Enhanced Collective Action Clauses and Sovereign Borrowing Costs

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This paper analyzes the effects of the inclusion of enhanced collective action clauses (CACs) in international (nondomestic law-governed) sovereign bonds on borrowing costs, using secondary-market bond yield spreads, during September 2014 to March 2021. Our findings indicate that in the period September 2014 to February 2020, where no restructuring episodes have occurred, enhanced CACs are negatively associated with sovereign bond yield spreads and cosequently lower borrowing costs. However, during the COVID-19 period of March 2020 to March 2021, when the Argentina and Ecuador sovereign debt restructurings occurred, investors bond pricing behavior was differentiated depending on the inclusion or not of enhanced CACs, with their inclusion being positively associated with yield spreads, maybe due to the lack of flexibility of investors binded by the enhanced CACs provisions. The results obtained for September 2014 to February 2020 continue to hold when the sample is extended to March 2021.

Keywords: collective action clause; sovereign bond contractual clause; governing law; sovereign debt restructuring; default; bond spreads; sovereign cost of borrowing.

JEL codes: E43, F32, F34, G12

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I. Introduction

Collective action clauses (CACs) allow for a supermajority of creditors to impose debt restructuring terms on minority holdout creditors. In August 2014, the International Capital Market Association (ICMA) proposed models of enhanced CACs and a pari passu clause for sovereign debt contracts in an effort to facilitate a more efficient and orderly restructuring process.[1] An efficient resolution process typically reduces the cost of restructuring. However, these ex-post benefits need to be contrasted with possible costs incurred from a CACs or enhanced CACs inclusion.

As sovereign issuers are averse to ex-ante increases in the cost of borrowing, CACs are frequently engaged in both policy and academic debates over whether their inclusion increases or lowers the cost of borrowing. Proponents of CACs focus more on how they facilitate orderly restructurings and thus benefit both investors and borrowers, while skeptics argue that CACs increase the cost of borrowing as investors may consider that these clauses make debt restructurings easier and in turn compromise future returns. This latter moral hazard argument, which is based on the presumption that allowing countries to renegotiate and lower their debt obligations reinforces their profligate behavior, may imply higher yields required by creditors.

Empirical analyses have aimed to determine the pricing impact of including CACs and enhanced CACs in international sovereign bond contracts. Our study sheds some light on the yield behavior of bonds adopting enhanced CACs and consequently on the sovereign cost of borrowing, which is a crucial determinant of new sovereign debt-issuances decisions. In this context, we also examine yield developments at times of debt distress that play a crucial role in debt restructurings. The systematic examination of the sovereign bond pricing of the inclusion of enhanced CACs was undertaken using a comprehensive, novel set of contractual-clauses data and secondary-market sovereign bond yield spread data spanning the period since the enactment of enhanced CACs. [2]

By employing bond yield spreads over the period September

1. Subsequently, the IMF Executive Board endorsed the ICMA recommendations in October 2014 (IMF 2014).

2. Contractual clauses data are collected by reading through each prospectuses of sovereign bond, provided by Perfect Information ltd.

2014-March 2021, we provide a thorough understanding of the bond pricing behavior and impact of enhanced CACs. Our findings show that in the period September 2014 to March 2020, where no pronounced crises or restructuring episodes occurred, inclusion of enhanced CACs is negatively associated with bond yield spreads/borrowing costs, both for investment-grade and noninvestment-grade issuers that are traditionally subject to more moral hazard concerns. The same results hold when the sample is extended to March 2021, i.e., to the period of March 2020 to March 2021 where the recent Argentina and Ecuador sovereign debt restructurings took place. However, when our analysis includes only the period March 2020 to March 2021, inclusion of enhanced CACs is shown to be associated with higher spreads/borrowing costs. The latter results suggest that market participants assess the inclusion of CACs and enhanced CACs differently during non-crisis and crisis periods. While during non-crisis periods bondholders consider their inclusion as beneficial, on the assumption that they facilitate an orderly and efficient debt resolution process in case of restructuring, investors seem to consider them as hinderance to open negotiations and holding-out options during crisis and restructuring periods. For example, during the recent restructurings of Argentina and Ecuador, the spreads of their bonds with enhanced CACs increased during this period (i.e., secondary-market bond prices fell). That is, inclusion of enhanced CACs was positively associated with sovereign borrowing costs (i.e., higher borrowing costs), probably due to the lack of flexibility of investors that are restricted by the enhanced CACs provisions.

The remainder of the paper is organized as follows: Section II provides a brief review of the literature on the cost of including CACs. An overview of the evolution of CACs and the current status of international sovereign bonds are presented in Section III. Sections IV discuss the findings of our empirical analysis for the period since the introduction of enhanced CACs in September 2014 and until end-March 2021. Finally, Section V concludes by offering some insights into interpreting our findings.

II. Brief Literature Review

There are broadly two opposing views on the cost impact of the inclusion of CACs, namely that inclusion of CACs leads to higher

yields or to lower yields of sovereign debt securities. Proponents of the view that CACs are associated with a higher cost of borrowing argue that inclusion of CACs would make it easier for sovereign debtors to restructure their debts, thus effectively decreasing creditors' returns, if they come to default. Specifically, they argue that the use of CACs encourages over-borrowing, facilitatean easier way out of defaults, and increase the chances of investors taking losses. Thus, CACs promote debtors' moral hazard and investors would consequently want to be compensated ex ante for the added risk with a higher market yield (Eichengreen and Mody 2000, Häseler 2009, De Grauwe 2011, Carletti, and others 2018, Ratha and others 2016).

The opposing view argues that inclusion of CACs in bond contracts would make restructurings more orderly and efficient, leading to fewer holdout-creditor problems, less time-involvement of creditors in debt resolutions, and in turn faster economic recovery of distressed countries through quicker international market access and higher trade (Gugiatti and Richards 2003, Bradley and Gulati 2013, Fang and others 2019).

Further, other empirical studies argue that there are no discernable CAC-related bond price effects (Stolper and Dougherty 2017) or there are some possible effects for euro-zone area bonds (Picarelli and others 2019, Steffen and others 2019, Carletti and others 2020), while Fang and others (2019) find that CACs help reduce holdout rates, especially for high-haircut debt restructuring cases. Also, their simulations demonstrate that only the strongest single-limb CACs minimize holdout and litigation risks. In turn, faster economic recovery would lead to a higher expected return on investment in the long run. Therefore, CACs should in principle lower the cost of borrowing and reduce the overall long-term economic risk.

With regard to the bond pricing impact of enhanced CACs, Chung and Papaioannou (2020) analyzing the effects of enhanced CACs on sovereign borrowing costs during September 2014 to March 2020 find that inclusion of enhanced CACs is associated with lower borrowing costs for both noninvestment-grade and investment-grade issuers. The authors interpret their findings as suggesting that market participants associate the inclusion of CACs and enhanced CACs with their implied benefits of an orderly and efficient debt resolution in case of restructuring.

III. An Overview of Collective Action Clauses

CACs in international sovereign bond contracts exist in various forms, largely relating to the evolution of financial markets. CACs facilitate sovereign debt restructurings, while making investors (financial institutions and other creditors) share the cost of borrowers' financial distress. Sovereign debt issuances prior to 2003 under New York law did not generally include such clauses, while CACs that allow collectively binding restructuring decisions have traditionally been included in sovereign bonds governed by English law. A wide use of CACs started with Mexico in February 2003, with the inclusion of CACs being the market practice for New York-law-governed bonds since then. Although a 75 percent majority of votes required is the typical form of CACs, "required votes" to change the terms varies from 18.75 to 85 percent of the outstanding bondholders (Bradley and Gulati 2013). [3]

In October 2010, the Eurozone had initiated the inclusion of standardized "double-limb" aggregation Euro CACs in all new euro area government bonds (domestic and foreign law-governed bonds) with a maturity above one year, starting from January 1, 2013. This double-limb aggregated voting structure requires that a minimum threshold of support be achieved both (1) across all series being restructured (75 percent); and (2) in each series (66.67 percent). If an individual series does not meet the 66.67 percent requirement, it is excluded from the restructuring while others that meet the requirement are included. The key advantage of this approach, relative to the traditional series-by-series CAC, is that the minimum level of support needed from each series is lowered from (the typical) 75 percent of outstanding principle to 66.67 percent of outstanding principal, thereby making it more difficult for holdout creditors to obtain a blocking position in a particular issue. While double-limb aggregation clauses in sovereign bonds were a welcome development, they still allow holdouts to control an issue and would not address the collective action problems as effectively as single-limb aggregation.

Further, the ICMA recommended enhanced CACs with "single-limb" option in August 2014 and a new standard pari passu clause for inclusion in sovereign debt securities, which were endorsed

3. The 18.75 percent vote typically is applied only if an initial quorum requirement is not satisfied.

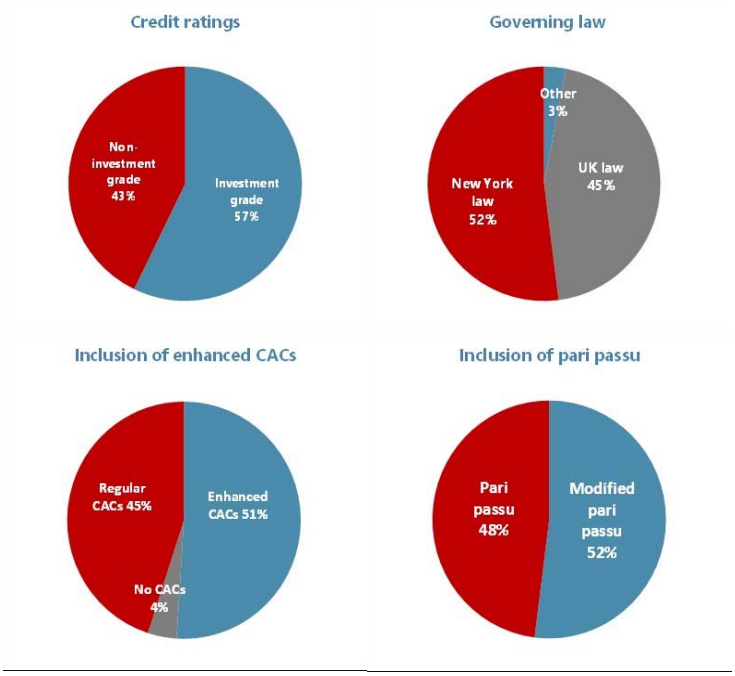

FIGURE 1. Foreign Law-Governed Sovereign Bonds (March 2021)

by the IMF in October 2014. A single-limb voting procedure enables bonds to be restructured based on a single vote across all instruments or a subset of instruments, thereby preventing a creditor or a group of creditors from holdouts in a particular series and in turn from nullifying the operation of CACs in that series. While issuances that incorporate the enhanced CACs include the key features of the ICMA proposals, the formulation of the clauses has evolved to suit specific needs and market preferences in various ways.[4]

In November 2018, the Eurogroup announced broad support among euro area finance ministers to amend the European Stability Mechanism (ESM) treaty to require single-limb CACs in all euro area issuances from 2022. Currently, the ESM treaty requires the inclusion of double-limb CACs in all issuances by euro area members. The inclusion of single-limb CACs would be a significant development in harmonizing market practice around the world.

4. The key features of the ICMA model single-limb clauses include: (1) a "uniformly applicable" requirement in a single-limb voting procedure; (2) a 75 percent aggregate voting requirement; and (3) sub-aggregation.

At present, a substantial proportion of outstanding international sovereign bonds incorporates various forms of CACs.[5] As of March 2021, it is estimated that of the approximately $1.58 trillion foreign law-governed sovereign bonds outstanding, about 45 percent is governed by English law and 52 percent by New York law (Figure 1). Approximately 56 percent of the outstanding stock includes the ICMA's enhanced CACs, while 39 percent of the outstanding stock has two-limb aggregated or series-by-series CACs (old forms of CACs), and 5 percent did not include any CACs. Out of outstanding bonds without enhanced CACs, about 44 percent is below investment-grade and more exposed to disadvantageous interpretation at the court in case of restructuring. The pari passu clause, which states that the bond debt will be ranked equally, could be found virtually in every international sovereign debt contract, and about 50 percent of outstanding stock includes the ICMA's strengthened pari passu clause. [6]

IV. Effects of Enhanced CACs on Secondary-Market Yields

Below, we provide empirical evidence on the effects of the inclusion of enhanced CACs on the yield spreads of foreign law-governed sovereign bonds traded in secondary markets from September 2014 to March 2021. The most significant benefit of using secondary-market yield data is the ability to analyze the evolution of the same bond with enhanced CACs during normal and sovereign debt crisis period. By controlling bond characteristics and time-variant financial-market variables, we try to shed light on how investors value bonds with and without enhanced CACs during normal times and times of an imminent potential debt restructuring.

Market participants have frequently asserted that investors are relatively less concerned about CACs in normal times or when they buy a bond at issuance, but they start to focus on the existence of CACs and are likely to value the bond differently at times of debt distress. A way to properly identify such market changes is to examine the evolution of secondary-market yields.

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5. The share of outstanding stock is calculated based on the outstanding amount in US dollars as of end-March 2021.

6. This figure is based on the Bloomberg, Dealogic, Perfect Information database, and various countries' authorities. This excludes GDP warrants and China's domestic issuances under Hong Kong SAR governing law.

A. Data

First, we use a sample of foreign law-governed sovereign bonds that were outstanding at the end of March 2021. Secondary-market bond yields were available for 1,081 bonds, omitting bonds with a remaining maturity of less than one year because they tend not to be actively traded and thus result in yields that are not representative of price discovery. Also, we use bonds with bond yields for mostly conventional-type bonds with a fixed rate, bullet payment, or simple coupon payment structure, not including bonds with complex coupon payment structures, amortization, convertibles, or variable rates. Our sample of outstanding bonded debt consisted of 5 percent bonds with no CACs, 39 percent with regular CACs, and 56 percent with enhanced CACs.

For the dependent variable, we use monthly sovereign bond yield spread (over respective benchmarks) data (in basis points) based on actual price quotes from dealers in the market.[7] Sovereign spreads can be interpreted as a risk premium, reflecting investors' price of the risk of unexpected losses (Remolona, 2007). We chose to use secondary market data, which allow the analysis of the pricing changes of traded bonds over the time, including times of distress, instead of primary-market data which show the actual cost of sovereign borrowing at issuance. For the independent variables in our analysis, we use Bloomberg data and the IMF World Economic Outlook (WEO) database for individual bond-specific characteristics (coupon, maturity, tranche volume in billions of US dollars, issue currency, stock exchange, governing law, SEC registration, monetary union, and emerging-market identification), while we use other time-variant market data from Bloomberg for debt-to-GDP ratio, the VIX, individual country CDSs, EMBI index, inflation, and exchange rates. Emerging markets are broadly defined, including frontier markets and low-income countries.

For bond contract information, we use the Perfect Information database. Information on inclusion of CACs is fine-tuned to encourage better understanding – namely, we use the binary variable for no CACs (1 or 0), regular CACs (1 or 0), and the enhanced CACs (1 or 0), as the three alternatives are mutually exclusive. As for countries' credit ratings, we use time series of S&P's long-term foreign currency

7. Primary pricing sources were BVAL and CBBT. If these were not available, we used generic Bloomberg pricing source BGN or others.

sovereign bond credit ratings (complemented by Moody's and Fitch ratings data), converting into numeric values, with the lower the grade, the larger the numbers. Regarding remaining maturities, they are calculated as the time remaining (in years) each month from the original maturities.

Further, from the Perfect Information database, we obtain data on various forms of CACs, enhanced CACs, and pari passu and strengthened pari passu clauses. A novelty of this study is the use of data indexing developed for each legal clause, as this level of detail has not been documented or used before.

For the purpose of this study, we look at foreign law-governed sovereign bonds, with the majority issued in foreign currency. Our sample includes advanced economies' bonds (that is, Austrian, Finnish, and Swedish sovereign bonds under English law) and emerging markets' sovereign bonds, which represent over 90 percent of the sample. We treat central bank bonds issued to finance the sovereign balance sheet as equivalent to government bonds issued by the ministry of finance. We do not include state-owned enterprise bonds or government guaranteed bonds. Further, we include sukuk (Islamic bonds) issued in international markets, using their regular yields.

This study expands the existing literature by providing a systematic analysis of the effects of inclusion of enhanced CACs on secondary-market bond yields for the period September 2014-March 2021, i.e., from their introduction until today. Our analysis uses such a comprehensive data sample, covering 79 time-points (monthly series) of 1081 outstanding bonds from 106 countries for all regions (advanced economies, emerging markets, and low-income countries).

B. Methodology

We use a panel regression model with the sovereign bond yield spread (in basis points) as the dependent variable and the variables discussed above as independent variables.[8] (We also ran the same model with the

8. As discussed in the data section above, for secondary-market yields, we use the Bloomberg mid-yield to maturity series for each bond, while the spread is calculated as the differential between a bond's yield and the respective benchmark bond yield, e.g., for a USD bond, as the difference between this bond yield and the US Treasury 10-year bond yield (in basis points). It is important to note that the yield spreads used are not spreads between yields of bond yield (in basis points). It is important to note that the yield spreads used are not spreads between yields of bonds with and without CACs.

mid-yield to maturity as the dependent variable, but no significant difference was observed in our findings.) Our analysis uses a monthly series from September 2014 to March 2021, a monthly series of a simple average of daily sovereign bond yield spreads, partly to avoid a noise from daily-yield volatility.[9] For estimating the impact of different types of CACs, we use a binary dummy variable for no CACs, regular CACs, and enhanced CACs. Our proposed model for the empirical analysis has the following specification:

$$Y_{i,t}, = \alpha + \beta_1 CAC + \beta_2 CAC\_ENHANCED + \beta_3 Xi,t + \beta_4 \theta_i, + \varepsilon_{i,t}$$

where $Y_{i,t}$ is the sovereign yield spread for bond i during month t, $X_{i,t}$ is a vector of time-variant variables, and θ_i is a bond-specific time invariant effect.

Our approach uses a rudimentary equation that fits the data well for the whole sample, and, when we break the sample, we omit any variable if we encounter a near singular matrix or an error.

The vector $X_{i,t}$ includes variables common to all bonds, as well as bond-specific variables (coupon, tranche volume in billions of US dollars, tenor, governing law as binary variables, credit rating at issuance, SEC registration, with definitions of the explanatory variables being provided in Appendix I. Time-variant variables include: (1) inflation in annual percent changes; (2) sovereign five-year CDSs; (3) bid-ask spreads; (4) the VIX; (5) exchange rates; (6) annual percent changes of CPI; (7) debt to GDP ratios; and (7) emerging markets bond index (EMBI) spreads.

As for three CACs groups , we use two variables in an equation, regular CACs and enhanced CACs, the coefficient is interpreted as the difference of spreads (increase or decrease) compared to the absence of CACs.[10] For example, if the regular CACs' coefficient is -40, this means the yield of bonds with the CACs is 40 basis points lower than bonds without CACs.

Given that pricing impact of CACs could be sensitive to the

9. To obtain meaningful results, we exclude spreads over 1,000 since bonds with spreads over 1,000 tend to have weak price discovery due to, e.g., limited liquidity. Bonds with remaining maturity of less than 12 month are excluded due to the limited trading activity and liquidity.

10. Inclusion of no CACs (1, 0 otherwise); inclusion of regular CACs (1, 0 otherwise); and inclusion of enhanced CACs (1, 0 otherwise).

prevailing international and local macroeconomic conditions, it is important to understand the different pricing impact during non-crisis periods and restructuring and other major external shock periods. To understand the differences in sovereigns' cost of borrowing during times of normalcy and crisis, we divide the sample into three periods, based on (i) the introduction of enhanced CACs until March 2021, (ii) the introduction of enhanced CACs until the start of COVID-19 in March 2020, and (iii) the Covid-19 period, March 2020 to March 2021 . As for our analysis relating to credit ratings, we use two groups of investment grade (AAA to BBB-) versus noninvestment grade (below BBB-). This allows the examination of the impact of each rating group on bond prices.

The investigation of the effects on bond pricing of enhanced CACs embedded in sovereign bonds by analyzing a comprehensive set of secondary-market bond yield spread data, some stylized primary-market yield observations, and a novel set of contractual-clause data covers the period September 2014 until March 2021, i.e., includes bond pricing information of the first year of the COVID-19 pandemic crisis. As far as we know, this is the first study that examines the impact of enhanced CACs from their first use in international sovereign bond contracts until March 2021.

C. Empirical Results

The examination of the pricing impact of enhanced CACs, since their introduction by ICMA in August 2014, is rather novel in the literature. Our overall sample of September 2014 to March 2021 spans a period of over 6 years (79 months) and covers 1,081 bonds.

Our results suggest that bonds that have included enhanced CACs exhibit negative signs with spreads during periods of no crisis — which means that the presence of enhanced CACs is associated with lower secondary-market yield spreads, while they are found to be consistently statistically significant. This result is consistent with expressed views from issuers and investors saying they do not price bonds based on their legal clauses, and it is likely that this finding will hold during periods of no market distress. However, bonds with enhanced CACs tend to be associated with higher yield spreads during debt restructuring periods, indicating that investors in these bonds try to sell them before the restructuring.

TABLE 1. Descriptive Statistics of Main Regression Variables

Variables / Statistics	Mean	Median	Max	Min	Std. Dev.	Skewness	Kurtosis
Spread	543.0	250.4	8,100.0	–	–	125.6	157.8
Coupon	4.7	4.5	12.8	–	2.2	0.2	2.8
Outstanding_$	1.3	1.3	5.9	–	0.9	0.9	4.9
Maturity	12.3	8.1	99.7	–	13.5	3.9	24.1
BID	0.8	0.4	100.0	–	3.2	23.3	646.4
SEC	0.3	–	1.0	0.0	0.5	0.8	1.7
EMBI	345.9	237.0	3,831.0	46.0	393.7	4.7	30.9
VIX	18.3	15.5	62.6	10.1	8.8	2.5	10.6
CDS	272.0	128.9	5,975.5	33.8	536.7	6.3	49.0
EXR	3,044.0	51	23,257	1	5,523.0	2.0	4.0
CPI	5.0	3.4	34.1	–	4.9	1.3	9.6
Debt	46.1	46.4	103.0	11.9	18.5	0.4	2.6
Issue	2013	2014	2021	1993	4.8	–	5.5
Mature	2031	2026	2117	2020	14.2	3.7	21.2
Orig_Mat	17.8	10.3	100.1	3.0	14.9	3.2	18.1
Rating	10.5	9.0	21.0	3.0	3.9	1.5	4.9
Yield	5.9	4.8	81.3	1.0	–	125.6	157.0

Note: BID denotes bid-ask spread. Outstanding$ denotes outstanding amount in billions of U.S. dollars. CDS denotes five-year credit default swap spread. Spreads denote each bond yields over 10-year US government treasury, German bund, Japanese government bond yields in bps, corresponding to each bond s issuing currency.

Impact of enhanced CACs on bond pricing

To understand the differences in the cost of sovereign capital borrowing during normal times and at times of crises, we break down the sample into the following periods:

1. After ICMA introduced enhanced CACs and before COVID-19: September 2014 – February 2020 (Normal period)
2. COVID-19 period of sovereign debt distress: March 2020 – March 2021 (Crisis period)
3. After ICMA introduced enhanced CACs, including COVID-19 period: September 2014 – March 2021 (Total period)

The results for these three periods are discussed below and summarized in Table 2. [11]

After ICMA introduced enhanced CACs (September 2014 – February 2020)

We find that the presence of enhanced CACs is negatively associated (statistically significant) with bond yield spreads, for both non-investment grade issuers and investment-grade issuers (Table 2). During this period, inclusion of regular CACs has also a negative and statistically significant association with bond spreads for the whole sample, with this cost-lowering association being more pronounced for non-investment grade bonds (Panel B). Such empirical results demonstrate that inclusion of the enhanced and regular CACs are associated with lower borrowing costs for the sovereign during normal times.

COVID-19 Sovereign Debt Distress: March 2020 – March 2021

During the COVID-19 crisis, enhanced CACs were used for the first time in the cases of Argentina and Ecuador sovereign debt restructurings and bond exchanges. It should be noted that although a two-limb voting mechanism under the enhanced CACs was used, and not a single limb mechanism, it still played an effective role to prevent

11. When we use the entire country sample, we observe that US dollar bonds and New York law-governed bonds are associated with excessively high bond yield spreads. Further, we detect that this result is mainly due to the abnormal pricing behavior of Argentina, Ecuador, Lebanon, Venezuela, and Zambia during debt stress period. Since this erratic price behavior was a major source of distortion of our results, to control a jittery secondary-market pricing pattern, we exclude sovereign bond spread data over 1000 from this analysis.

TABLE 2. Regression Results: ICMA Enhanced CACs (Dependent Variable: Spread over benchmark yield in basis points)

Periods	2014 M9–2020 M2 Normal	2020 M3–2021 M3 Crisis	2014 M9–2021 M3 Total Period
A. Total Sample			
Coupon	6.8**	3.5	7.2**
Outstanding_$	15.1**	1.0	13.3**
Maturity	0.1	0.4	−0.1
IG	−238.8**	−225.5**	−249.0**
BID	1.6**	1.6	1.8**
USD	−205.6**	−87.8**	190.8**
NY-Law	1.2	−41.2**	−11.1**
SEC	43.8**	−4.1	36.8**
EMBI	0.2**	0.1**	0.1**
VIX	2.7**	1.6**	2.8**
CDS	0.0**	0.4**	0.0**
EXR	0.0**	0.0**	0.0**
CPI(−6)	4.8**	12.9**	5.1**
Debt(−6)	−0.8**	0.3	−0.6
Enhances CACs	−74.7**	28.5*	−51.3**
Regular CACs	16.2**	71.8	−0.2
C	575.0**	−473.0	596.3**
R-Squared	0.44	0.58	0.44
B. Non-Investment Grade Bond			
Coupon	18.7**	10.2	11.7**
Outstanding_$	34.4**	2.3	2.9
Maturity	1.6	3.8**	1.9**
IG			
BID	−7.3**	37.6**	20.4**
USD	−216.1**	22.1	−63.6**
NY-Law	−78.7	95.1**	−57.5**
SEC	68.4**	100.7**	−17.9
EMBI	0.1**	−0.2**	0.1**
VIX	3.2**	4.5**	4.8**
CDS	0.0	0.5**	0.0**
EXR	0.0**	0.0**	0.0**
CPI(−6)	−2.5**	18.5**	1.9**
Debt(−6)	−0.2	3.2**	−0.4**
Enhances CACs	−75.8**	12.8	21.3
Regular CACs	−102.4**	−55.0	−17.9
C	−2,372.0**	−7,628.0	−3,425.8**
R-Squared	0.28	0.42	0.26

(*Continued*)

TABLE 2. (Continued)

Periods	2014 M9–2020 M2 Normal	2020 M3–2021 M3 Crisis	2014 M9–2021 M3 Total Period
C. Investment Grade bond			
Coupon	2.3	0.0	1.7**
Outstanding_$	25.1**	−2.5	20.9**
Maturity	0.0	0.0	0.0
IG			
BID	2.1**	−5.2**	−2.1**
USD	−222.9**	−76.6**	−205.4**
NY-Law	42.2**	6.5	35.6**
SEC	44.8**	−5.6**	39.1**
EMBI	0.0*	0.1**	0.1**
VIX	2.7**	0.7**	1.7**
CDS	0.2	0.3**	0.2**
EXR	0.0**	0.0**	0.0**
CPI(−6)	6.7**	31.5**	6.2**
Debt(−6)	−1.6**	−2.5**	−1.8**
Enhances CACs	−9.5**	−7.7	−8.1**
Regular CACs	−6.2*	−89.5**	4.1
C	251.0**	245.0	287.0**
R-Squared	0.39	0.28	0.35

Note: **,* statistically significant at the 1% and 5% levels respectively.

holdouts. Developments in secondary-market bond pricing during the COVID-19 period of sovereign debt distress have shown that investors differentiate between bonds with enhanced CACs and regular CACs at times of debt distress. It has been observed that investors are relatively less concerned about CACs in normal times or when they buy a bond at issuance, but they start to focus on the existence of CACs and are likely to value bonds differently at times of debt distress.

In the case of the 2020 Ecuador restructuring, only one bond maturing in 2024 did not include enhanced CACs. Such bond provided more legal advantages to creditors (it required a higher voting threshold for agreeing to a restructuring) than bonds with enhanced CACs. Therefore, the bond without enhanced CACs (2024) was traded at a premium in the secondary market compared to the other bonds with enhanced CACs that contained lower voting share for deciding on a restructuring- in effect, making restructurings easier (Figure 2A).

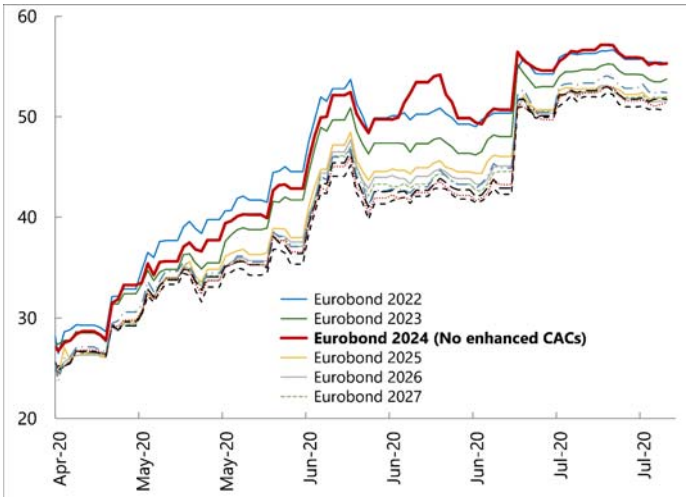

FIGURE 2A. Eurobond Price Path Under Debt Restructuring - Ecuador

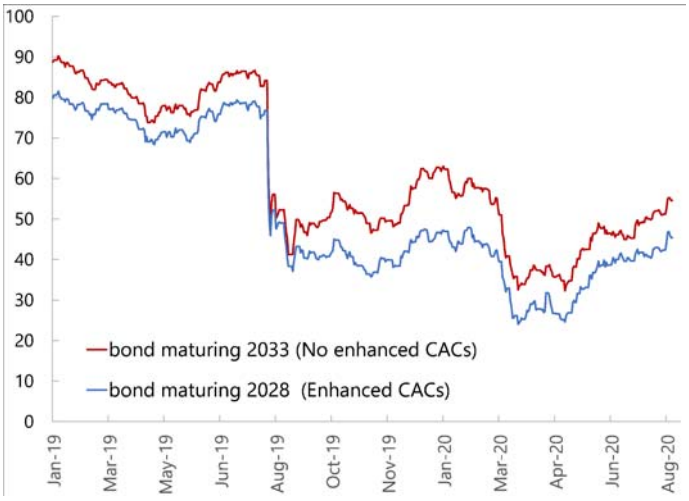

FIGURE 2B. Eurobond Price Path Under Debt Restructuring - Argentina

Source: Bloomberg

This price differential might reflect creditors' demand for a discount to compensate for the lower CAC voting threshold of bonds with enhanced CACs. Also, Argentina's bonds demonstrated similar pricing patterns for differences in legal provisions, showing that CAC voting thresholds

could have played a role in pricing differences (Figure 2B).

Our empirical analysis on bond pricing developments during this period, confirmed this observation. We find that the presence of enhanced CACs was positively associated (statistically significant) with bond yield spreads for total sample, which includes Ecuador and Argentina (Table 2). During this period, regular CACs appear to have a positive association with bond spreads for non-investment grade issuers, but less than the spread of bonds with enhanced CACs. Such empirical results indicate that inclusion of enhanced CACs and regular CACs was associated with higher borrowing costs for the sovereign, i.e., lower pricing, as shown in Figures 2A and 2B.

These results could be interpreted as (i) ex ante (in normal times), investors prefer bonds that include enhanced CACs because they tend to reduce the costs of any future financial distress through the benefits of an efficient and orderly restructuring, but (ii) ex post (near or during restructurings), investors prefer to hold bonds without enhanced CACs as they give them greater bargaining power.

Further, it should be noted that experience is quite isolated in the distressed scenario. During the 2020 restructurings, bonds with enhanced CACs appeared to be priced unfavorably at times of debt distress, notwithstanding the fact that enhanced CACs strongly demonstrated their ability to achieve high creditor participation and shorter duration of the restructuring process. Thus, both sovereigns and investors benefitted from enhanced CACs aggregation feature, after the restructuring is over, market shows no indication that investors are demanding a premium for enhanced CACs in normal times or at issuance. For non-distressed cases, it seems that investors will continue to value the benefits of including enhanced CACs over future tail risks (potential restructurings).

After ICMA introduced enhanced CACs, including COVID-19 period: September 2014 – March 2021

Our results show the inclusion of enhanced CACs is negatively associated (statistically significant) with bond yield spreads (Table 2). As for noninvestment grade bonds, during the normal times, enhanced CACs was associated with lower cost, however, after the debt restructuring crisis hit, presence of enhanced CACs no longer has significant impact on the pricing (positive). Cost-lowering effect was smaller for investment grade bonds, but there was not much changes

after the crisis and they continue to be associated with lower borrowing cost (statistically significant).

V. Effects of Enhanced CACs on Primary Bond Yields

In this section, we illustrate the trends of the cost of borrowing for selected countries' bond issues without CACs, with regular CACs, and with enhanced CACs. For meaningful comparisons, we select countries that possess relatively similar bond characteristics (with regard to coupon rate, remaining maturity, tranche volume, currency, and ratings) since the introduction of enhanced CACs. Thus, we look at Mexico (New York law) and Romania (UK law) as investment-grade issuers, while we concentrate on Indonesia (New York law) as a lower-grade issuer. This analysis intends to complement previous econometric results that were not statistically significant and demonstrate that idiosyncratic differences in individual countries, for example, due to varying liquidity in sovereign bond markets, investor base compositions, or geopolitical risk, may be responsible for differences in yield movements.

When the yields of bonds with enhanced CACs are compared with respective bond yields at the sovereign yield curve, no obvious pricing impact is observed. Further, in the secondary market, when these major issuers (Mexico, Indonesia, and Romania) are examined at market lows and highs, based on the performance of their sovereign CDSs, no pricing difference for bonds with enhanced CACs was observed, even during debt distressed periods.[12] (Figure 3) For example, Mexico's and Indonesia's bonds with enhanced CACs did not display materially higher yields, being consistently aligned with the respective sovereign bond yield curves. Mexico's bonds with enhanced CACs seem to have been priced based on Mexico's standing sovereign USD yield curve. Under UK-governing law, we observe a similar same pattern—the pricing of Romania's new EUR bonds with enhanced CACs is aligned with the EUR sovereign yield curve, during both normal and distressed times.

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12. We chose the highest sovereign CDS point in time as distressed day. Sovereign yield curve shows slight upward parallel shift and yields of bonds with enhanced CACs are consistently aligned with yield curve.

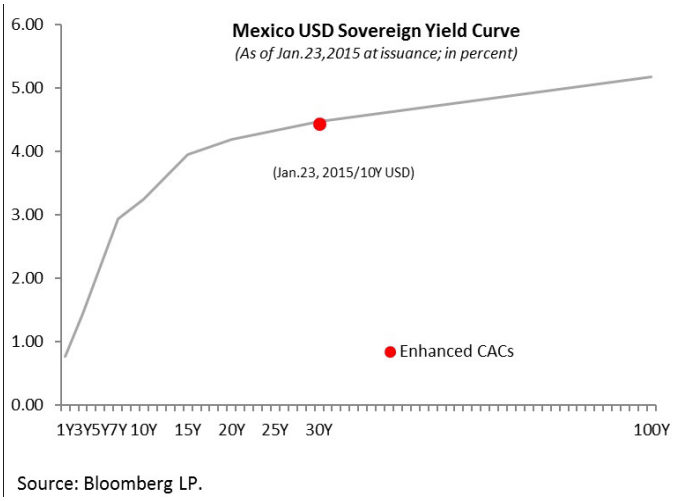

FIGURE 3A. Enhanced CACs as of Jan. 23, 2015 –Mexico

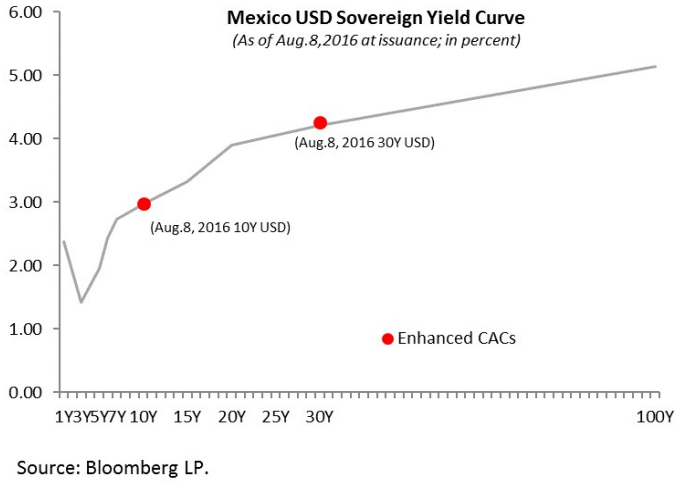

FIGURE 3B. Enhanced CACs as of Aug. 8, 2016 –Mexico

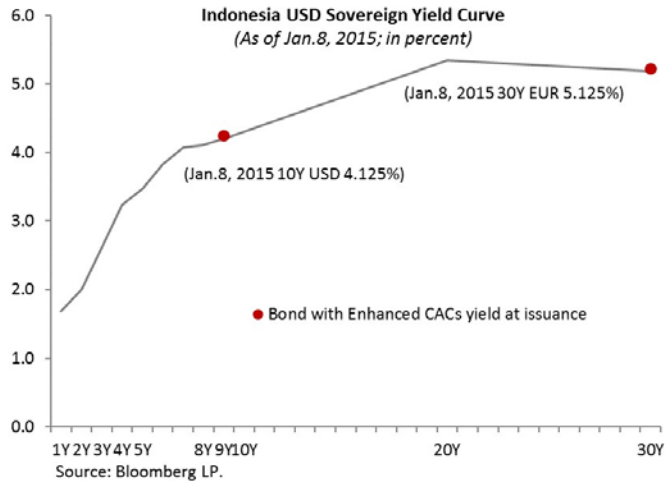

FIGURE 3C. Enhanced CACs as of Jan. 8, 2015 – Indonesia

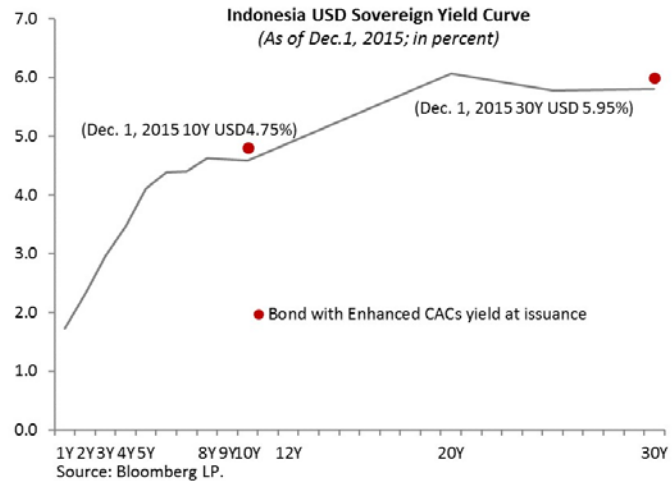

FIGURE 3D. Enhanced CACs as of Dec. 1, 2015 – Indonesia

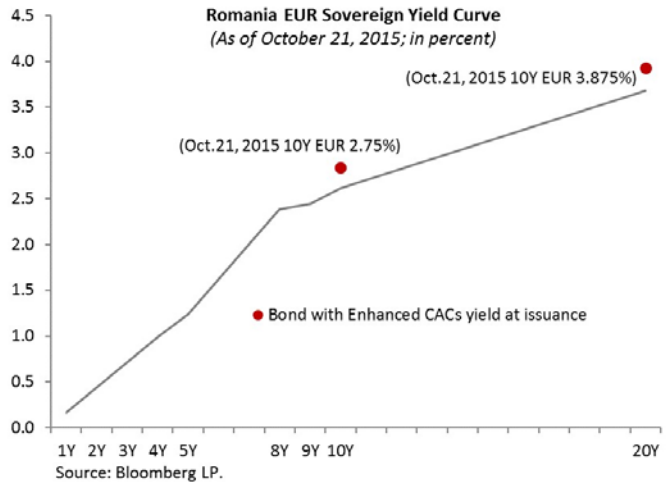

FIGURE 3E. Enhanced CACs as of Oct. 21, 2015 –Romania

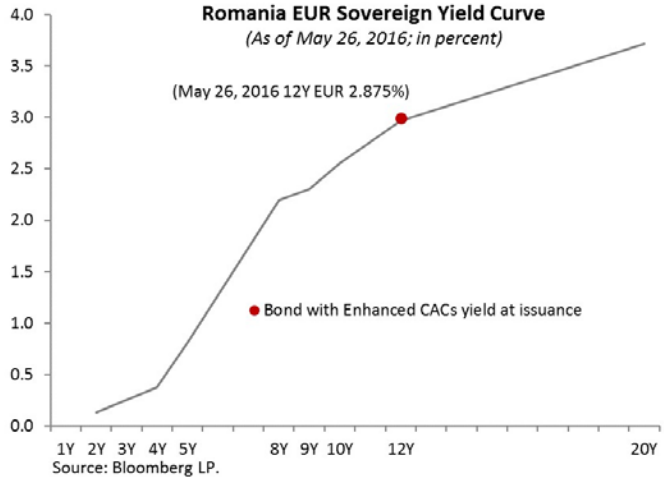

FIGURE 3F. Enhanced CACs as of May 26, 2016 –Romania

VI. Conclusion

Our empirical study provides novel quantitative estimates on the effect of the use of enhanced CACs on bond pricing. Using secondary-market sovereign bond yield spreads, we analyze pricing impact of following periods: (1) after the ICMA introduced enhanced CACs and before Covid-19 (September 2014–February 2020); (2) from the start of Covid-19 and until one year after (March 2020-March 21) and (3) combined period after the ICMA introduced enhanced CACs (September 2104-March 2021). In the first period, September 2014 to March 2020, where no pronounced crises or restructuring episodes have occurred, enhanced CACs are shown to be negatively associated with borrowing costs for investment and noninvestment grade issuers.

However, during March 2020 to March 2021 that includes the crisis period of the 2020 Argentina and Ecuador debt restructurings, enhanced CACs are found to be positively associated with borrowing costs, while there is no longer significant pricing impact for noninvestment grade issuers. These findings show that investors' bond pricing behavior tends to be differentiated during crisis periods and debt restructurings, with the price of bonds that include enhanced CACs being lower (and, consequently, the bond yield being higher) compared to prices of bonds that do not include enhanced CACs.

For the entire period after enhanced CACs were introduced and until the end of the first quarter of 2021, our analysis shows that inclusion of enhanced CACs is still associated with lower borrowing costs overall, while there is no longer statistically significant pricing impact for non-investment grade issuers from these specific contractual clauses.

Based on our analysis, a few intriguing questions are raised and remain for further research. For example, (i) what makes investors' bond pricing patterns to change in the face of crises and restructurings for bonds that include enhanced CACs, and (ii) when does this behavioral change occur. Specifically, what triggers investors to react adversely and sell their bonds with enhanced CACs during crises from being favorable and buying bonds with enhanced CACs in periods of no crisis for these bonds? Why bondholders switch abruptly their bond pricing behavior during crises/restructuring periods? What makes them to prefer bonds without enhanced CACs during crises/restructuring periods? Can we theorize that it is a sudden realization of the potential risk of restructuring triggered by some set signal? Or, is it because bondholders gradually realize that CACs restrain their flexibility in

restructuring negotiations and want to get rid of the bonds with enhanced CACs that they hold before a likely restructuring? Or, is it because they are afraid that the recovery price will be lower than the market price of these bonds at the time of restructuring? Or, is it because they are afraid that the restructured bonds will not have comparable terms with the ones that they hold (e.g., in terms of coupon, maturity, grace period, etc). At the same time, we need to answer why bondholders' price behavior is different during no-crisis periods, i.e., why they favor bonds with enhanced CACs during no-crisis periods. These questions need to be answered in consultation with market participants holding bonds with enhance CACs during crisis periods.

In order to better grasp how the inclusion of enhanced CACs affects secondary-market bond yield spreads, the composition of the investor base, among other factors, need to be examined thoroughly. As known, the composition of the investor base may change quickly as a result of market developments and could influence bond prices. During debt-distressed periods, for instance, it has been reported that institutional investors are largely replaced by hedge funds, and sometimes by official creditors, e.g., Argentina, which might affect bond pricing behavior.

Overall, using a comprehensive secondary-market bond spread dataset, we find that the inclusion of enhanced CACs is associated with lower bond yield spreads and related sovereign borrowing costs over the period since their introduction, while higher bond yield spreads and consequently higher sovereign borrowing costs are exhibited during debt restructuring episodes. Therefore, since enhanced CACs are expected to ensure an orderly and efficient debt restructuring process, inclusion of these legal clauses should be promoted as having a broad beneficial impact on both issuers and investors.

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APPENDIX I. Description of Variables

This appendix provides a description of variables included in the primary- and secondary-market analyses:

- Mid-yield to maturity: Monthly data are based on the simple average of daily mid-yield to maturity from September 2014 to March 2021 (time-variant).
- Spread: Sovereign bond yield spread over relevant benchmark. It is calculated based on the issue currency. If the issue currency is the U.S. dollar, we use US treasury 10-year generic yields to calculate the spread. For euro-denominated bonds, German 10-year bond generic yield are used as benchmark, while for Yen-denominated bonds, we use Japanese 10-year bond generic yields.
- Credit rating: S&P foreign-currency long-term sovereign credit

ratings are converted to numeric values, as outlined in Appendix III Table 1. This metric is also complemented by Moody's and Fitch ratings when the S&P rating is not available. A sovereign credit rating for each data point is converted to a numeric value over the months (time-variant).

- Rating: Credit rating at issuance: S&P foreign-currency long-term sovereign credit ratings at issuance are converted to numeric value, as outlined in Appendix III, Table 1.
- Maturity: year of maturity.
- MAT: Remaining maturities: Years to maturity is calculated based on the last day of the month (time-variant).
- BID: Bid-ask spread.: The bid-ask spread is calculated based on bid and ask prices for each month. This monthly series is based on the average of daily series whenever there was a meaningful bid price and ask price (time-variant).
- Coupon: Each bond's coupon in percent (time-invariant).
- Outstanding_$: amount: Each bond's outstanding tranche volume, not the total deal volume. Each tranche volume is converted to billions of US dollars based on the exchange rate of the date of issuance (time- invariant).
- EUR currency: If a bond is issued in euros, the value is 1, otherwise 0 (binary value).
- USD currency: If a bond is issued in US dollars, the value is 1, otherwise 0.
- English law: If the governing law is English law, the value is 1, otherwise 0, with the significant majority of other cases being New York law. Also, we employ another governing-law category, while English law, New York law, and other governing law are mutually exclusive, and their value adds up to 1 for each bond. Other governing law comprises less than 2 percent of total cases (time-invariant).
- CDS: Credit default swap spread.: Monthly series of each sovereign issuer's CDS spread is used for each specific bond. Monthly series are simple averages of daily series (time-invariant).
- VIX: CBOE Volatility Index at the time of the issue date, a measure of the implied volatility of S&P 500 index options, calculated and published by the CBOE (time-variant).
- SEC: If a bond is registered in SEC at the time of issuance, the value is 1, otherwise 0.
- CPI: Consumer Price Index. (CPI): Annualized consumer inflation

growth rate in percent, monthly

- EXR: Exchange rate (EXR).: National currency to US dollar, monthly average of daily exchange rates.
- Debt: Debt-to-GDP ratio of previous year: Debt to GDP in percent in the year t-1
- Monetary union: If the issuer is a member of a monetary union at each data point, the value is 1, otherwise 0.
- No CACs: Based on the sales documents and prospectuses available from Perfect Information, Dealogic, and Bloomberg database, if a bond does not include collective action clauses, the value is 1, otherwise 0. For the period of September 2014 to March 2021, no CACs, CACs, and enhanced CACs are mutually exclusive, and they add up to 1 for each bond.
- Regular CACs: Based on the sales documents and prospectuses available from Perfect Information, Dealogic, and Bloomberg database, if a bond includes collective action clauses, the value is 1, otherwise 0 (time-invariant).
- Enhanced CACs: Based on the sales documents and prospectuses available from Perfect Information, Dealogic, and Bloomberg database, if a bond includes ICMA's enhanced version of collective action clauses, the value is 1, otherwise 0. The IMF Legal Department staff verify the correct indexing of this information (time-invariant).
- Emerging markets (EM): If the issuing country is an Emerging Market and not an advanced economy, according to the IMF WEO definition, the value is 1, otherwise 0 (binary value).

APPENDIX II. Bond Pricing Explanatory Variables

Explanatory variables are added to enhance the understanding of the relationship between secondary-market yield spreads and each independent variable, with most coefficients generating the expected sign. In particular, we employ bond-specific characteristics, bid-ask spreads, and other macroeconomic and financial market determinants as the main explanatory variables. Time-variant credit ratings and remaining maturities data are used in the analysis, but later removed them from the analysis since they are found to be endogenous to the bond pricing. The more creditworthy bonds (1–10 numeric values) are associated with lower yield spreads, and less creditworthy bonds

(numeric values over 10) are associated with higher yield spreads. The more the months-to-maturities means higher yield spreads, just in line with sovereign bond yield curve and term structures.

- Bond-specific characteristics

Coupon and tranche volumes are generally positively associated with yield spreads, while tranche volumes are important variables to determine the yields. Issue currency seems meaningful as well, suggesting issuing in US dollars is associated with lower yield spreads compared to bonds issued in other currencies (Japanese yen, British pound, Scandinavian currencies, Chinese renminbi). Credit rating at issuance is classified as investment grade (IG) or noninvestment grade, and investment grade is associated with lower yield spread through the analysis time period. Governing law is not a consistently significant determinant, changing signs over the various considered periods.

- Bid-ask spreads – We use bid-ask spread changes of each bond over the time period to see the relationship between sovereign bond liquidity and secondary-market yield spreads. Our results show they are positively associated, indicating that the more liquid bonds are (lower bid-ask spread), the lower yield spreads are (lower risks). They are statistically significant since September 2014; this association is slightly more pronounced for the noninvestment-grade issuers group during the crisis.
- Other macroeconomic and financial market variables – The consumer price index annual growth rate is positively associated with yield spreads, which indicates that when the inflation rate rises, bond yield spreads rise accordingly. The EMBI index, CDS spread and market VIX are positively associated as expected, meaning yield spreads increase as market risks increase. Exchange rate is positively associated with statistical significance. The results of most of the macroeconomic indicators broadly confirm that macroeconomic fundamentals play a major role in explaining governments bond yields differentials.

APPENDIX III. Numerical Conversion of Credit Ratings

Composite credit ratings	Numeric value		
AAA	1	Prime	Investment grade
AA+	2	High Grade	
AA	3		
AA-	4		
A+	5	Upper Medium Grade	
A	6		
A-	7		
BBB+	8	Lower Medium Grade	
BBB	9		
BBB-	10		
BB+	11	Noninvestment Grade Speculative	Noninvestment grade
BB	12		
BB-	13		
B+	14	Highly Speculative	
B	15		
B-	16		
CCC+	17	Substantial Risks	
CCC	18		
CCC-	19		
CC+	20	Near Default	
CC	21		
CC-	22	In Default	
C+	23		
C	24		
C-	25		
D	26		
Not rated	27		