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Syndicated Bank Lending and Rating Downgrades: When Do Sovereign Ceiling Policies Really Matter?

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Syndicated bank lending and rating downgrades: When do sovereign ceiling policies really matter?

We examine the effect of firm credit rating downgrades on the pricing of syndicated bank loans following rating downgrades in the firms' countries of domicile. We find that the sovereign ceiling policies used by credit rating agencies create a disproportionally adverse impact on the bounded firms' borrowing costs relative to other domestic firms following their sovereign's rating downgrade. By exploring the relevant mechanisms, we find that not all firms are equally penalized by the sovereign ceiling rule: relationship and cross-listed borrowers with subsidiaries in the lender's country and borrowers operating in competitive industries are much less affected.

Keywords: Credit ratings, Sovereign ceiling, Bank credit, Relationship lending, Foreign-currency lending, Firm credit constraints.

JEL classification: F34 ; G21; G24; G28; G32; H63

1. Introduction

Sovereign credit rating downgrades carry significant negative consequences for firms domiciled in publicly-downgraded countries. In rating the creditworthiness of debt obligors, major credit rating agencies (CRAs) maintain a so called "sovereign ceiling policy" – whereby domestic firms are unlikely to receive a rating higher than that of their sovereign. Hence, when there is a sovereign downgrade, firms with ratings equal to that of their sovereign become technically "bounded" by the implicit ceiling and they also get downgraded, irrespective of their fundamentals. Consequently, they bear the direct consequences of the downgrade whereas non-bounded firms may only experience indirect consequences via the deterioration of the macroeconomic environment in the country. The literature shows that bounded corporate borrowers cut back on corporate investment and reduce their reliance on credit markets relatively more than firms with ratings below the bound following a sovereign downgrade event. Moreover, the bond yields of sovereign ceiling bounded firms increase significantly more than for otherwise similar firms (see Almeida, Cunha, Ferreira and Restrepo, 2017).

We investigate whether banks in the syndicated loan market would also alter their lending behavior in response to sovereign rating downgrades that impact borrowing firms. Specifically, would banks punish bounded firms more than non-bounded firms following the sovereign downgrade of the borrower's country? To the best of our knowledge, this aspect of the impact of CRAs' sovereign rating actions has not been addressed in the literature. Hence, this study fills the void in the extant literature by examining the responses of syndicated lenders following sovereign downgrades. It is important to understand how these major credit events impact on syndicated bank lending decisions given the significance of this type of bank credit extended to corporate borrowers.

To explore the aforementioned we follow prior studies in employing an identification strategy that exploits the variation in corporate credit ratings that is due to CRAs' sovereign

ceiling policies (see Adelino and Ferreira, 2016; Almeida, Cunha, Ferreira and Restrepo, 2017). As these studies argue, whilst there is no explicit requirement for CRAs to rate a non-sovereign entity at or below the related sovereign, in practice, corporate credit ratings infrequently exceed those of their sovereigns. By applying this strategy to the syndicated lending market over 1993-2019, we show that the sovereign ceiling policy leads to an asymmetric effect on borrowers' cost of credit. Firms with a rating equal to their sovereign before the downgrade are subject to significantly greater increases in loan spreads relative to control firms rated below their sovereign (non-bounded firms). This extra cost is equal to approximately 63 basis points and represents almost USD 7.7 million of additional interest expenses per year for a loan of average size and maturity. Importantly, it mainly arises when bounded firms receive loans from foreign banks. Thus, bounded firms face a significant disadvantage compared to their non-bounded counterparts in the event of a sovereign downgrade.

Similar to Adelino and Ferreira (2016) and Almeida, Cunha, Ferreira and Restrepo (2017), our identification strategy has the advantage that non-bounded firms have similar but lower credit quality than bounded firms and the sovereign downgrade events represent exogenous shocks on corporate credit ratings. Hence, alternative explanations based on changes in firm fundamentals, or firm credit risk, or both, are unlikely to explain the discontinuous change in ratings around the sovereign ceiling following the sovereign downgrade event. The exogenous and asymmetric effect of sovereign downgrades on firm ratings is thus likely to be due to the existence of the sovereign ceiling policy, and not necessarily to changes in firm's fundamentals or the domestic macroeconomic environment.

Several sensitivity tests show that these baseline findings are robust, and of these, the following four are noteworthy. First, we use different sets of fixed effects (see, e.g., Jiménez, Ongena, Peydró and Saurina, 2014). These include "bank times year" and "lender's country times year" fixed effects that exclude any alternative supply-side explanations of our findings,

and further control for the time-varying macroeconomic environment in the lender's country. Second, we also consider the impact of sovereigns' local currency rating downgrades as a robustness check. Additionally, we examine the impact of rating outlooks as these are forward-looking assessments of sovereign credit quality. Third, we use alternative model specifications with different loan control variables to show that the results are not affected by the "bad controls problem". We further employ specifications where our sample of bounded firms is matched with a subsample of unbounded firms according to their credit quality and their fundamental attributes. Fourth, we estimate a Heckman-type model, which models the probability of a firm borrowing from the given bank to account for sample-selection issues (Dass and Massa, 2011).

We conduct additional analyses to understand the mechanism that leads to this high cost of international bank credit for bounded firms. By focusing on potential demand-side explanations, we show that this cost is contingent on certain firm characteristics and financing choices. In particular, large borrowers with less reliance on debt financing and greater reliance on internal funds can partially offset the higher loan spread premium following the rating downgrade.

Our examination of country fundamentals reveals that borrower countries with more developed financial markets are generally associated with lower bank borrowing costs. Hence, the concomitant increase in bank loan spreads following a sovereign downgrade can be ameliorated when bounded firms have access to alternative forms of financing. We reveal that the exchange rate arrangements also play a fundamental role since they allow for currency depreciation as a means for restoring competitiveness. In this regard, we find that the transition away from a fixed exchange rate system to more flexible arrangements, such as crawling pegs and bands, further eases the cost of international bank credit for bounded firms following a sovereign downgrade.

Lastly, we explore how bounded firms should respond to sovereign downgrades to avoid or offset the higher borrowing costs and tougher loan conditions following a sovereign downgrade. We identify four potential avenues. First, establishing an information-intensive banking relationship with a lender is important. We find that by borrowing from the same lead lender at least once in the two years before the current loan, firms can recover a significant portion of the initial interest rate premium compared to first-time borrowers. Furthermore, the benefits to the bounded firms increase with the previous loan amount and frequency of such previous relationships.

On the same line, borrowing from international lenders with subsidiaries in the borrower's country mitigates the negative impact on bank loan terms. These subsidiaries enable the parent banks to gain access to important information about the firm's solvency and prospects as well as the domestic macroeconomic environment. Firms further ameliorate the aggravating effect of the sovereign ceiling rule when operate subsidiaries in the lender's country. In both cases, the information asymmetry stemming from the sovereign downgrade and the subsequent downgrade of the bounded firms can be better assessed and managed, thereby resulting in more favourable loan terms.

Second, we look at the borrowers' alternative financing sources. Arguably, firms with financing flexibility and access to foreign capital markets can achieve lower cost of credit *ceteris paribus*. We find this to be the case, since the aggravating effect of domestic downgrades on loan spreads is largely mitigated – if not reversed – for cross-listed firms. Moreover, this is further evident for firms cross-listed in the U.S. as listing on a U.S. stock exchange appears to send a positive signal to market participants. Finally, we show that the response of bounded firms' spreads to sovereign downgrades is contingent on the level of industry competition. By employing various measures of industry concentration (Herfindahl-Hirschmann index, Lerner index, market share of top five firms) we find that borrowers

operating in more competitive industries are affected less relative to those in less competitive ones.

Our analysis further concers the role of syndicate's structure as a means for mitigating the aggravating effect of the sovereign ceiling rule. We find that an increase in the lead banks' loan share via the formation of a more narrow and concentrated syndicate can have a certification effect, easing potential adverse selection and subsequent moral hazard concerns regarding the bounded firms' solvency risk.

This paper contributes to the literature on the impact of corporate credit rating downgrades on firms' cost of credit. In this regard, it highlights the higher cost of credit faced by bounded firms following a downgrade, especially when resorting to international financing; most importantly, it identifies the operative mechanisms that drive the higher borrowing costs. The closest papers to ours are possibly those of Adelino and Ferreira (2016), who in a similar setting examine the lending behavior of domestic bounded banks after the sovereign downgrade, whereas Almeida, Cunha, Ferreira and Restrepo (2017) analyze the real impact on domestic bounded firms. We complement these studies, by investigating the impact of sovereign downgrades and the sovereign ceiling policy-induced corporate downgrades on the financing costs of the domestic bounded firms and evaluate potential demand-side explanations.

We present new and comprehensive evidence on the differential impact of sovereign downgrades (considering both foreign- and local-currency denominated ratings and as well as short-term rating outlooks) on the pricing of syndicated loans directed to bounded borrowers relative to non-bounded ones. Importantly, we identify potential avenues for affected firms to alleviate the negative impact stemming from the interaction of sovereign and corporate credit risk as reflected in the sovereign and corporate downgrade events, respectively. Concerning this interaction, we point to a new and overlooked aspect of the sovereign-firm nexus that

affects firm financing conditions and materializes due to the operation of the sovereign ceiling rule. Thus far, prior studies have mainly investigated sovereign credit risk (through sovereign credit ratings) as determinants of corporate credit ratings (see Borensztein, Cowan and Valenzuela, 2013), or corporate CDS spreads during the European sovereign debt crisis (see Bedendo and Colla, 2015; Augustin, Boustanifar, Breckenfelder and Schnitzler, 2018). Our work extends far beyond studies focused on the sovereign debt crisis, showing that sovereign downgrades increased the bank borrowing costs of European firms (see Drago and Gallo, 2017) by contributing new evidence on corporate borrowers' immunity to their country's rating demise.

Last but not least, we contribute to the literature on the importance of information asymmetry for syndicate formation. Information asymmetries between contracting parties are crucial for the design of optimal contracts (see Brealey, Leland and Pyle, 1977; Holmstrom and Tirole, 1997). The asymmetries are manifested between the lending counterparties and primarily relate to the lead banks' reputation. Lead banks subject to enforcement actions by their regulators increase their loan shares to entice participants to continue to co-finance the loan (see Delis, Iosifidi, Kokas, Xefteris and Ongena, 2020). Furthermore, lead arrangers' reputation measured by large-scale bankruptcies affect their subsequent syndication activity (see Gopalan, Nanda and Yerramilli, 2011), while greater control-ownership divergence causes lead arrangers to retain higher loan shares (see Lin, Ma, Malatesta and Xuan, 2012).

However, asymmetries are also present between lenders and borrowers. In particular, lead arrangers retain the largest share of the loan the first time an opaque borrower accesses the syndicated loan market and retain lower amounts as the borrower subsequently accesses the market (see Sufi, 2007). This is the case for firms that require intense monitoring and due diligence and suggests that problems of information asymmetry are reduced when the borrower becomes more "known" in the syndicated loan market. However, the larger the retained share,

the greater the increase in the moral hazard problems (see, e.g., Dennis and Mollyneaux, 2000; Dennis, Nandy and Sharpe, 2000; Sufi, 2007; Ivashina, 2009).

We provide evidence on the implications for syndicate structure when borrowing firms experience an exogenous negative shock to their creditworthiness that is totally unrelated to a deterioration in firm fundamentals. We document that the sovereign ceiling rule – due to an increase in firm-stemming information asymmetry – drives the lead arrangers' responsibility for all price and non-price-setting decisions in the loan. As such, the aggravating effect of the sovereign ceiling rule can be ameliorated through the formation of more concentrated syndicates with lead arrangers' acquiring an increasing stake in the loan.

The rest of the paper proceeds as follows. Section 2 discusses the data and empirical methodology. Sections 3-4 present and discuss the main empirical results. Section 5 concludes the paper. An Internet Appendix provides several additional summary statistics and robustness checks.

2. Data and empirical model

We obtain data from various sources to build our detailed matched bank-firm dataset. First, we collect all syndicated loan deals made (at the facility level) over the period 1993 to 2019 from the Refinitiv LPC DealScan database. Dealscan contains the most comprehensive historical loan-deal information available on the global syndicated loan market. We exclude all loans for which there is no conventional pricing (i.e., there is no loan spread data) and this removes all types of Islamic finance and very specialized credit lines. We match the loans with the long-term foreign-currency sovereign credit ratings of the borrower's country issued by Standard & Poor's (S&P). The literature reports that S&P's ratings are updated more frequently and generally precede other credit rating agencies (see Ismailescu and Kazemi, 2010; Alsakka, ap

Gwilym and Vu, 2014; Drago and Gallo, 2017).[1] We match loan facilities with bank- and firm-specific characteristics from Compustat, as well as with macroeconomic and institutional (country-year) variables from several sources. The number of loan facilities for our baseline specifications ranges from 7,592 to 8,499 depending on the controls and the set of fixed effects used. Our preferred specification includes 8,498 loans, granted by 278 lead lenders headquartered in 36 countries to 578 borrowers from 50 countries; see Table 1 for key descriptive statistics.

3.1. Empirical model and key variables

To examine whether a bounded firm faces a higher cost of credit following a domestic sovereign downgrade relative to non-bounded firms, we use a regression approach very similar to Adelino and Ferreira (2016), Almeida, Cunha, Ferreira and Restrepo (2017), Berg, Saunders, Steffen and Streitz (2016), and Gande and Saunders (2012):[2]

$$Cost\ of\ credit_{lt} = a_0 + a_1 Bound_{kt-1} + a_2 Sovereign\ downgrade_{kt-1} + a_3 Bound_{kt-1} \times Sovereign\ downgrade_{kt-1} + a_4 Controls_{kt} + u_{lt} \quad (1)$$

where $Cost\ of\ credit_{lt}$ measures the cost of loan facility *l* originated at time *t*. The most widely used measure is the all-in spread drawn (*AISD*), denoting the spread over LIBOR,

[1] Credit ratings from S&P, along with ratings from Moody's, are further allowed to be used for determining risk weights under Basel II.

[2] Gande and Saunders (2012) examine a model where the loan amount (or leverage) of firms is regressed on the interaction term between traded syndicated loans (vs. non-traded loans) and the pre-post trade periods. Berg, Saunders, Steffen and Streitz (2016), use a similar interaction terms model to examine the differential responses of loan spreads and other variables in Europe vs. the U.S. due to foreign lending and other institutional characteristics. Adelino and Ferreira (2016) adopt a diff-in-diff framework to examine the impact of domestic sovereign downgrades on the domestic bounded banks' lending supply relative to non-bounded banks. Similarly, Almeida, Cunha, Ferreira and Restrepo (2017) examine the real effects of domestic sovereign downgrades on domestic bounded firms compared to non-bounded firms.

although the recent literature (e.g., Berg, Saunders, Steffen and Streitz, 2016) also highlights the importance of fees and all-in spread undrawn (*AISU*).

Bound is a binary variable equal to one if the firm has a credit rating equal to or above the credit rating of its domicile country, and zero otherwise. *Sovereign downgrade* is a binary variable equal to one for a downgrade in the long-term foreign-currency credit rating of the borrower's country, and zero otherwise. The interaction of the two, i.e., *Bound* × *Sovereign downgrade*, is in turn equal to one if in the year of the sovereign downgrade the firm has a credit rating equal to or above the credit rating of its domicile country, and zero otherwise (Table A2 provides information on sovereign credit rating downgrades and the domestic bounded firms at the time of the sovereign downgrade). The vector a_0 denotes different types of fixed effects, *Controls* is a vector of control variables of different dimension *k*, and *u* is a stochastic disturbance. We identify the lender's and the borrower's country as the country in which the lender and the borrower are located, respectively. Where a loan is provided by the parent bank's foreign affiliate or subsidiary, the lender's country is set as the country of the affiliate/subsidiary. Similarly, for firms receiving loans through their foreign subsidiaries, we set the borrower's country as the country of the affiliate/subsidiary.[3]

Put simply, our identification strategy provides a direct comparison across two states: bounded (treated) firms and non-bounded (control) firms during the occurrence of a domestic sovereign downgrade. The main coefficient of interest is a_3, which shows the differential effect of *Sovereign downgrade* on the cost of credit between bounded and non-bounded firms. In other words, we obtain identification from the fact that a sovereign downgrade exerts an

[3] For example, although Citibank (the parent bank) is headquartered in the US, for loans provided by Citibank International Plc, we set the lender's country as the UK. In sensitivity tests, we further examine cases of cross-border loans where the lending bank has an affiliate or subsidiary in the borrower's country. If the bank can fund the loan through its affiliate/subsidiary by resorting to the domestic wholesale markets, it can – to an extent – remove the macroeconomic risk. To accomplish this we identify all banks' subsidiaries in the borrower's country. Similarly, we examine cases where the borrowing firm has an affiliate or subsidiary in the lender's country, although the number of these subsidiaries is relatively small. We discuss this further in Section 4.

asymmetric effect on the cost of loans granted to domestic bounded firms relative to control firms that are not at the bound. We expect a_3 to be positive if the sovereign ceiling policies matter for the determination of loan spreads and thus increase the cost of credit for bounded firms.

To enhance our identification strategy and enable the comparison between our treatment (bounded) and control (non-bounded) groups, the latter includes firms with credit rating which is at most two notches below the credit rating of their sovereign.[4] Our key assumption is that the two groups would have followed parallel trends in the absence of the treatment. Differences in the posttreatment period can only be attributed to the treatment ((in our context, sovereign downgrades) when this assumption holds. This assumption would be violated if bounded and non-bounded firms had unobservable characteristics that predict greater sensitivity to sovereign debt crises, even in the absence of downgrades. In this diff-in-diff framework we ensure that all firms have similar characteristics and fundamentals, that is, in the absence of the treatment, the treatment group would behave similarly to the control group.

Moreover, the coefficients a_1 and a_2 show how the bound indicators and the sovereign downgrade respectively affect the cost of credit for all loans in the sample. If the model is well identified, the interaction term and the control variables should explain (most of) the effect of *Bound* and *Sovereign downgrade* on the cost of credit (i.e., a_1 and a_2 should be statistically insignificant or weakly significant). In fact, the effect of sovereign downgrades on the cost of loans for the domestic non-bounded firms should be minimal or zero, especially when controlling for other firm- and macro-level factors.

[4] In sensitivity exercises we intensify this restriction and include firms with a credit rating at most one notch below their sovereign's or relax it completely and include firms with any credit rating below their sovereign's.

3.3. Identification, controls, and fixed effects.

A key aim of our empirical analysis is to identify the differential effect of the sovereign downgrade event on bounded firms. Given that, we want to ensure that our empirical tests are not driven by inappropriate identification assumptions. The key identifying assumption in our empirical strategy is that trends related to loan spreads are the same among the treatment and control groups prior to the downgrade event. Figure 1, presents the evolution of average loan spreads between bounded and non-bounded borrowers in the years prior and after the sovereign downgrade. We observe a parallel trend in the spreads of bounded and non-bounded borrowers throughout the pre-downgrade years (and a subsequent divergence in the year of the downgrade and thereafter), which is an indicator that this assumption is reasonable.

[Insert Figure 1 about here]

We include a battery of control variables and fixed effects to account for potential omitted variables. Following the relevant literature (e.g., Ivashina, 2009; Adelino and Ferreira, 2016; Almeida, Cunha, Ferreira and Restrepo, 2017; Hasan, Hoi, Wu and Zhang, 2017; Kim, 2019; Delis, Hasan and Ongena, 2020), we control for loan characteristics such as the log of the loan amount, loan maturity (in months), the number of lenders in the syndicate, dummies for performance-pricing provisions and/or collateral, and the total number of covenants.[5] We also control for the total assets of the bank (*Bank size*), the bank return on assets (*Bank ROA*), and the bank's non-performing loans (*Bank NPLs*). Similarly, our firm-level controls include firm size (*Firm size*), firm return on assets (*Firm ROA*), and firm leverage (*Firm Leverage*). We include country-pair-specific variables, such as the difference in the GDP growth rates between the lender's and the borrower's countries (*GDP growth*), or in their GDP per capita (*GDP per capita*) to account for the differences in the degrees of economic development and

[5] Distinguishing between types of covenants (e.g., general and financial covenants) does not affect our results.

the macroeconomic conditions of the borrower's country. Detailed descriptions of these variables are provided in Table A1 and summary statistics in Table 1.

We also use loan type and purpose fixed effects; these are important as loan facilities include credit lines and term loans, which have fundamental differences in their contractual arrangements and pricing (see Berg, Saunders and Steffen, 2016) and their purpose (e.g., corporate purposes, working capital, takeovers or acquisitions, debt repayment, etc.). Moreover, we use year, bank, and firm fixed effects. These fixed effects complement our bank- and firm-level characteristics and allow us to control for possible time-invariant bank- and firm-specific explanations of our findings (such as credit risk and performance), that are not isolated by the inclusion of our set of control variables. We further control for changes in the macroeconomic environment of the lenders' countries and the borrowers' countries using lender's country fixed effects and borrower's country fixed effects, respectively. These fixed effects saturate the effect of *Bound* × *Sovereign downgrade* from other country (socioeconomic and political) effects on bank lending;[6] moreover, they control for changes in monetary conditions. Further, we use country-pair fixed effects to capture common characteristics between the lenders' and borrowers' country-pairs.

In even more stringent specifications, we use bank × year fixed effects. These allow us to control for time-varying supply (bank)-side explanations of our findings (such as changes in a bank's financial soundness, corporate governance, etc.). The regression still yields results on the main coefficients of interest because there are multiple loan facilities from the same bank within years. Similarly, the use of lender's country × year fixed effects shields our specification from country-year (macroeconomic) developments in the lenders' countries. Again, the

[6] These are country factors affecting all banks and firms within a country. Several studies examine such macro effects on international bank lending (e.g., Delis, Hasan and Ongena, 2020; and the associated references), and in this study these effects are fully controlled for via the fixed effects.

regression still yields significant results on the main coefficient of interest because there are multiple loan facilities from the same country within each year.

The number of loan facilities in our baseline specification is 8,498. Table 1 reports the key descriptive statistics for the set of loan-, bank-, firm-, and macro-level variables in our sample. In Panels A and B of Table 2 we report the summary statistics for key loan features for bounded vs. bounded firms following the domestic sovereign downgrade; Panel C reports their differences. The total number of loans granted to bounded firms is 3,863 and constitute approximately 45.5% of the full sample. Out of these, 453 loans are granted to 51 bounded firms experiencing a domestic sovereign downgrade; Table A2 presents the complete list of these 51 bounded firms. We find that, on average, *AISD* is 40.4 basis points higher for bounded firms compared to their non-bounded counterparts. This difference is statistically significant at the 1% level, and is also evident when the *AISU* is considered. In addition, loans granted to the former type of firms are of shorter maturity and more likely to be secured; they are also granted from larger syndicates and carry fewer covenants.

[Insert Tables 1 and 2 about here]

3. The effect of sovereign ceiling policies on the cost of credit

3.1. Baseline results

Table 3 reports our baseline results. We cluster standard errors by firm and also by year to avoid time-varying correlations in the data driving our inferences. In line with our discussion in Section 2, we consider different fixed effects in our model specifications. In column (1), we include the simplest fixed effects, namely those at the year-, bank- and firm-level. In column (2), we introduce lender's and borrower's country fixed effects. These control for macroeconomic developments in the lenders' and borrowers' countries, respectively. We further add loan type and purpose fixed effects in column (3) and borrower's industry effects

in column (4). In column (5) we introduce bank × year fixed effects to control for time-varying supply-side forces. Our last specification (column (6)) includes lender's country × year fixed effects to control for within-year macroeconomic developments in the lender's country and country-pair fixed effects.

[Insert Table 3 about here]

Across all specifications, the coefficient on *Bound* is generally insignificant or weakly significant as the sovereign ceiling also should not affect financial intermediation until a sovereign downgrade event occurs. The coefficient on *Sovereign downgrade* is statistically insignificant, which is not surprising as sovereign credit risk should not affect *AISD* unless the borrowing firm is affected (also in line with our priors discussed in Section 2).

We use column (3) as our baseline specification, as the set of fixed effects included in the given specification captures the effect of sovereign ceiling policies on loan spreads and we obtain identification from the maximum number of lenders and borrowers in our sample. The main coefficient of interest a_3 shows that a sovereign downgrade event increases *AISD* by an average of 63.0 basis points (bps) for bounded firms compared to non-bounded firms. This is a large and economically significant effect, equal to a 41.9% (=60.0 bps ÷ 150.4 bps) increase for the average loan in our sample. Given that the average loan size is $1.22 billion, bounded firms experiencing a sovereign downgrade pay on average approximately USD 7.7 million (=$1.22 billion × 60.0 basis points) more per year in interest payments. Considering that the average time to maturity is 3.4 years, this represents approximately USD 26.4 million in extra interest expenses over the loan's duration.[7] Therefore, we can infer that the sovereign ceiling rule substantially raises the cost of loans for bounded firms compared to firms below the bound in the event of a sovereign downgrade.

[7] Assuming 3.4 annual payments and LIBOR as the discount rate, the increase in interest expense amounts to USD 24.4 million for an average 12-month LIBOR rate of 3.3% during our sample period (for similar calculations, see Ivashina and Sun, 2011).

In Table 4, we replicate the estimations of Table 3 by replacing *Sovereign downgrade* with its local-currency counterpart (*Sovereign downgrade lc*). Results across all specifications mirror those of Table 3 for all our variables of interest. Unsurprisingly, the results are similar considering the strong positive correlation between the two types of credit ratings, as foreign-currency credit rating downgrades are almost always accompanied by local-currency credit rating downgrades. The marginally weaker coefficient on our interaction term, which now ranges from 52.6 to 55.4 bps might be attributed to the fact that insurance on sovereign debt is mostly denominated in foreign currency, thereby inducing greater sensitivity to foreign-currency credit rating changes relative to local-currency credit rating changes.

[Insert Table 4 about here]

In Table A3 of the Appendix, we examine the sensitivity of our estimates to the "bad controls" problem, by interchangeably excluding loan-level control variables from our specifications. We initially omit all loan controls (column 1) and sequentially introduce a different combination of non-price terms (*Loan amount, Maturity, Collateral, Number of lenders, Performance provisions, General covenants*) in columns (2)-(4).[8] Irrespective of the specification used, the coefficient on the interaction term remains consistently positive and statistically significant pointing to higher cost of credit for bounded firms relative to non-bounded ones. Moreover, in Appendix Table A4 we replicate the specifications of Table 3 for an extended sample, where we relax our restriction that the borrower's credit rating is at most two notches below its sovereign's. The extended group of non-bounded firms now includes borrowers with any credit rating below the credit rating of their sovereign. Results from this exercise are very similar to our baseline.

[8] The replacement (or addition) of *General covenants* with *Financial covenants* or *Net covenants* leaves our results unchanged.

The size and magnitude of the estimated coefficients on the control variables in Tables 3-4 are generally in line with expectations and the recent works of Bae and Goyal (2009), Ivashina (2009), Cai, Saunders and Steffen (2018), and Delis, Hasan and Ongena (2020). In particular, loan spreads increase with the loan amount and the covenants attached, while collateral appears to be irrelevant. The behaviour of the firm-level variables is also largely as anticipated. In this regard, higher return on bank assets and lower leverage are associated with decreasing *AISD*, while bank characteristics appear immaterial for loan spreads as the effect of supply-side forces is largely controlled in our specifications. Lastly, the higher the difference between the lender's and the borrower's country GDP growth, the higher the spread on loans directed to the borrower country's firms.

3.2. Short-term ratings and rating outlook

We further distinguish between short- and long-term credit ratings, since it might be that some of the effects of sovereign downgrades on the bounded firm's borrowing costs is stemming from downgrades in the sovereign's short-term credit ratings that usually precede (or coincide with) downgrades in the sovereign's long-term credit ratings. To test this, in specification (1) of Table 5, we interact *Bound* × *Sovereign downgrade* with its short-term counterpart *Short-term downgrade*.[9] The coefficient on the double interaction term – albeit relatively weaker than our baseline estimates – is positive and significant, verifying that long-term sovereign downgrades affect bounded firms disproportionally more relative to those below the bound. However, this asymmetric effect of *Sovereign downgrade* on bounded firms is not magnified when *Short-term downgrade* is also considered, as the latter appears to exert a negligible effect as seen by the insignificant coefficient on the triple interaction term.

[9] We further include all double interactions. For expositional purposes these are not reported here and are available on request.

[Insert Table 5 about here]

Credit ratings are inherently backward-looking credit risk measures, whereas outlooks attached to current ratings are forward-looking assessments made by the credit rating agencies. As such, outlook measures contain additional information that might be priced into loan spreads. In specification (2), we consider changes in the outlook for long term foreign currency sovereign ratings by including the interaction of *Bound* × *Sovereign downgrade* with *Outlook downgrade*. The coefficient on the triple interaction term is positive and statistically significant and larger in magnitude compared to the double interaction. This suggests that a deterioration in the sovereign's credit rating outlook is considered an indicator of impending credit rating downgrades. Its effect on *AISD* is over and above that exerted by *Bound* × *Sovereign downgrade*, as reflected in its positive and statistically significant coefficient of the latter.

3.3. Domestic borrowing vs foreign borrowing

This section examines potential differences in the effect of sovereign downgrades on the bounded firms' cost of credit between domestic and foreign loans. Cross-border loans constitute a significant component of the syndicated loan market and emerge as an increasingly popular form of corporate financing.[10] Moreover, although domestic lenders and borrowers are equally affected by the sovereign event, foreign banks are not. In this regard, we examine whether bounded firms are faced with higher borrowing costs when they resort to foreign banks for financing relative to when they resort to domestic banks. In the first two columns of Table 6, we run our baseline specification for the subsample of loans granted from foreign banks (column (1)) and the subsample of loans granted from domestic banks (column (2)).

[Insert Table 6 about here]

[10] Cross-border syndicated lending reported in DealScan amounted to more than $2 trillion in 2019.

Initially, we examine the combined effect of sovereign downgrades and the sovereign ceiling rule on cross-border borrowing operations. This is the largest category in our sample, since we observe 6,388 loan facilities granted from foreign banks, approximately 75.2% of total loan facilities. In these operations, foreign banks are exposed to the deteriorating macroeconomic fundamentals in the bounded firm's country. They are further exposed to exchange rate risk, either directly through lending in the borrower country's currency, or indirectly through lending in their own domestic currency. In the presence of these risks, we expect that foreign banks pass the costs to firms in the form of higher loan spreads. Our estimates in column (1) confirm this proposition: the coefficient on our double interaction term is statistically significant and equal to 53.9 bps. This further reveals that most of the effect of sovereign downgrades on bounded firms' spreads materializes when the latter obtain financing from foreign rather than domestic banks.

Next, we consider loans granted from domestic lenders to domestic borrowers. These are 2,110 loans or approximately 24.8% of our sample. Since in cases of domestic loans banks are also affected by the sovereign downgrade event, we expect that they are also subject to price concessions when lending domestically; therefore, the higher spread with which bounded firms are faced following the sovereign downgrade, should not be evident when borrowing from domestic banks. Estimates from specification (2) verify this conjecture, since bounded firms are not faced with an increase in their loan spreads after the downgrade event (non-statistically significant coefficient on *Bound* × *Sovereign downgrade*).

However, banks can also be subject to the sovereign ceiling rule, which can in turn reduce their lending supply and drive their loan spreads up (see Adelino and Ferreira, 2016). To this end, in column (3) we replicate specification (2) by replacing our bounded firm indicator with an indicator on whether the lending bank is bounded or not (*Bound (Bank)*). Estimates reveal that indeed, bounded banks charge a higher loan spread equal to more than 26

basis points, when lending domestically following a domestic downgrade; a finding in line with Adelino and Ferreira (2016). In our last specification (column (4)), we further consider the case where both loan counterparties are bounded. This is a rare event, as we observe only 46 loans granted from bounded lenders to domestic bounded borrowers. Nonetheless, our estimates indicate that these loans carry a higher spread (surpassing 30 bps) relative to loans where only one or none of the counterparties is bounded (coefficient on *Bound* × *Sovereign downgrade (Bank & Firm)*).

3.4. Results from a subsample of firms with similar fundamentals

To alleviate any remaining concerns that our results are not driven by the sovereign ceiling rule, we further employ a subsample of firms with similar fundamentals that are either above the bound or marginally below. To accomplish this, we match our sample of bounded firms with a subsample of non-bounded firms according to their credit rating and fundamentals. Results from this exercise are reported in Table 7.

[Insert Table 7 about here]

We initially restrict our sample of non-bounded firms to include only borrowers with credit rating one notch below their sovereign's (compared to the cap of two notches employed in our baseline regressions). We then examine this group vis à vis our bounded firms' group (column 1). According to the results, the effect of sovereign downgrades on bounded firms is identical to our initial estimates; a sovereign downgrade event increases *AISD* by 63.1 basis points for bounded firms compared to firms only one notch below the bound (coefficient on double interaction). In each of the subsequent specifications, we retain the preceding specification's subsample and progressively impose an additional matching criterion. Specifically, we further limit our subsample to include firms of a similar size, return on assets, and level of leverage (columns (2), (3) and (4) respectively). Across these specifications the

coefficient on *Bound* × *Sovereign downgrade* retains its negative and statistically significant sign, while its size ranges between 52.1-72.8 basis points. Again, this effect is in line with our baseline estimates, validating the higher spreads faced by bounded firms relative to other very similar firms that are just below the bound (and unaffected by the sovereign ceiling effect).

3.5. Additional results

In Appendix Table A5 we examine the effect of the sovereign ceiling rule on other price and non-price loan terms. Given the role of loan fees in the syndicated loan contract (see Berg, Saunders and Steffen, 2016), in column (1) we replace *AISD* as dependent variable with commitment plus facility fees, defined as all-in spread undrawn (*AISU*). A constraining factor of the global DealScan database is that the reporting of fees is limited, either because loan deals do not include specifications for undrawn funds or simply due to missing information. Results in column (1) point to a non-statistically significant coefficient on the interaction term; we conclude that the sovereign ceiling rule is only reflected on the spread of the drawn portion of the loan. We consequently estimate our baseline regression by using each of the non-price loan terms as a dependent variable (columns (2)-(6)). We notice that bounded firms receive loans of shorter maturity following the downgrade event (negative coefficient on the interaction term in column (3)). However, in all remaining specifications, the coefficients on *Bound* × *Sovereign downgrade* are not statistically significant.

In Appendix Table A6, we confirm the insensitivity of our inferences to the type of standard error clustering used. In this respect, we initially cluster standard errors by loan *and* year, and loan *and* firm (columns (1) and (2) respectively). Given, the multi-country nature of our dataset, we consequently cluster errors by borrower's country *and* year (column (3)), and by borrower's country *and* firm (column (4)). Our last specification adopts a more demanding

clustering, as standard errors are clustered by borrower's country *and* firm *and* year. Across all specifications, estimates remain almost identical to our baseline results.

Thus far, we assume that all loans enter the model with equal weights. Normally, the fixed effects in Table 3 provide a safeguard against cross-country variations. We nevertheless acknowledge that our empirical specification might leave the analysis open to the critique that countries receiving more or fewer loans might affect our results disproportionately. To this end, we re-estimate our preferred specification using weighted least squares and several different weights based on the country-year number of loans. We retain the same set of fixed effects and report results from this exercise in Table A7. Across all specifications, and irrespective of the type or frequency of the chosen weight, the coefficient on *Bound* × *Sovereign downgrade* retains its positive and statistically significant value. As for the coefficients on the set of our loan- and bank-level control variables, these are in line with those suggested by our baseline regressions.

Thus far our results could be subject to a sample-selection bias, in the sense that the variables driving our findings might further determine the firm's decision to receive a loan from the particular bank. It may be, for instance, that the impact of the sovereign ceiling rule on loan contracting is due to affected (bounded) firms being the ones more likely to request a loan. To eliminate this potential selection bias, we follow Dass and Massa (2011) and employ Heckman's (1979) two-stage model to calculate the probability of a firm entering into a loan deal. In the first stage, we run a probit model to estimate the firm's loan-taking decision. During this stage, our loan sample is extended and includes all syndicated loan facilities available in Dealscan. We calculate Heckman's lambda (inverse mills ratio) and include it as an additional control variable in the second-stage OLS estimation of specifications (1)-(3) of Table A8.

In line with Dass and Massa (2011), we assume that the borrower's decision to get a syndicated loan is a function of the main determinants of the decision to borrow in general.

Consequently, our probit regression is augmented with a set of loan-, bank-, and firm-level characteristics; a set of weights for the number, origin, and direction of loans made in a given year; and year, bank, firm, lender's and borrower's country dummies. Our set of annual weights include the number of loans made by a given bank (*Bank loans*), the number of loans to a given firm (*Firm loans*), and the number of loans between a given bank-firm pair (*Bank-firm loans*).

We present results from this exercise in columns (1)-(3) of Table A8 (Panels A and B). Probit estimates (Panel A), indicate that the higher the firm's size and return on assets and the lower the leverage, the more likely is the completion of a syndicated loan deal. Loans of a greater amount and shorter maturity are more likely to be granted, particularly when these loans include many lenders, are secured, and carry pricing provisions and covenants. Most importantly, estimates from the second-stage regressions (Panel B) confirm the asymmetrically strong positive impact of the sovereign ceiling rule on *AISD* (as reflected in the coefficient on *Bound* × *Sovereign downgrade*).

Last, we control for differences stemming from the macroeconomic and institutional environment in the borrower's country as these factors are known to also influence lending decisions (see, e.g., Delis, Hasan and Ongena, 2020). We include certain macroeconomic and institutional controls (debt-to-GDP ratio, inflation dynamics, prevalence of democratic institutions, economic freedom, real interest rate) and a measure of global uncertainty (stock market volatility). In theory, the slow-moving nature of these variables should cause them to correlate strongly with the borrower's country and country-pair fixed effects employed in Table 3. Due to their high pair-wise correlations, we do not employ all variables simultaneously. Results from this exercise remain very similar to our baseline (Table A9).

4. Identifying the mechanisms and potential remedies

Thus far, our analysis points to an asymmetrically higher cost of credit faced by bounded firms relative to non-bounded firms following a sovereign downgrade event in their country. In this section, we identify those firm characteristics that potentially offset this disproportionately aggravating effect of sovereign downgrades on bounded firms.

4.1 Exploring the mechanisms: Borrower's fundamentals

We initially consider alternative demand-side explanations of our findings and identify certain firm traits that may be driving our results. To this end, Table 8 includes the interaction of *Bound* × *Sovereign downgrade* with a number of different firm characteristics reflecting the firm's size, profitability, capital structure and operating performance. To ensure that variation in the spreads is not stemming from within-firm changes in each of these characteristics (which is likely endogenous to our bound indicator), in all specifications of Table 8 we do not include firm fixed effects.

Specification (1) reveals that the effect of the sovereign ceiling rule on the cost of credit is contingent on firm size. In this regard, large firms are able to offset – to some extent – the higher spread following the downgrade event. In specific, a one standard deviation increase in the firm's total assets saves the firm approximately 12.0 basis points (=-4.6 bps × 2.61) or 20.2% of the initial spread charged (coefficient on *Bound* × *Sovereign downgrade* × *Firm size*). Furthermore, bounded firms generating high returns on their assets are able to contain their high borrowing costs relative to their non-bounded counterparts (coefficient on triple interaction in specification (2)).

[Insert Table 8 about here]

The next two specifications consider the firm's decision with regards to its capital structure. Estimates point to a positive relationship between firm indebtedness and *AISD*, as more leveraged firms face higher borrowing costs; however, greater reliance on equity

financing exerts the opposite effect, thereby easing the firm's interest burden (coefficients on triple interactions in specifications (3) and (4), respectively). Similarly, firms with larger cash holdings and retained earnings further manage to partially reverse the increased borrowing costs after the downgrade. This result is intuitive, since reliance on own funds limits the need to resort to external financing. In this respect, a one standard deviation increase in cash holdings and retained earnings enables the firm to recover 45.9% and 41.1% respectively of the initial spread increase (coefficients on triple interactions in specifications (5) and (6)).

4.2 Exploring the mechanisms: Borrower's country fundamentals

Consequently, we allow for the possibility that the firms' decision to resort to bank financing is related to borrowing conditions and credit constraints in the domestic credit market as well as the level of domestic financial market development. We expect that firms in countries with less developed financial markets and consequently a greater reliance on the banking sector are subject to higher borrowing costs. This is in turn, a natural corollary of the reduction in domestic credit supply following a downgrade (see Adelino and Ferreira, 2016). However, in countries with developed financial markets, domestic firms have access to alternative sources of financing that consequently ease their borrowing costs. To examine this hypothesis, Table 9 includes the interaction between a set of variables reflecting the financial market conditions and fundamentals in the borrower's country and *Bound* × *Sovereign downgrade*. All specifications do not include borrower's country fixed effects; this isolates any variation from within-country changes in our set of country fundamentals, which are endogenous to the sovereign downgrade event.

[Insert Table 9 about here]

We initially focus on the level of stock market capitalization in the borrower's country. Estimates from specification (1) suggest that a highly capitalized domestic stock market acts

as a counterweight to the increasing loan spreads following the downgrade (significant and negative coefficient on triple interaction term). Consequently, and considering the literature that typically measures credit constraints using the ratio of credit provided by banks over GDP (e.g., Beck and Demirgüç-Kunt, 2006; Beck, Demirgüç-Kunt and Levine, 2010; Manova, 2012), we focus on measures reflecting the type and volume of domestic credit provided in the domestic economy. In particular, we generate a binary variable equal to one if countries fall within the 75th percentile of domestic credit provided by either the non-bank financial sector (specification (2)) or the banking sector (specification (3)), and zero otherwise.

Estimates in columns (2)-(3) verify our earlier expectations about the offsetting effect of the level of domestic financial flexibility on the corporate borrower's cost of credit. The coefficient on *Bound* × *Sovereign downgrade* × *Financial sector credit* indicates that bounded firms can alleviate their interest rate burden when operating in an economy where credit is principally provided by the non-bank financial sector. On the other hand, affected firms in countries with a greater reliance on the domestic banking sector are faced with significantly higher borrowing costs following the downgrade (positive and significant coefficient on *Bound* × *Sovereign downgrade* × *Banking sector credit*). These results are further verified in specification (4), where we consider the ratio of these variables.

Our last exercise concerns the importance of the exchange rate regimes for the borrowing firm's cost of credit. One key lesson from the 1990s currency crises was the increasing difficulties faced by countries when attempting to build a reputation needed to sustain a durable fixed exchange rate (see Eichengreen, Rose and Wyplosz, 1995; Obstfeld and Rogoff, 1995). Consequently, many of them adopted a more flexible form of exchange-rate targeting as a way to limit currency volatility, while reducing susceptibility to speculative attacks. This trend was nevertheless reversed following the Asian financial crisis and the Russian default, with countries favouring corner solutions and adopting either hard pegs (e.g.,

currency boards, dollarization, or currency unions) or freely floating exchange rate regimes (Calvo and Reinhart, 2002). It is therefore not clear how exchange rate arrangements affect the cost of credit, especially in the aftermath of financial crises which usually precede or follow downgrades in the sovereign's credit rating.

We explore this in specification (5), by interacting *Bound* × *Sovereign downgrade* with the borrower's home exchange rate regime using the exchange rate classification of Ilzetzki, Reinhart and Rogoff (2017). This measure is a categorical variable ranging from 1 to 5, with lower values reflecting less flexible regimes such as currency board arrangements or de facto pegs and higher values reflecting more flexible regimes such as managed or freely floating arrangements.[11] Presumably, wide bands allow authorities to actively use monetary policy when it is most needed, thereby enhancing the overall credibility of their commitment to the band and stabilizing intra-band movements and exchange rate fluctuations (Obstfeld and Rogoff, 1995). In addition, flexible arrangements allow for currency depreciation as a means of restoring the competitiveness of the downgraded country, thereby facilitating the recovery of the domestic economy. Indeed, the negative and statistically significant coefficient on *Bound* × *Sovereign downgrade* × *Exchange rate arrangement* in column (5) indicates that moving away from a fixed regime and allowing for some degree of fluctuation lowers the cost of bank credit for affected firms after the downgrade. The additional interest rate savings amount to approximately 24.3 basis points or 48.2% of the original interest rate premium charged.

4.3. Exploring the mechanisms: Relationship lending

Our results thus far highlight an important competitive disadvantage of bounded firms relative to non-bounded borrowers in the event of a sovereign downgrade that persists in a number of

[11] The classification further includes a sixth category for dual markets in which parallel market data is missing. However, the respective classification does not apply to any of the countries in our sample.

sensitivity tests. In this section, we consider two potential practices that might help alleviate the negative effects from a sovereign downgrade: the formation of bank-firm lending relationships and the utilization of bank and firm subsidiaries.

Prior lending relationships allow lenders to acquire valuable information about the borrowing firm's operations and credit risk. It is reasonable to expect that bounded firms with prior lending ties with their banks might be able to offset the higher loan spreads following a sovereign downgrade. We test this hypothesis in Table 10, by interacting our variables of main interest with *Relationship lending*, a variable reflecting the existence of a prior lending relationship between the given bank-firm pair over the previous 2-year period (see, e.g., Bharath, Dahiya, Saunders and Srinivasan, 2009).

[Insert Table 10 about here]

Estimates in column (1) show that relationship borrowers are able to recover approximately 15.6 basis points (or 22.0%) of the interest rate premium following a downgrade event (coefficient on *Bound* × *Sovereign downgrade* × *Relationship lending*). The offsetting effect of relationship lending further increases with the size and magnitude of this relationship: the greater the number or the amount of loans between the given bank-firm pair during the previous 2-year period, the greater the interest rate savings for the bounded firms following the downgrade (coefficients on triple interaction terms in columns (2)-(3)).

The next two specifications of Table 10 examine the role of subsidiaries. When the lending bank operates an affiliate or subsidiary in the borrower's country, it can gain access to important information about the firm's creditworthiness and operations. Furthermore, through its subsidiary, the bank is accustomed to the domestic macroeconomic environment, while it can also remove part of the macroeconomic risk if it can fund the loan through its affiliate/subsidiary by resorting to the domestic wholesale markets. We therefore expect that borrowers resorting to lenders with subsidiaries in the borrower's country, minimize the

information asymmetry with regards to the firm's credit risk and the domestic macroeconomic risk enabling them to achieve more favourable loan terms.

This is verified by the estimates in column (4), where loans granted from banks with domestic subsidiaries carry an approximately 6.9% lower *AISD* than the average loans directed to bound firms following the sovereign downgrade (coefficients on triple and double interaction terms, respectively). Similar reasoning applies to firms operating subsidiaries in the lead bank's country. By operating in the lender's country, firms can communicate important information regarding its operations to the lender so as to reduce information asymmetry. As estimates in column (5) reveal, this results in a 15.3% decrease in the offered spread.

4.4. Exploring the mechanisms: Cross-listing and industry competition

In this section we examine whether the ability to access alternative sources of financing and the level of competition in the firm's industry reverse the aggravating effect of sovereign downgrades on bounded firms' borrowing costs. To accomplish this, we interact our sovereign downgrade and bound indicators with a number of variables reflecting the firms' cross-listing status and the degree of industry competition.

A listing on a foreign stock exchange presents the issuing firm with an incentive to commit to providing higher quality financial information and exposes the company to further scrutiny of reputable intermediaries (see Lang, Raedy and Wilson, 2006; Shi, Magnan and Kim, 2012). This is further driven by the dual pressures from both host and home countries' stock exchanges that cross-listed firms face, which in turn make them more adept at attracting alternative financing sources (see Hillman and Wan, 2005). Similarly, cross-listed firms benefit in the product market by releasing more information to foreign markets; this translates into a higher likelihood that managers will issue forecasts, thereby minimizing the information asymmetry about their future prospects and performance (see Saudagaran, 1988).

For all these reasons, we expect that cross-listed firms are less subject to the aggravating effect of the sovereign ceiling rule after the downgrade event relative to domestically listed companies. Their global outreach and superior network combined with their effective monitoring, provides the former type of firms with a comparative advantage that renders them less sensitive to domestic downgrades. We examine this premise in columns (1) and (2) of Table 11, where we interact *Bound* × *Sovereign downgrade* with an indicator of a firm's cross-listing status. Results from column (1), suggest that the effect of *Bound* × *Sovereign downgrade* on *AISD* is somewhat mitigated for cross-listed bounded firms: the latter save approximately 5.0 basis points compared to domestically listed bounded firms (negative and statistically significant coefficeint on triple interaction term). Furthermore, the reversal effect of the cross-listing status is even more potent for bounded firms listed on U.S. stock exchanges, in addition to their domestic stock exchange (column (2)).

[Insert Table 11 about here]

We consequently examine the level of industry competition, since the cost of bank debt is different for firms that operate in competitive industries relative to those in more concentrated industries (see Valta, 2012; Boubaker, Saffar and Sassi, 2018). To examine if our results are different in more competitive industries we distinguish between firms located in the bottom tercile of our sample based on measures of industry concentration. Our measures of industry concentration are the Herfindahl-Hirschmann index (HHI), Lerner index, and top five concentration ratio, i.e., the sum of market shares of the largest five firms in the industry (see Aghion, Bloom, Blundell, Griffith and Howitt, 2005; Mueller, Ouimet and Simintzi, 2017). By construction, lower (higher) values indicate greater (smaller) competition in the given industry. Estimates from specifications (3)-(5) confirm the differential role of industry competition: the negative and statistically significant coefficients on the triple interaction terms indicate that

bounded firms in more competitive industries are able to save between 4.7-6.6. basis points of the initial spread increase due to the downgrade event.

4.5. Exploring the mechanisms: The role of syndicate's structure

A potential channel through which the aggravating effect of the sovereign ceiling rule could manifest is syndicate structure, which operates via other lenders that join the lead bank in forming a syndicate. If lending banks are unfamiliar with the borrowing firm, this gives rise to an adverse selection problem wherein the borrower must convince the lender of its solid credit reputation. By forming a more dispersed syndicate and retaining a larger share of the loan, the lead bank can minimize this problem of information asymmetry. This can alleviate the need for potential lenders to spend more time investigating the borrower in order to acquire more "informed" capital regarding itss financial health. Being part of a more narrow syndicate can also have a certification effect, easing potential adverse selection and subsequent moral hazard concerns regarding the borrower's solvency risk (see, e.g., Dennis and Mullineaux, 2000; Lee and Mullineaux, 2004; Jones, Lang and Nigro, 2005; Suffi, 2007; Ivashina, 2009).

Below, we examine how syndicate structure helps alleviate the effect of sovereign ceiling rule by interacting *Bound* × *Sovereign downgrade* with a number of loan characteristics reflecting the size and structure of a syndicate. Results are presented in Table 12, with estimates from column (1) suggesting that a decrease in the number of lenders reduces *AISD* for bounded firms following a downgrade. Specifically, including thirteen less lenders in the syndicate (i.e., decreasing *Number of lenders* by approximately one standard deviation) saves the borrower around 20.8 basis points. Column (2) shows that this effect is mainly driven by lead banks, since excluding eight lead lenders in the syndicate results in spread savings of 15.2 bps.

[Insert Table 12 about here]

Columns (3) and (4) feature the interaction of *Bound* × *Sovereign downgrade* with lead bank loan share and degree of syndicate concentration, respectively. Both specifications confirm the beneficial effect of spreading the loan share across few members in the syndicate. According to column (3), increasing *Bank share* by one standard deviation (or 17.4%) results in lower *AISD* by approximately 8.3 basis points (coefficient on *Bound* × *Sovereign downgrade* × *Bank share*). This is further reflected in syndicate concentration, with a rise in the syndicate's Herfindahl index (i.e., forming a more concentrated syndicate) leading to an additional decrease of similar magnitude in the offered spread.

Across all specifications, the coefficient on *Bound* × *Sovereign downgrade* remains positive and statistically significant, confirming the aggravating effect of the sovereign ceiling rule on loan spreads. However, this effect can be largely mitigated when increasing the lead bank's stake in a loan and forming a more concentrated syndicate.

6. Conclusion

This paper examines the impact of changes in credit ratings on bank loan contracting by taking advantage of the heterogeneous variations in corporate credit ratings induced by the sovereign ceiling policies of credit rating agencies. Our results suggest that firms with ratings at the sovereign bound are subject to significantly higher borrowing costs and worse loan conditions following a sovereign downgrade than otherwise similar firms whose ratings are not at the sovereign bound. Our baseline specification suggests that loans directed to these firms are priced at approximately 63 basis points higher than the corresponding spread on loans to non-bounded firms. These results are robust to several changes in the baseline specification and alternative estimation methods. We calculate this additional cost of the sovereign ceiling rule for the average loan size and maturity to be approximately USD 7.7 million per year. Thus, firms bounded by their sovereign's credit rating have a significant disadvantage compared to

their non-bounded counterparts in the event of a sovereign downgrade. Moreover, we show that this additional cost materializes when bounded firms obtain financing from foreign banks.

Our analysis further investigates the mechanisms leading to this excessive increase in loan spreads by considering alternative demand-side explanations. We show that this increase is contingent on certain firm characteristics since larger and less-leveraged borrowers with a greater reliance on own funds can partially offset the initial loan spread premium following the downgrade event. When turning to country fundamentals, we find that borrower countries with more developed financial markets (and where credit is mostly provided by the non-bank financial sector rather than the banking sector) are generally associated with lower borrowing costs. The adoption of a more flexible exchange rate regime further eases the cost of credit for bounded firms following a domestic downgrade, as it allows for greater monetary freedom.

Firms have also some levers at their disposal in order to reduce the post-downgrade widening in information asymmetry. These include borrowing from banks with whom they have prior lending relationships or borrowing from banks that operate subsidiaries in the borrower's country. Either of these, can lower the extra cost of credit that bounded borrowers are subject to after a domestic downgrade; this is further evident for borrowers that operate subsidiaries in the lender's country. Moreover, the aggravating effect of sovereign downgrades on loan spreads is largely mitigated for cross-listed firms since the latter have better access to alternative financing sources and to foreign capital markets. Finally, we point to the role of industry concentration, as firms operating in more competitive industries are affected less relative to those in less competitive ones.

Finally, the increase in the lead banks' loan share via the formation of a more narrow and concentrated syndicate can have a certification effect, easing potential adverse selection and subsequent moral hazard concerns regarding the bounded firms' solvency risk. Future

research in this area may further explore the interactive effects of the banking regulatory environment within borrower countries with the rating events.

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Figure 1. Average spreads for bounded vs. non-bounded firms

The figure reports the average *AISD* on all loans received by borrowers in the years before and after their sovereign's downgrade. The average spread (in basis points) of loan facilities is depicted on the Y-axis and the corresponding year is depicted on the X-axis.

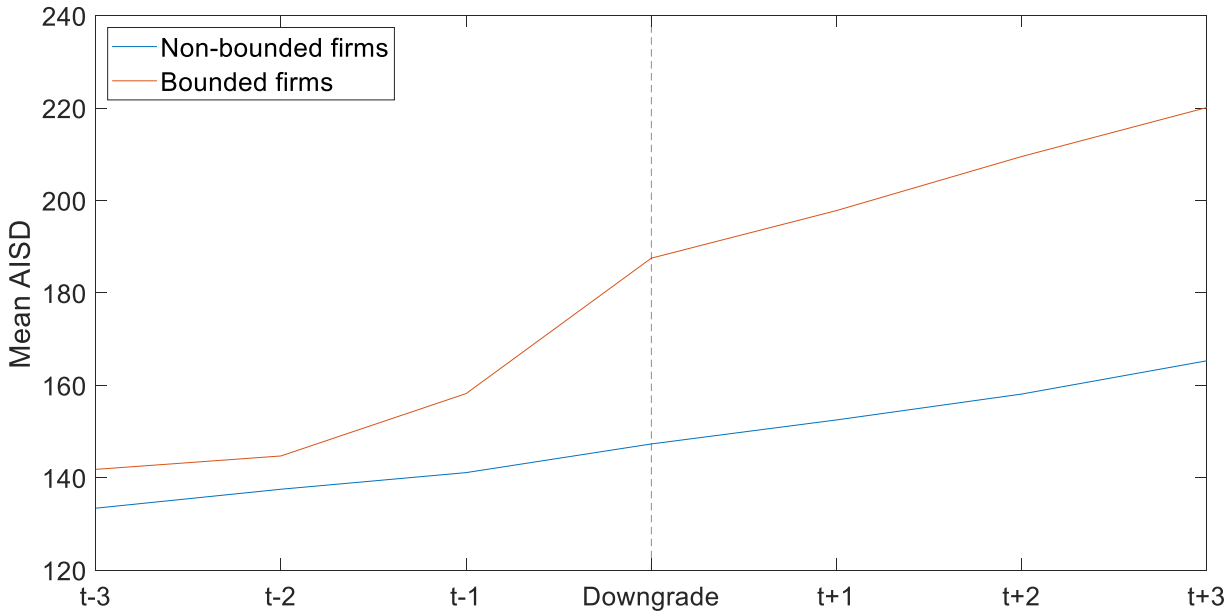

Table 1. Summary statistics

The table reports summary statistics (number of observations, mean, standard deviation, minimum and maximum values) for all variables used in the estimations of the main text. All variables are defined in Table A1.

	Obs.	Mean	Std. dev.	Min.	Max.
AISD	8,498	150.43	94.66	20.00	1,325.00
AISU	2,546	13.58	19.43	0.75	200.00
Sovereign downgrade	8,498	0.09	0.29	0.00	1.00
Sovereign downgrade lc	8,412	0.13	0.33	0.00	1.00
Short-term downgrade	8,483	0.04	0.20	0.00	1.00
Outlook downgrade	8,498	0.17	0.37	0.00	1.00
Bound	8,498	0.45	0.50	0.00	1.00
Loan amount	8,498	20.21	1.46	13.40	24.20
Loan amount (USD million)	8,498	1,220.00	3,090.00	0.66	32,400.00
Maturity	8,498	41.19	32.76	3.00	720.00
Collateral	8,498	0.17	0.38	0.00	1.00
Number of lenders	8,498	18.42	12.66	1.00	86.00
Number of leads	8,498	10.28	7.73	0.00	34.00
Performance provisions	8,498	0.12	0.32	0.00	1.00
General covenants	8,498	0.13	0.46	0.00	4.00
Financial covenants	8,498	0.10	0.39	0.00	4.00
Net covenants	8,498	0.03	0.18	0.00	1.00
Bank share	8,497	12.39	17.35	1.00	100.00
Syndicate Herfindahl	8,497	1,170.97	1,943.43	200.00	10,000.00
Bank size	8,498	13.84	1.11	8.63	19.37
Bank ROA	8,498	0.36	0.45	-0.98	2.91
Bank NPLs	8,498	0.50	0.73	0.00	5.52
Firm size	8,498	12.12	2.61	6.45	24.49
Firm ROA	8,498	7.80	5.52	-13.34	36.58
Firm leverage	8,498	19.44	12.39	0.00	81.82
Firm equity	8,498	10.63	2.48	3.73	22.50
Firm cash	5,978	8.67	2.50	-4.27	16.89
Firm retained earnings	8,162	20.68	22.41	-66.43	198.29
GDP growth	8,498	-1.70	3.43	-18.29	19.06
GDP per capita	8,498	17,349.33	19,907.46	-69,506.60	88,250.53
Stock market capitalization	7,629	95.02	117.22	5.24	1,254.47
Financial sector credit	8,008	121.44	69.42	3.65	345.72
Banking sector credit	8,008	68.52	38.22	8.23	207.89
Exchange rate arrangement	8,072	2.57	1.13	1.00	5.00

Table 2. Summary statistics for bounded firms vs. non-bounded firms post-sovereign downgrade

The table reports summary statistics for key price and non-price loan terms. All variables are defined in Table A1. Panel A includes observations for the group of bounded firms (i.e., firms with a credit rating equal to or above their sovereign prior to the sovereign downgrade) after the sovereign downgrade event. Panel B includes observations for the group of non-bounded firms (i.e., firms with a credit rating below their sovereign prior to the sovereign downgrade) after the sovereign downgrade event. Panel C reports results from the mean-comparison test for differences in the mean and standard error between observations in Panel A and Panel B. The*** mark denotes statistical significance at 1% level.

	Obs.	Mean	Std. dev.	Min.	Max.
Panel A: Bounded firms post-sovereign downgrade					
AISD	453	187.51	128.54	20.00	650.00
AISU	106	48.91	44.09	5.00	180.00
Loan amount	453	20.57	1.44	16.12	23.81
Maturity	453	37.50	22.88	3.00	146.00
Collateral	453	0.32	0.47	0.00	1.00
Number of lenders	453	18.08	11.26	1.00	48.00
Performance provisions	453	0.23	0.42	0.00	1.00
General covenants	453	0.01	0.11	0.00	1.00
Panel B: Non-bounded firms post-sovereign downgrade					
AISD	354	147.13	153.62	1.00	800.00
AISU	102	12.51	10.91	4.00	52.50
Loan amount	354	20.54	1.35	16.83	22.74
Maturity	354	55.16	24.51	12.00	240.00
Collateral	354	0.15	0.36	0.00	1.00
Number of lenders	354	14.05	7.54	1.00	36.00
Performance provisions	354	0.26	0.44	0.00	1.00
General covenants	354	0.22	0.51	0.00	2.00

Panel C: Mean-comparison test for the mean and standard error

	Mean	Std. error
AISD	40.39***	10.16
AISU	36.40***	4.42
Loan amount	0.03	0.10
Maturity	-17.66***	1.69
Collateral	0.17***	0.03
Number of lenders	4.03***	0.66
Performance provisions	-0.03	0.03
General covenants	-0.21***	0.03

Table 3. Baseline results with different fixed effects

The table reports coefficients and t-statistics [in brackets]. The dependent variable is *AISD* and all variables are defined in Table A1. Estimation method is OLS with standard errors clustered by firm *and* year. Each specification includes a different set of fixed effects, as given in the lower part of the table. The *, **, and *** marks denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Bound	12.405	12.405	13.628*	13.521*	9.811	12.287*
	[1.679]	[1.674]	[2.011]	[2.003]	[1.378]	[1.884]
Sovereign downgrade	-9.636	-9.636	-12.546	-13.678	-13.742	-11.405
	[-0.765]	[-0.762]	[-0.984]	[-1.070]	[-1.043]	[-0.934]
Bound × Sovereign downgrade	60.574**	60.574**	62.976**	63.911**	61.685**	64.058**
	[2.317]	[2.310]	[2.675]	[2.579]	[2.348]	[2.490]
Loan amount	-3.668	-3.668	-2.855	-2.108	-2.138	-2.671
	[-1.574]	[-1.569]	[-1.209]	[-0.904]	[-1.071]	[-1.357]
Maturity	0.203***	0.203***	0.265**	0.260**	0.315***	0.322***
	[2.881]	[2.872]	[2.721]	[2.635]	[3.001]	[3.135]
Collateral	7.972	7.972	6.495	6.087	6.079	5.008
	[1.470]	[1.465]	[1.247]	[1.127]	[1.198]	[1.079]
Number of lenders	0.253	0.253	0.390	0.375	0.263	0.269
	[1.103]	[1.099]	[1.646]	[1.591]	[1.085]	[1.101]
Performance provisions	0.163	0.163	-4.078	-3.957	-3.368	-2.727
	[0.024]	[0.024]	[-0.734]	[-0.707]	[-0.543]	[-0.452]
General covenants	13.252*	13.252*	13.212*	12.845	11.779	12.659
	[1.742]	[1.737]	[1.711]	[1.630]	[1.206]	[1.271]
Bank size	-0.959	-0.959	-1.128	-1.220		
	[-0.253]	[-0.252]	[-0.331]	[-0.369]		
Bank ROA	-0.641	-0.641	-1.538	-2.122		
	[-0.301]	[-0.300]	[-0.762]	[-1.109]		
Bank NPLs	-1.922	-1.922	-1.146	-0.997		
	[-1.173]	[-1.170]	[-0.758]	[-0.649]		
Firm size	0.878	0.878	1.456**	1.480**	1.272**	1.516**
	[1.425]	[1.420]	[2.121]	[2.129]	[2.087]	[2.341]
Firm ROA	-0.689	-0.689	-1.044	-1.122*	-1.022*	-0.957
	[-1.050]	[-1.047]	[-1.667]	[-1.725]	[-1.718]	[-1.595]
Firm leverage	0.050*	0.050*	0.068**	0.069**	0.075**	0.075**
	[1.759]	[1.754]	[2.693]	[2.759]	[2.621]	[2.802]
GDP growth	1.515	1.515	1.176	1.196	2.507**	
	[1.617]	[1.612]	[1.242]	[1.267]	[2.129]	
GDP per capita	-0.001	-0.001	-0.001	-0.000	0.001	
	[-0.849]	[-0.847]	[-0.627]	[-0.329]	[0.502]	
Constant	164.922**	164.922**	134.071*	115.636*	81.312**	99.450**
	[2.383]	[2.376]	[1.953]	[1.746]	[2.480]	[2.580]
Observations	8,499	8,499	8,498	8,307	7,682	7,592
Adj. R-squared	0.783	0.781	0.803	0.798	0.808	0.797
Year effects	Y	Y	Y	Y	N	N
Bank effects	Y	Y	Y	Y	N	N
Firm effects	Y	Y	Y	Y	Y	Y
Lender's country effects	N	Y	Y	Y	Y	N
Borrower's country effects	N	Y	Y	Y	Y	Y
Loan type and purpose effects	N	N	Y	Y	Y	Y
Industry effects	N	N	N	Y	Y	Y
Bank × year effects	N	N	N	N	Y	Y
Lender's country × year effects	N	N	N	N	N	Y
Country-pair effects	N	N	N	N	N	Y

Table 4. Baseline results with different fixed effects (local-currency ratings)

The table reports coefficients and t-statistics [in brackets]. The dependent variable is *AISD* and all variables are defined in Table A1. Estimation method is OLS with standard errors clustered by firm *and* year. Each specification includes a different set of fixed effects, as given in the lower part of the table. In all specifications *Sovereign downgrade lc* is a binary variable equal to one if the sovereign's local-currency credit rating is downgraded in the year before the loan facility's origination year, and zero otherwise. The *, **, and *** marks denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Bound	12.605	12.605	13.449*	13.257*	9.254	12.354*
	[1.650]	[1.645]	[1.882]	[1.866]	[1.185]	[1.771]
Sovereign downgrade lc	-7.001	-7.001	-9.992	-10.520	-12.814	-10.243
	[-0.835]	[-0.833]	[-1.164]	[-1.193]	[-1.349]	[-1.113]
Bound × Sovereign downgrade lc	52.614**	52.614**	54.826***	55.133**	54.025**	55.443**
	[2.441]	[2.434]	[2.812]	[2.606]	[2.325]	[2.425]
Loan amount	-3.665	-3.665	-2.902	-2.149	-2.112	-2.625
	[-1.557]	[-1.552]	[-1.223]	[-0.918]	[-1.067]	[-1.354]
Maturity	0.195***	0.195***	0.262***	0.256**	0.306***	0.312***
	[2.907]	[2.898]	[2.852]	[2.771]	[3.075]	[3.205]
Collateral	8.467	8.467	6.988	6.580	6.405	5.573
	[1.540]	[1.536]	[1.303]	[1.187]	[1.254]	[1.185]
Number of lenders	0.284	0.284	0.412*	0.395*	0.302	0.315
	[1.303]	[1.300]	[1.798]	[1.740]	[1.291]	[1.363]
Performance provisions	0.208	0.208	-3.999	-3.859	-2.996	-2.565
	[0.031]	[0.031]	[-0.716]	[-0.685]	[-0.471]	[-0.419]
General covenants	13.491*	13.491*	13.579*	13.222	11.896	12.647
	[1.791]	[1.785]	[1.785]	[1.698]	[1.220]	[1.271]
Bank size	-1.247	-1.247	-1.522	-1.589		
	[-0.317]	[-0.316]	[-0.422]	[-0.452]		
Bank ROA	-0.397	-0.397	-1.405	-2.078		
	[-0.173]	[-0.173]	[-0.702]	[-1.077]		
Bank NPLs	-2.037	-2.037	-1.187	-1.022		
	[-1.218]	[-1.214]	[-0.792]	[-0.677]		
Firm size	0.727	0.727	1.274*	1.293*	1.105*	1.337**
	[1.159]	[1.156]	[1.827]	[1.824]	[1.723]	[2.085]
Firm ROA	-0.699	-0.699	-1.051*	-1.133*	-0.990	-0.930
	[-1.076]	[-1.073]	[-1.720]	[-1.789]	[-1.703]	[-1.590]
Firm leverage	0.051	0.051	0.068**	0.070**	0.076**	0.076**
	[1.695]	[1.690]	[2.568]	[2.629]	[2.549]	[2.741]
GDP growth	1.438	1.438	1.142	1.147	2.344*	
	[1.427]	[1.422]	[1.146]	[1.159]	[1.900]	
GDP per capita	-0.001	-0.001	-0.000	-0.000	0.002	
	[-0.707]	[-0.705]	[-0.435]	[-0.127]	[0.837]	
Constant	169.294**	169.294**	140.744*	121.582*	69.300*	100.674**
	[2.406]	[2.399]	[2.003]	[1.789]	[2.058]	[2.684]
Observations	8,410	8,410	8,407	8,216	7,605	7,519
Adj. R-squared	0.783	0.782	0.803	0.798	0.808	0.797
Year effects	Y	Y	Y	Y	N	N
Bank effects	Y	Y	Y	Y	N	N
Firm effects	Y	Y	Y	Y	Y	Y
Lender's country effects	N	Y	Y	Y	Y	N
Borrower's country effects	N	Y	Y	Y	Y	Y
Loan type and purpose effects	N	N	Y	Y	Y	Y
Industry effects	N	N	N	Y	Y	Y
Bank × year effects	N	N	N	N	Y	Y
Lender's country × year effects	N	N	N	N	N	Y
Country-pair effects	N	N	N	N	N	Y

Table 5. Interaction with short-term ratings and outlook

The table reports coefficients and t-statistics [in brackets]. The dependent variable is AISD and all variables are defined in Table A1. Estimation method is OLS with standard errors clustered by firm and year. In specification (1), *Bound* × *Sovereign downgrade* is interacted with *Short-term downgrade*, i.e., a binary variable equal to one if the sovereign's short-term credit rating is downgraded in the year before the loan facility's origination year (zero otherwise). In specification (2), *Bound* × *Sovereign downgrade* is interacted with *Outlook downgrade*, i.e., a binary variable equal to one if the sovereign's credit rating outlook is downgraded in the year before the loan facility's origination year (zero otherwise). All specifications include year, bank, firm, lender's country, borrower's country, loan type and purpose fixed effects. The *, **, and *** marks denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)
Bound	13.748*	12.351*
	[2.028]	[1.923]
Sovereign downgrade	-12.140	-13.444
	[-0.964]	[-1.037]
Bound × Sovereign downgrade	46.582***	35.549**
	[3.290]	[2.573]
Bound × Sovereign downgrade × Short-term downgrade	27.078	
	[1.018]	
Bound × Sovereign downgrade × Outlook downgrade		48.481**
		[2.475]
Observations	8,481	8,498
Adj. R-squared	0.804	0.804
Fixed effects	Y	Y

Table 6. Domestic borrowing vs foreign borrowing

The table reports coefficients and t-statistics [in brackets]. The dependent variable is AISD and all variables are defined in Table A1. Estimation method used is OLS with standard errors clustered by firm and year. In specification (1), estimates are from the subsample of loans from foreign banks. In specifications (2)-(4), estimates are from the subsample of loans from domestic banks. In specification (3 *Sovereign downgrade* is interacted with *Bound (Bank)*, i.e., a binary variable equal to one if the lender's credit rating is equal to or above the lender's country credit rating in the year before the loan facility's origination year, and zero otherwise. In specification (4), *Sovereign downgrade* is interacted with *Bound (Bank & Firm)*, i.e., a binary variable equal to one if the lender's and the borrower's credit ratings are equal to or above their country's credit rating in the year before the loan facility's origination year, and zero otherwise. All specifications include year, bank, firm, borrower's country, loan type and purpose fixed effects. Specification (1) additionally includes lender's country fixed effects. The *, **, and *** marks denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1) Loans from foreign banks	(2) Loans from domestic banks	(3) Loans from domestic banks	(4) Loans from domestic banks
Bound	13.939	18.295*		
	[1.598]	[1.968]		
Bound (Bank)			-27.842**	
			[-2.125]	
Bound (Bank & Firm)				0.015
				[0.002]
Sovereign downgrade	-0.267	-22.079	4.708	8.187
	[-0.015]	[-1.365]	[0.147]	[0.297]
Bound × Sovereign downgrade	53.930***	59.305		
	[2.870]	[1.588]		
Bound (Bank) × Sovereign downgrade			28.391**	
			[2.183]	
Bound (Bank & Firm) × Sovereign downgrade				29.987*
				[1.764]
Observations	6,388	2,110	2,110	2,110
Adj. R-squared	0.801	0.814	0.838	0.808
Fixed effects	Y	Y	Y	Y

Table 7. Results from subsamples with similar firm fundamentals

This table reports coefficients and t-statistics [in brackets]. The dependent variable is *AISD* and all variables are defined in Table A1. Estimation method is OLS with standard errors clustered by firm *and* year. Different specifications include different subsamples of matched firms. Specification (1) includes a subsample of bounded firms and firms that are one notch below the bound. Specification (2) includes the subsample of specification (1) and further limits the subsample to firms with size (*Firm size*) within one standard deviation of the sample mean. Specification (3) includes the subsample of specification (2) and further limits the subsample to firms with return on assets (*Firm ROA*) within one standard deviation of the sample mean. Specification (4) includes the subsample of specification (3) and further limits the subsample to firms with leverage (*Firm leverage*) within one standard deviation of the sample mean. All specifications include year, bank, firm, lender's country, borrower's country, loan type and purpose fixed effects. The *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
Bound	-7.872	-4.778	-4.879	2.494
	[-1.363]	[-0.681]	[-0.618]	[0.331]
Sovereign downgrade	-7.461	-16.824	-12.055	-8.142
	[-0.838]	[-1.177]	[-0.751]	[-0.575]
Bound × Sovereign downgrade	63.125***	72.804***	53.474***	52.067***
	[4.553]	[4.431]	[3.227]	[3.667]
Loan amount	-9.658***	-11.596***	-11.939**	-13.609***
	[-2.929]	[-3.224]	[-2.744]	[-3.131]
Maturity	0.562***	0.526***	0.740***	0.637***
	[5.907]	[4.372]	[3.654]	[3.399]
Collateral	9.377	13.403*	10.901*	10.633*
	[1.476]	[2.004]	[1.939]	[1.823]
Number of lenders	-0.054	-0.107	-0.117	-0.157
	[-0.209]	[-0.417]	[-0.340]	[-0.453]
Performance provisions	13.537	15.817	5.244	5.189
	[1.060]	[1.465]	[0.435]	[0.428]
General covenants	9.076**	5.894	3.268	2.165
	[2.077]	[1.165]	[0.601]	[0.349]
Bank size	-8.289	-11.397	-9.055	-12.607
	[-1.447]	[-1.672]	[-1.163]	[-1.634]
Bank ROA	0.089	-0.939	6.756	5.520
	[0.024]	[-0.252]	[1.599]	[1.275]
Bank NPLs	-2.068	-3.009	-2.591	-1.681
	[-0.869]	[-1.060]	[-0.758]	[-0.469]
Firm size	-0.036	-3.299	3.711	-0.471
	[-0.040]	[-1.124]	[1.004]	[-0.115]
Firm ROA	-0.814	-1.060**	-2.241*	-2.381*
	[-1.644]	[-2.095]	[-1.886]	[-1.818]
Firm leverage	0.003	0.004	-0.028	0.020
	[0.239]	[0.231]	[-1.523]	[0.250]
GDP growth	0.892	0.924	2.556	3.368**
	[0.769]	[0.589]	[1.670]	[2.187]
GDP per capita	0.001	0.001	0.001	0.002**
	[0.542]	[0.705]	[0.491]	[2.644]
Constant	378.135***	485.416***	399.536**	484.367***
	[3.501]	[3.385]	[2.441]	[3.119]
Observations	5,044	3,825	2,973	2,699
Adj. R-squared	0.647	0.640	0.663	0.683
Fixed effects	Y	Y	Y	Y

Table 8. Borrower's fundamentals

The table reports coefficients and t-statistics [in brackets]. The dependent variable is *AISD* and all variables are defined in Table A1. Estimation method is OLS with standard errors clustered by firm *and* year. In specification (1), *Bound × Sovereign downgrade* is interacted with *Firm size*, i.e., the log of total firm assets. In specification (2), *Bound × Sovereign downgrade* is interacted with *Firm ROA*, i.e., the return on total firm assets. In specification (3), *Bound × Sovereign downgrade* is interacted with *Firm leverage*, i.e., the firm leverage. In specification (4), *Bound × Sovereign downgrade* is interacted with *Firm equity*, i.e., the log of firm equity capital. In specification (5), *Bound × Sovereign downgrade* is interacted with *Firm cash*, i.e., the log of firm cash holdings. In specification (6), *Bound × Sovereign downgrade* is interacted with *Firm retained earnings*, i.e., the log of firm retained earnings. All specifications include year, bank, lender's country, borrower's country, loan type and purpose fixed effects. The *, **, and *** marks denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Bound	13.374*	13.597*	13.399*	13.449*	15.165*	13.217*
	[2.017]	[2.014]	[2.036]	[2.031]	[1.916]	[1.948]
Sovereign downgrade	-12.227	-12.612	-11.652	-12.234	-18.394	-13.636
	[-0.967]	[-0.990]	[-0.930]	[-0.969]	[-1.324]	[-1.070]
Bound × Sovereign downgrade	59.575**	49.731**	30.704**	54.732**	60.486**	61.668**
	[2.603]	[2.633]	[2.161]	[2.568]	[2.297]	[2.260]
Bound × Sovereign downgrade × Firm size	-4.645**					
	[-2.101]					
Bound × Sovereign downgrade × Firm ROA		-1.864*				
		[-1.833]				
Bound × Sovereign downgrade × Firm leverage			1.259*			
			[1.827]			
Bound × Sovereign downgrade × Firm equity				-5.789*		
				[-1.966]		
Bound × Sovereign downgrade × Firm cash					-11.108*	
					[-1.771]	
Bound × Sovereign downgrade × Firm retained earnings						-1.139**
						[-2.210]
Observations	8,498	8,498	8,498	8,498	5,942	8,156
Adj. R-squared	0.803	0.803	0.804	0.804	0.820	0.798
Full set of controls	Y	Y	Y	Y	Y	Y
Fixed effects	Y	Y	Y	Y	Y	Y

Table 9. Borrower's country fundamentals

The table reports coefficients and t-statistics [in brackets]. The dependent variable is *AISD* and all variables are defined in Table A1. Estimation method is OLS with standard errors clustered by firm *and* year. In specification (1), *Bound* × *Sovereign downgrade* is interacted with *Stock market capitalization*, i.e., the total value of all listed shares in the borrower's country stock market (% of GDP). In specification (2), *Bound* × *Sovereign downgrade* is interacted with *Financial sector credit*, i.e., the domestic credit in the borrower's country provided by the financial sector (% of GDP). In specification (3), *Bound* × *Sovereign downgrade* is interacted with *Banking sector credit*, i.e., the domestic credit in the borrower's country provided by the banking sector (% of GDP). In specification (4), *Bound* × *Sovereign downgrade* is interacted with *Financial/Banking sector credit*, i.e., the ratio of *Financial sector credit* to *Banking sector credit*. In specification (5), *Bound* × *Sovereign downgrade* is interacted with *Exchange rate arrangement*, i.e., a categorical variable ranging from 1 to 5 reflecting the exchange rate regime in the borrower's country based on the exchange rate regime classification of Ilzetzki, Reinhart, and Rogoff (2019). All specifications include year, bank, firm, lender's country, loan type and purpose fixed effects. The *, **, and *** marks denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Bound	9.079	13.085*	12.224*	12.151	11.802*
	[1.352]	[1.838]	[1.768]	[1.712]	[1.779]
Sovereign downgrade	-23.125**	-15.510	-14.806	-16.248	-14.331
	[-2.071]	[-1.186]	[-1.153]	[-1.207]	[-1.113]
Bound × Sovereign downgrade	89.769**	59.982**	28.376**	59.415**	50.416**
	[2.096]	[2.570]	[2.825]	[2.581]	[2.147]
Bound × Sovereign downgrade × Stock market capitalization	-38.093*				
	[-1.804]				
Bound × Sovereign downgrade × Financial sector credit		-0.053**			
		[-2.196]			
Bound × Sovereign downgrade × Banking sector credit			0.516*		
			[1.967]		
Bound × Sovereign downgrade × Financial/Banking sector credit				-22.587*	
				[-1.868]	
Bound × Sovereign downgrade × Exchange rate arrangement					-24.285*
					[-1.843]
Observations	7,623	8,002	8,002	8,002	8,071
Adj. R-squared	0.824	0.806	0.807	0.807	0.807
Full set of controls	Y	Y	Y	Y	Y
Fixed effects	Y	Y	Y	Y	Y

Table 10. Lending relationships and subsidiary role

This table reports estimated coefficients and t-statistics [in brackets]. The dependent variable is *AISD* and all variables are defined in Table A1. Estimation method used is OLS with standard errors clustered by firm *and* year. In specification (1), *Bound* is interacted with *Relationship lending*, i.e., a binary variable equal to 1 for a prior lending relationship between the lender and the borrower during the previous 2-year period, and zero otherwise. In specification (2), *Bound* is interacted with *Relationship lending number*, i.e., the ratio of the number of prior loans between the lender and the borrower during the previous 2-year period to the total number of loans received by the borrower during the same period. In specification (3), *Bound* is interacted with *Relationship lending amount*, i.e., the ratio of the amount of prior loans between the lender and the borrower during the previous 2-year period to the total amount of loans received by the borrower during the same period. In specification (4), *Bound* is interacted with *Bank subsidiary*, i.e., a binary variable equal to one if the lender operates a subsidiary in the borrower's country, and zero otherwise. In specification (5), *Bound* is interacted with *Firm subsidiary*, i.e., a binary variable equal to one if the borrower operates a subsidiary in the lender's country, and zero otherwise. All specifications include year, bank, firm, lender's country, borrower's country, loan type and purpose fixed effects. The *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively

	(1)	(2)	(3)	(4)	(5)
Bound	13.456*	13.588*	13.577*	13.406**	13.824*
	[2.014]	[2.013]	[1.998]	[2.073]	[2.028]
Sovereign downgrade	-11.857	-12.508	-12.564	-15.081	-14.009
	[-0.937]	[-0.985]	[-0.970]	[-1.233]	[-1.046]
Bound × Sovereign downgrade	70.923**	65.786**	65.740**	65.283***	68.408***
	[2.536]	[2.705]	[2.682]	[2.876]	[2.818]
Bound × Sovereign downgrade × Relationship lending	-15.589*				
	[-1.944]				
Bound × Sovereign downgrade × Relationship lending number		-65.012*			
		[-1.792]			
Bound × Sovereign downgrade × Relationship lending amount			-61.040*		
			[-1.744]		
Bound × Sovereign downgrade × Bank subsidiary				-4.481**	
				[2.548]	
Bound × Sovereign downgrade × Firm subsidiary					-10.490*
					[-1.774]
Observations	8,495	8,495	8,404	6,340	7,532
Adj. R-squared	0.803	0.803	0.803	0.803	0.797
Full set of controls	Y	Y	Y	Y	Y
Fixed effects	Y	Y	Y	Y	Y

Table 11. Borrower's listing status and industry concentration

The table reports coefficients and t-statistics [in brackets]. The dependent variable is *AISD* and all variables are defined in Table A1. Estimation method is OLS with standard errors clustered by firm *and* year. Each specification includes the interaction of the bound indicator with different indicators reflecting the borrower's listing status and the borrower industry's concentration. In specification (1), *Bound* × *Sovereign downgrade* is interacted with *Cross-listed*, i.e., a binary variable equal to one if the borrower's common shares are listed on two or more stock exchanges, and zero otherwise. In specification (2), *Bound* × *Sovereign downgrade* is interacted with *Cross-listed in U.S.*,, i.e., a binary variable equal to one if the borrower's common shares are listed on two or more stock exchanges, where one of them is a U.S. stock exchange, and otherwise zero. In specification (3), *Bound* × *Sovereign downgrade* is interacted with *Low HHI*, i.e., a binary variable equal to one if the Herfindahl-Hirschmann index of the borrower's industry is in the bottom tercile of our sample, and zero otherwise. In specification (4), *Bound* × *Sovereign downgrade* is interacted with *Low Lerner index*, i.e., a binary variable equal to one if the Lerner index of the borrower's industry is in the bottom tercile of our sample, and zero otherwise. In specification (5), *Bound* × *Sovereign downgrade* is interacted with *Low top-5 concentration*, i.e., a binary variable equal to one if the sum of market shares of the largest five firms in the borrower's industry is in the bottom tercile of our sample, and zero otherwise. All specifications include year, bank, lender's country, borrower's country, loan type and purpose fixed effects. Specifications (2)-(5) additionally include firm fixed effects. The *, **, and *** marks denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Bound	13.491*	13.446*	13.698*	13.691*	13.570*
	[1.984]	[1.968]	[1.994]	[2.011]	[2.016]
Sovereign downgrade	-12.661	-12.689	-12.861	-12.640	-12.545
	[-0.992]	[-0.994]	[-1.020]	[-0.977]	[-0.985]
Bound × Sovereign downgrade	63.410**	63.616**	65.687**	60.521***	65.157**
	[2.649]	[2.668]	[2.721]	[2.959]	[2.389]
Bound × Sovereign downgrade × Cross-listed	-4.996**				
	[-2.157]				
Bound × Sovereign downgrade × Cross-listed in U.S.		-9.286**			
		[-2.254]			
Bound × Sovereign downgrade × Low HHI			-6.566**		
			[-2.353]		
Bound × Sovereign downgrade × Low Lerner index				-4.692**	
				[-2.284]	
Bound × Sovereign downgrade × Low top-5 concentration					-5.237**
					[-2.278]
Observations	8,485	8,485	8,498	8,498	8,498
Adj. R-squared	0.803	0.803	0.803	0.803	0.803
Full set of controls	Y	Y	Y	Y	Y
Fixed effects	Y	Y	Y	Y	Y

Table 12. The syndicate's structure

The table reports coefficients and t-statistics [in brackets]. The dependent variable is *AISD* and all variables are defined in Table A1. Estimation method is OLS with standard errors clustered by firm *and* year. Each specification includes the interaction of the bound indicator with different indicators reflecting the syndicate's structure. In specification (1), *Bound × Sovereign downgrade* is interacted with *Number of lenders*, i.e., the number of banks involved in the syndicated loan. In specification (2), *Bound × Sovereign downgrade* is interacted with *Number of leads*, i.e., the number of lead banks involved in the syndicated loan. In specification (3), *Bound × Sovereign downgrade* is interacted with *Bank share*, i.e., the bank's share of the loan facility. In specification (4), *Bound × Sovereign downgrade* is interacted with *Syndicate Herfindahl*, i.e., the Herfindahl index of the syndicate. All specifications include year, bank, firm, lender's country, borrower's country, loan type and purpose fixed effects. The *, **, and *** marks denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
Bound	13.496*	13.786*	13.621*	13.628*
	[2.020]	[2.007]	[2.013]	[2.011]
Sovereign downgrade	-11.990	-12.376	-12.740	-12.672
	[-0.958]	[-0.976]	[-1.004]	[-1.001]
Bound × Sovereign downgrade	73.973**	73.410**	67.886***	66.194***
	[2.131]	[2.390]	[3.146]	[3.188]
Bound × Sovereign downgrade × Number of lenders	1.596*			
	[1.789]			
Bound × Sovereign downgrade × Number of leads		1.865*		
		[1.800]		
Bound × Sovereign downgrade × Bank share			-0.480**	
			[-2.030]	
Bound × Sovereign downgrade × Syndicate Herfindahl				-0.003*
				[-1.988]
Observations	8,498	8,498	8,497	8,497
Adj. R-squared	0.803	0.803	0.803	0.803
Full set of controls	Y	Y	Y	Y
Fixed effects	Y	Y	Y	Y

Internet Appendix
Syndicated bank lending and rating downgrades: When do sovereign ceiling policies really matter?

Abstract

The first section includes the definitions of variables employed. The second section includes information on the construction of the sample. The third section reports several additional sensitivity tests.

Table A1. Variable definitions and sources

Variable	Description	Source
A. Dependent variables in main specifications		
AISD	All-in spread drawn, defined as the sum of the spread over LIBOR plus any facility fee.	DealScan
AISU	All-in spread undrawn, defined as the sum of the facility fee and the commitment fee.	DealScan
B. Main explanatory variables: Bounded firms		
Bound	A binary variable equal to one if the borrower's credit rating is equal to or above the borrower's country credit rating in the year before the loan facility's origination year, and zero otherwise. The variable *Bound (Bank)* is the equivalent variable for the lender's credit rating, and the variable *Bound (Bank & Firm)* is the equivalent variable for the lender's and the borrower's credit ratings.	S&P Credit Ratings
C. Explanatory variables: Sovereign downgrade		
Sovereign downgrade	A binary variable equal to one, if the sovereign's long-term foreign-currency credit rating is downgraded in the year before the loan facility's origination year, and zero otherwise. Sovereign downgrade lc is the equivalent variable for local-currency credit ratings.	S&P Credit Ratings
Short-term downgrade	A binary variable equal to one, if the sovereign's short-term foreign-currency credit rating is downgraded in the year before the loan facility's origination year, and zero otherwise.	S&P Credit Ratings
Outlook downgrade	A binary variable equal to one, if the outlook on the sovereign's long-term foreign-currency credit rating is downgraded in the year before the loan facility's origination year, and zero otherwise.	S&P Credit Ratings
D. Explanatory variables: Loan characteristics		
Loan amount	Log of the loan facility amount in USD.	DealScan
Maturity	Loan duration in months.	DealScan
Collateral	A binary variable equal to one if the loan is secured with collateral, and zero otherwise.	DealScan
Number of lenders	The number of banks involved in the syndicated loan.	DealScan
Number of leads	The number of lead banks involved in the syndicated loan.	DealScan
Performance provisions	A binary variable equal to one if the loan has performance pricing provisions, and zero otherwise.	DealScan
General covenants	The total number of covenants in the loan contract.	DealScan
Financial covenants	The number of financial covenants in the loan contract.	DealScan
Net covenants	The number of net covenants in the loan contract.	DealScan
Loan type	A series of binary variables indicating loan type (e.g., term loans, revolvers, etc.).	DealScan
Loan purpose	A series of binary variables indicating loan purpose (e.g., corporate purpose, debt repay, etc.).	DealScan
Bank share	The bank's share of the loan facility.	DealScan
Syndicate Herfindahl	The Herfindahl index of the syndicate (a measure of the concentration of holdings within a syndicate). The Herfindahl index is calculated using each syndicate member's share in the loan. It is the sum of the squared individual shares in the loan, and varies from zero to 10,000, with 10,000 being the Herfindahl when a lender holds 100% of the loan.	DealScan
Relationship lending	A binary variable equal to one for a prior loan facility between the lender and the borrower in the 2-year period before the loan facility's origination year, and zero otherwise.	DealScan
Relationship lending number	The ratio of the number of prior loan facilities between the lender and the borrower in the 2-year period before the loan facility's origination year to the total number of loans received by the borrower during the same period.	DealScan

Relationship lending amount	The ratio of the amount of prior loan facilities between the lender and the borrower in the 2-year period before the loan facility's origination year to the total amount of loans received by the borrower during the same period.	DealScan

E. Explanatory variables: Lender characteristics

Bank size	The log of total bank assets.	Compustat
Bank ROA	The return on total bank assets.	Compustat
Bank NPLs	The ratio of non-performing loans to total bank loans.	Compustat
Bank subsidiary	Abinary variable equal to one if the lender operates a subsidiary in the borrower's country, and zero otherwise.	DealScan

F. *Explanatory variables: Borrower characteristics*

Firm size	The log of total firm assets.	Compustat
Firm ROA	The return on total firm assets.	Compustat
Firm leverage	The firm leverage.	Compustat
Firm equity	The log of firm equity capital.	Compustat
Firm cash	The log of firm cash holdings.	Compustat
Firm retained earnings	The log of firm retained earnings.	Compustat
Firm subsidiary	A binary variable equal to one if the borrower operates a subsidiary in the lender's country, and zero otherwise.	DealScan
Cross-listed	A binary variable equal to one if the firm's common shares are listed on one or more foreign stock exchanges in addition to the firm's domestic stock exchange, and zero otherwise. The variable *Cross-listed in U.S.* is the equivalent variable if the firm's common shares are listed on a U.S. stock exchange (in addition to its domestic stock exchange).	Compustat; Firm disclosures

G. Explanatory variables: Borrower's industry characteristics

Low HHI	A binary variable equal to one if the Herfindahl-Hirschmann index of the borrower's industry is in the bottom tercile of our sample, and zero otherwise.	DealScan; Compustat
Low Lerner index	A binary variable equal to one if the Lerner index of the borrower's industry is in the bottom tercile of our sample, and zero otherwise.	DealScan; Compustat
Low top-5 concentration	A binary variable equal to one if the sum of market shares of the largest five firms in the borrower's industry is in the bottom tercile of our sample, and zero otherwise.	DealScan; Compustat

H. Explanatory variables: Borrower's country characteristics

GDP growth	The difference in annual GDP growth rate (%) between the lender's and the borrower's countries.	WDI
GDP per capita	The difference in annual GDP per capita in constant prices between the lender's and the borrower's countries.	WDI
Stock market capitalization	The total value (in USD) of all listed shares in the borrower's country stock market as a percentage of GDP.	WDI
Financial sector credit	The domestic credit in the borrower's country provided by the financial sector as a percentage of GDP.	WDI
Banking sector credit	The domestic credit in the borrower's country provided by the banking sector as a percentage of GDP.	WDI
Exchange rate arrangement	A categorical variable ranging from 1 to 5 reflecting the exchange rate arrangement in the borrower's country. The variable is based on the exchange rate regime classification of Ilzetzki, Reinhart, and Rogoff (2019), with lower values reflecting less flexible arrangements (e.g., a value of 1 includes pre announced pegs, currency board arrangements, pre announced horizontal bands narrower than or equal to +/- 2%, de facto pegs) and higher values reflecting more flexible arrangements (e.g., a value of 4 includes freely floating arrangements, and a value of 5 includes freely floating arrangements).	Ilzetzki, Reinhart and Rogoff (2019)

Table A2. Sovereign downgrades and bounded firms affected

The table presents the sovereign downgrade events for the borrower countries in our sample and the bounded firms affected.

Country	Year of Downgrade	Bounded firms affected
Mexico	1995	AXA SA de CV
Turkey	1996	Turk Ekonomi Bankasi AS [TEB]
Korea (South)	1997	Hana Bank
Malaysia	1997	Tenaga Nasional Bhd
Malaysia	1997	Telekom Malaysia Bhd
Hong Kong	1998	Citibank NA Hong Kong Branch
Hong Kong	1998	Bank of America Asia
Malaysia	1998	Public Bank Bhd
Malaysia	1998	Malayan Banking Bhd
Argentina	2000	Transportadora de Gas del Sur SA
Turkey	2001	Turkiye Garanti Bankasi AS
Turkey	2001	Finansbank AS [Turkey]
Japan	2002	Tokyo Electric Power Co Inc
Japan	2002	Ajinomoto Co Inc
Japan	2002	Abbott Japan Co Ltd
Philippines	2003	Globe Telecom Inc
Greece	2004	Coca-Cola Hellenic Bottling Co SA (CCHBC)
Philippines	2005	San Miguel Corp
Italy	2006	Enel SpA
Argentina	2008	Pan American Energy
Russia	2008	Severneftegazprom OAO
Russia	2008	Sakhalin II Project
Mexico	2009	PMI Trading Ltd
Mexico	2009	Grupo Bimbo
Mexico	2009	Petroleos Mexicanos (Pemex)
Greece	2010	OTE Hellenic Telecommunications Organisation SA
Ireland	2010	Accenture
Portugal	2010	Energias de Portugal SA [EDP]
Greece	2011	Titan Cement Co SA
Greece	2011	Coca-Cola Hellenic Bottling Co SA (CCHBC)
Italy	2011	SNAM Rete Gas SpA
USA	2011	Momentive Performance Materials Inc
USA	2011	WW Grainger Inc
USA	2011	NetJets Inc
Italy	2012	SNAM Rete Gas SpA
Italy	2012	Enel Rete Gas SpA
Portugal	2012	Energias de Portugal SA [EDP]
Spain	2012	Gas Natural SDG SA
Spain	2012	Amadeus IT Group SA
Spain	2012	Iberdrola SA
Spain	2012	Enagas SA
Argentina	2013	Pan American Energy
Italy	2013	Enel SpA
Italy	2013	Luxottica Group SpA
Italy	2013	Terna SpA [Trasmissione Elettricita Rete Nazionale]
Ukraine	2013	Ferrexpo Group
Argentina	2014	Pan American Energy
Brazil	2014	Vale SA
Brazil	2014	Gerdau
Ghana	2014	Kosmos Energy Ghana HC
Italy	2014	Enel SpA
Italy	2014	Exor SpA
Italy	2014	Terna SpA [Trasmissione Elettricita Rete Nazionale]
Russia	2014	Uralkali JSC [Uralkaly OAO]
Russia	2014	Gazprom OAO

South Africa	2014	Investec Bank Ltd [South Africa]
Bahrain	2015	Bahrain Steel B.S.C.C. EC
Russia	2015	Uralkali JSC [Uralkaly OAO]
Mexico	1995	AXA SA de CV
Turkey	1996	Turk Ekonomi Bankasi AS [TEB]
Korea (South)	1997	Hana Bank
Malaysia	1997	Tenaga Nasional Bhd
Malaysia	1997	Telekom Malaysia Bhd
Hong Kong	1998	Citibank NA Hong Kong Branch
Hong Kong	1998	Bank of America Asia
Malaysia	1998	Public Bank Bhd
Malaysia	1998	Malayan Banking Bhd
Argentina	2000	Transportadora de Gas del Sur SA
Turkey	2001	Turkiye Garanti Bankasi AS
Turkey	2001	Finansbank AS [Turkey]
Japan	2002	Tokyo Electric Power Co Inc
Japan	2002	Ajinomoto Co Inc
Japan	2002	Abbott Japan Co Ltd
Philippines	2003	Globe Telecom Inc
Greece	2004	Coca-Cola Hellenic Bottling Co SA (CCHBC)
Philippines	2005	San Miguel Corp
Italy	2006	Enel SpA
Argentina	2008	Pan American Energy
Russia	2008	Severneftegazprom OAO
Russia	2008	Sakhalin II Project
Mexico	2009	PMI Trading Ltd
Mexico	2009	Grupo Bimbo
Mexico	2009	Petroleos Mexicanos (Pemex)
Greece	2010	OTE Hellenic Telecommunications Organisation SA
Ireland	2010	Accenture
Portugal	2010	Energias de Portugal SA [EDP]
Greece	2011	Titan Cement Co SA
Greece	2011	Coca-Cola Hellenic Bottling Co SA (CCHBC)
Italy	2011	SNAM Rete Gas SpA
USA	2011	Momentive Performance Materials Inc
USA	2011	WW Grainger Inc
USA	2011	NetJets Inc
Italy	2012	SNAM Rete Gas SpA
Italy	2012	Enel Rete Gas SpA
Portugal	2012	Energias de Portugal SA [EDP]
Spain	2012	Gas Natural SDG SA
Spain	2012	Amadeus IT Group SA
Spain	2012	Iberdrola SA
Spain	2012	Enagas SA
Argentina	2013	Pan American Energy
Italy	2013	Enel SpA
Italy	2013	Luxottica Group SpA
Italy	2013	Terna SpA [Trasmissione Elettricita Rete Nazionale]
Ukraine	2013	Ferrexpo Group
Argentina	2014	Pan American Energy
Brazil	2014	Vale SA
Brazil	2014	Gerdau
Ghana	2014	Kosmos Energy Ghana HC
Italy	2014	Enel SpA
Italy	2014	Exor SpA
Italy	2014	Terna SpA [Trasmissione Elettricita Rete Nazionale]
Russia	2014	Uralkali JSC [Uralkaly OAO]
Russia	2014	Gazprom OAO

	South Africa	2014	Investec Bank Ltd [South Africa]
	Bahrain	2015	Bahrain Steel B.S.C.C. EC
	Russia	2015	Uralkali JSC [Uralkaly OAO]
Total	19	21	51

Table A3. Different loan controls

The table reports coefficients and t-statistics [in brackets]. The dependent variable is *AISD* and all variables are defined in Table A1. Estimation method is OLS with standard errors clustered by firm *and* year. Different specifications include different loan controls to show that the estimates on the term *Bound* × *Sovereign downgrade* are not overly sensitive to the loan controls used. All specifications include year, bank, firm, lender's country, borrower's country, loan type and purpose fixed effects. The *, **, and *** marks denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
Bound	13.875*	13.914*	13.288*	14.095**
	[2.002]	[2.001]	[1.956]	[2.075]
Sovereign downgrade	-11.773	-11.776	-11.098	-13.776
	[-0.948]	[-0.896]	[-0.859]	[-1.142]
Bound × Sovereign downgrade	60.482**	60.230**	62.541**	63.499**
	[2.588]	[2.524]	[2.652]	[2.747]
Loan amount			-2.164	-2.683
			[-0.943]	[-1.138]
Maturity			0.276**	0.266**
			[2.715]	[2.685]
Collateral		7.305		6.405
		[1.361]		[1.201]
Number of lenders		0.365		0.420
		[1.680]		[1.687]
Performance provisions		-4.014	-2.181	
		[-0.722]	[-0.380]	
General covenants		13.090*	13.998*	
		[1.726]	[1.775]	
Bank size	-1.770	-1.966	-1.136	-1.033
	[-0.538]	[-0.594]	[-0.329]	[-0.306]
Bank ROA	-1.360	-1.560	-1.567	-1.420
	[-0.652]	[-0.734]	[-0.768]	[-0.719]
Bank NPLs	-0.894	-0.983	-1.216	-0.987
	[-0.590]	[-0.654]	[-0.808]	[-0.647]
Firm size	1.358*	1.562**	1.328*	1.381*
	[1.794]	[2.159]	[1.773]	[2.046]
Firm ROA	-0.934	-1.007	-0.993	-1.027
	[-1.428]	[-1.638]	[-1.600]	[-1.539]
Firm leverage	0.074**	0.072**	0.070**	0.068**
	[2.724]	[2.765]	[2.621]	[2.720]
GDP growth	1.419	1.302	1.126	1.337
	[1.622]	[1.434]	[1.164]	[1.527]
GDP per capita	-0.001	-0.001	-0.001	-0.001
	[-0.745]	[-0.735]	[-0.602]	[-0.648]
Constant	108.289***	99.175**	128.323*	131.528*
	[2.945]	[2.687]	[1.866]	[1.935]
Observations	8,498	8,498	8,498	8,498
Adj. R-squared	0.798	0.801	0.802	0.801
Fixed effects	Y	Y	Y	Y

Table A4. Results from extended sample

The table reports coefficients and t-statistics [in brackets]. The dependent variable is *AISD* and all variables are defined in Table A1. Estimation method is OLS with standard errors clustered by firm *and* year. Each specification includes a different set of fixed effects, as given in the lower part of the table. All specifications include estimations from an extended sample where the group of non-bound borrowers includes borrowers with any credit rating below the credit rating of their sovereign. The *, **, and *** marks denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Bound	9.820*	9.797*	11.306**	11.157*	11.377*	14.481**
	[1.772]	[1.766]	[2.116]	[2.032]	[2.065]	[2.618]
Sovereign downgrade	-1.730	-1.726	-1.385	-1.573	2.998	4.859
	[-0.194]	[-0.193]	[-0.170]	[-0.191]	[0.408]	[0.679]
Bound × Sovereign downgrade	59.918***	59.926***	58.421***	57.465***	45.796**	47.048**
	[3.920]	[3.918]	[4.297]	[3.821]	[2.624]	[2.755]
Loan amount	-2.876**	-2.874**	-7.103***	-7.040***	-6.208***	-6.280***
	[-2.087]	[-2.085]	[-6.767]	[-6.403]	[-5.884]	[-5.958]
Maturity	0.117**	0.117**	0.183*	0.176*	0.192*	0.199*
	[2.267]	[2.269]	[1.817]	[1.720]	[1.835]	[1.906]
Collateral	33.517***	33.495***	28.506***	28.975***	28.380***	28.315***
	[6.387]	[6.381]	[5.375]	[5.349]	[4.856]	[4.876]
Number of lenders	-0.715***	-0.715***	-0.317**	-0.309**	-0.309**	-0.338**
	[-4.906]	[-4.904]	[-2.636]	[-2.512]	[-2.493]	[-2.682]
Performance provisions	-13.651***	-13.653***	-10.361***	-10.722***	-11.879***	-12.028***
	[-4.163]	[-4.162]	[-4.090]	[-4.160]	[-4.447]	[-4.494]
General covenants	3.214**	3.211**	4.215***	4.225***	4.204***	4.220***
	[2.248]	[2.246]	[3.534]	[3.478]	[3.062]	[3.088]
Bank size	-0.428	-0.448	-1.345	-0.760		
	[-0.190]	[-0.199]	[-0.637]	[-0.359]		
Bank ROA	-2.709*	-2.725*	-2.724**	-2.662*		
	[-2.025]	[-2.035]	[-2.055]	[-2.027]		
Bank NPLs	1.192	1.208	1.764	1.782		
	[0.873]	[0.886]	[1.374]	[1.355]		
Firm size	-0.381	-0.377	0.518	0.674	1.081	0.885
	[-0.269]	[-0.266]	[0.378]	[0.502]	[0.833]	[0.693]
Firm ROA	-2.073***	-2.072***	-2.057***	-2.064***	-2.046***	-2.052***
	[-9.235]	[-9.237]	[-9.707]	[-9.466]	[-8.918]	[-8.881]
Firm leverage	-0.000*	-0.000*	-0.000	-0.000*	-0.000*	-0.000**
	[-1.714]	[-1.713]	[-1.678]	[-1.707]	[-1.919]	[-2.127]
GDP growth	1.013	1.007	0.751	0.755	1.078	
	[1.445]	[1.431]	[1.028]	[1.030]	[1.029]	
GDP per capita	0.001*	0.001*	0.002***	0.002**	0.002	
	[1.762]	[1.782]	[2.910]	[2.729]	[1.513]	
Constant	240.653***	240.716***	318.757***	307.565***	273.745***	280.986***
	[5.691]	[5.688]	[8.860]	[8.800]	[12.705]	[12.825]
Observations	65,019	65,019	65,013	62,788	57,217	57,117
Adj. R-squared	0.730	0.729	0.758	0.759	0.777	0.775
Year effects	Y	Y	Y	Y	N	N
Bank effects	Y	Y	Y	Y	N	N
Firm effects	Y	Y	Y	Y	Y	Y
Lender's country effects	N	Y	Y	Y	Y	N
Borrower's country effects	N	Y	Y	Y	Y	Y
Loan type and purpose effects	N	N	Y	Y	Y	Y
Industry effects	N	N	N	Y	Y	Y
Bank × year effects	N	N	N	N	Y	Y
Lender's country × year effects	N	N	N	N	N	Y
Country-pair effects	N	N	N	N	N	Y

Table A5. Other loan characteristics

The table reports coefficients and t-statistics [in brackets]. The dependent variable is denoted in the second line of the table and all variables are defined in Table A1. Estimation method is OLS with standard errors clustered by firm *and* year. All specifications include year, bank, firm, lender's country, borrower's country, loan type and purpose fixed effects. The *, **, and *** marks denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)		(3)	(4)	(5)	(6)
	AISU	(2)	Maturity	Collateral	Performance	General
		Loan amount			provisions	covenants
Bound	0.033	-0.065	-0.182	-0.028	-0.038	0.021
	[0.030]	[-0.917]	[-0.055]	[-0.715]	[-0.987]	[0.567]
Sovereign downgrade	-1.657	-0.281*	0.428	-0.034	0.010	-0.085
	[-0.482]	[-1.806]	[0.152]	[-0.484]	[0.103]	[-0.536]
Bound × Sovereign downgrade	6.669	0.184	-10.952*	0.146	0.051	0.014
	[1.421]	[0.918]	[-2.048]	[1.562]	[0.464]	[0.107]
AISD	0.096***	-0.001	0.034**	0.000	-0.000	0.001
	[3.514]	[-1.290]	[2.680]	[1.181]	[-0.717]	[1.491]
Loan amount	0.446		0.225	0.002	0.007	0.016**
	[1.423]		[0.350]	[0.342]	[1.096]	[2.092]
Maturity	0.017	0.000		0.001	0.000	0.000
	[0.643]	[0.330]		[1.356]	[0.536]	[0.008]
Collateral	-3.142	0.017	2.955		0.010	-0.009
	[-0.825]	[0.340]	[1.212]		[0.271]	[-0.353]
Number of lenders	0.134*	0.015***	0.049	0.001	0.004***	0.003**
	[2.032]	[3.571]	[0.588]	[0.351]	[2.866]	[2.205]
Performance provisions	-1.980**	0.073	1.186	0.014		0.134**
	[-2.084]	[1.051]	[0.547]	[0.267]		[2.667]
General covenants	2.167**	0.096***	0.016	-0.007	0.078*	
	[2.395]	[2.960]	[0.009]	[-0.332]	[1.911]	
Bank size	-0.568	0.055	-2.513	0.033*	0.031	0.013
	[-0.832]	[1.012]	[-1.194]	[1.761]	[1.367]	[0.530]
Bank ROA	-0.130	0.051	0.528	0.014	0.017	0.013
	[-0.344]	[1.300]	[0.431]	[0.754]	[0.981]	[1.595]
Bank NPLs	0.228	-0.012	0.533	-0.000	-0.002	0.013
	[0.520]	[-0.629]	[0.781]	[-0.039]	[-0.302]	[1.486]
Firm size	-0.293	0.021*	0.564**	-0.035***	-0.001	-0.007
	[-0.591]	[2.022]	[2.055]	[-3.697]	[-0.436]	[-1.679]
Firm ROA	0.105	-0.007	0.106	0.008**	0.001	0.002
	[1.151]	[-0.800]	[0.505]	[2.168]	[0.219]	[0.421]
Firm leverage	-0.013***	-0.000	0.009	-0.000	-0.000	-0.000
	[-4.018]	[-1.654]	[1.508]	[-1.063]	[-1.094]	[-0.238]
Firm tangibility	0.592**	-0.009	0.332	-0.003	0.001	0.012
	[2.198]	[-0.821]	[1.083]	[-0.935]	[0.299]	[1.612]
GDP growth	0.000	0.000	-0.000	-0.000	-0.000*	-0.000
	[1.206]	[1.276]	[-0.883]	[-1.181]	[-1.705]	[-0.866]
GDP per capita	5.761	18.832***	63.320	0.065	-0.338	-0.329
	[0.421]	[23.941]	[1.487]	[0.180]	[-1.147]	[-0.805]
Constant	2,478	8,498	8,498	8,498	8,498	8,498
	0.950	0.796	0.790	0.597	0.593	0.663
Observations	0.033	-0.065	-0.182	-0.028	-0.038	0.021
Adj. R-squared	[0.030]	[-0.917]	[-0.055]	[-0.715]	[-0.987]	[0.567]
Fixed effects	Y	Y	Y	Y	Y	Y

Table A6. Different clustering of standard errors

The table reports coefficients and t-statistics [in brackets]. The dependent variable is *AISD* and all variables are defined in Table 1. Estimation method is OLS. The lower part of the table denotes the type of standard error clustering (C refers to borrower's country, F refers to firm, L refers to loan, and Y refers to year). All specifications include year, bank, firm, lender's country, borrower's country, loan type and purpose fixed effects. The *, **, and *** marks denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Bound	13.628**	13.628**	13.628**	13.628**	13.628**
	[2.226]	[2.346]	[2.234]	[2.611]	[2.234]
Sovereign downgrade	-12.546	-12.546	-12.546	-12.546	-12.546
	[-1.395]	[-0.839]	[-0.986]	[-0.838]	[-0.986]
Bound × Sovereign downgrade	62.976***	62.976***	62.976***	62.976***	62.976***
	[3.228]	[2.631]	[2.872]	[2.695]	[2.872]
Loan amount	-2.855	-2.855	-2.855	-2.855	-2.855
	[-1.465]	[-1.402]	[-1.214]	[-1.295]	[-1.214]
Maturity	0.265**	0.265***	0.265***	0.265***	0.265***
	[2.527]	[3.037]	[3.040]	[3.537]	[3.040]
Collateral	6.495	6.495	6.495*	6.495**	6.495*
	[1.179]	[1.247]	[1.977]	[2.161]	[1.977]
Number of lenders	0.390**	0.390*	0.390**	0.390**	0.390**
	[2.203]	[1.740]	[2.082]	[2.235]	[2.082]
Performance provisions	-4.078	-4.078	-4.078	-4.078	-4.078
	[-1.114]	[-0.572]	[-0.820]	[-0.763]	[-0.820]
General covenants	13.212*	13.212**	13.212*	13.212**	13.212*
	[1.910]	[1.965]	[1.742]	[2.145]	[1.742]
Bank size	-1.128	-1.128	-1.128	-1.128	-1.128
	[-0.347]	[-0.419]	[-0.322]	[-0.383]	[-0.322]
Bank ROA	-1.538	-1.538	-1.538	-1.538	-1.538
	[-0.817]	[-0.765]	[-0.653]	[-0.804]	[-0.653]
Bank NPLs	-1.146	-1.146	-1.146	-1.146	-1.146
	[-0.941]	[-0.770]	[-0.724]	[-0.832]	[-0.724]
Firm size	1.456**	1.456**	1.456**	1.456**	1.456**
	[2.157]	[2.155]	[2.231]	[2.537]	[2.231]
Firm ROA	-1.044**	-1.044	-1.044*	-1.044*	-1.044*
	[-2.228]	[-1.516]	[-1.822]	[-1.715]	[-1.822]
Firm leverage	0.068***	0.068***	0.068**	0.068***	0.068**
	[2.927]	[2.731]	[2.540]	[2.680]	[2.540]
GDP growth	1.176	1.176	1.176	1.176**	1.176
	[1.324]	[1.430]	[1.654]	[2.403]	[1.654]
GDP per capita	-0.001	-0.001	-0.001	-0.001	-0.001
	[-0.709]	[-0.747]	[-0.719]	[-0.862]	[-0.719]
Constant	134.071**	134.071**	134.071*	134.071*	134.071*
	[2.156]	[2.379]	[1.816]	[1.968]	[1.816]
Observations	8,498	8,498	8,498	8,498	8,498
Adj. R-squared	0.804	0.803	0.803	0.803	0.803
Fixed effects	Y	Y	Y	Y	Y
Clustering	L&Y	L&F	C&Y	C&F	C&F&Y

Table A7. Weighted least squares

The table reports coefficients and t-statistics [in brackets]. The dependent variable is *AISD* and all variables are defined in Table A1. Estimation method is weighted least squares with standard errors clustered by firm *and* year. In specification (1), we weight by the number of loans between the lender's country and the borrower's country to the total number of loans in our sample. In specification (2), we employ the weight of specification (1) at the yearly frequency. In specification (3), we weight by the number of loans between the lender and the borrower's country to the total number of loans in our sample. In specification (4), we employ the weight of specification (3) at the yearly frequency. In specification (5), we weight by the number of loans between the lender and the borrower to the total number of loans in our sample. In specification (6), we employ the weight of specification (5) at the yearly frequency. All specifications include year, bank, firm, lender's country, borrower's country, loan type and purpose fixed effects. The *, **, and *** marks denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Bound	13.601*	14.168**	13.676*	13.790*	13.623*	13.522*
	[2.004]	[2.111]	[2.021]	[2.031]	[2.009]	[1.992]
Sovereign downgrade	-12.552	-11.330	-12.549	-12.163	-12.552	-12.547
	[-0.983]	[-0.881]	[-0.984]	[-0.950]	[-0.986]	[-0.985]
Bound × Sovereign downgrade	62.997**	61.640**	62.984**	62.716**	62.981**	62.935**
	[2.673]	[2.607]	[2.676]	[2.656]	[2.676]	[2.672]
Loan amount	-2.846	-2.922	-2.866	-2.933	-2.839	-2.744
	[-1.205]	[-1.237]	[-1.213]	[-1.236]	[-1.185]	[-1.155]
Maturity	0.264**	0.269**	0.265**	0.266**	0.265**	0.266**
	[2.695]	[2.707]	[2.712]	[2.715]	[2.727]	[2.728]
Collateral	6.503	6.320	6.471	6.508	6.499	6.462
	[1.248]	[1.211]	[1.245]	[1.253]	[1.242]	[1.241]
Number of lenders	0.390	0.394	0.390	0.388	0.391	0.391
	[1.646]	[1.680]	[1.643]	[1.646]	[1.642]	[1.640]
Performance provisions	-4.033	-4.271	-4.135	-4.156	-4.093	-4.230
	[-0.723]	[-0.780]	[-0.747]	[-0.751]	[-0.731]	[-0.757]
General covenants	13.238*	13.061	13.204*	13.309*	13.214*	13.197*
	[1.711]	[1.686]	[1.708]	[1.727]	[1.711]	[1.709]
Bank size	-1.128	-1.247	-1.051	-0.889	-1.146	-1.212
	[-0.331]	[-0.367]	[-0.308]	[-0.262]	[-0.334]	[-0.355]
Bank ROA	-1.607	-0.886	-1.319	-1.174	-1.552	-1.586
	[-0.781]	[-0.435]	[-0.629]	[-0.578]	[-0.769]	[-0.781]
Bank NPLs	-1.156	-0.997	-1.149	-1.116	-1.143	-1.181
	[-0.765]	[-0.663]	[-0.757]	[-0.736]	[-0.752]	[-0.784]
Firm size	1.460**	1.339*	1.453**	1.417**	1.459**	1.466**
	[2.103]	[1.951]	[2.105]	[2.077]	[2.123]	[2.131]
Firm ROA	-1.050	-1.045	-1.033	-1.036	-1.045	-1.047
	[-1.668]	[-1.677]	[-1.652]	[-1.659]	[-1.656]	[-1.670]
Firm leverage	0.068**	0.066**	0.068**	0.067**	0.068**	0.068**
	[2.708]	[2.658]	[2.699]	[2.690]	[2.693]	[2.700]
GDP growth	1.178	1.176	1.179	1.184	1.176	1.177
	[1.243]	[1.245]	[1.247]	[1.256]	[1.231]	[1.240]
GDP per capita	-0.001	-0.000	-0.001	-0.000	-0.001	-0.001
	[-0.627]	[-0.538]	[-0.617]	[-0.564]	[-0.632]	[-0.633]
Constant	133.448*	140.201**	133.738*	133.163*	133.809*	132.436*
	[1.955]	[2.055]	[1.952]	[1.951]	[1.951]	[1.939]
Observations	8,498	8,498	8,498	8,498	8,498	8,498
Adj. R-squared	0.803	0.803	0.803	0.803	0.803	0.803
Fixed effects	Y	Y	Y	Y	Y	Y

Table A8. Heckman sample-selection model

The table reports coefficients and t-statistics [in brackets] from Heckman's (1979) sample-selection model. The dependent variable is in the second line of each panel and all variables are defined in Table A1. Estimation method in Panel A is maximum likelihood and in Panel B is OLS with standard errors clustered by firm *and* year. Panel A reports the estimates from the first-stage probit model to estimate the determinants of the firm's loan-taking decision. Panel B reports the estimates from the second-stage OLS regression for the effect of sovereign ceiling on loan spreads. Each of the specification in Panel B includes the inverse mills ratio (*Lambda*) from the corresponding specification in Panel A. All specifications in Panel A include year, bank firm, lender's country and borrower's country dummies. All specifications in Panel B include year, bank, firm, lender's country, borrower's country, loan type and purpose fixed effects. The *, **, and *** marks denote statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: The loan-taking decision by the firm

	(1)	(2)	(3)
	Loan deal	Loan deal	Loan deal
Firm size	0.047***	-0.067***	0.035*
	[8.416]	[-3.763]	[1.778]
Firm ROA	0.019***	0.014***	0.019***
	[8.180]	[5.484]	[7.439]
Firm leverage	-0.000***	-0.000***	-0.001***
	[-8.337]	[-4.665]	[-10.280]
Firm equity		0.117***	0.020
		[6.613]	[1.026]
Firm debt			0.012***
			[10.489]
Loan amount	0.066***	0.049***	0.020**
	[7.758]	[5.439]	[2.217]
Maturity	-0.001***	-0.001***	-0.002***
	[-2.711]	[-4.471]	[-6.135]
Collateral	0.864***	0.924***	0.877***
	[19.426]	[21.012]	[19.736]
Number of lenders	0.057***	0.064***	0.058***
	[36.900]	[39.571]	[37.606]
Performance provisions	0.909***	0.927***	0.947***
	[15.568]	[15.892]	[15.986]
General covenants	0.176***	0.155***	0.174***
	[5.137]	[4.522]	[4.970]
Bank size	0.039***	0.004	0.011
	[3.321]	[0.362]	[0.968]
Bank ROA	0.105***	0.063**	0.075**
	[3.565]	[2.164]	[2.538]
Bank NPLs	0.008	0.003	-0.000
	[0.475]	[0.182]	[-0.025]
Bank loans	-7.289***		
	[-15.447]		
Firm loans		-7.151***	
		[-10.795]	
Bank-firm loans			-2.843***
			[-12.627]
Constant	60.045***	39.827***	47.437***
	[11.033]	[7.446]	[8.873]
Observations	16,321	16,321	16,321

Panel B: The effect of Bound × Sovereign downgrade on loan spreads

	(1) AISD	(2) AISD	(3) AISD
Bound	13.603*	13.608*	13.720*
	[2.006]	[2.002]	[2.014]
Sovereign downgrade	-12.547	-12.560	-12.477
	[-0.982]	[-0.983]	[-0.983]
Bound × Sovereign downgrade	63.096**	63.020**	62.885**
	[2.688]	[2.695]	[2.690]
Loan amount	-3.068	-2.905	-2.625
	[-1.384]	[-1.304]	[-1.153]
Maturity	0.268**	0.266**	0.255**
	[2.737]	[2.685]	[2.501]
Collateral	5.512	6.221	8.559*
	[1.242]	[1.347]	[1.830]
Number of lenders	0.317	0.370	0.546
	[0.981]	[1.017]	[1.612]
Performance provisions	-5.599	-4.450	-0.948
	[-0.842]	[-0.653]	[-0.143]
General covenants	12.864	13.129	13.876*
	[1.621]	[1.662]	[1.754]
Bank size	-1.172	-1.130	-1.089
	[-0.347]	[-0.332]	[-0.323]
Bank ROA	-1.776	-1.578	-1.226
	[-0.928]	[-0.839]	[-0.635]
Bank NPLs	-1.181	-1.144	-1.141
	[-0.739]	[-0.751]	[-0.732]
Firm size	1.436*	1.450*	1.513**
	[2.033]	[2.042]	[2.110]
Firm ROA	-1.096	-1.055	-0.949
	[-1.641]	[-1.597]	[-1.448]
Firm leverage	0.069***	0.068***	0.066**
	[2.858]	[2.830]	[2.717]
GDP growth	1.182	1.177	1.169
	[1.238]	[1.236]	[1.251]
GDP per capita	-0.001	-0.001	-0.001
	[-0.622]	[-0.627]	[-0.625]
Lambda	-4.510	-1.147	9.218
	[-0.409]	[-0.094]	[0.834]
Constant	143.504**	136.256**	119.596*
	[2.293]	[2.165]	[1.941]
Observations	8,498	8,498	8,498
Adj. R-squared	0.803	0.803	0.803

Table A9. Different macro-controls

This table reports coefficients and t-statistics [in brackets]. The dependent variable is *AISD* and all variables are defined in Table A1. The estimation method is OLS with standard errors clustered by firm *and* year. Each specification includes a different set of macro-level controls. All specifications include year, bank, firm, lender's country, borrower's country, loan type and purpose fixed effects. The *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Bound	6.692	13.219*	13.251	12.032*	13.730*
	[0.815]	[1.867]	[1.522]	[1.762]	[1.966]
Sovereign downgrade	-17.210	-16.813	-28.815	-20.810	-12.502
	[-1.192]	[-1.308]	[-1.695]	[-1.642]	[-0.978]
Bound × Sovereign downgrade	55.414**	65.963**	69.895**	64.885***	61.908**
	[2.393]	[2.422]	[2.528]	[2.931]	[2.605]
Loan amount	-2.716	-1.865	-3.446	-2.533	-2.791
	[-1.108]	[-0.822]	[-1.522]	[-1.027]	[-1.211]
Maturity	0.072	0.239**	0.203*	0.271**	0.264***
	[0.494]	[2.367]	[1.815]	[2.425]	[2.782]
Collateral	9.346	4.712	9.359	7.360	6.685
	[1.367]	[0.839]	[1.091]	[1.369]	[1.294]
Number of lenders	0.278	0.348	0.429**	0.388	0.386
	[0.926]	[1.522]	[2.303]	[1.536]	[1.589]
Performance provisions	-7.378	-3.813	-7.164	-4.214	-4.235
	[-0.944]	[-0.648]	[-1.082]	[-0.765]	[-0.744]
General covenants	14.476	12.934	6.889	13.534	13.464*
	[1.655]	[1.577]	[1.082]	[1.640]	[1.743]
Bank size	4.461	-2.221	-0.456	-0.055	-1.391
	[1.174]	[-0.625]	[-0.111]	[-0.016]	[-0.407]
Bank ROA	0.347	-2.778*	-4.376*	-2.092	-1.659
	[0.111]	[-1.782]	[-1.719]	[-1.173]	[-0.854]
Bank NPLs	-0.557	-0.284	0.244	-0.589	-1.064
	[-0.300]	[-0.193]	[0.112]	[-0.373]	[-0.689]
Firm size	2.706	0.293	0.136	1.087	1.479**
	[1.256]	[0.313]	[0.097]	[1.516]	[2.145]
Firm ROA	-1.092	-1.047	-1.243**	-0.990	-1.050
	[-1.622]	[-1.557]	[-2.192]	[-1.468]	[-1.663]
Firm leverage	0.090**	0.075**	0.075**	0.073***	0.074***
	[2.603]	[2.805]	[2.119]	[2.900]	[2.817]
GDP growth	1.644	0.968	2.143**	0.793	1.161
	[1.375]	[0.989]	[2.223]	[0.903]	[1.217]
GDP per capita	-0.000	0.001	-0.001	0.000	-0.001
	[-0.269]	[0.870]	[-0.545]	[0.293]	[-0.615]
Debt-to-GDP	-0.307				
	[-1.049]				
Inflation		-0.826*			
		[-1.898]			
Trade balance			-0.000		
			[-0.715]		
Real rate			0.991		
			[0.947]		
Polity				-4.672**	
				[-2.498]	
Economic freedom				-1.916**	
				[-2.569]	
Vix					0.193
					[0.433]
Constant	67.374	120.265*	146.276	268.467***	131.935*
	[0.782]	[1.752]	[1.714]	[3.208]	[2.046]
Observations	5,228	8,015	4,322	7,956	8,455

Adj. R-squared	0.813	0.805	0.843	0.808	0.803
Fixed effects	Y	Y	Y	Y	Y

Syndicated bank lending and rating downgrades: When do sovereign ceiling policies really matter?

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Syndicated bank lending and rating downgrades: When do sovereign ceiling policies really matter?

We examine the effect of firm credit rating downgrades on the pricing of syndicated bank loans following rating downgrades in the firms' countries of domicile. We find that the sovereign ceiling policies used by credit rating agencies create a disproportionally adverse impact on the bounded firms' borrowing costs relative to other domestic firms following their sovereign's rating downgrade. By exploring the relevant mechanisms, we find that not all firms are equally penalized by the sovereign ceiling rule: relationship and cross-listed borrowers with subsidiaries in the lender's country and borrowers operating in competitive industries are much less affected.

Keywords: Credit ratings, Sovereign ceiling, Bank credit, Relationship lending, Foreign-currency lending, Firm credit constraints.

JEL classification: F34 ; G21; G24; G28; G32; H63

1. Introduction

Sovereign credit rating downgrades carry significant negative consequences for firms domiciled in publicly-downgraded countries. In rating the creditworthiness of debt obligors, major credit rating agencies (CRAs) maintain a so called "sovereign ceiling policy" – whereby domestic firms are unlikely to receive a rating higher than that of their sovereign. Hence, when there is a sovereign downgrade, firms with ratings equal to that of their sovereign become technically "bounded" by the implicit ceiling and they also get downgraded, irrespective of their fundamentals. Consequently, they bear the direct consequences of the downgrade whereas non-bounded firms may only experience indirect consequences via the deterioration of the macroeconomic environment in the country. The literature shows that bounded corporate borrowers cut back on corporate investment and reduce their reliance on credit markets relatively more than firms with ratings below the bound following a sovereign downgrade event. Moreover, the bond yields of sovereign ceiling bounded firms increase significantly more than for otherwise similar firms (see Almeida, Cunha, Ferreira and Restrepo, 2017).

We investigate whether banks in the syndicated loan market would also alter their lending behavior in response to sovereign rating downgrades that impact borrowing firms. Specifically, would banks punish bounded firms more than non-bounded firms following the sovereign downgrade of the borrower's country? To the best of our knowledge, this aspect of the impact of CRAs' sovereign rating actions has not been addressed in the literature. Hence, this study fills the void in the extant literature by examining the responses of syndicated lenders following sovereign downgrades. It is important to understand how these major credit events impact on syndicated bank lending decisions given the significance of this type of bank credit extended to corporate borrowers.

To explore the aforementioned we follow prior studies in employing an identification strategy that exploits the variation in corporate credit ratings that is due to CRAs' sovereign

ceiling policies (see Adelino and Ferreira, 2016; Almeida, Cunha, Ferreira and Restrepo, 2017). As these studies argue, whilst there is no explicit requirement for CRAs to rate a non-sovereign entity at or below the related sovereign, in practice, corporate credit ratings infrequently exceed those of their sovereigns. By applying this strategy to the syndicated lending market over 1993-2019, we show that the sovereign ceiling policy leads to an asymmetric effect on borrowers' cost of credit. Firms with a rating equal to their sovereign before the downgrade are subject to significantly greater increases in loan spreads relative to control firms rated below their sovereign (non-bounded firms). This extra cost is equal to approximately 63 basis points and represents almost USD 7.7 million of additional interest expenses per year for a loan of average size and maturity. Importantly, it mainly arises when bounded firms receive loans from foreign banks. Thus, bounded firms face a significant disadvantage compared to their non-bounded counterparts in the event of a sovereign downgrade.

Similar to Adelino and Ferreira (2016) and Almeida, Cunha, Ferreira and Restrepo (2017), our identification strategy has the advantage that non-bounded firms have similar but lower credit quality than bounded firms and the sovereign downgrade events represent exogenous shocks on corporate credit ratings. Hence, alternative explanations based on changes in firm fundamentals, or firm credit risk, or both, are unlikely to explain the discontinuous change in ratings around the sovereign ceiling following the sovereign downgrade event. The exogenous and asymmetric effect of sovereign downgrades on firm ratings is thus likely to be due to the existence of the sovereign ceiling policy, and not necessarily to changes in firm's fundamentals or the domestic macroeconomic environment.

Several sensitivity tests show that these baseline findings are robust, and of these, the following four are noteworthy. First, we use different sets of fixed effects (see, e.g., Jiménez, Ongena, Peydró and Saurina, 2014). These include "bank times year" and "lender's country times year" fixed effects that exclude any alternative supply-side explanations of our findings,

and further control for the time-varying macroeconomic environment in the lender's country. Second, we also consider the impact of sovereigns' local currency rating downgrades as a robustness check. Additionally, we examine the impact of rating outlooks as these are forward-looking assessments of sovereign credit quality. Third, we use alternative model specifications with different loan control variables to show that the results are not affected by the "bad controls problem". We further employ specifications where our sample of bounded firms is matched with a subsample of unbounded firms according to their credit quality and their fundamental attributes. Fourth, we estimate a Heckman-type model, which models the probability of a firm borrowing from the given bank to account for sample-selection issues (Dass and Massa, 2011).

We conduct additional analyses to understand the mechanism that leads to this high cost of international bank credit for bounded firms. By focusing on potential demand-side explanations, we show that this cost is contingent on certain firm characteristics and financing choices. In particular, large borrowers with less reliance on debt financing and greater reliance on internal funds can partially offset the higher loan spread premium following the rating downgrade.

Our examination of country fundamentals reveals that borrower countries with more developed financial markets are generally associated with lower bank borrowing costs. Hence, the concomitant increase in bank loan spreads following a sovereign downgrade can be ameliorated when bounded firms have access to alternative forms of financing. We reveal that the exchange rate arrangements also play a fundamental role since they allow for currency depreciation as a means for restoring competitiveness. In this regard, we find that the transition away from a fixed exchange rate system to more flexible arrangements, such as crawling pegs and bands, further eases the cost of international bank credit for bounded firms following a sovereign downgrade.

Lastly, we explore how bounded firms should respond to sovereign downgrades to avoid or offset the higher borrowing costs and tougher loan conditions following a sovereign downgrade. We identify four potential avenues. First, establishing an information-intensive banking relationship with a lender is important. We find that by borrowing from the same lead lender at least once in the two years before the current loan, firms can recover a significant portion of the initial interest rate premium compared to first-time borrowers. Furthermore, the benefits to the bounded firms increase with the previous loan amount and frequency of such previous relationships.

On the same line, borrowing from international lenders with subsidiaries in the borrower's country mitigates the negative impact on bank loan terms. These subsidiaries enable the parent banks to gain access to important information about the firm's solvency and prospects as well as the domestic macroeconomic environment. Firms further ameliorate the aggravating effect of the sovereign ceiling rule when operate subsidiaries in the lender's country. In both cases, the information asymmetry stemming from the sovereign downgrade and the subsequent downgrade of the bounded firms can be better assessed and managed, thereby resulting in more favourable loan terms.

Second, we look at the borrowers' alternative financing sources. Arguably, firms with financing flexibility and access to foreign capital markets can achieve lower cost of credit *ceteris paribus*. We find this to be the case, since the aggravating effect of domestic downgrades on loan spreads is largely mitigated – if not reversed – for cross-listed firms. Moreover, this is further evident for firms cross-listed in the U.S. as listing on a U.S. stock exchange appears to send a positive signal to market participants. Finally, we show that the response of bounded firms' spreads to sovereign downgrades is contingent on the level of industry competition. By employing various measures of industry concentration (Herfindahl-Hirschmann index, Lerner index, market share of top five firms) we find that borrowers

operating in more competitive industries are affected less relative to those in less competitive ones.

Our analysis further concers the role of syndicate's structure as a means for mitigating the aggravating effect of the sovereign ceiling rule. We find that an increase in the lead banks' loan share via the formation of a more narrow and concentrated syndicate can have a certification effect, easing potential adverse selection and subsequent moral hazard concerns regarding the bounded firms' solvency risk.

This paper contributes to the literature on the impact of corporate credit rating downgrades on firms' cost of credit. In this regard, it highlights the higher cost of credit faced by bounded firms following a downgrade, especially when resorting to international financing; most importantly, it identifies the operative mechanisms that drive the higher borrowing costs. The closest papers to ours are possibly those of Adelino and Ferreira (2016), who in a similar setting examine the lending behavior of domestic bounded banks after the sovereign downgrade, whereas Almeida, Cunha, Ferreira and Restrepo (2017) analyze the real impact on domestic bounded firms. We complement these studies, by investigating the impact of sovereign downgrades and the sovereign ceiling policy-induced corporate downgrades on the financing costs of the domestic bounded firms and evaluate potential demand-side explanations.

We present new and comprehensive evidence on the differential impact of sovereign downgrades (considering both foreign- and local-currency denominated ratings and as well as short-term rating outlooks) on the pricing of syndicated loans directed to bounded borrowers relative to non-bounded ones. Importantly, we identify potential avenues for affected firms to alleviate the negative impact stemming from the interaction of sovereign and corporate credit risk as reflected in the sovereign and corporate downgrade events, respectively. Concerning this interaction, we point to a new and overlooked aspect of the sovereign-firm nexus that

affects firm financing conditions and materializes due to the operation of the sovereign ceiling rule. Thus far, prior studies have mainly investigated sovereign credit risk (through sovereign credit ratings) as determinants of corporate credit ratings (see Borensztein, Cowan and Valenzuela, 2013), or corporate CDS spreads during the European sovereign debt crisis (see Bedendo and Colla, 2015; Augustin, Boustanifar, Breckenfelder and Schnitzler, 2018). Our work extends far beyond studies focused on the sovereign debt crisis, showing that sovereign downgrades increased the bank borrowing costs of European firms (see Drago and Gallo, 2017) by contributing new evidence on corporate borrowers' immunity to their country's rating demise.

Last but not least, we contribute to the literature on the importance of information asymmetry for syndicate formation. Information asymmetries between contracting parties are crucial for the design of optimal contracts (see Brealey, Leland and Pyle, 1977; Holmstrom and Tirole, 1997). The asymmetries are manifested between the lending counterparties and primarily relate to the lead banks' reputation. Lead banks subject to enforcement actions by their regulators increase their loan shares to entice participants to continue to co-finance the loan (see Delis, Iosifidi, Kokas, Xefteris and Ongena, 2020). Furthermore, lead arrangers' reputation measured by large-scale bankruptcies affect their subsequent syndication activity (see Gopalan, Nanda and Yerramilli, 2011), while greater control-ownership divergence causes lead arrangers to retain higher loan shares (see Lin, Ma, Malatesta and Xuan, 2012).

However, asymmetries are also present between lenders and borrowers. In particular, lead arrangers retain the largest share of the loan the first time an opaque borrower accesses the syndicated loan market and retain lower amounts as the borrower subsequently accesses the market (see Sufi, 2007). This is the case for firms that require intense monitoring and due diligence and suggests that problems of information asymmetry are reduced when the borrower becomes more "known" in the syndicated loan market. However, the larger the retained share,

the greater the increase in the moral hazard problems (see, e.g., Dennis and Mollyneaux, 2000; Dennis, Nandy and Sharpe, 2000; Sufi, 2007; Ivashina, 2009).

We provide evidence on the implications for syndicate structure when borrowing firms experience an exogenous negative shock to their creditworthiness that is totally unrelated to a deterioration in firm fundamentals. We document that the sovereign ceiling rule – due to an increase in firm-stemming information asymmetry – drives the lead arrangers' responsibility for all price and non-price-setting decisions in the loan. As such, the aggravating effect of the sovereign ceiling rule can be ameliorated through the formation of more concentrated syndicates with lead arrangers' acquiring an increasing stake in the loan.

The rest of the paper proceeds as follows. Section 2 discusses the data and empirical methodology. Sections 3-4 present and discuss the main empirical results. Section 5 concludes the paper. An Internet Appendix provides several additional summary statistics and robustness checks.

2. Data and empirical model

We obtain data from various sources to build our detailed matched bank-firm dataset. First, we collect all syndicated loan deals made (at the facility level) over the period 1993 to 2019 from the Refinitiv LPC DealScan database. Dealscan contains the most comprehensive historical loan-deal information available on the global syndicated loan market. We exclude all loans for which there is no conventional pricing (i.e., there is no loan spread data) and this removes all types of Islamic finance and very specialized credit lines. We match the loans with the long-term foreign-currency sovereign credit ratings of the borrower's country issued by Standard & Poor's (S&P). The literature reports that S&P's ratings are updated more frequently and generally precede other credit rating agencies (see Ismailescu and Kazemi, 2010; Alsakka, ap

Gwilym and Vu, 2014; Drago and Gallo, 2017).[1] We match loan facilities with bank- and firm-specific characteristics from Compustat, as well as with macroeconomic and institutional (country-year) variables from several sources. The number of loan facilities for our baseline specifications ranges from 7,592 to 8,499 depending on the controls and the set of fixed effects used. Our preferred specification includes 8,498 loans, granted by 278 lead lenders headquartered in 36 countries to 578 borrowers from 50 countries; see Table 1 for key descriptive statistics.

3.1. Empirical model and key variables

To examine whether a bounded firm faces a higher cost of credit following a domestic sovereign downgrade relative to non-bounded firms, we use a regression approach very similar to Adelino and Ferreira (2016), Almeida, Cunha, Ferreira and Restrepo (2017), Berg, Saunders, Steffen and Streitz (2016), and Gande and Saunders (2012):[2]

$$Cost\ of\ credit_{lt} = a_0 + a_1 Bound_{kt-1} + a_2 Sovereign\ downgrade_{kt-1} + a_3 Bound_{kt-1} \times Sovereign\ downgrade_{kt-1} + a_4 Controls_{kt} + u_{lt} \quad (1)$$

where $Cost\ of\ credit_{lt}$ measures the cost of loan facility *l* originated at time *t*. The most widely used measure is the all-in spread drawn (*AISD*), denoting the spread over LIBOR,

[1] Credit ratings from S&P, along with ratings from Moody's, are further allowed to be used for determining risk weights under Basel II.

[2] Gande and Saunders (2012) examine a model where the loan amount (or leverage) of firms is regressed on the interaction term between traded syndicated loans (vs. non-traded loans) and the pre-post trade periods. Berg, Saunders, Steffen and Streitz (2016), use a similar interaction terms model to examine the differential responses of loan spreads and other variables in Europe vs. the U.S. due to foreign lending and other institutional characteristics. Adelino and Ferreira (2016) adopt a diff-in-diff framework to examine the impact of domestic sovereign downgrades on the domestic bounded banks' lending supply relative to non-bounded banks. Similarly, Almeida, Cunha, Ferreira and Restrepo (2017) examine the real effects of domestic sovereign downgrades on domestic bounded firms compared to non-bounded firms.

although the recent literature (e.g., Berg, Saunders, Steffen and Streitz, 2016) also highlights the importance of fees and all-in spread undrawn (*AISU*).

Bound is a binary variable equal to one if the firm has a credit rating equal to or above the credit rating of its domicile country, and zero otherwise. *Sovereign downgrade* is a binary variable equal to one for a downgrade in the long-term foreign-currency credit rating of the borrower's country, and zero otherwise. The interaction of the two, i.e., *Bound* × *Sovereign downgrade*, is in turn equal to one if in the year of the sovereign downgrade the firm has a credit rating equal to or above the credit rating of its domicile country, and zero otherwise (Table A2 provides information on sovereign credit rating downgrades and the domestic bounded firms at the time of the sovereign downgrade). The vector a_0 denotes different types of fixed effects, *Controls* is a vector of control variables of different dimension *k*, and *u* is a stochastic disturbance. We identify the lender's and the borrower's country as the country in which the lender and the borrower are located, respectively. Where a loan is provided by the parent bank's foreign affiliate or subsidiary, the lender's country is set as the country of the affiliate/subsidiary. Similarly, for firms receiving loans through their foreign subsidiaries, we set the borrower's country as the country of the affiliate/subsidiary.[3]

Put simply, our identification strategy provides a direct comparison across two states: bounded (treated) firms and non-bounded (control) firms during the occurrence of a domestic sovereign downgrade. The main coefficient of interest is a_3, which shows the differential effect of *Sovereign downgrade* on the cost of credit between bounded and non-bounded firms. In other words, we obtain identification from the fact that a sovereign downgrade exerts an

[3] For example, although Citibank (the parent bank) is headquartered in the US, for loans provided by Citibank International Plc, we set the lender's country as the UK. In sensitivity tests, we further examine cases of cross-border loans where the lending bank has an affiliate or subsidiary in the borrower's country. If the bank can fund the loan through its affiliate/subsidiary by resorting to the domestic wholesale markets, it can – to an extent – remove the macroeconomic risk. To accomplish this we identify all banks' subsidiaries in the borrower's country. Similarly, we examine cases where the borrowing firm has an affiliate or subsidiary in the lender's country, although the number of these subsidiaries is relatively small. We discuss this further in Section 4.

asymmetric effect on the cost of loans granted to domestic bounded firms relative to control firms that are not at the bound. We expect a_3 to be positive if the sovereign ceiling policies matter for the determination of loan spreads and thus increase the cost of credit for bounded firms.

To enhance our identification strategy and enable the comparison between our treatment (bounded) and control (non-bounded) groups, the latter includes firms with credit rating which is at most two notches below the credit rating of their sovereign.[4] Our key assumption is that the two groups would have followed parallel trends in the absence of the treatment. Differences in the posttreatment period can only be attributed to the treatment ((in our context, sovereign downgrades) when this assumption holds. This assumption would be violated if bounded and non-bounded firms had unobservable characteristics that predict greater sensitivity to sovereign debt crises, even in the absence of downgrades. In this diff-in-diff framework we ensure that all firms have similar characteristics and fundamentals, that is, in the absence of the treatment, the treatment group would behave similarly to the control group.

Moreover, the coefficients a_1 and a_2 show how the bound indicators and the sovereign downgrade respectively affect the cost of credit for all loans in the sample. If the model is well identified, the interaction term and the control variables should explain (most of) the effect of *Bound* and *Sovereign downgrade* on the cost of credit (i.e., a_1 and a_2 should be statistically insignificant or weakly significant). In fact, the effect of sovereign downgrades on the cost of loans for the domestic non-bounded firms should be minimal or zero, especially when controlling for other firm- and macro-level factors.

[4] In sensitivity exercises we intensify this restriction and include firms with a credit rating at most one notch below their sovereign's or relax it completely and include firms with any credit rating below their sovereign's.

3.3. Identification, controls, and fixed effects.

A key aim of our empirical analysis is to identify the differential effect of the sovereign downgrade event on bounded firms. Given that, we want to ensure that our empirical tests are not driven by inappropriate identification assumptions. The key identifying assumption in our empirical strategy is that trends related to loan spreads are the same among the treatment and control groups prior to the downgrade event. Figure 1, presents the evolution of average loan spreads between bounded and non-bounded borrowers in the years prior and after the sovereign downgrade. We observe a parallel trend in the spreads of bounded and non-bounded borrowers throughout the pre-downgrade years (and a subsequent divergence in the year of the downgrade and thereafter), which is an indicator that this assumption is reasonable.

[Insert Figure 1 about here]

We include a battery of control variables and fixed effects to account for potential omitted variables. Following the relevant literature (e.g., Ivashina, 2009; Adelino and Ferreira, 2016; Almeida, Cunha, Ferreira and Restrepo, 2017; Hasan, Hoi, Wu and Zhang, 2017; Kim, 2019; Delis, Hasan and Ongena, 2020), we control for loan characteristics such as the log of the loan amount, loan maturity (in months), the number of lenders in the syndicate, dummies for performance-pricing provisions and/or collateral, and the total number of covenants.[5] We also control for the total assets of the bank (*Bank size*), the bank return on assets (*Bank ROA*), and the bank's non-performing loans (*Bank NPLs*). Similarly, our firm-level controls include firm size (*Firm size*), firm return on assets (*Firm ROA*), and firm leverage (*Firm Leverage*). We include country-pair-specific variables, such as the difference in the GDP growth rates between the lender's and the borrower's countries (*GDP growth*), or in their GDP per capita (*GDP per capita*) to account for the differences in the degrees of economic development and

[5] Distinguishing between types of covenants (e.g., general and financial covenants) does not affect our results.

the macroeconomic conditions of the borrower's country. Detailed descriptions of these variables are provided in Table A1 and summary statistics in Table 1.

We also use loan type and purpose fixed effects; these are important as loan facilities include credit lines and term loans, which have fundamental differences in their contractual arrangements and pricing (see Berg, Saunders and Steffen, 2016) and their purpose (e.g., corporate purposes, working capital, takeovers or acquisitions, debt repayment, etc.). Moreover, we use year, bank, and firm fixed effects. These fixed effects complement our bank- and firm-level characteristics and allow us to control for possible time-invariant bank- and firm-specific explanations of our findings (such as credit risk and performance), that are not isolated by the inclusion of our set of control variables. We further control for changes in the macroeconomic environment of the lenders' countries and the borrowers' countries using lender's country fixed effects and borrower's country fixed effects, respectively. These fixed effects saturate the effect of *Bound* × *Sovereign downgrade* from other country (socioeconomic and political) effects on bank lending;[6] moreover, they control for changes in monetary conditions. Further, we use country-pair fixed effects to capture common characteristics between the lenders' and borrowers' country-pairs.

In even more stringent specifications, we use bank × year fixed effects. These allow us to control for time-varying supply (bank)-side explanations of our findings (such as changes in a bank's financial soundness, corporate governance, etc.). The regression still yields results on the main coefficients of interest because there are multiple loan facilities from the same bank within years. Similarly, the use of lender's country × year fixed effects shields our specification from country-year (macroeconomic) developments in the lenders' countries. Again, the

[6] These are country factors affecting all banks and firms within a country. Several studies examine such macro effects on international bank lending (e.g., Delis, Hasan and Ongena, 2020; and the associated references), and in this study these effects are fully controlled for via the fixed effects.

regression still yields significant results on the main coefficient of interest because there are multiple loan facilities from the same country within each year.

The number of loan facilities in our baseline specification is 8,498. Table 1 reports the key descriptive statistics for the set of loan-, bank-, firm-, and macro-level variables in our sample. In Panels A and B of Table 2 we report the summary statistics for key loan features for bounded vs. bounded firms following the domestic sovereign downgrade; Panel C reports their differences. The total number of loans granted to bounded firms is 3,863 and constitute approximately 45.5% of the full sample. Out of these, 453 loans are granted to 51 bounded firms experiencing a domestic sovereign downgrade; Table A2 presents the complete list of these 51 bounded firms. We find that, on average, *AISD* is 40.4 basis points higher for bounded firms compared to their non-bounded counterparts. This difference is statistically significant at the 1% level, and is also evident when the *AISU* is considered. In addition, loans granted to the former type of firms are of shorter maturity and more likely to be secured; they are also granted from larger syndicates and carry fewer covenants.

[Insert Tables 1 and 2 about here]

3. The effect of sovereign ceiling policies on the cost of credit

3.1. Baseline results

Table 3 reports our baseline results. We cluster standard errors by firm and also by year to avoid time-varying correlations in the data driving our inferences. In line with our discussion in Section 2, we consider different fixed effects in our model specifications. In column (1), we include the simplest fixed effects, namely those at the year-, bank- and firm-level. In column (2), we introduce lender's and borrower's country fixed effects. These control for macroeconomic developments in the lenders' and borrowers' countries, respectively. We further add loan type and purpose fixed effects in column (3) and borrower's industry effects

in column (4). In column (5) we introduce bank × year fixed effects to control for time-varying supply-side forces. Our last specification (column (6)) includes lender's country × year fixed effects to control for within-year macroeconomic developments in the lender's country and country-pair fixed effects.

[Insert Table 3 about here]

Across all specifications, the coefficient on *Bound* is generally insignificant or weakly significant as the sovereign ceiling also should not affect financial intermediation until a sovereign downgrade event occurs. The coefficient on *Sovereign downgrade* is statistically insignificant, which is not surprising as sovereign credit risk should not affect *AISD* unless the borrowing firm is affected (also in line with our priors discussed in Section 2).

We use column (3) as our baseline specification, as the set of fixed effects included in the given specification captures the effect of sovereign ceiling policies on loan spreads and we obtain identification from the maximum number of lenders and borrowers in our sample. The main coefficient of interest a_3 shows that a sovereign downgrade event increases *AISD* by an average of 63.0 basis points (bps) for bounded firms compared to non-bounded firms. This is a large and economically significant effect, equal to a 41.9% (=60.0 bps ÷ 150.4 bps) increase for the average loan in our sample. Given that the average loan size is $1.22 billion, bounded firms experiencing a sovereign downgrade pay on average approximately USD 7.7 million (=$1.22 billion × 60.0 basis points) more per year in interest payments. Considering that the average time to maturity is 3.4 years, this represents approximately USD 26.4 million in extra interest expenses over the loan's duration.[7] Therefore, we can infer that the sovereign ceiling rule substantially raises the cost of loans for bounded firms compared to firms below the bound in the event of a sovereign downgrade.

[7] Assuming 3.4 annual payments and LIBOR as the discount rate, the increase in interest expense amounts to USD 24.4 million for an average 12-month LIBOR rate of 3.3% during our sample period (for similar calculations, see Ivashina and Sun, 2011).

In Table 4, we replicate the estimations of Table 3 by replacing *Sovereign downgrade* with its local-currency counterpart (*Sovereign downgrade lc*). Results across all specifications mirror those of Table 3 for all our variables of interest. Unsurprisingly, the results are similar considering the strong positive correlation between the two types of credit ratings, as foreign-currency credit rating downgrades are almost always accompanied by local-currency credit rating downgrades. The marginally weaker coefficient on our interaction term, which now ranges from 52.6 to 55.4 bps might be attributed to the fact that insurance on sovereign debt is mostly denominated in foreign currency, thereby inducing greater sensitivity to foreign-currency credit rating changes relative to local-currency credit rating changes.

[Insert Table 4 about here]

In Table A3 of the Appendix, we examine the sensitivity of our estimates to the "bad controls" problem, by interchangeably excluding loan-level control variables from our specifications. We initially omit all loan controls (column 1) and sequentially introduce a different combination of non-price terms (*Loan amount, Maturity, Collateral, Number of lenders, Performance provisions, General covenants*) in columns (2)-(4).[8] Irrespective of the specification used, the coefficient on the interaction term remains consistently positive and statistically significant pointing to higher cost of credit for bounded firms relative to non-bounded ones. Moreover, in Appendix Table A4 we replicate the specifications of Table 3 for an extended sample, where we relax our restriction that the borrower's credit rating is at most two notches below its sovereign's. The extended group of non-bounded firms now includes borrowers with any credit rating below the credit rating of their sovereign. Results from this exercise are very similar to our baseline.

[8] The replacement (or addition) of *General covenants* with *Financial covenants* or *Net covenants* leaves our results unchanged.

The size and magnitude of the estimated coefficients on the control variables in Tables 3-4 are generally in line with expectations and the recent works of Bae and Goyal (2009), Ivashina (2009), Cai, Saunders and Steffen (2018), and Delis, Hasan and Ongena (2020). In particular, loan spreads increase with the loan amount and the covenants attached, while collateral appears to be irrelevant. The behaviour of the firm-level variables is also largely as anticipated. In this regard, higher return on bank assets and lower leverage are associated with decreasing *AISD*, while bank characteristics appear immaterial for loan spreads as the effect of supply-side forces is largely controlled in our specifications. Lastly, the higher the difference between the lender's and the borrower's country GDP growth, the higher the spread on loans directed to the borrower country's firms.

3.2. Short-term ratings and rating outlook

We further distinguish between short- and long-term credit ratings, since it might be that some of the effects of sovereign downgrades on the bounded firm's borrowing costs is stemming from downgrades in the sovereign's short-term credit ratings that usually precede (or coincide with) downgrades in the sovereign's long-term credit ratings. To test this, in specification (1) of Table 5, we interact *Bound* × *Sovereign downgrade* with its short-term counterpart *Short-term downgrade*.[9] The coefficient on the double interaction term – albeit relatively weaker than our baseline estimates – is positive and significant, verifying that long-term sovereign downgrades affect bounded firms disproportionally more relative to those below the bound. However, this asymmetric effect of *Sovereign downgrade* on bounded firms is not magnified when *Short-term downgrade* is also considered, as the latter appears to exert a negligible effect as seen by the insignificant coefficient on the triple interaction term.

[9] We further include all double interactions. For expositional purposes these are not reported here and are available on request.

[Insert Table 5 about here]

Credit ratings are inherently backward-looking credit risk measures, whereas outlooks attached to current ratings are forward-looking assessments made by the credit rating agencies. As such, outlook measures contain additional information that might be priced into loan spreads. In specification (2), we consider changes in the outlook for long term foreign currency sovereign ratings by including the interaction of *Bound* × *Sovereign downgrade* with *Outlook downgrade*. The coefficient on the triple interaction term is positive and statistically significant and larger in magnitude compared to the double interaction. This suggests that a deterioration in the sovereign's credit rating outlook is considered an indicator of impending credit rating downgrades. Its effect on *AISD* is over and above that exerted by *Bound* × *Sovereign downgrade*, as reflected in its positive and statistically significant coefficient of the latter.

3.3. Domestic borrowing vs foreign borrowing

This section examines potential differences in the effect of sovereign downgrades on the bounded firms' cost of credit between domestic and foreign loans. Cross-border loans constitute a significant component of the syndicated loan market and emerge as an increasingly popular form of corporate financing.[10] Moreover, although domestic lenders and borrowers are equally affected by the sovereign event, foreign banks are not. In this regard, we examine whether bounded firms are faced with higher borrowing costs when they resort to foreign banks for financing relative to when they resort to domestic banks. In the first two columns of Table 6, we run our baseline specification for the subsample of loans granted from foreign banks (column (1)) and the subsample of loans granted from domestic banks (column (2)).

[Insert Table 6 about here]

[10] Cross-border syndicated lending reported in DealScan amounted to more than $2 trillion in 2019.

Initially, we examine the combined effect of sovereign downgrades and the sovereign ceiling rule on cross-border borrowing operations. This is the largest category in our sample, since we observe 6,388 loan facilities granted from foreign banks, approximately 75.2% of total loan facilities. In these operations, foreign banks are exposed to the deteriorating macroeconomic fundamentals in the bounded firm's country. They are further exposed to exchange rate risk, either directly through lending in the borrower country's currency, or indirectly through lending in their own domestic currency. In the presence of these risks, we expect that foreign banks pass the costs to firms in the form of higher loan spreads. Our estimates in column (1) confirm this proposition: the coefficient on our double interaction term is statistically significant and equal to 53.9 bps. This further reveals that most of the effect of sovereign downgrades on bounded firms' spreads materializes when the latter obtain financing from foreign rather than domestic banks.

Next, we consider loans granted from domestic lenders to domestic borrowers. These are 2,110 loans or approximately 24.8% of our sample. Since in cases of domestic loans banks are also affected by the sovereign downgrade event, we expect that they are also subject to price concessions when lending domestically; therefore, the higher spread with which bounded firms are faced following the sovereign downgrade, should not be evident when borrowing from domestic banks. Estimates from specification (2) verify this conjecture, since bounded firms are not faced with an increase in their loan spreads after the downgrade event (non-statistically significant coefficient on *Bound* × *Sovereign downgrade*).

However, banks can also be subject to the sovereign ceiling rule, which can in turn reduce their lending supply and drive their loan spreads up (see Adelino and Ferreira, 2016). To this end, in column (3) we replicate specification (2) by replacing our bounded firm indicator with an indicator on whether the lending bank is bounded or not (*Bound (Bank)*). Estimates reveal that indeed, bounded banks charge a higher loan spread equal to more than 26

basis points, when lending domestically following a domestic downgrade; a finding in line with Adelino and Ferreira (2016). In our last specification (column (4)), we further consider the case where both loan counterparties are bounded. This is a rare event, as we observe only 46 loans granted from bounded lenders to domestic bounded borrowers. Nonetheless, our estimates indicate that these loans carry a higher spread (surpassing 30 bps) relative to loans where only one or none of the counterparties is bounded (coefficient on *Bound* × *Sovereign downgrade (Bank & Firm)*).

3.4. Results from a subsample of firms with similar fundamentals

To alleviate any remaining concerns that our results are not driven by the sovereign ceiling rule, we further employ a subsample of firms with similar fundamentals that are either above the bound or marginally below. To accomplish this, we match our sample of bounded firms with a subsample of non-bounded firms according to their credit rating and fundamentals. Results from this exercise are reported in Table 7.

[Insert Table 7 about here]

We initially restrict our sample of non-bounded firms to include only borrowers with credit rating one notch below their sovereign's (compared to the cap of two notches employed in our baseline regressions). We then examine this group vis à vis our bounded firms' group (column 1). According to the results, the effect of sovereign downgrades on bounded firms is identical to our initial estimates; a sovereign downgrade event increases *AISD* by 63.1 basis points for bounded firms compared to firms only one notch below the bound (coefficient on double interaction). In each of the subsequent specifications, we retain the preceding specification's subsample and progressively impose an additional matching criterion. Specifically, we further limit our subsample to include firms of a similar size, return on assets, and level of leverage (columns (2), (3) and (4) respectively). Across these specifications the

coefficient on *Bound* × *Sovereign downgrade* retains its negative and statistically significant sign, while its size ranges between 52.1-72.8 basis points. Again, this effect is in line with our baseline estimates, validating the higher spreads faced by bounded firms relative to other very similar firms that are just below the bound (and unaffected by the sovereign ceiling effect).

3.5. Additional results

In Appendix Table A5 we examine the effect of the sovereign ceiling rule on other price and non-price loan terms. Given the role of loan fees in the syndicated loan contract (see Berg, Saunders and Steffen, 2016), in column (1) we replace *AISD* as dependent variable with commitment plus facility fees, defined as all-in spread undrawn (*AISU*). A constraining factor of the global DealScan database is that the reporting of fees is limited, either because loan deals do not include specifications for undrawn funds or simply due to missing information. Results in column (1) point to a non-statistically significant coefficient on the interaction term; we conclude that the sovereign ceiling rule is only reflected on the spread of the drawn portion of the loan. We consequently estimate our baseline regression by using each of the non-price loan terms as a dependent variable (columns (2)-(6)). We notice that bounded firms receive loans of shorter maturity following the downgrade event (negative coefficient on the interaction term in column (3)). However, in all remaining specifications, the coefficients on *Bound* × *Sovereign downgrade* are not statistically significant.

In Appendix Table A6, we confirm the insensitivity of our inferences to the type of standard error clustering used. In this respect, we initially cluster standard errors by loan *and* year, and loan *and* firm (columns (1) and (2) respectively). Given, the multi-country nature of our dataset, we consequently cluster errors by borrower's country *and* year (column (3)), and by borrower's country *and* firm (column (4)). Our last specification adopts a more demanding

clustering, as standard errors are clustered by borrower's country *and* firm *and* year. Across all specifications, estimates remain almost identical to our baseline results.

Thus far, we assume that all loans enter the model with equal weights. Normally, the fixed effects in Table 3 provide a safeguard against cross-country variations. We nevertheless acknowledge that our empirical specification might leave the analysis open to the critique that countries receiving more or fewer loans might affect our results disproportionately. To this end, we re-estimate our preferred specification using weighted least squares and several different weights based on the country-year number of loans. We retain the same set of fixed effects and report results from this exercise in Table A7. Across all specifications, and irrespective of the type or frequency of the chosen weight, the coefficient on *Bound* × *Sovereign downgrade* retains its positive and statistically significant value. As for the coefficients on the set of our loan- and bank-level control variables, these are in line with those suggested by our baseline regressions.

Thus far our results could be subject to a sample-selection bias, in the sense that the variables driving our findings might further determine the firm's decision to receive a loan from the particular bank. It may be, for instance, that the impact of the sovereign ceiling rule on loan contracting is due to affected (bounded) firms being the ones more likely to request a loan. To eliminate this potential selection bias, we follow Dass and Massa (2011) and employ Heckman's (1979) two-stage model to calculate the probability of a firm entering into a loan deal. In the first stage, we run a probit model to estimate the firm's loan-taking decision. During this stage, our loan sample is extended and includes all syndicated loan facilities available in Dealscan. We calculate Heckman's lambda (inverse mills ratio) and include it as an additional control variable in the second-stage OLS estimation of specifications (1)-(3) of Table A8.

In line with Dass and Massa (2011), we assume that the borrower's decision to get a syndicated loan is a function of the main determinants of the decision to borrow in general.

Consequently, our probit regression is augmented with a set of loan-, bank-, and firm-level characteristics; a set of weights for the number, origin, and direction of loans made in a given year; and year, bank, firm, lender's and borrower's country dummies. Our set of annual weights include the number of loans made by a given bank (*Bank loans*), the number of loans to a given firm (*Firm loans*), and the number of loans between a given bank-firm pair (*Bank-firm loans*).

We present results from this exercise in columns (1)-(3) of Table A8 (Panels A and B). Probit estimates (Panel A), indicate that the higher the firm's size and return on assets and the lower the leverage, the more likely is the completion of a syndicated loan deal. Loans of a greater amount and shorter maturity are more likely to be granted, particularly when these loans include many lenders, are secured, and carry pricing provisions and covenants. Most importantly, estimates from the second-stage regressions (Panel B) confirm the asymmetrically strong positive impact of the sovereign ceiling rule on *AISD* (as reflected in the coefficient on *Bound* × *Sovereign downgrade*).

Last, we control for differences stemming from the macroeconomic and institutional environment in the borrower's country as these factors are known to also influence lending decisions (see, e.g., Delis, Hasan and Ongena, 2020). We include certain macroeconomic and institutional controls (debt-to-GDP ratio, inflation dynamics, prevalence of democratic institutions, economic freedom, real interest rate) and a measure of global uncertainty (stock market volatility). In theory, the slow-moving nature of these variables should cause them to correlate strongly with the borrower's country and country-pair fixed effects employed in Table 3. Due to their high pair-wise correlations, we do not employ all variables simultaneously. Results from this exercise remain very similar to our baseline (Table A9).

4. Identifying the mechanisms and potential remedies

Thus far, our analysis points to an asymmetrically higher cost of credit faced by bounded firms relative to non-bounded firms following a sovereign downgrade event in their country. In this section, we identify those firm characteristics that potentially offset this disproportionately aggravating effect of sovereign downgrades on bounded firms.

4.1 Exploring the mechanisms: Borrower's fundamentals

We initially consider alternative demand-side explanations of our findings and identify certain firm traits that may be driving our results. To this end, Table 8 includes the interaction of *Bound* × *Sovereign downgrade* with a number of different firm characteristics reflecting the firm's size, profitability, capital structure and operating performance. To ensure that variation in the spreads is not stemming from within-firm changes in each of these characteristics (which is likely endogenous to our bound indicator), in all specifications of Table 8 we do not include firm fixed effects.

Specification (1) reveals that the effect of the sovereign ceiling rule on the cost of credit is contingent on firm size. In this regard, large firms are able to offset – to some extent – the higher spread following the downgrade event. In specific, a one standard deviation increase in the firm's total assets saves the firm approximately 12.0 basis points (=-4.6 bps × 2.61) or 20.2% of the initial spread charged (coefficient on *Bound* × *Sovereign downgrade* × *Firm size*). Furthermore, bounded firms generating high returns on their assets are able to contain their high borrowing costs relative to their non-bounded counterparts (coefficient on triple interaction in specification (2)).

[Insert Table 8 about here]

The next two specifications consider the firm's decision with regards to its capital structure. Estimates point to a positive relationship between firm indebtedness and *AISD*, as more leveraged firms face higher borrowing costs; however, greater reliance on equity

financing exerts the opposite effect, thereby easing the firm's interest burden (coefficients on triple interactions in specifications (3) and (4), respectively). Similarly, firms with larger cash holdings and retained earnings further manage to partially reverse the increased borrowing costs after the downgrade. This result is intuitive, since reliance on own funds limits the need to resort to external financing. In this respect, a one standard deviation increase in cash holdings and retained earnings enables the firm to recover 45.9% and 41.1% respectively of the initial spread increase (coefficients on triple interactions in specifications (5) and (6)).

4.2 Exploring the mechanisms: Borrower's country fundamentals

Consequently, we allow for the possibility that the firms' decision to resort to bank financing is related to borrowing conditions and credit constraints in the domestic credit market as well as the level of domestic financial market development. We expect that firms in countries with less developed financial markets and consequently a greater reliance on the banking sector are subject to higher borrowing costs. This is in turn, a natural corollary of the reduction in domestic credit supply following a downgrade (see Adelino and Ferreira, 2016). However, in countries with developed financial markets, domestic firms have access to alternative sources of financing that consequently ease their borrowing costs. To examine this hypothesis, Table 9 includes the interaction between a set of variables reflecting the financial market conditions and fundamentals in the borrower's country and *Bound* × *Sovereign downgrade*. All specifications do not include borrower's country fixed effects; this isolates any variation from within-country changes in our set of country fundamentals, which are endogenous to the sovereign downgrade event.

[Insert Table 9 about here]

We initially focus on the level of stock market capitalization in the borrower's country. Estimates from specification (1) suggest that a highly capitalized domestic stock market acts

as a counterweight to the increasing loan spreads following the downgrade (significant and negative coefficient on triple interaction term). Consequently, and considering the literature that typically measures credit constraints using the ratio of credit provided by banks over GDP (e.g., Beck and Demirgüç-Kunt, 2006; Beck, Demirgüç-Kunt and Levine, 2010; Manova, 2012), we focus on measures reflecting the type and volume of domestic credit provided in the domestic economy. In particular, we generate a binary variable equal to one if countries fall within the 75th percentile of domestic credit provided by either the non-bank financial sector (specification (2)) or the banking sector (specification (3)), and zero otherwise.

Estimates in columns (2)-(3) verify our earlier expectations about the offsetting effect of the level of domestic financial flexibility on the corporate borrower's cost of credit. The coefficient on *Bound* × *Sovereign downgrade* × *Financial sector credit* indicates that bounded firms can alleviate their interest rate burden when operating in an economy where credit is principally provided by the non-bank financial sector. On the other hand, affected firms in countries with a greater reliance on the domestic banking sector are faced with significantly higher borrowing costs following the downgrade (positive and significant coefficient on *Bound* × *Sovereign downgrade* × *Banking sector credit*). These results are further verified in specification (4), where we consider the ratio of these variables.

Our last exercise concerns the importance of the exchange rate regimes for the borrowing firm's cost of credit. One key lesson from the 1990s currency crises was the increasing difficulties faced by countries when attempting to build a reputation needed to sustain a durable fixed exchange rate (see Eichengreen, Rose and Wyplosz, 1995; Obstfeld and Rogoff, 1995). Consequently, many of them adopted a more flexible form of exchange-rate targeting as a way to limit currency volatility, while reducing susceptibility to speculative attacks. This trend was nevertheless reversed following the Asian financial crisis and the Russian default, with countries favouring corner solutions and adopting either hard pegs (e.g.,

currency boards, dollarization, or currency unions) or freely floating exchange rate regimes (Calvo and Reinhart, 2002). It is therefore not clear how exchange rate arrangements affect the cost of credit, especially in the aftermath of financial crises which usually precede or follow downgrades in the sovereign's credit rating.

We explore this in specification (5), by interacting *Bound* × *Sovereign downgrade* with the borrower's home exchange rate regime using the exchange rate classification of Ilzetzki, Reinhart and Rogoff (2017). This measure is a categorical variable ranging from 1 to 5, with lower values reflecting less flexible regimes such as currency board arrangements or de facto pegs and higher values reflecting more flexible regimes such as managed or freely floating arrangements.[11] Presumably, wide bands allow authorities to actively use monetary policy when it is most needed, thereby enhancing the overall credibility of their commitment to the band and stabilizing intra-band movements and exchange rate fluctuations (Obstfeld and Rogoff, 1995). In addition, flexible arrangements allow for currency depreciation as a means of restoring the competitiveness of the downgraded country, thereby facilitating the recovery of the domestic economy. Indeed, the negative and statistically significant coefficient on *Bound* × *Sovereign downgrade* × *Exchange rate arrangement* in column (5) indicates that moving away from a fixed regime and allowing for some degree of fluctuation lowers the cost of bank credit for affected firms after the downgrade. The additional interest rate savings amount to approximately 24.3 basis points or 48.2% of the original interest rate premium charged.

4.3. Exploring the mechanisms: Relationship lending

Our results thus far highlight an important competitive disadvantage of bounded firms relative to non-bounded borrowers in the event of a sovereign downgrade that persists in a number of

[11] The classification further includes a sixth category for dual markets in which parallel market data is missing. However, the respective classification does not apply to any of the countries in our sample.

sensitivity tests. In this section, we consider two potential practices that might help alleviate the negative effects from a sovereign downgrade: the formation of bank-firm lending relationships and the utilization of bank and firm subsidiaries.

Prior lending relationships allow lenders to acquire valuable information about the borrowing firm's operations and credit risk. It is reasonable to expect that bounded firms with prior lending ties with their banks might be able to offset the higher loan spreads following a sovereign downgrade. We test this hypothesis in Table 10, by interacting our variables of main interest with *Relationship lending*, a variable reflecting the existence of a prior lending relationship between the given bank-firm pair over the previous 2-year period (see, e.g., Bharath, Dahiya, Saunders and Srinivasan, 2009).

[Insert Table 10 about here]

Estimates in column (1) show that relationship borrowers are able to recover approximately 15.6 basis points (or 22.0%) of the interest rate premium following a downgrade event (coefficient on *Bound* × *Sovereign downgrade* × *Relationship lending*). The offsetting effect of relationship lending further increases with the size and magnitude of this relationship: the greater the number or the amount of loans between the given bank-firm pair during the previous 2-year period, the greater the interest rate savings for the bounded firms following the downgrade (coefficients on triple interaction terms in columns (2)-(3)).

The next two specifications of Table 10 examine the role of subsidiaries. When the lending bank operates an affiliate or subsidiary in the borrower's country, it can gain access to important information about the firm's creditworthiness and operations. Furthermore, through its subsidiary, the bank is accustomed to the domestic macroeconomic environment, while it can also remove part of the macroeconomic risk if it can fund the loan through its affiliate/subsidiary by resorting to the domestic wholesale markets. We therefore expect that borrowers resorting to lenders with subsidiaries in the borrower's country, minimize the

information asymmetry with regards to the firm's credit risk and the domestic macroeconomic risk enabling them to achieve more favourable loan terms.

This is verified by the estimates in column (4), where loans granted from banks with domestic subsidiaries carry an approximately 6.9% lower *AISD* than the average loans directed to bound firms following the sovereign downgrade (coefficients on triple and double interaction terms, respectively). Similar reasoning applies to firms operating subsidiaries in the lead bank's country. By operating in the lender's country, firms can communicate important information regarding its operations to the lender so as to reduce information asymmetry. As estimates in column (5) reveal, this results in a 15.3% decrease in the offered spread.

4.4. Exploring the mechanisms: Cross-listing and industry competition

In this section we examine whether the ability to access alternative sources of financing and the level of competition in the firm's industry reverse the aggravating effect of sovereign downgrades on bounded firms' borrowing costs. To accomplish this, we interact our sovereign downgrade and bound indicators with a number of variables reflecting the firms' cross-listing status and the degree of industry competition.

A listing on a foreign stock exchange presents the issuing firm with an incentive to commit to providing higher quality financial information and exposes the company to further scrutiny of reputable intermediaries (see Lang, Raedy and Wilson, 2006; Shi, Magnan and Kim, 2012). This is further driven by the dual pressures from both host and home countries' stock exchanges that cross-listed firms face, which in turn make them more adept at attracting alternative financing sources (see Hillman and Wan, 2005). Similarly, cross-listed firms benefit in the product market by releasing more information to foreign markets; this translates into a higher likelihood that managers will issue forecasts, thereby minimizing the information asymmetry about their future prospects and performance (see Saudagaran, 1988).

For all these reasons, we expect that cross-listed firms are less subject to the aggravating effect of the sovereign ceiling rule after the downgrade event relative to domestically listed companies. Their global outreach and superior network combined with their effective monitoring, provides the former type of firms with a comparative advantage that renders them less sensitive to domestic downgrades. We examine this premise in columns (1) and (2) of Table 11, where we interact *Bound* × *Sovereign downgrade* with an indicator of a firm's cross-listing status. Results from column (1), suggest that the effect of *Bound* × *Sovereign downgrade* on *AISD* is somewhat mitigated for cross-listed bounded firms: the latter save approximately 5.0 basis points compared to domestically listed bounded firms (negative and statistically significant coefficeint on triple interaction term). Furthermore, the reversal effect of the cross-listing status is even more potent for bounded firms listed on U.S. stock exchanges, in addition to their domestic stock exchange (column (2)).

[Insert Table 11 about here]

We consequently examine the level of industry competition, since the cost of bank debt is different for firms that operate in competitive industries relative to those in more concentrated industries (see Valta, 2012; Boubaker, Saffar and Sassi, 2018). To examine if our results are different in more competitive industries we distinguish between firms located in the bottom tercile of our sample based on measures of industry concentration. Our measures of industry concentration are the Herfindahl-Hirschmann index (HHI), Lerner index, and top five concentration ratio, i.e., the sum of market shares of the largest five firms in the industry (see Aghion, Bloom, Blundell, Griffith and Howitt, 2005; Mueller, Ouimet and Simintzi, 2017). By construction, lower (higher) values indicate greater (smaller) competition in the given industry. Estimates from specifications (3)-(5) confirm the differential role of industry competition: the negative and statistically significant coefficients on the triple interaction terms indicate that

bounded firms in more competitive industries are able to save between 4.7-6.6. basis points of the initial spread increase due to the downgrade event.

4.5. Exploring the mechanisms: The role of syndicate's structure

A potential channel through which the aggravating effect of the sovereign ceiling rule could manifest is syndicate structure, which operates via other lenders that join the lead bank in forming a syndicate. If lending banks are unfamiliar with the borrowing firm, this gives rise to an adverse selection problem wherein the borrower must convince the lender of its solid credit reputation. By forming a more dispersed syndicate and retaining a larger share of the loan, the lead bank can minimize this problem of information asymmetry. This can alleviate the need for potential lenders to spend more time investigating the borrower in order to acquire more "informed" capital regarding itss financial health. Being part of a more narrow syndicate can also have a certification effect, easing potential adverse selection and subsequent moral hazard concerns regarding the borrower's solvency risk (see, e.g., Dennis and Mullineaux, 2000; Lee and Mullineaux, 2004; Jones, Lang and Nigro, 2005; Suffi, 2007; Ivashina, 2009).

Below, we examine how syndicate structure helps alleviate the effect of sovereign ceiling rule by interacting *Bound* × *Sovereign downgrade* with a number of loan characteristics reflecting the size and structure of a syndicate. Results are presented in Table 12, with estimates from column (1) suggesting that a decrease in the number of lenders reduces *AISD* for bounded firms following a downgrade. Specifically, including thirteen less lenders in the syndicate (i.e., decreasing *Number of lenders* by approximately one standard deviation) saves the borrower around 20.8 basis points. Column (2) shows that this effect is mainly driven by lead banks, since excluding eight lead lenders in the syndicate results in spread savings of 15.2 bps.

[Insert Table 12 about here]

Columns (3) and (4) feature the interaction of *Bound* × *Sovereign downgrade* with lead bank loan share and degree of syndicate concentration, respectively. Both specifications confirm the beneficial effect of spreading the loan share across few members in the syndicate. According to column (3), increasing *Bank share* by one standard deviation (or 17.4%) results in lower *AISD* by approximately 8.3 basis points (coefficient on *Bound* × *Sovereign downgrade* × *Bank share*). This is further reflected in syndicate concentration, with a rise in the syndicate's Herfindahl index (i.e., forming a more concentrated syndicate) leading to an additional decrease of similar magnitude in the offered spread.

Across all specifications, the coefficient on *Bound* × *Sovereign downgrade* remains positive and statistically significant, confirming the aggravating effect of the sovereign ceiling rule on loan spreads. However, this effect can be largely mitigated when increasing the lead bank's stake in a loan and forming a more concentrated syndicate.

6. Conclusion

This paper examines the impact of changes in credit ratings on bank loan contracting by taking advantage of the heterogeneous variations in corporate credit ratings induced by the sovereign ceiling policies of credit rating agencies. Our results suggest that firms with ratings at the sovereign bound are subject to significantly higher borrowing costs and worse loan conditions following a sovereign downgrade than otherwise similar firms whose ratings are not at the sovereign bound. Our baseline specification suggests that loans directed to these firms are priced at approximately 63 basis points higher than the corresponding spread on loans to non-bounded firms. These results are robust to several changes in the baseline specification and alternative estimation methods. We calculate this additional cost of the sovereign ceiling rule for the average loan size and maturity to be approximately USD 7.7 million per year. Thus, firms bounded by their sovereign's credit rating have a significant disadvantage compared to

their non-bounded counterparts in the event of a sovereign downgrade. Moreover, we show that this additional cost materializes when bounded firms obtain financing from foreign banks.

Our analysis further investigates the mechanisms leading to this excessive increase in loan spreads by considering alternative demand-side explanations. We show that this increase is contingent on certain firm characteristics since larger and less-leveraged borrowers with a greater reliance on own funds can partially offset the initial loan spread premium following the downgrade event. When turning to country fundamentals, we find that borrower countries with more developed financial markets (and where credit is mostly provided by the non-bank financial sector rather than the banking sector) are generally associated with lower borrowing costs. The adoption of a more flexible exchange rate regime further eases the cost of credit for bounded firms following a domestic downgrade, as it allows for greater monetary freedom.

Firms have also some levers at their disposal in order to reduce the post-downgrade widening in information asymmetry. These include borrowing from banks with whom they have prior lending relationships or borrowing from banks that operate subsidiaries in the borrower's country. Either of these, can lower the extra cost of credit that bounded borrowers are subject to after a domestic downgrade; this is further evident for borrowers that operate subsidiaries in the lender's country. Moreover, the aggravating effect of sovereign downgrades on loan spreads is largely mitigated for cross-listed firms since the latter have better access to alternative financing sources and to foreign capital markets. Finally, we point to the role of industry concentration, as firms operating in more competitive industries are affected less relative to those in less competitive ones.

Finally, the increase in the lead banks' loan share via the formation of a more narrow and concentrated syndicate can have a certification effect, easing potential adverse selection and subsequent moral hazard concerns regarding the bounded firms' solvency risk. Future

research in this area may further explore the interactive effects of the banking regulatory environment within borrower countries with the rating events.

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Figure 1. Average spreads for bounded vs. non-bounded firms

The figure reports the average *AISD* on all loans received by borrowers in the years before and after their sovereign's downgrade. The average spread (in basis points) of loan facilities is depicted on the Y-axis and the corresponding year is depicted on the X-axis.

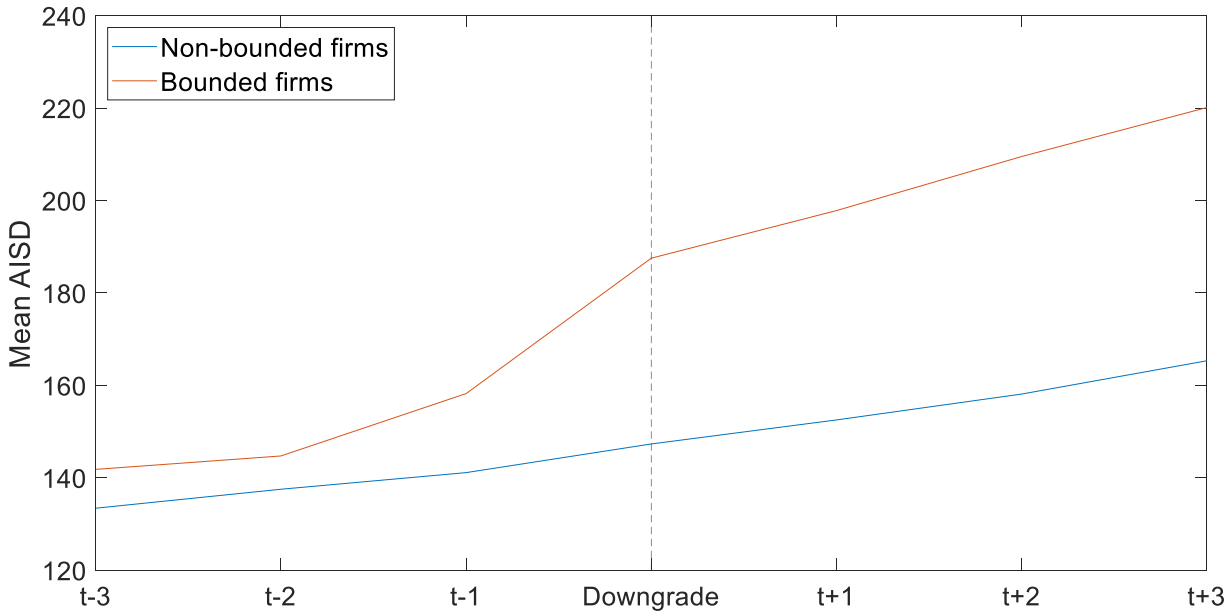

Table 1. Summary statistics

The table reports summary statistics (number of observations, mean, standard deviation, minimum and maximum values) for all variables used in the estimations of the main text. All variables are defined in Table A1.

	Obs.	Mean	Std. dev.	Min.	Max.
AISD	8,498	150.43	94.66	20.00	1,325.00
AISU	2,546	13.58	19.43	0.75	200.00
Sovereign downgrade	8,498	0.09	0.29	0.00	1.00
Sovereign downgrade lc	8,412	0.13	0.33	0.00	1.00
Short-term downgrade	8,483	0.04	0.20	0.00	1.00
Outlook downgrade	8,498	0.17	0.37	0.00	1.00
Bound	8,498	0.45	0.50	0.00	1.00
Loan amount	8,498	20.21	1.46	13.40	24.20
Loan amount (USD million)	8,498	1,220.00	3,090.00	0.66	32,400.00
Maturity	8,498	41.19	32.76	3.00	720.00
Collateral	8,498	0.17	0.38	0.00	1.00
Number of lenders	8,498	18.42	12.66	1.00	86.00
Number of leads	8,498	10.28	7.73	0.00	34.00
Performance provisions	8,498	0.12	0.32	0.00	1.00
General covenants	8,498	0.13	0.46	0.00	4.00
Financial covenants	8,498	0.10	0.39	0.00	4.00
Net covenants	8,498	0.03	0.18	0.00	1.00
Bank share	8,497	12.39	17.35	1.00	100.00
Syndicate Herfindahl	8,497	1,170.97	1,943.43	200.00	10,000.00
Bank size	8,498	13.84	1.11	8.63	19.37
Bank ROA	8,498	0.36	0.45	-0.98	2.91
Bank NPLs	8,498	0.50	0.73	0.00	5.52
Firm size	8,498	12.12	2.61	6.45	24.49
Firm ROA	8,498	7.80	5.52	-13.34	36.58
Firm leverage	8,498	19.44	12.39	0.00	81.82
Firm equity	8,498	10.63	2.48	3.73	22.50
Firm cash	5,978	8.67	2.50	-4.27	16.89
Firm retained earnings	8,162	20.68	22.41	-66.43	198.29
GDP growth	8,498	-1.70	3.43	-18.29	19.06
GDP per capita	8,498	17,349.33	19,907.46	-69,506.60	88,250.53
Stock market capitalization	7,629	95.02	117.22	5.24	1,254.47
Financial sector credit	8,008	121.44	69.42	3.65	345.72
Banking sector credit	8,008	68.52	38.22	8.23	207.89
Exchange rate arrangement	8,072	2.57	1.13	1.00	5.00

Table 2. Summary statistics for bounded firms vs. non-bounded firms post-sovereign downgrade

The table reports summary statistics for key price and non-price loan terms. All variables are defined in Table A1. Panel A includes observations for the group of bounded firms (i.e., firms with a credit rating equal to or above their sovereign prior to the sovereign downgrade) after the sovereign downgrade event. Panel B includes observations for the group of non-bounded firms (i.e., firms with a credit rating below their sovereign prior to the sovereign downgrade) after the sovereign downgrade event. Panel C reports results from the mean-comparison test for differences in the mean and standard error between observations in Panel A and Panel B. The*** mark denotes statistical significance at 1% level.

	Obs.	Mean	Std. dev.	Min.	Max.
Panel A: Bounded firms post-sovereign downgrade					
AISD	453	187.51	128.54	20.00	650.00
AISU	106	48.91	44.09	5.00	180.00
Loan amount	453	20.57	1.44	16.12	23.81
Maturity	453	37.50	22.88	3.00	146.00
Collateral	453	0.32	0.47	0.00	1.00
Number of lenders	453	18.08	11.26	1.00	48.00
Performance provisions	453	0.23	0.42	0.00	1.00
General covenants	453	0.01	0.11	0.00	1.00
Panel B: Non-bounded firms post-sovereign downgrade					
AISD	354	147.13	153.62	1.00	800.00
AISU	102	12.51	10.91	4.00	52.50
Loan amount	354	20.54	1.35	16.83	22.74
Maturity	354	55.16	24.51	12.00	240.00
Collateral	354	0.15	0.36	0.00	1.00
Number of lenders	354	14.05	7.54	1.00	36.00
Performance provisions	354	0.26	0.44	0.00	1.00
General covenants	354	0.22	0.51	0.00	2.00

Panel C: Mean-comparison test for the mean and standard error

	Mean	Std. error
AISD	40.39***	10.16
AISU	36.40***	4.42
Loan amount	0.03	0.10
Maturity	-17.66***	1.69
Collateral	0.17***	0.03
Number of lenders	4.03***	0.66
Performance provisions	-0.03	0.03
General covenants	-0.21***	0.03

Table 3. Baseline results with different fixed effects

The table reports coefficients and t-statistics [in brackets]. The dependent variable is *AISD* and all variables are defined in Table A1. Estimation method is OLS with standard errors clustered by firm *and* year. Each specification includes a different set of fixed effects, as given in the lower part of the table. The *, **, and *** marks denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Bound	12.405	12.405	13.628*	13.521*	9.811	12.287*
	[1.679]	[1.674]	[2.011]	[2.003]	[1.378]	[1.884]
Sovereign downgrade	-9.636	-9.636	-12.546	-13.678	-13.742	-11.405
	[-0.765]	[-0.762]	[-0.984]	[-1.070]	[-1.043]	[-0.934]
Bound × Sovereign downgrade	60.574**	60.574**	62.976**	63.911**	61.685**	64.058**
	[2.317]	[2.310]	[2.675]	[2.579]	[2.348]	[2.490]
Loan amount	-3.668	-3.668	-2.855	-2.108	-2.138	-2.671
	[-1.574]	[-1.569]	[-1.209]	[-0.904]	[-1.071]	[-1.357]
Maturity	0.203***	0.203***	0.265**	0.260**	0.315***	0.322***
	[2.881]	[2.872]	[2.721]	[2.635]	[3.001]	[3.135]
Collateral	7.972	7.972	6.495	6.087	6.079	5.008
	[1.470]	[1.465]	[1.247]	[1.127]	[1.198]	[1.079]
Number of lenders	0.253	0.253	0.390	0.375	0.263	0.269
	[1.103]	[1.099]	[1.646]	[1.591]	[1.085]	[1.101]
Performance provisions	0.163	0.163	-4.078	-3.957	-3.368	-2.727
	[0.024]	[0.024]	[-0.734]	[-0.707]	[-0.543]	[-0.452]
General covenants	13.252*	13.252*	13.212*	12.845	11.779	12.659
	[1.742]	[1.737]	[1.711]	[1.630]	[1.206]	[1.271]
Bank size	-0.959	-0.959	-1.128	-1.220		
	[-0.253]	[-0.252]	[-0.331]	[-0.369]		
Bank ROA	-0.641	-0.641	-1.538	-2.122		
	[-0.301]	[-0.300]	[-0.762]	[-1.109]		
Bank NPLs	-1.922	-1.922	-1.146	-0.997		
	[-1.173]	[-1.170]	[-0.758]	[-0.649]		
Firm size	0.878	0.878	1.456**	1.480**	1.272**	1.516**
	[1.425]	[1.420]	[2.121]	[2.129]	[2.087]	[2.341]
Firm ROA	-0.689	-0.689	-1.044	-1.122*	-1.022*	-0.957
	[-1.050]	[-1.047]	[-1.667]	[-1.725]	[-1.718]	[-1.595]
Firm leverage	0.050*	0.050*	0.068**	0.069**	0.075**	0.075**
	[1.759]	[1.754]	[2.693]	[2.759]	[2.621]	[2.802]
GDP growth	1.515	1.515	1.176	1.196	2.507**	
	[1.617]	[1.612]	[1.242]	[1.267]	[2.129]	
GDP per capita	-0.001	-0.001	-0.001	-0.000	0.001	
	[-0.849]	[-0.847]	[-0.627]	[-0.329]	[0.502]	
Constant	164.922**	164.922**	134.071*	115.636*	81.312**	99.450**
	[2.383]	[2.376]	[1.953]	[1.746]	[2.480]	[2.580]
Observations	8,499	8,499	8,498	8,307	7,682	7,592
Adj. R-squared	0.783	0.781	0.803	0.798	0.808	0.797
Year effects	Y	Y	Y	Y	N	N
Bank effects	Y	Y	Y	Y	N	N
Firm effects	Y	Y	Y	Y	Y	Y
Lender's country effects	N	Y	Y	Y	Y	N
Borrower's country effects	N	Y	Y	Y	Y	Y
Loan type and purpose effects	N	N	Y	Y	Y	Y
Industry effects	N	N	N	Y	Y	Y
Bank × year effects	N	N	N	N	Y	Y
Lender's country × year effects	N	N	N	N	N	Y
Country-pair effects	N	N	N	N	N	Y

Table 4. Baseline results with different fixed effects (local-currency ratings)

The table reports coefficients and t-statistics [in brackets]. The dependent variable is *AISD* and all variables are defined in Table A1. Estimation method is OLS with standard errors clustered by firm *and* year. Each specification includes a different set of fixed effects, as given in the lower part of the table. In all specifications *Sovereign downgrade lc* is a binary variable equal to one if the sovereign's local-currency credit rating is downgraded in the year before the loan facility's origination year, and zero otherwise. The *, **, and *** marks denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Bound	12.605	12.605	13.449*	13.257*	9.254	12.354*
	[1.650]	[1.645]	[1.882]	[1.866]	[1.185]	[1.771]
Sovereign downgrade lc	-7.001	-7.001	-9.992	-10.520	-12.814	-10.243
	[-0.835]	[-0.833]	[-1.164]	[-1.193]	[-1.349]	[-1.113]
Bound × Sovereign downgrade lc	52.614**	52.614**	54.826***	55.133**	54.025**	55.443**
	[2.441]	[2.434]	[2.812]	[2.606]	[2.325]	[2.425]
Loan amount	-3.665	-3.665	-2.902	-2.149	-2.112	-2.625
	[-1.557]	[-1.552]	[-1.223]	[-0.918]	[-1.067]	[-1.354]
Maturity	0.195***	0.195***	0.262***	0.256**	0.306***	0.312***
	[2.907]	[2.898]	[2.852]	[2.771]	[3.075]	[3.205]
Collateral	8.467	8.467	6.988	6.580	6.405	5.573
	[1.540]	[1.536]	[1.303]	[1.187]	[1.254]	[1.185]
Number of lenders	0.284	0.284	0.412*	0.395*	0.302	0.315
	[1.303]	[1.300]	[1.798]	[1.740]	[1.291]	[1.363]
Performance provisions	0.208	0.208	-3.999	-3.859	-2.996	-2.565
	[0.031]	[0.031]	[-0.716]	[-0.685]	[-0.471]	[-0.419]
General covenants	13.491*	13.491*	13.579*	13.222	11.896	12.647
	[1.791]	[1.785]	[1.785]	[1.698]	[1.220]	[1.271]
Bank size	-1.247	-1.247	-1.522	-1.589		
	[-0.317]	[-0.316]	[-0.422]	[-0.452]		
Bank ROA	-0.397	-0.397	-1.405	-2.078		
	[-0.173]	[-0.173]	[-0.702]	[-1.077]		
Bank NPLs	-2.037	-2.037	-1.187	-1.022		
	[-1.218]	[-1.214]	[-0.792]	[-0.677]		
Firm size	0.727	0.727	1.274*	1.293*	1.105*	1.337**
	[1.159]	[1.156]	[1.827]	[1.824]	[1.723]	[2.085]
Firm ROA	-0.699	-0.699	-1.051*	-1.133*	-0.990	-0.930
	[-1.076]	[-1.073]	[-1.720]	[-1.789]	[-1.703]	[-1.590]
Firm leverage	0.051	0.051	0.068**	0.070**	0.076**	0.076**
	[1.695]	[1.690]	[2.568]	[2.629]	[2.549]	[2.741]
GDP growth	1.438	1.438	1.142	1.147	2.344*	
	[1.427]	[1.422]	[1.146]	[1.159]	[1.900]	
GDP per capita	-0.001	-0.001	-0.000	-0.000	0.002	
	[-0.707]	[-0.705]	[-0.435]	[-0.127]	[0.837]	
Constant	169.294**	169.294**	140.744*	121.582*	69.300*	100.674**
	[2.406]	[2.399]	[2.003]	[1.789]	[2.058]	[2.684]
Observations	8,410	8,410	8,407	8,216	7,605	7,519
Adj. R-squared	0.783	0.782	0.803	0.798	0.808	0.797
Year effects	Y	Y	Y	Y	N	N
Bank effects	Y	Y	Y	Y	N	N
Firm effects	Y	Y	Y	Y	Y	Y
Lender's country effects	N	Y	Y	Y	Y	N
Borrower's country effects	N	Y	Y	Y	Y	Y
Loan type and purpose effects	N	N	Y	Y	Y	Y
Industry effects	N	N	N	Y	Y	Y
Bank × year effects	N	N	N	N	Y	Y
Lender's country × year effects	N	N	N	N	N	Y
Country-pair effects	N	N	N	N	N	Y

Table 5. Interaction with short-term ratings and outlook

The table reports coefficients and t-statistics [in brackets]. The dependent variable is AISD and all variables are defined in Table A1. Estimation method is OLS with standard errors clustered by firm and year. In specification (1), *Bound* × *Sovereign downgrade* is interacted with *Short-term downgrade*, i.e., a binary variable equal to one if the sovereign's short-term credit rating is downgraded in the year before the loan facility's origination year (zero otherwise). In specification (2), *Bound* × *Sovereign downgrade* is interacted with *Outlook downgrade*, i.e., a binary variable equal to one if the sovereign's credit rating outlook is downgraded in the year before the loan facility's origination year (zero otherwise). All specifications include year, bank, firm, lender's country, borrower's country, loan type and purpose fixed effects. The *, **, and *** marks denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)
Bound	13.748*	12.351*
	[2.028]	[1.923]
Sovereign downgrade	-12.140	-13.444
	[-0.964]	[-1.037]
Bound × Sovereign downgrade	46.582***	35.549**
	[3.290]	[2.573]
Bound × Sovereign downgrade × Short-term downgrade	27.078	
	[1.018]	
Bound × Sovereign downgrade × Outlook downgrade		48.481**
		[2.475]
Observations	8,481	8,498
Adj. R-squared	0.804	0.804
Fixed effects	Y	Y

Table 6. Domestic borrowing vs foreign borrowing

The table reports coefficients and t-statistics [in brackets]. The dependent variable is AISD and all variables are defined in Table A1. Estimation method used is OLS with standard errors clustered by firm and year. In specification (1), estimates are from the subsample of loans from foreign banks. In specifications (2)-(4), estimates are from the subsample of loans from domestic banks. In specification (3 *Sovereign downgrade* is interacted with *Bound (Bank)*, i.e., a binary variable equal to one if the lender's credit rating is equal to or above the lender's country credit rating in the year before the loan facility's origination year, and zero otherwise. In specification (4), *Sovereign downgrade* is interacted with *Bound (Bank & Firm)*, i.e., a binary variable equal to one if the lender's and the borrower's credit ratings are equal to or above their country's credit rating in the year before the loan facility's origination year, and zero otherwise. All specifications include year, bank, firm, borrower's country, loan type and purpose fixed effects. Specification (1) additionally includes lender's country fixed effects. The *, **, and *** marks denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1) Loans from foreign banks	(2) Loans from domestic banks	(3) Loans from domestic banks	(4) Loans from domestic banks
Bound	13.939	18.295*		
	[1.598]	[1.968]		
Bound (Bank)			-27.842**	
			[-2.125]	
Bound (Bank & Firm)				0.015
				[0.002]
Sovereign downgrade	-0.267	-22.079	4.708	8.187
	[-0.015]	[-1.365]	[0.147]	[0.297]
Bound × Sovereign downgrade	53.930***	59.305		
	[2.870]	[1.588]		
Bound (Bank) × Sovereign downgrade			28.391**	
			[2.183]	
Bound (Bank & Firm) × Sovereign downgrade				29.987*
				[1.764]
Observations	6,388	2,110	2,110	2,110
Adj. R-squared	0.801	0.814	0.838	0.808
Fixed effects	Y	Y	Y	Y

Table 7. Results from subsamples with similar firm fundamentals

This table reports coefficients and t-statistics [in brackets]. The dependent variable is *AISD* and all variables are defined in Table A1. Estimation method is OLS with standard errors clustered by firm *and* year. Different specifications include different subsamples of matched firms. Specification (1) includes a subsample of bounded firms and firms that are one notch below the bound. Specification (2) includes the subsample of specification (1) and further limits the subsample to firms with size (*Firm size*) within one standard deviation of the sample mean. Specification (3) includes the subsample of specification (2) and further limits the subsample to firms with return on assets (*Firm ROA*) within one standard deviation of the sample mean. Specification (4) includes the subsample of specification (3) and further limits the subsample to firms with leverage (*Firm leverage*) within one standard deviation of the sample mean. All specifications include year, bank, firm, lender's country, borrower's country, loan type and purpose fixed effects. The *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
Bound	-7.872	-4.778	-4.879	2.494
	[-1.363]	[-0.681]	[-0.618]	[0.331]
Sovereign downgrade	-7.461	-16.824	-12.055	-8.142
	[-0.838]	[-1.177]	[-0.751]	[-0.575]
Bound × Sovereign downgrade	63.125***	72.804***	53.474***	52.067***
	[4.553]	[4.431]	[3.227]	[3.667]
Loan amount	-9.658***	-11.596***	-11.939**	-13.609***
	[-2.929]	[-3.224]	[-2.744]	[-3.131]
Maturity	0.562***	0.526***	0.740***	0.637***
	[5.907]	[4.372]	[3.654]	[3.399]
Collateral	9.377	13.403*	10.901*	10.633*
	[1.476]	[2.004]	[1.939]	[1.823]
Number of lenders	-0.054	-0.107	-0.117	-0.157
	[-0.209]	[-0.417]	[-0.340]	[-0.453]
Performance provisions	13.537	15.817	5.244	5.189
	[1.060]	[1.465]	[0.435]	[0.428]
General covenants	9.076**	5.894	3.268	2.165
	[2.077]	[1.165]	[0.601]	[0.349]
Bank size	-8.289	-11.397	-9.055	-12.607
	[-1.447]	[-1.672]	[-1.163]	[-1.634]
Bank ROA	0.089	-0.939	6.756	5.520
	[0.024]	[-0.252]	[1.599]	[1.275]
Bank NPLs	-2.068	-3.009	-2.591	-1.681
	[-0.869]	[-1.060]	[-0.758]	[-0.469]
Firm size	-0.036	-3.299	3.711	-0.471
	[-0.040]	[-1.124]	[1.004]	[-0.115]
Firm ROA	-0.814	-1.060**	-2.241*	-2.381*
	[-1.644]	[-2.095]	[-1.886]	[-1.818]
Firm leverage	0.003	0.004	-0.028	0.020
	[0.239]	[0.231]	[-1.523]	[0.250]
GDP growth	0.892	0.924	2.556	3.368**
	[0.769]	[0.589]	[1.670]	[2.187]
GDP per capita	0.001	0.001	0.001	0.002**
	[0.542]	[0.705]	[0.491]	[2.644]
Constant	378.135***	485.416***	399.536**	484.367***
	[3.501]	[3.385]	[2.441]	[3.119]
Observations	5,044	3,825	2,973	2,699
Adj. R-squared	0.647	0.640	0.663	0.683
Fixed effects	Y	Y	Y	Y

Table 8. Borrower's fundamentals

The table reports coefficients and t-statistics [in brackets]. The dependent variable is *AISD* and all variables are defined in Table A1. Estimation method is OLS with standard errors clustered by firm *and* year. In specification (1), *Bound × Sovereign downgrade* is interacted with *Firm size*, i.e., the log of total firm assets. In specification (2), *Bound × Sovereign downgrade* is interacted with *Firm ROA*, i.e., the return on total firm assets. In specification (3), *Bound × Sovereign downgrade* is interacted with *Firm leverage*, i.e., the firm leverage. In specification (4), *Bound × Sovereign downgrade* is interacted with *Firm equity*, i.e., the log of firm equity capital. In specification (5), *Bound × Sovereign downgrade* is interacted with *Firm cash*, i.e., the log of firm cash holdings. In specification (6), *Bound × Sovereign downgrade* is interacted with *Firm retained earnings*, i.e., the log of firm retained earnings. All specifications include year, bank, lender's country, borrower's country, loan type and purpose fixed effects. The *, **, and *** marks denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Bound	13.374*	13.597*	13.399*	13.449*	15.165*	13.217*
	[2.017]	[2.014]	[2.036]	[2.031]	[1.916]	[1.948]
Sovereign downgrade	-12.227	-12.612	-11.652	-12.234	-18.394	-13.636
	[-0.967]	[-0.990]	[-0.930]	[-0.969]	[-1.324]	[-1.070]
Bound × Sovereign downgrade	59.575**	49.731**	30.704**	54.732**	60.486**	61.668**
	[2.603]	[2.633]	[2.161]	[2.568]	[2.297]	[2.260]
Bound × Sovereign downgrade × Firm size	-4.645**					
	[-2.101]					
Bound × Sovereign downgrade × Firm ROA		-1.864*				
		[-1.833]				
Bound × Sovereign downgrade × Firm leverage			1.259*			
			[1.827]			
Bound × Sovereign downgrade × Firm equity				-5.789*		
				[-1.966]		
Bound × Sovereign downgrade × Firm cash					-11.108*	
					[-1.771]	
Bound × Sovereign downgrade × Firm retained earnings						-1.139**
						[-2.210]
Observations	8,498	8,498	8,498	8,498	5,942	8,156
Adj. R-squared	0.803	0.803	0.804	0.804	0.820	0.798
Full set of controls	Y	Y	Y	Y	Y	Y
Fixed effects	Y	Y	Y	Y	Y	Y

Table 9. Borrower's country fundamentals

The table reports coefficients and t-statistics [in brackets]. The dependent variable is *AISD* and all variables are defined in Table A1. Estimation method is OLS with standard errors clustered by firm *and* year. In specification (1), *Bound* × *Sovereign downgrade* is interacted with *Stock market capitalization*, i.e., the total value of all listed shares in the borrower's country stock market (% of GDP). In specification (2), *Bound* × *Sovereign downgrade* is interacted with *Financial sector credit*, i.e., the domestic credit in the borrower's country provided by the financial sector (% of GDP). In specification (3), *Bound* × *Sovereign downgrade* is interacted with *Banking sector credit*, i.e., the domestic credit in the borrower's country provided by the banking sector (% of GDP). In specification (4), *Bound* × *Sovereign downgrade* is interacted with *Financial/Banking sector credit*, i.e., the ratio of *Financial sector credit* to *Banking sector credit*. In specification (5), *Bound* × *Sovereign downgrade* is interacted with *Exchange rate arrangement*, i.e., a categorical variable ranging from 1 to 5 reflecting the exchange rate regime in the borrower's country based on the exchange rate regime classification of Ilzetzki, Reinhart, and Rogoff (2019). All specifications include year, bank, firm, lender's country, loan type and purpose fixed effects. The *, **, and *** marks denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Bound	9.079	13.085*	12.224*	12.151	11.802*
	[1.352]	[1.838]	[1.768]	[1.712]	[1.779]
Sovereign downgrade	-23.125**	-15.510	-14.806	-16.248	-14.331
	[-2.071]	[-1.186]	[-1.153]	[-1.207]	[-1.113]
Bound × Sovereign downgrade	89.769**	59.982**	28.376**	59.415**	50.416**
	[2.096]	[2.570]	[2.825]	[2.581]	[2.147]
Bound × Sovereign downgrade × Stock market capitalization	-38.093*				
	[-1.804]				
Bound × Sovereign downgrade × Financial sector credit		-0.053**			
		[-2.196]			
Bound × Sovereign downgrade × Banking sector credit			0.516*		
			[1.967]		
Bound × Sovereign downgrade × Financial/Banking sector credit				-22.587*	
				[-1.868]	
Bound × Sovereign downgrade × Exchange rate arrangement					-24.285*
					[-1.843]
Observations	7,623	8,002	8,002	8,002	8,071
Adj. R-squared	0.824	0.806	0.807	0.807	0.807
Full set of controls	Y	Y	Y	Y	Y
Fixed effects	Y	Y	Y	Y	Y

Table 10. Lending relationships and subsidiary role

This table reports estimated coefficients and t-statistics [in brackets]. The dependent variable is *AISD* and all variables are defined in Table A1. Estimation method used is OLS with standard errors clustered by firm *and* year. In specification (1), *Bound* is interacted with *Relationship lending*, i.e., a binary variable equal to 1 for a prior lending relationship between the lender and the borrower during the previous 2-year period, and zero otherwise. In specification (2), *Bound* is interacted with *Relationship lending number*, i.e., the ratio of the number of prior loans between the lender and the borrower during the previous 2-year period to the total number of loans received by the borrower during the same period. In specification (3), *Bound* is interacted with *Relationship lending amount*, i.e., the ratio of the amount of prior loans between the lender and the borrower during the previous 2-year period to the total amount of loans received by the borrower during the same period. In specification (4), *Bound* is interacted with *Bank subsidiary*, i.e., a binary variable equal to one if the lender operates a subsidiary in the borrower's country, and zero otherwise. In specification (5), *Bound* is interacted with *Firm subsidiary*, i.e., a binary variable equal to one if the borrower operates a subsidiary in the lender's country, and zero otherwise. All specifications include year, bank, firm, lender's country, borrower's country, loan type and purpose fixed effects. The *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively

	(1)	(2)	(3)	(4)	(5)
Bound	13.456*	13.588*	13.577*	13.406**	13.824*
	[2.014]	[2.013]	[1.998]	[2.073]	[2.028]
Sovereign downgrade	-11.857	-12.508	-12.564	-15.081	-14.009
	[-0.937]	[-0.985]	[-0.970]	[-1.233]	[-1.046]
Bound × Sovereign downgrade	70.923**	65.786**	65.740**	65.283***	68.408***
	[2.536]	[2.705]	[2.682]	[2.876]	[2.818]
Bound × Sovereign downgrade × Relationship lending	-15.589*				
	[-1.944]				
Bound × Sovereign downgrade × Relationship lending number		-65.012*			
		[-1.792]			
Bound × Sovereign downgrade × Relationship lending amount			-61.040*		
			[-1.744]		
Bound × Sovereign downgrade × Bank subsidiary				-4.481**	
				[2.548]	
Bound × Sovereign downgrade × Firm subsidiary					-10.490*
					[-1.774]
Observations	8,495	8,495	8,404	6,340	7,532
Adj. R-squared	0.803	0.803	0.803	0.803	0.797
Full set of controls	Y	Y	Y	Y	Y
Fixed effects	Y	Y	Y	Y	Y

Table 11. Borrower's listing status and industry concentration

The table reports coefficients and t-statistics [in brackets]. The dependent variable is *AISD* and all variables are defined in Table A1. Estimation method is OLS with standard errors clustered by firm *and* year. Each specification includes the interaction of the bound indicator with different indicators reflecting the borrower's listing status and the borrower industry's concentration. In specification (1), *Bound* × *Sovereign downgrade* is interacted with *Cross-listed*, i.e., a binary variable equal to one if the borrower's common shares are listed on two or more stock exchanges, and zero otherwise. In specification (2), *Bound* × *Sovereign downgrade* is interacted with *Cross-listed in U.S.*,, i.e., a binary variable equal to one if the borrower's common shares are listed on two or more stock exchanges, where one of them is a U.S. stock exchange, and otherwise zero. In specification (3), *Bound* × *Sovereign downgrade* is interacted with *Low HHI*, i.e., a binary variable equal to one if the Herfindahl-Hirschmann index of the borrower's industry is in the bottom tercile of our sample, and zero otherwise. In specification (4), *Bound* × *Sovereign downgrade* is interacted with *Low Lerner index*, i.e., a binary variable equal to one if the Lerner index of the borrower's industry is in the bottom tercile of our sample, and zero otherwise. In specification (5), *Bound* × *Sovereign downgrade* is interacted with *Low top-5 concentration*, i.e., a binary variable equal to one if the sum of market shares of the largest five firms in the borrower's industry is in the bottom tercile of our sample, and zero otherwise. All specifications include year, bank, lender's country, borrower's country, loan type and purpose fixed effects. Specifications (2)-(5) additionally include firm fixed effects. The *, **, and *** marks denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Bound	13.491*	13.446*	13.698*	13.691*	13.570*
	[1.984]	[1.968]	[1.994]	[2.011]	[2.016]
Sovereign downgrade	-12.661	-12.689	-12.861	-12.640	-12.545
	[-0.992]	[-0.994]	[-1.020]	[-0.977]	[-0.985]
Bound × Sovereign downgrade	63.410**	63.616**	65.687**	60.521***	65.157**
	[2.649]	[2.668]	[2.721]	[2.959]	[2.389]
Bound × Sovereign downgrade × Cross-listed	-4.996**				
	[-2.157]				
Bound × Sovereign downgrade × Cross-listed in U.S.		-9.286**			
		[-2.254]			
Bound × Sovereign downgrade × Low HHI			-6.566**		
			[-2.353]		
Bound × Sovereign downgrade × Low Lerner index				-4.692**	
				[-2.284]	
Bound × Sovereign downgrade × Low top-5 concentration					-5.237**
					[-2.278]
Observations	8,485	8,485	8,498	8,498	8,498
Adj. R-squared	0.803	0.803	0.803	0.803	0.803
Full set of controls	Y	Y	Y	Y	Y
Fixed effects	Y	Y	Y	Y	Y

Table 12. The syndicate's structure

The table reports coefficients and t-statistics [in brackets]. The dependent variable is *AISD* and all variables are defined in Table A1. Estimation method is OLS with standard errors clustered by firm *and* year. Each specification includes the interaction of the bound indicator with different indicators reflecting the syndicate's structure. In specification (1), *Bound × Sovereign downgrade* is interacted with *Number of lenders*, i.e., the number of banks involved in the syndicated loan. In specification (2), *Bound × Sovereign downgrade* is interacted with *Number of leads*, i.e., the number of lead banks involved in the syndicated loan. In specification (3), *Bound × Sovereign downgrade* is interacted with *Bank share*, i.e., the bank's share of the loan facility. In specification (4), *Bound × Sovereign downgrade* is interacted with *Syndicate Herfindahl*, i.e., the Herfindahl index of the syndicate. All specifications include year, bank, firm, lender's country, borrower's country, loan type and purpose fixed effects. The *, **, and *** marks denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
Bound	13.496*	13.786*	13.621*	13.628*
	[2.020]	[2.007]	[2.013]	[2.011]
Sovereign downgrade	-11.990	-12.376	-12.740	-12.672
	[-0.958]	[-0.976]	[-1.004]	[-1.001]
Bound × Sovereign downgrade	73.973**	73.410**	67.886***	66.194***
	[2.131]	[2.390]	[3.146]	[3.188]
Bound × Sovereign downgrade × Number of lenders	1.596*			
	[1.789]			
Bound × Sovereign downgrade × Number of leads		1.865*		
		[1.800]		
Bound × Sovereign downgrade × Bank share			-0.480**	
			[-2.030]	
Bound × Sovereign downgrade × Syndicate Herfindahl				-0.003*
				[-1.988]
Observations	8,498	8,498	8,497	8,497
Adj. R-squared	0.803	0.803	0.803	0.803
Full set of controls	Y	Y	Y	Y
Fixed effects	Y	Y	Y	Y

Internet Appendix
Syndicated bank lending and rating downgrades: When do sovereign ceiling policies really matter?

Abstract

The first section includes the definitions of variables employed. The second section includes information on the construction of the sample. The third section reports several additional sensitivity tests.

Table A1. Variable definitions and sources

Variable	Description	Source
A. Dependent variables in main specifications		
AISD	All-in spread drawn, defined as the sum of the spread over LIBOR plus any facility fee.	DealScan
AISU	All-in spread undrawn, defined as the sum of the facility fee and the commitment fee.	DealScan
B. Main explanatory variables: Bounded firms		
Bound	A binary variable equal to one if the borrower's credit rating is equal to or above the borrower's country credit rating in the year before the loan facility's origination year, and zero otherwise. The variable *Bound (Bank)* is the equivalent variable for the lender's credit rating, and the variable *Bound (Bank & Firm)* is the equivalent variable for the lender's and the borrower's credit ratings.	S&P Credit Ratings
C. Explanatory variables: Sovereign downgrade		
Sovereign downgrade	A binary variable equal to one, if the sovereign's long-term foreign-currency credit rating is downgraded in the year before the loan facility's origination year, and zero otherwise. Sovereign downgrade lc is the equivalent variable for local-currency credit ratings.	S&P Credit Ratings
Short-term downgrade	A binary variable equal to one, if the sovereign's short-term foreign-currency credit rating is downgraded in the year before the loan facility's origination year, and zero otherwise.	S&P Credit Ratings
Outlook downgrade	A binary variable equal to one, if the outlook on the sovereign's long-term foreign-currency credit rating is downgraded in the year before the loan facility's origination year, and zero otherwise.	S&P Credit Ratings
D. Explanatory variables: Loan characteristics		
Loan amount	Log of the loan facility amount in USD.	DealScan
Maturity	Loan duration in months.	DealScan
Collateral	A binary variable equal to one if the loan is secured with collateral, and zero otherwise.	DealScan
Number of lenders	The number of banks involved in the syndicated loan.	DealScan
Number of leads	The number of lead banks involved in the syndicated loan.	DealScan
Performance provisions	A binary variable equal to one if the loan has performance pricing provisions, and zero otherwise.	DealScan
General covenants	The total number of covenants in the loan contract.	DealScan
Financial covenants	The number of financial covenants in the loan contract.	DealScan
Net covenants	The number of net covenants in the loan contract.	DealScan
Loan type	A series of binary variables indicating loan type (e.g., term loans, revolvers, etc.).	DealScan
Loan purpose	A series of binary variables indicating loan purpose (e.g., corporate purpose, debt repay, etc.).	DealScan
Bank share	The bank's share of the loan facility.	DealScan
Syndicate Herfindahl	The Herfindahl index of the syndicate (a measure of the concentration of holdings within a syndicate). The Herfindahl index is calculated using each syndicate member's share in the loan. It is the sum of the squared individual shares in the loan, and varies from zero to 10,000, with 10,000 being the Herfindahl when a lender holds 100% of the loan.	DealScan
Relationship lending	A binary variable equal to one for a prior loan facility between the lender and the borrower in the 2-year period before the loan facility's origination year, and zero otherwise.	DealScan
Relationship lending number	The ratio of the number of prior loan facilities between the lender and the borrower in the 2-year period before the loan facility's origination year to the total number of loans received by the borrower during the same period.	DealScan

Relationship lending amount	The ratio of the amount of prior loan facilities between the lender and the borrower in the 2-year period before the loan facility's origination year to the total amount of loans received by the borrower during the same period.	DealScan

E. Explanatory variables: Lender characteristics

Bank size	The log of total bank assets.	Compustat
Bank ROA	The return on total bank assets.	Compustat
Bank NPLs	The ratio of non-performing loans to total bank loans.	Compustat
Bank subsidiary	Abinary variable equal to one if the lender operates a subsidiary in the borrower's country, and zero otherwise.	DealScan

F. *Explanatory variables: Borrower characteristics*

Firm size	The log of total firm assets.	Compustat
Firm ROA	The return on total firm assets.	Compustat
Firm leverage	The firm leverage.	Compustat
Firm equity	The log of firm equity capital.	Compustat
Firm cash	The log of firm cash holdings.	Compustat
Firm retained earnings	The log of firm retained earnings.	Compustat
Firm subsidiary	A binary variable equal to one if the borrower operates a subsidiary in the lender's country, and zero otherwise.	DealScan
Cross-listed	A binary variable equal to one if the firm's common shares are listed on one or more foreign stock exchanges in addition to the firm's domestic stock exchange, and zero otherwise. The variable *Cross-listed in U.S.* is the equivalent variable if the firm's common shares are listed on a U.S. stock exchange (in addition to its domestic stock exchange).	Compustat; Firm disclosures

G. Explanatory variables: Borrower's industry characteristics

Low HHI	A binary variable equal to one if the Herfindahl-Hirschmann index of the borrower's industry is in the bottom tercile of our sample, and zero otherwise.	DealScan; Compustat
Low Lerner index	A binary variable equal to one if the Lerner index of the borrower's industry is in the bottom tercile of our sample, and zero otherwise.	DealScan; Compustat
Low top-5 concentration	A binary variable equal to one if the sum of market shares of the largest five firms in the borrower's industry is in the bottom tercile of our sample, and zero otherwise.	DealScan; Compustat

H. Explanatory variables: Borrower's country characteristics

GDP growth	The difference in annual GDP growth rate (%) between the lender's and the borrower's countries.	WDI
GDP per capita	The difference in annual GDP per capita in constant prices between the lender's and the borrower's countries.	WDI
Stock market capitalization	The total value (in USD) of all listed shares in the borrower's country stock market as a percentage of GDP.	WDI
Financial sector credit	The domestic credit in the borrower's country provided by the financial sector as a percentage of GDP.	WDI
Banking sector credit	The domestic credit in the borrower's country provided by the banking sector as a percentage of GDP.	WDI
Exchange rate arrangement	A categorical variable ranging from 1 to 5 reflecting the exchange rate arrangement in the borrower's country. The variable is based on the exchange rate regime classification of Ilzetzki, Reinhart, and Rogoff (2019), with lower values reflecting less flexible arrangements (e.g., a value of 1 includes pre announced pegs, currency board arrangements, pre announced horizontal bands narrower than or equal to +/- 2%, de facto pegs) and higher values reflecting more flexible arrangements (e.g., a value of 4 includes freely floating arrangements, and a value of 5 includes freely floating arrangements).	Ilzetzki, Reinhart and Rogoff (2019)

Table A2. Sovereign downgrades and bounded firms affected

The table presents the sovereign downgrade events for the borrower countries in our sample and the bounded firms affected.

Country	Year of Downgrade	Bounded firms affected
Mexico	1995	AXA SA de CV
Turkey	1996	Turk Ekonomi Bankasi AS [TEB]
Korea (South)	1997	Hana Bank
Malaysia	1997	Tenaga Nasional Bhd
Malaysia	1997	Telekom Malaysia Bhd
Hong Kong	1998	Citibank NA Hong Kong Branch
Hong Kong	1998	Bank of America Asia
Malaysia	1998	Public Bank Bhd
Malaysia	1998	Malayan Banking Bhd
Argentina	2000	Transportadora de Gas del Sur SA
Turkey	2001	Turkiye Garanti Bankasi AS
Turkey	2001	Finansbank AS [Turkey]
Japan	2002	Tokyo Electric Power Co Inc
Japan	2002	Ajinomoto Co Inc
Japan	2002	Abbott Japan Co Ltd
Philippines	2003	Globe Telecom Inc
Greece	2004	Coca-Cola Hellenic Bottling Co SA (CCHBC)
Philippines	2005	San Miguel Corp
Italy	2006	Enel SpA
Argentina	2008	Pan American Energy
Russia	2008	Severneftegazprom OAO
Russia	2008	Sakhalin II Project
Mexico	2009	PMI Trading Ltd
Mexico	2009	Grupo Bimbo
Mexico	2009	Petroleos Mexicanos (Pemex)
Greece	2010	OTE Hellenic Telecommunications Organisation SA
Ireland	2010	Accenture
Portugal	2010	Energias de Portugal SA [EDP]
Greece	2011	Titan Cement Co SA
Greece	2011	Coca-Cola Hellenic Bottling Co SA (CCHBC)
Italy	2011	SNAM Rete Gas SpA
USA	2011	Momentive Performance Materials Inc
USA	2011	WW Grainger Inc
USA	2011	NetJets Inc
Italy	2012	SNAM Rete Gas SpA
Italy	2012	Enel Rete Gas SpA
Portugal	2012	Energias de Portugal SA [EDP]
Spain	2012	Gas Natural SDG SA
Spain	2012	Amadeus IT Group SA
Spain	2012	Iberdrola SA
Spain	2012	Enagas SA
Argentina	2013	Pan American Energy
Italy	2013	Enel SpA
Italy	2013	Luxottica Group SpA
Italy	2013	Terna SpA [Trasmissione Elettricita Rete Nazionale]
Ukraine	2013	Ferrexpo Group
Argentina	2014	Pan American Energy
Brazil	2014	Vale SA
Brazil	2014	Gerdau
Ghana	2014	Kosmos Energy Ghana HC
Italy	2014	Enel SpA
Italy	2014	Exor SpA
Italy	2014	Terna SpA [Trasmissione Elettricita Rete Nazionale]
Russia	2014	Uralkali JSC [Uralkaly OAO]
Russia	2014	Gazprom OAO

South Africa	2014	Investec Bank Ltd [South Africa]
Bahrain	2015	Bahrain Steel B.S.C.C. EC
Russia	2015	Uralkali JSC [Uralkaly OAO]
Mexico	1995	AXA SA de CV
Turkey	1996	Turk Ekonomi Bankasi AS [TEB]
Korea (South)	1997	Hana Bank
Malaysia	1997	Tenaga Nasional Bhd
Malaysia	1997	Telekom Malaysia Bhd
Hong Kong	1998	Citibank NA Hong Kong Branch
Hong Kong	1998	Bank of America Asia
Malaysia	1998	Public Bank Bhd
Malaysia	1998	Malayan Banking Bhd
Argentina	2000	Transportadora de Gas del Sur SA
Turkey	2001	Turkiye Garanti Bankasi AS
Turkey	2001	Finansbank AS [Turkey]
Japan	2002	Tokyo Electric Power Co Inc
Japan	2002	Ajinomoto Co Inc
Japan	2002	Abbott Japan Co Ltd
Philippines	2003	Globe Telecom Inc
Greece	2004	Coca-Cola Hellenic Bottling Co SA (CCHBC)
Philippines	2005	San Miguel Corp
Italy	2006	Enel SpA
Argentina	2008	Pan American Energy
Russia	2008	Severneftegazprom OAO
Russia	2008	Sakhalin II Project
Mexico	2009	PMI Trading Ltd
Mexico	2009	Grupo Bimbo
Mexico	2009	Petroleos Mexicanos (Pemex)
Greece	2010	OTE Hellenic Telecommunications Organisation SA
Ireland	2010	Accenture
Portugal	2010	Energias de Portugal SA [EDP]
Greece	2011	Titan Cement Co SA
Greece	2011	Coca-Cola Hellenic Bottling Co SA (CCHBC)
Italy	2011	SNAM Rete Gas SpA
USA	2011	Momentive Performance Materials Inc
USA	2011	WW Grainger Inc
USA	2011	NetJets Inc
Italy	2012	SNAM Rete Gas SpA
Italy	2012	Enel Rete Gas SpA
Portugal	2012	Energias de Portugal SA [EDP]
Spain	2012	Gas Natural SDG SA
Spain	2012	Amadeus IT Group SA
Spain	2012	Iberdrola SA
Spain	2012	Enagas SA
Argentina	2013	Pan American Energy
Italy	2013	Enel SpA
Italy	2013	Luxottica Group SpA
Italy	2013	Terna SpA [Trasmissione Elettricita Rete Nazionale]
Ukraine	2013	Ferrexpo Group
Argentina	2014	Pan American Energy
Brazil	2014	Vale SA
Brazil	2014	Gerdau
Ghana	2014	Kosmos Energy Ghana HC
Italy	2014	Enel SpA
Italy	2014	Exor SpA
Italy	2014	Terna SpA [Trasmissione Elettricita Rete Nazionale]
Russia	2014	Uralkali JSC [Uralkaly OAO]
Russia	2014	Gazprom OAO

	South Africa	2014	Investec Bank Ltd [South Africa]
	Bahrain	2015	Bahrain Steel B.S.C.C. EC
	Russia	2015	Uralkali JSC [Uralkaly OAO]
Total	19	21	51

Table A3. Different loan controls

The table reports coefficients and t-statistics [in brackets]. The dependent variable is *AISD* and all variables are defined in Table A1. Estimation method is OLS with standard errors clustered by firm *and* year. Different specifications include different loan controls to show that the estimates on the term *Bound* × *Sovereign downgrade* are not overly sensitive to the loan controls used. All specifications include year, bank, firm, lender's country, borrower's country, loan type and purpose fixed effects. The *, **, and *** marks denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
Bound	13.875*	13.914*	13.288*	14.095**
	[2.002]	[2.001]	[1.956]	[2.075]
Sovereign downgrade	-11.773	-11.776	-11.098	-13.776
	[-0.948]	[-0.896]	[-0.859]	[-1.142]
Bound × Sovereign downgrade	60.482**	60.230**	62.541**	63.499**
	[2.588]	[2.524]	[2.652]	[2.747]
Loan amount			-2.164	-2.683
			[-0.943]	[-1.138]
Maturity			0.276**	0.266**
			[2.715]	[2.685]
Collateral		7.305		6.405
		[1.361]		[1.201]
Number of lenders		0.365		0.420
		[1.680]		[1.687]
Performance provisions		-4.014	-2.181	
		[-0.722]	[-0.380]	
General covenants		13.090*	13.998*	
		[1.726]	[1.775]	
Bank size	-1.770	-1.966	-1.136	-1.033
	[-0.538]	[-0.594]	[-0.329]	[-0.306]
Bank ROA	-1.360	-1.560	-1.567	-1.420
	[-0.652]	[-0.734]	[-0.768]	[-0.719]
Bank NPLs	-0.894	-0.983	-1.216	-0.987
	[-0.590]	[-0.654]	[-0.808]	[-0.647]
Firm size	1.358*	1.562**	1.328*	1.381*
	[1.794]	[2.159]	[1.773]	[2.046]
Firm ROA	-0.934	-1.007	-0.993	-1.027
	[-1.428]	[-1.638]	[-1.600]	[-1.539]
Firm leverage	0.074**	0.072**	0.070**	0.068**
	[2.724]	[2.765]	[2.621]	[2.720]
GDP growth	1.419	1.302	1.126	1.337
	[1.622]	[1.434]	[1.164]	[1.527]
GDP per capita	-0.001	-0.001	-0.001	-0.001
	[-0.745]	[-0.735]	[-0.602]	[-0.648]
Constant	108.289***	99.175**	128.323*	131.528*
	[2.945]	[2.687]	[1.866]	[1.935]
Observations	8,498	8,498	8,498	8,498
Adj. R-squared	0.798	0.801	0.802	0.801
Fixed effects	Y	Y	Y	Y

Table A4. Results from extended sample

The table reports coefficients and t-statistics [in brackets]. The dependent variable is *AISD* and all variables are defined in Table A1. Estimation method is OLS with standard errors clustered by firm *and* year. Each specification includes a different set of fixed effects, as given in the lower part of the table. All specifications include estimations from an extended sample where the group of non-bound borrowers includes borrowers with any credit rating below the credit rating of their sovereign. The *, **, and *** marks denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Bound	9.820*	9.797*	11.306**	11.157*	11.377*	14.481**
	[1.772]	[1.766]	[2.116]	[2.032]	[2.065]	[2.618]
Sovereign downgrade	-1.730	-1.726	-1.385	-1.573	2.998	4.859
	[-0.194]	[-0.193]	[-0.170]	[-0.191]	[0.408]	[0.679]
Bound × Sovereign downgrade	59.918***	59.926***	58.421***	57.465***	45.796**	47.048**
	[3.920]	[3.918]	[4.297]	[3.821]	[2.624]	[2.755]
Loan amount	-2.876**	-2.874**	-7.103***	-7.040***	-6.208***	-6.280***
	[-2.087]	[-2.085]	[-6.767]	[-6.403]	[-5.884]	[-5.958]
Maturity	0.117**	0.117**	0.183*	0.176*	0.192*	0.199*
	[2.267]	[2.269]	[1.817]	[1.720]	[1.835]	[1.906]
Collateral	33.517***	33.495***	28.506***	28.975***	28.380***	28.315***
	[6.387]	[6.381]	[5.375]	[5.349]	[4.856]	[4.876]
Number of lenders	-0.715***	-0.715***	-0.317**	-0.309**	-0.309**	-0.338**
	[-4.906]	[-4.904]	[-2.636]	[-2.512]	[-2.493]	[-2.682]
Performance provisions	-13.651***	-13.653***	-10.361***	-10.722***	-11.879***	-12.028***
	[-4.163]	[-4.162]	[-4.090]	[-4.160]	[-4.447]	[-4.494]
General covenants	3.214**	3.211**	4.215***	4.225***	4.204***	4.220***
	[2.248]	[2.246]	[3.534]	[3.478]	[3.062]	[3.088]
Bank size	-0.428	-0.448	-1.345	-0.760		
	[-0.190]	[-0.199]	[-0.637]	[-0.359]		
Bank ROA	-2.709*	-2.725*	-2.724**	-2.662*		
	[-2.025]	[-2.035]	[-2.055]	[-2.027]		
Bank NPLs	1.192	1.208	1.764	1.782		
	[0.873]	[0.886]	[1.374]	[1.355]		
Firm size	-0.381	-0.377	0.518	0.674	1.081	0.885
	[-0.269]	[-0.266]	[0.378]	[0.502]	[0.833]	[0.693]
Firm ROA	-2.073***	-2.072***	-2.057***	-2.064***	-2.046***	-2.052***
	[-9.235]	[-9.237]	[-9.707]	[-9.466]	[-8.918]	[-8.881]
Firm leverage	-0.000*	-0.000*	-0.000	-0.000*	-0.000*	-0.000**
	[-1.714]	[-1.713]	[-1.678]	[-1.707]	[-1.919]	[-2.127]
GDP growth	1.013	1.007	0.751	0.755	1.078	
	[1.445]	[1.431]	[1.028]	[1.030]	[1.029]	
GDP per capita	0.001*	0.001*	0.002***	0.002**	0.002	
	[1.762]	[1.782]	[2.910]	[2.729]	[1.513]	
Constant	240.653***	240.716***	318.757***	307.565***	273.745***	280.986***
	[5.691]	[5.688]	[8.860]	[8.800]	[12.705]	[12.825]
Observations	65,019	65,019	65,013	62,788	57,217	57,117
Adj. R-squared	0.730	0.729	0.758	0.759	0.777	0.775
Year effects	Y	Y	Y	Y	N	N
Bank effects	Y	Y	Y	Y	N	N
Firm effects	Y	Y	Y	Y	Y	Y
Lender's country effects	N	Y	Y	Y	Y	N
Borrower's country effects	N	Y	Y	Y	Y	Y
Loan type and purpose effects	N	N	Y	Y	Y	Y
Industry effects	N	N	N	Y	Y	Y
Bank × year effects	N	N	N	N	Y	Y
Lender's country × year effects	N	N	N	N	N	Y
Country-pair effects	N	N	N	N	N	Y

Table A5. Other loan characteristics

The table reports coefficients and t-statistics [in brackets]. The dependent variable is denoted in the second line of the table and all variables are defined in Table A1. Estimation method is OLS with standard errors clustered by firm *and* year. All specifications include year, bank, firm, lender's country, borrower's country, loan type and purpose fixed effects. The *, **, and *** marks denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)		(3)	(4)	(5)	(6)
	AISU	(2)	Maturity	Collateral	Performance	General
		Loan amount			provisions	covenants
Bound	0.033	-0.065	-0.182	-0.028	-0.038	0.021
	[0.030]	[-0.917]	[-0.055]	[-0.715]	[-0.987]	[0.567]
Sovereign downgrade	-1.657	-0.281*	0.428	-0.034	0.010	-0.085
	[-0.482]	[-1.806]	[0.152]	[-0.484]	[0.103]	[-0.536]
Bound × Sovereign downgrade	6.669	0.184	-10.952*	0.146	0.051	0.014
	[1.421]	[0.918]	[-2.048]	[1.562]	[0.464]	[0.107]
AISD	0.096***	-0.001	0.034**	0.000	-0.000	0.001
	[3.514]	[-1.290]	[2.680]	[1.181]	[-0.717]	[1.491]
Loan amount	0.446		0.225	0.002	0.007	0.016**
	[1.423]		[0.350]	[0.342]	[1.096]	[2.092]
Maturity	0.017	0.000		0.001	0.000	0.000
	[0.643]	[0.330]		[1.356]	[0.536]	[0.008]
Collateral	-3.142	0.017	2.955		0.010	-0.009
	[-0.825]	[0.340]	[1.212]		[0.271]	[-0.353]
Number of lenders	0.134*	0.015***	0.049	0.001	0.004***	0.003**
	[2.032]	[3.571]	[0.588]	[0.351]	[2.866]	[2.205]
Performance provisions	-1.980**	0.073	1.186	0.014		0.134**
	[-2.084]	[1.051]	[0.547]	[0.267]		[2.667]
General covenants	2.167**	0.096***	0.016	-0.007	0.078*	
	[2.395]	[2.960]	[0.009]	[-0.332]	[1.911]	
Bank size	-0.568	0.055	-2.513	0.033*	0.031	0.013
	[-0.832]	[1.012]	[-1.194]	[1.761]	[1.367]	[0.530]
Bank ROA	-0.130	0.051	0.528	0.014	0.017	0.013
	[-0.344]	[1.300]	[0.431]	[0.754]	[0.981]	[1.595]
Bank NPLs	0.228	-0.012	0.533	-0.000	-0.002	0.013
	[0.520]	[-0.629]	[0.781]	[-0.039]	[-0.302]	[1.486]
Firm size	-0.293	0.021*	0.564**	-0.035***	-0.001	-0.007
	[-0.591]	[2.022]	[2.055]	[-3.697]	[-0.436]	[-1.679]
Firm ROA	0.105	-0.007	0.106	0.008**	0.001	0.002
	[1.151]	[-0.800]	[0.505]	[2.168]	[0.219]	[0.421]
Firm leverage	-0.013***	-0.000	0.009	-0.000	-0.000	-0.000
	[-4.018]	[-1.654]	[1.508]	[-1.063]	[-1.094]	[-0.238]
Firm tangibility	0.592**	-0.009	0.332	-0.003	0.001	0.012
	[2.198]	[-0.821]	[1.083]	[-0.935]	[0.299]	[1.612]
GDP growth	0.000	0.000	-0.000	-0.000	-0.000*	-0.000
	[1.206]	[1.276]	[-0.883]	[-1.181]	[-1.705]	[-0.866]
GDP per capita	5.761	18.832***	63.320	0.065	-0.338	-0.329
	[0.421]	[23.941]	[1.487]	[0.180]	[-1.147]	[-0.805]
Constant	2,478	8,498	8,498	8,498	8,498	8,498
	0.950	0.796	0.790	0.597	0.593	0.663
Observations	0.033	-0.065	-0.182	-0.028	-0.038	0.021
Adj. R-squared	[0.030]	[-0.917]	[-0.055]	[-0.715]	[-0.987]	[0.567]
Fixed effects	Y	Y	Y	Y	Y	Y

Table A6. Different clustering of standard errors

The table reports coefficients and t-statistics [in brackets]. The dependent variable is *AISD* and all variables are defined in Table 1. Estimation method is OLS. The lower part of the table denotes the type of standard error clustering (C refers to borrower's country, F refers to firm, L refers to loan, and Y refers to year). All specifications include year, bank, firm, lender's country, borrower's country, loan type and purpose fixed effects. The *, **, and *** marks denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Bound	13.628**	13.628**	13.628**	13.628**	13.628**
	[2.226]	[2.346]	[2.234]	[2.611]	[2.234]
Sovereign downgrade	-12.546	-12.546	-12.546	-12.546	-12.546
	[-1.395]	[-0.839]	[-0.986]	[-0.838]	[-0.986]
Bound × Sovereign downgrade	62.976***	62.976***	62.976***	62.976***	62.976***
	[3.228]	[2.631]	[2.872]	[2.695]	[2.872]
Loan amount	-2.855	-2.855	-2.855	-2.855	-2.855
	[-1.465]	[-1.402]	[-1.214]	[-1.295]	[-1.214]
Maturity	0.265**	0.265***	0.265***	0.265***	0.265***
	[2.527]	[3.037]	[3.040]	[3.537]	[3.040]
Collateral	6.495	6.495	6.495*	6.495**	6.495*
	[1.179]	[1.247]	[1.977]	[2.161]	[1.977]
Number of lenders	0.390**	0.390*	0.390**	0.390**	0.390**
	[2.203]	[1.740]	[2.082]	[2.235]	[2.082]
Performance provisions	-4.078	-4.078	-4.078	-4.078	-4.078
	[-1.114]	[-0.572]	[-0.820]	[-0.763]	[-0.820]
General covenants	13.212*	13.212**	13.212*	13.212**	13.212*
	[1.910]	[1.965]	[1.742]	[2.145]	[1.742]
Bank size	-1.128	-1.128	-1.128	-1.128	-1.128
	[-0.347]	[-0.419]	[-0.322]	[-0.383]	[-0.322]
Bank ROA	-1.538	-1.538	-1.538	-1.538	-1.538
	[-0.817]	[-0.765]	[-0.653]	[-0.804]	[-0.653]
Bank NPLs	-1.146	-1.146	-1.146	-1.146	-1.146
	[-0.941]	[-0.770]	[-0.724]	[-0.832]	[-0.724]
Firm size	1.456**	1.456**	1.456**	1.456**	1.456**
	[2.157]	[2.155]	[2.231]	[2.537]	[2.231]
Firm ROA	-1.044**	-1.044	-1.044*	-1.044*	-1.044*
	[-2.228]	[-1.516]	[-1.822]	[-1.715]	[-1.822]
Firm leverage	0.068***	0.068***	0.068**	0.068***	0.068**
	[2.927]	[2.731]	[2.540]	[2.680]	[2.540]
GDP growth	1.176	1.176	1.176	1.176**	1.176
	[1.324]	[1.430]	[1.654]	[2.403]	[1.654]
GDP per capita	-0.001	-0.001	-0.001	-0.001	-0.001
	[-0.709]	[-0.747]	[-0.719]	[-0.862]	[-0.719]
Constant	134.071**	134.071**	134.071*	134.071*	134.071*
	[2.156]	[2.379]	[1.816]	[1.968]	[1.816]
Observations	8,498	8,498	8,498	8,498	8,498
Adj. R-squared	0.804	0.803	0.803	0.803	0.803
Fixed effects	Y	Y	Y	Y	Y
Clustering	L&Y	L&F	C&Y	C&F	C&F&Y

Table A7. Weighted least squares

The table reports coefficients and t-statistics [in brackets]. The dependent variable is *AISD* and all variables are defined in Table A1. Estimation method is weighted least squares with standard errors clustered by firm *and* year. In specification (1), we weight by the number of loans between the lender's country and the borrower's country to the total number of loans in our sample. In specification (2), we employ the weight of specification (1) at the yearly frequency. In specification (3), we weight by the number of loans between the lender and the borrower's country to the total number of loans in our sample. In specification (4), we employ the weight of specification (3) at the yearly frequency. In specification (5), we weight by the number of loans between the lender and the borrower to the total number of loans in our sample. In specification (6), we employ the weight of specification (5) at the yearly frequency. All specifications include year, bank, firm, lender's country, borrower's country, loan type and purpose fixed effects. The *, **, and *** marks denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Bound	13.601*	14.168**	13.676*	13.790*	13.623*	13.522*
	[2.004]	[2.111]	[2.021]	[2.031]	[2.009]	[1.992]
Sovereign downgrade	-12.552	-11.330	-12.549	-12.163	-12.552	-12.547
	[-0.983]	[-0.881]	[-0.984]	[-0.950]	[-0.986]	[-0.985]
Bound × Sovereign downgrade	62.997**	61.640**	62.984**	62.716**	62.981**	62.935**
	[2.673]	[2.607]	[2.676]	[2.656]	[2.676]	[2.672]
Loan amount	-2.846	-2.922	-2.866	-2.933	-2.839	-2.744
	[-1.205]	[-1.237]	[-1.213]	[-1.236]	[-1.185]	[-1.155]
Maturity	0.264**	0.269**	0.265**	0.266**	0.265**	0.266**
	[2.695]	[2.707]	[2.712]	[2.715]	[2.727]	[2.728]
Collateral	6.503	6.320	6.471	6.508	6.499	6.462
	[1.248]	[1.211]	[1.245]	[1.253]	[1.242]	[1.241]
Number of lenders	0.390	0.394	0.390	0.388	0.391	0.391
	[1.646]	[1.680]	[1.643]	[1.646]	[1.642]	[1.640]
Performance provisions	-4.033	-4.271	-4.135	-4.156	-4.093	-4.230
	[-0.723]	[-0.780]	[-0.747]	[-0.751]	[-0.731]	[-0.757]
General covenants	13.238*	13.061	13.204*	13.309*	13.214*	13.197*
	[1.711]	[1.686]	[1.708]	[1.727]	[1.711]	[1.709]
Bank size	-1.128	-1.247	-1.051	-0.889	-1.146	-1.212
	[-0.331]	[-0.367]	[-0.308]	[-0.262]	[-0.334]	[-0.355]
Bank ROA	-1.607	-0.886	-1.319	-1.174	-1.552	-1.586
	[-0.781]	[-0.435]	[-0.629]	[-0.578]	[-0.769]	[-0.781]
Bank NPLs	-1.156	-0.997	-1.149	-1.116	-1.143	-1.181
	[-0.765]	[-0.663]	[-0.757]	[-0.736]	[-0.752]	[-0.784]
Firm size	1.460**	1.339*	1.453**	1.417**	1.459**	1.466**
	[2.103]	[1.951]	[2.105]	[2.077]	[2.123]	[2.131]
Firm ROA	-1.050	-1.045	-1.033	-1.036	-1.045	-1.047
	[-1.668]	[-1.677]	[-1.652]	[-1.659]	[-1.656]	[-1.670]
Firm leverage	0.068**	0.066**	0.068**	0.067**	0.068**	0.068**
	[2.708]	[2.658]	[2.699]	[2.690]	[2.693]	[2.700]
GDP growth	1.178	1.176	1.179	1.184	1.176	1.177
	[1.243]	[1.245]	[1.247]	[1.256]	[1.231]	[1.240]
GDP per capita	-0.001	-0.000	-0.001	-0.000	-0.001	-0.001
	[-0.627]	[-0.538]	[-0.617]	[-0.564]	[-0.632]	[-0.633]
Constant	133.448*	140.201**	133.738*	133.163*	133.809*	132.436*
	[1.955]	[2.055]	[1.952]	[1.951]	[1.951]	[1.939]
Observations	8,498	8,498	8,498	8,498	8,498	8,498
Adj. R-squared	0.803	0.803	0.803	0.803	0.803	0.803
Fixed effects	Y	Y	Y	Y	Y	Y

Table A8. Heckman sample-selection model

The table reports coefficients and t-statistics [in brackets] from Heckman's (1979) sample-selection model. The dependent variable is in the second line of each panel and all variables are defined in Table A1. Estimation method in Panel A is maximum likelihood and in Panel B is OLS with standard errors clustered by firm *and* year. Panel A reports the estimates from the first-stage probit model to estimate the determinants of the firm's loan-taking decision. Panel B reports the estimates from the second-stage OLS regression for the effect of sovereign ceiling on loan spreads. Each of the specification in Panel B includes the inverse mills ratio (*Lambda*) from the corresponding specification in Panel A. All specifications in Panel A include year, bank firm, lender's country and borrower's country dummies. All specifications in Panel B include year, bank, firm, lender's country, borrower's country, loan type and purpose fixed effects. The *, **, and *** marks denote statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: The loan-taking decision by the firm

	(1)	(2)	(3)
	Loan deal	Loan deal	Loan deal
Firm size	0.047***	-0.067***	0.035*
	[8.416]	[-3.763]	[1.778]
Firm ROA	0.019***	0.014***	0.019***
	[8.180]	[5.484]	[7.439]
Firm leverage	-0.000***	-0.000***	-0.001***
	[-8.337]	[-4.665]	[-10.280]
Firm equity		0.117***	0.020
		[6.613]	[1.026]
Firm debt			0.012***
			[10.489]
Loan amount	0.066***	0.049***	0.020**
	[7.758]	[5.439]	[2.217]
Maturity	-0.001***	-0.001***	-0.002***
	[-2.711]	[-4.471]	[-6.135]
Collateral	0.864***	0.924***	0.877***
	[19.426]	[21.012]	[19.736]
Number of lenders	0.057***	0.064***	0.058***
	[36.900]	[39.571]	[37.606]
Performance provisions	0.909***	0.927***	0.947***
	[15.568]	[15.892]	[15.986]
General covenants	0.176***	0.155***	0.174***
	[5.137]	[4.522]	[4.970]
Bank size	0.039***	0.004	0.011
	[3.321]	[0.362]	[0.968]
Bank ROA	0.105***	0.063**	0.075**
	[3.565]	[2.164]	[2.538]
Bank NPLs	0.008	0.003	-0.000
	[0.475]	[0.182]	[-0.025]
Bank loans	-7.289***		
	[-15.447]		
Firm loans		-7.151***	
		[-10.795]	
Bank-firm loans			-2.843***
			[-12.627]
Constant	60.045***	39.827***	47.437***
	[11.033]	[7.446]	[8.873]
Observations	16,321	16,321	16,321

Panel B: The effect of Bound × Sovereign downgrade on loan spreads

	(1) AISD	(2) AISD	(3) AISD
Bound	13.603*	13.608*	13.720*
	[2.006]	[2.002]	[2.014]
Sovereign downgrade	-12.547	-12.560	-12.477
	[-0.982]	[-0.983]	[-0.983]
Bound × Sovereign downgrade	63.096**	63.020**	62.885**
	[2.688]	[2.695]	[2.690]
Loan amount	-3.068	-2.905	-2.625
	[-1.384]	[-1.304]	[-1.153]
Maturity	0.268**	0.266**	0.255**
	[2.737]	[2.685]	[2.501]
Collateral	5.512	6.221	8.559*
	[1.242]	[1.347]	[1.830]
Number of lenders	0.317	0.370	0.546
	[0.981]	[1.017]	[1.612]
Performance provisions	-5.599	-4.450	-0.948
	[-0.842]	[-0.653]	[-0.143]
General covenants	12.864	13.129	13.876*
	[1.621]	[1.662]	[1.754]
Bank size	-1.172	-1.130	-1.089
	[-0.347]	[-0.332]	[-0.323]
Bank ROA	-1.776	-1.578	-1.226
	[-0.928]	[-0.839]	[-0.635]
Bank NPLs	-1.181	-1.144	-1.141
	[-0.739]	[-0.751]	[-0.732]
Firm size	1.436*	1.450*	1.513**
	[2.033]	[2.042]	[2.110]
Firm ROA	-1.096	-1.055	-0.949
	[-1.641]	[-1.597]	[-1.448]
Firm leverage	0.069***	0.068***	0.066**
	[2.858]	[2.830]	[2.717]
GDP growth	1.182	1.177	1.169
	[1.238]	[1.236]	[1.251]
GDP per capita	-0.001	-0.001	-0.001
	[-0.622]	[-0.627]	[-0.625]
Lambda	-4.510	-1.147	9.218
	[-0.409]	[-0.094]	[0.834]
Constant	143.504**	136.256**	119.596*
	[2.293]	[2.165]	[1.941]
Observations	8,498	8,498	8,498
Adj. R-squared	0.803	0.803	0.803

Table A9. Different macro-controls

This table reports coefficients and t-statistics [in brackets]. The dependent variable is *AISD* and all variables are defined in Table A1. The estimation method is OLS with standard errors clustered by firm *and* year. Each specification includes a different set of macro-level controls. All specifications include year, bank, firm, lender's country, borrower's country, loan type and purpose fixed effects. The *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Bound	6.692	13.219*	13.251	12.032*	13.730*
	[0.815]	[1.867]	[1.522]	[1.762]	[1.966]
Sovereign downgrade	-17.210	-16.813	-28.815	-20.810	-12.502
	[-1.192]	[-1.308]	[-1.695]	[-1.642]	[-0.978]
Bound × Sovereign downgrade	55.414**	65.963**	69.895**	64.885***	61.908**
	[2.393]	[2.422]	[2.528]	[2.931]	[2.605]
Loan amount	-2.716	-1.865	-3.446	-2.533	-2.791
	[-1.108]	[-0.822]	[-1.522]	[-1.027]	[-1.211]
Maturity	0.072	0.239**	0.203*	0.271**	0.264***
	[0.494]	[2.367]	[1.815]	[2.425]	[2.782]
Collateral	9.346	4.712	9.359	7.360	6.685
	[1.367]	[0.839]	[1.091]	[1.369]	[1.294]
Number of lenders	0.278	0.348	0.429**	0.388	0.386
	[0.926]	[1.522]	[2.303]	[1.536]	[1.589]
Performance provisions	-7.378	-3.813	-7.164	-4.214	-4.235
	[-0.944]	[-0.648]	[-1.082]	[-0.765]	[-0.744]
General covenants	14.476	12.934	6.889	13.534	13.464*
	[1.655]	[1.577]	[1.082]	[1.640]	[1.743]
Bank size	4.461	-2.221	-0.456	-0.055	-1.391
	[1.174]	[-0.625]	[-0.111]	[-0.016]	[-0.407]
Bank ROA	0.347	-2.778*	-4.376*	-2.092	-1.659
	[0.111]	[-1.782]	[-1.719]	[-1.173]	[-0.854]
Bank NPLs	-0.557	-0.284	0.244	-0.589	-1.064
	[-0.300]	[-0.193]	[0.112]	[-0.373]	[-0.689]
Firm size	2.706	0.293	0.136	1.087	1.479**
	[1.256]	[0.313]	[0.097]	[1.516]	[2.145]
Firm ROA	-1.092	-1.047	-1.243**	-0.990	-1.050
	[-1.622]	[-1.557]	[-2.192]	[-1.468]	[-1.663]
Firm leverage	0.090**	0.075**	0.075**	0.073***	0.074***
	[2.603]	[2.805]	[2.119]	[2.900]	[2.817]
GDP growth	1.644	0.968	2.143**	0.793	1.161
	[1.375]	[0.989]	[2.223]	[0.903]	[1.217]
GDP per capita	-0.000	0.001	-0.001	0.000	-0.001
	[-0.269]	[0.870]	[-0.545]	[0.293]	[-0.615]
Debt-to-GDP	-0.307				
	[-1.049]				
Inflation		-0.826*			
		[-1.898]			
Trade balance			-0.000		
			[-0.715]		
Real rate			0.991		
			[0.947]		
Polity				-4.672**	
				[-2.498]	
Economic freedom				-1.916**	
				[-2.569]	
Vix					0.193
					[0.433]
Constant	67.374	120.265*	146.276	268.467***	131.935*
	[0.782]	[1.752]	[1.714]	[3.208]	[2.046]
Observations	5,228	8,015	4,322	7,956	8,455

Adj. R-squared	0.813	0.805	0.843	0.808	0.803
Fixed effects	Y	Y	Y	Y	Y