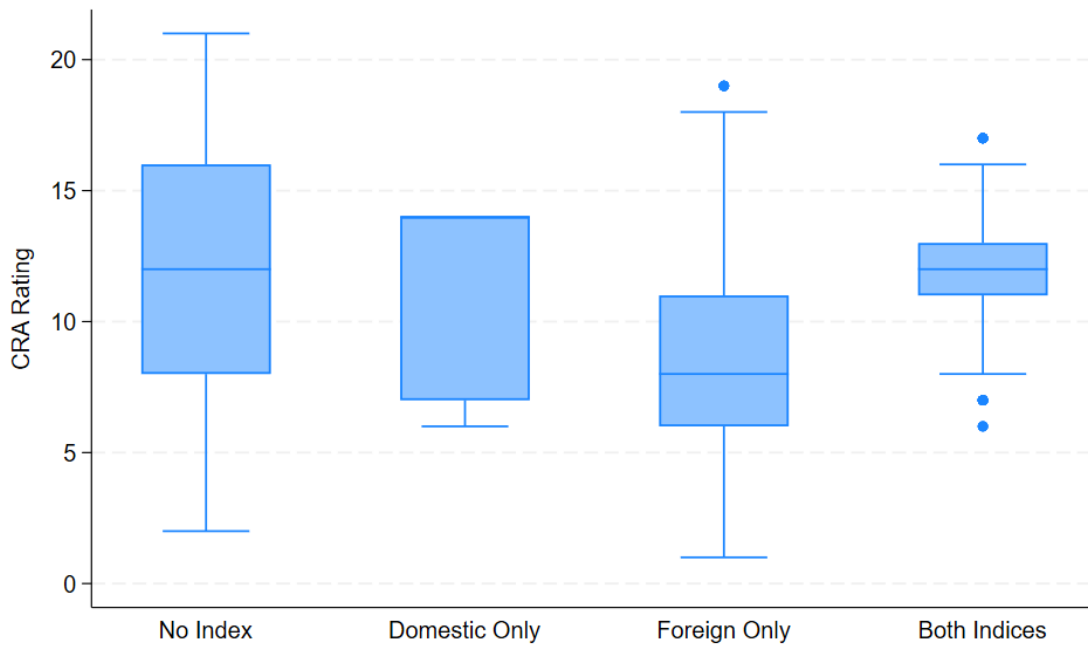


Figure 12: Relationship between Ratings and Indexes



## B Determinants of Ratings and Sentiment

Models 1 and 2 are pooled OLS estimates (i.e. no unit fixed effects) with ratings and sentiment as dependent variables, respectively. Model 3 adds rating as a control variable

Table 6: Determinants of Ratings and Sentiment, 1994-2024

	Pooled Analysis			Within-Country Analysis		
	Ratings (19)	Sentiment (20)	Sentiment (21)	Ratings (22)	Sentiment (23)	Sentiment (24)
Democracy	0.072* (0.027)	0.059 (0.041)	0.043 (0.041)	-0.133* (0.034)	0.426* (0.090)	0.473* (0.089)
log GDP per cap	0.313* (0.008)	0.061* (0.012)	-0.005 (0.013)	0.239* (0.013)	-0.190* (0.034)	-0.284* (0.034)
Growth	0.022* (0.001)	0.030* (0.002)	0.025* (0.002)	0.006* (0.001)	0.027* (0.002)	0.025* (0.002)
Inflation	-0.014* (0.000)	-0.004* (0.001)	-0.001 (0.001)	-0.008* (0.000)	-0.005* (0.001)	-0.002* (0.001)
FX Reserves	0.058* (0.001)	0.034* (0.002)	0.021* (0.002)	0.031* (0.001)	0.038* (0.004)	0.026* (0.004)
Trade (% of GDP)	0.001* (0.000)	0.004* (0.000)	0.003* (0.000)	0.001* (0.000)	0.001* (0.001)	0.001 (0.001)
Debt Service	-0.020* (0.001)	-0.018* (0.001)	-0.014* (0.001)	-0.016* (0.001)	-0.020* (0.002)	-0.013* (0.002)
CRA Rating			0.215* (0.013)			0.393* (0.021)
Constant	-3.142* (0.062)	-1.026* (0.095)	-0.359* (0.102)	-2.356* (0.106)	1.069* (0.278)	1.991* (0.281)
R2	0.32	0.07	0.09	0.17	0.04	0.07
N	14639	14481	14425	14639	14481	14425

\* $p < 0.05$ ; Country fixed effects are included in models 4-6. All covariates lagged one month. Standard errors are reported in parentheses.

to the model of report sentiment. Models 4-6 then introduce country fixed effects in the same sequence of models, restricting identification to within-country variation over time. Model 4 regresses rating level, Model 5 regresses report sentiment, and Model 6 regresses report sentiment but adds credit rating level as a control.

In the pooled specifications, rating levels and report sentiment respond to democracy in the expected directions, though with statistical significance variance. But in the fixed effect models, estimations and inferences change significantly. In the Model 4 regression of rating level, democracy is *negatively* associated with ratings. In Models 5 and 6, which regress report sentiment, democracy is positively associated with sentiment and is both statistically and substantively significant. When a country's democracy improves (backslides), Moody's reports reflect this. The report language becomes more favorable (negative), even when controlling for rating. In sum, sentiment captures the CRA's assessment of political-institutional factors that ratings are too coarse and slow to register.

## C Sentiment Validity

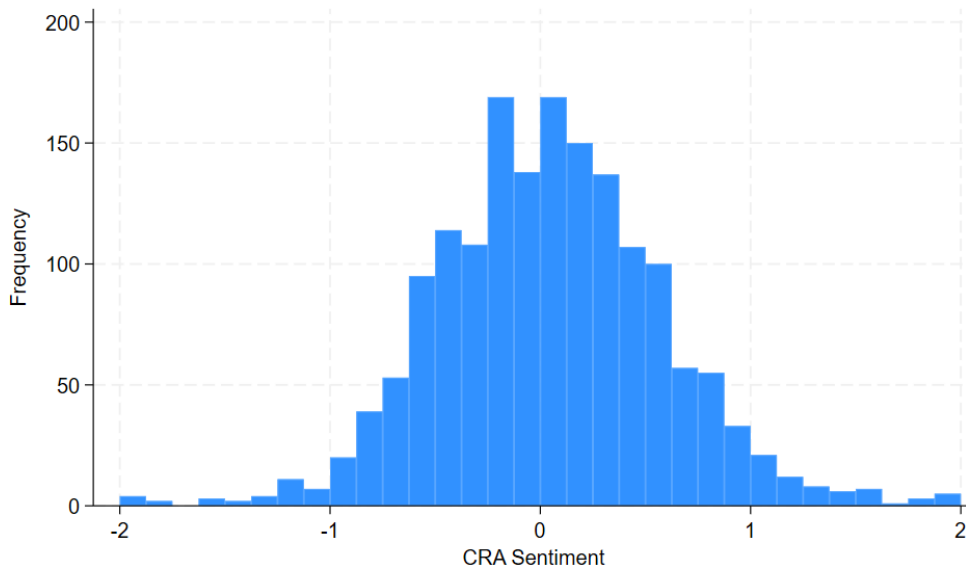


Figure 13: Histogram of Sentiment in Rating Reports

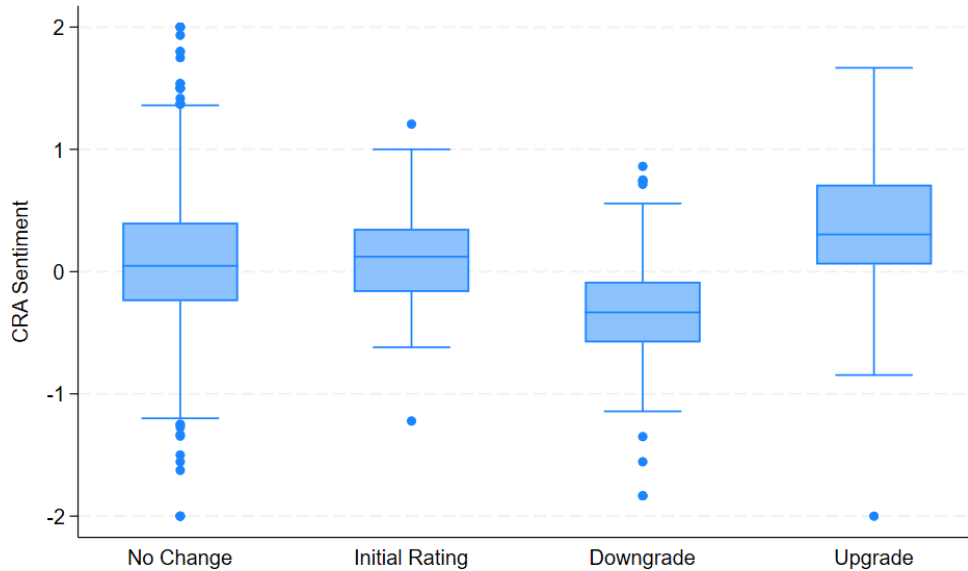
We probe the face validity of the sentiment measure by comparing it to ratings actions. Of reports that lead to rating changes, downgrades should generally be associated with negative sentiment while upgrades should be generally associated with positive sentiment. Figure 14 shows this is the case. The inter-quartile range (IQR) of sentiment in reports that led to downgrades is negative and statistically different from the positive IQR of sentiment in reports that led to upgrades. Of reports that do not lead to rating changes (as noted above, the modal rating report outcome), sentiment should not be skewed in one direction or another. Figure 14 also shows this is the case: for reports that lead to no change in ratings, the full range of sentiment scores are observed, and these scores are normally distributed around the mean sentiment score. Sentiment for initial ratings are also normally distributed around the mean. These patterns within each report type signal our sentiment measure is sensible.

To further probe face validity of the sentiment measure, we examine how sentiment relates to report outlooks. Outlooks are forward-looking categorizations of sovereign risk, signaling the anticipated direction of future rating changes. Each report provides one of three prospective outlooks about the rating given in the report: negative, stable, and positive.<sup>15</sup> Negative outlooks should be associated with negative report sentiment, while positive outlooks should be associated with positive sentiment. Figure 15 shows this is the case. The IQR of sentiment in reports that conclude with negative outlooks are fully negative and statistically different from the fully positive IQR of sentiment in reports that conclude with positive outlooks. Moreover, reports that lead to stable outlooks (the modal

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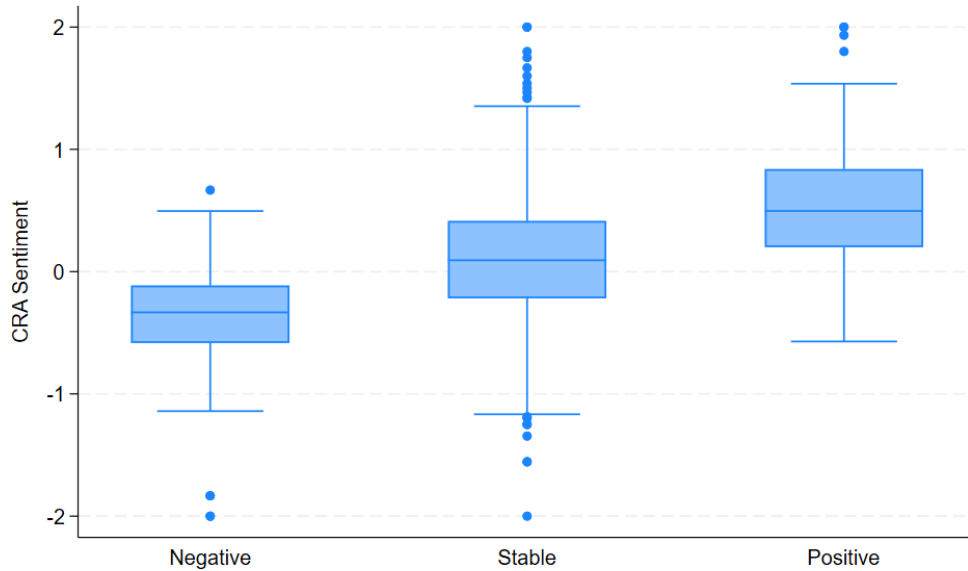
<sup>15</sup>CRA's occasionally assign "on review" or "watchlist" designations when actively evaluating imminent rating changes. We code these as stable outlooks unless the report text indicates clear directionality. We treat review/watchlist as a distinct category in the appendix; the results remain substantively unchanged.

Figure 14: Relationship Between Sentiment and Rating Actions



outcome in our data) covers the full range of possible sentiment scores and is normally distributed around the mean sentiment score. These patterns provide further confidence that the sentiment measure captures the substantive meaning we intend to identify across reports.

Figure 15: Relationship Between Sentiment and Rating Outlook



We also assess the difference between report sentiment versus both final ratings actions and outlook categories. While sentiment tendencies across report types give confidence in the validity of the measure, report sentiment should also vary enough within each type

of report that sentiment is not simply a function of ratings changes or outlooks.

The distribution of sentiment across all categories in both figures confirm rating reports carry detailed risk assessment information that cannot be captured by simply assessing only rating decisions or outlooks. Most notable is that reports which simply affirm ratings (Figure 14) and give stable outlooks (Figure 15) include the full range of sentiment scores, normally distributed. Meanwhile, downgrades and negative outlooks sometimes include positive sentiment outside of their respective IQRs, while upgrades and positive outlooks sometimes include negative sentiment outside of their respective IQRs. Together, these distributions confirm CRA reports provide additional detailed information to market actors that cannot be captured by simply assessing whether there was a rating change or assessing the outlook.

H2 expects that CRA report content affects bond spreads in unindexed countries but not in indexed countries. Testing this hypothesis with historical index data requires that the distribution of CRA report sentiment between indexed and unindexed countries sufficiently overlaps. If sentiment is systematically more positive for indexed countries than for unindexed countries, the data is separated (indexed and unindexed countries become qualitatively distinct types of units). If data is separated, any estimated difference in the effect of sentiment between indexed and unindexed countries would be driven by fundamentally different CRA data-generating processes rather than an index moderating effect.

Figures 16 and 17 show there is no such separation. CRA sentiment distributions are comparable across included and excluded countries in both the foreign currency and local currency contexts, and sentiments are normally distributed across these country subgroups. In other words, there is no statistical difference between rating report sentiment of indexed versus unindexed countries across issuers of either foreign or local currency bonds. Furthermore, we plot the distribution of report sentiment by whether the sovereign is in neither index, in either the foreign or local currency index, or in both foreign and local currency bond indexes (Figure 18). The distribution of CRA report sentiment across these unit-types is not statistically different, providing further evidence that CRA report sentiment is not separated across unit types.

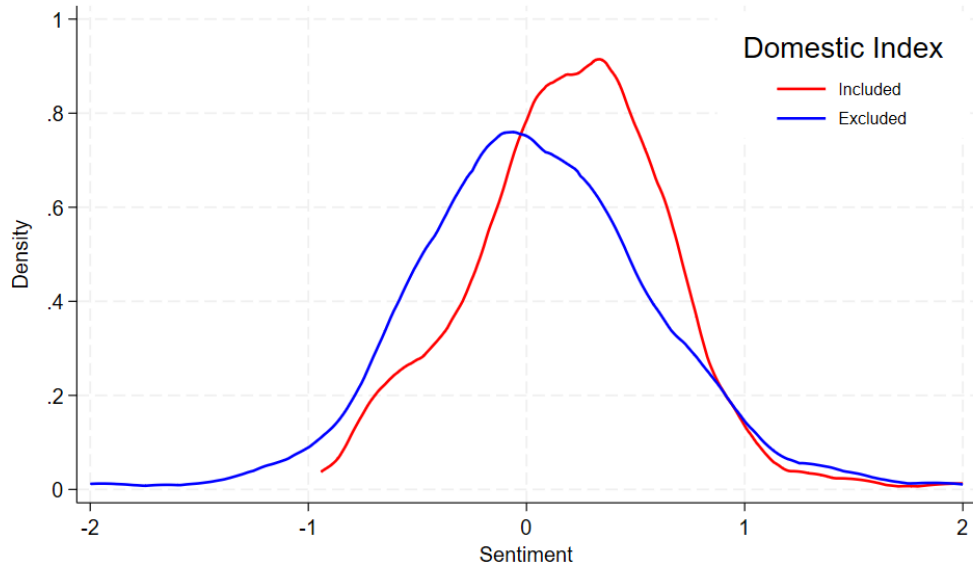


Figure 16: Histogram of Moody's Sentiment By Domestic Index Status

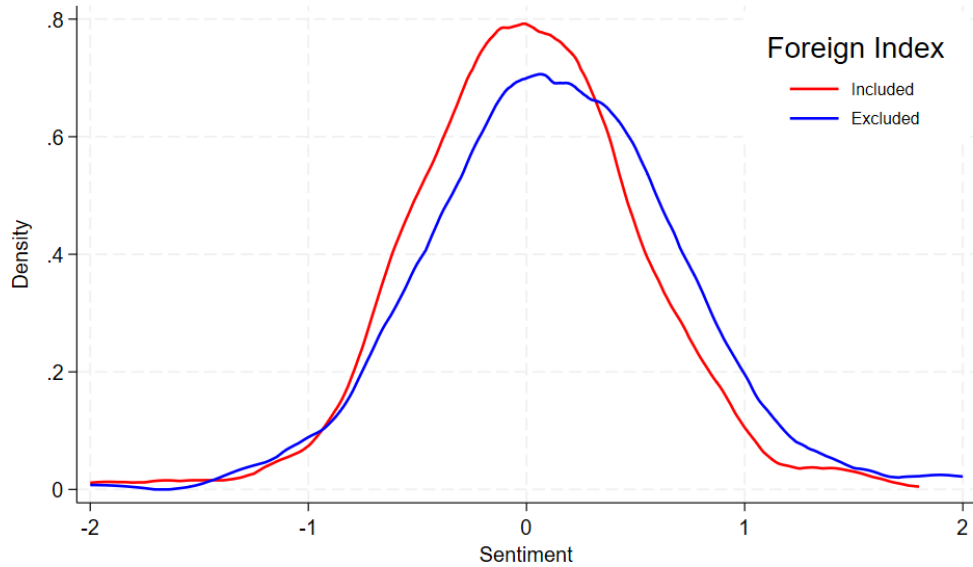
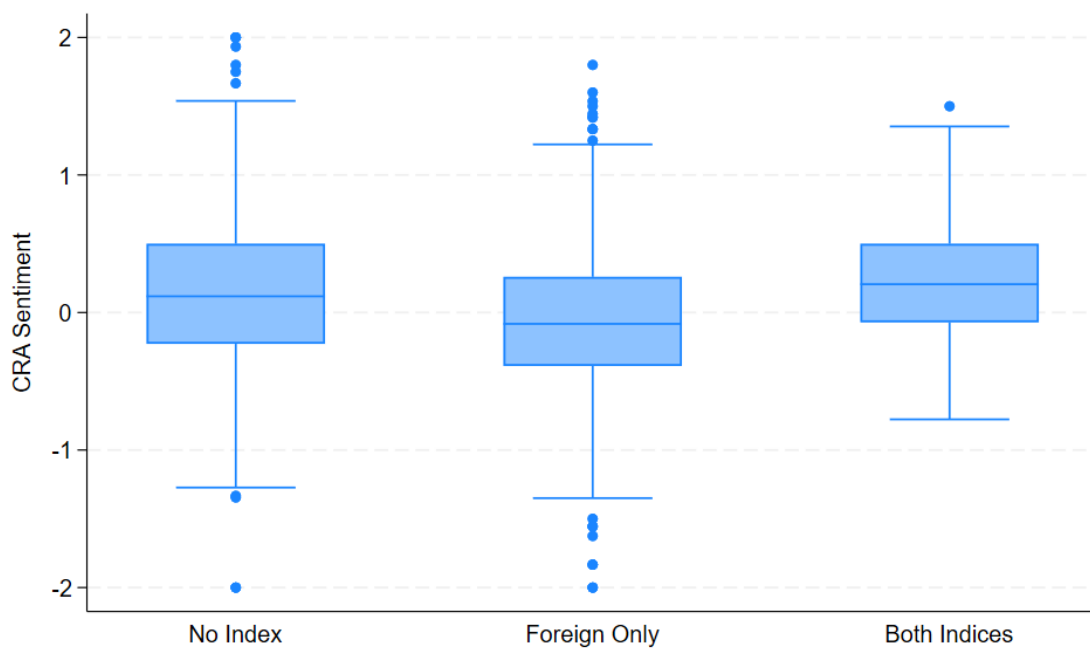


Figure 17: Histogram of Moody's Sentiment By Foreign Index Status

Figure 18: Relationship between Sentiment and Index Status



## D Effects of Rating

As a robustness check, we re-estimate our main specifications from the manuscript using only credit rating levels, omitting the sentiment measure. Table 7 shows the results are consistent with the core findings. In the secondary market, higher ratings reduce EMBIG spreads. In the primary market, ratings reduce local currency bond coupon spreads, and the interaction between ratings and domestic index status is positive and significant, indicating that index inclusion attenuates the effect of ratings on borrowing costs in the same manner observed for sentiment (see Figure 19).

For foreign currency bonds, the pattern of market segmentation likewise holds in Table 8. Ratings reduce coupon spreads for index-ineligible issues but have no discernible effect on index-eligible issues (see Figure 20). While ratings replicate the same segmentation pattern, the main models demonstrate that sentiment carries independent information beyond the rating level itself. The ratings-only results reported here confirm that our findings about market segmentation are not an artifact of the sentiment measure, but reflect a structural feature of how index inclusion conditions the market impact of CRA assessments.



Figure 19: CRA Report Sentiment Effect on Local Currency Bond Spreads by Index Status

Table 7: CRA Ratings Effects on Primary and Secondary Market Bond Yields

	EMBIG bond yield spreads		Bond coupon spreads	
	(25)	(26)	(27)	(28)
CRA Rating	-0.952*	-0.384*	-0.446*	-0.510*
	(0.054)	(0.056)	(0.058)	(0.061)
Domestic Index			1.468*	-1.858
			(0.326)	(1.032)
Rating $\times$ Dom Index				0.300*
Democracy	2.843*	-5.768*	-5.813*	-5.929*
	(0.927)	(0.930)	(0.936)	(0.936)
LeftLead	0.606*	-1.044*	-1.097*	-1.190*
	(0.230)	(0.243)	(0.245)	(0.246)
CBI	2.403*	-10.679*	-10.336*	-10.565*
	(0.799)	(1.137)	(1.144)	(1.145)
Political Stability	0.341	-0.333	-0.440	-0.479*
	(0.237)	(0.231)	(0.234)	(0.234)
log GDP per cap	2.828*	-3.451*	-2.806*	-2.806*
	(0.658)	(0.655)	(0.676)	(0.675)
Growth	-0.366*	-0.049*	-0.058*	-0.058*
	(0.025)	(0.024)	(0.024)	(0.024)
Inflation	0.065*	0.033*	0.034*	0.033*
	(0.009)	(0.009)	(0.009)	(0.009)
FX Reserves	0.333*	-0.090*	-0.109*	-0.109*
	(0.042)	(0.039)	(0.040)	(0.040)
Trade (% of GDP)	0.044*	0.055*	0.053*	0.052*
	(0.008)	(0.007)	(0.007)	(0.007)
Debt Service	0.065*	-0.167*	-0.159*	-0.155*
	(0.016)	(0.015)	(0.015)	(0.015)
Global Bond Issues USD	-0.014*	0.019*	0.020*	0.021*
	(0.006)	(0.005)	(0.005)	(0.005)
Constant	-15.070*	42.868*	38.627*	39.538*
	(5.305)	(5.168)	(5.296)	(5.299)
R2	0.25	0.12	0.12	0.12
N	5744	8815	8770	8770

\* $p < 0.05$ ; Unit and year-fixed effects are included in each model. All covariates lagged one month. Standard errors are reported in parentheses.

Table 8: CRA Rating Effects on Foreign Currency Bond Coupon Spreads, 1994-2020

	Foreign Currency Index Eligible (29)	Foreign Currency Index Ineligible (30)
CRA Rating	0.005 (0.025)	-0.317* (0.058)
Democracy	-4.771* (0.713)	-3.778* (1.571)
LeftLead	-0.311* (0.095)	-0.296 (0.172)
CBI	-0.632 (0.398)	-16.328* (2.800)
Political Stability	-0.011 (0.120)	-1.029* (0.215)
log GDP per cap	2.442* (0.241)	2.884* (1.210)
Growth	-0.077* (0.012)	0.034 (0.018)
Inflation	-0.012* (0.005)	-0.063* (0.008)
FX Reserves	-0.050* (0.019)	0.186* (0.045)
Trade (% of GDP)	-0.012* (0.004)	-0.034* (0.013)
Debt Service	-0.044* (0.012)	-0.067* (0.017)
Global Bond Issues USD	0.006* (0.002)	0.000 (0.003)
Constant	-13.521* (1.964)	-4.386 (9.644)
R2	0.30	0.73
N	2886	808

\* $p < 0.05$ ; Unit and year fixed effects are included in each model. All covariates lagged one month. Standard errors are reported in parentheses. The dependent variable is the coupon price for foreign currency issues, minus the price of 10 year US treasury bills. Sample only includes countries included in JP Morgan foreign currency index. Model # are US Dollar issues of at least 500 million, automatically eligible to be included in the index. Model # are non-US dollar, foreign currency issues worth at least 500 million USD, which are ineligible for the index.

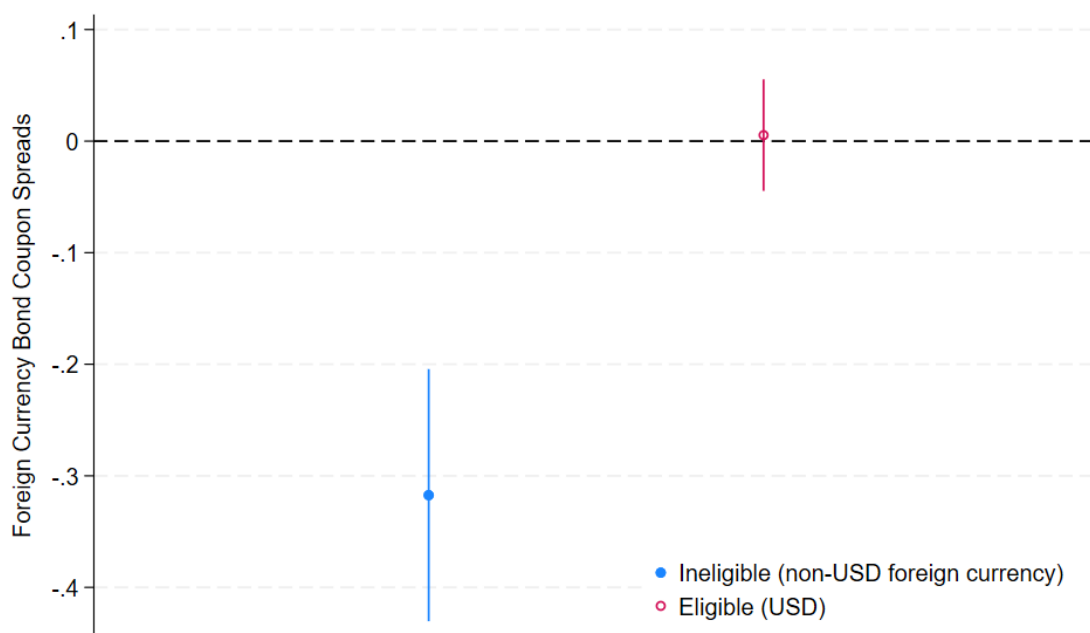


Figure 20: CRA Rating Effect on Foreign Currency Bond Spreads by Foreign Index Status

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