

Mind the Sovereign Ceiling on Corporate Performance

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ABSTRACT

We find direct evidence that sovereign default risk has a negative impact on corporate performance via a rating spillover channel. Difference-in-differences tests exploiting the heterogeneity in corporate credit ratings following sovereign rating downgrades reveal that firm performance deteriorates predominantly for sovereign bound firms with higher information asymmetry, limited financial flexibility, and those operating in countries with less developed banking systems and lower investor protection.

JEL classification: G24, G31, G32, G38, H63, I25

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1. Introduction

As governments around the world have grappled with their sovereign debt levels in recent years on the back of an extended period of low borrowing costs, the longer-term implications of sovereign default risk for corporate sector performance and economic recovery remains a live issue to explore. In particular, the impact on corporate borrowers is heterogeneous and to date, is not comprehensively understood. Understanding whether the credit rating channel is a key channel in amplifying sovereign default risk within a country is important as the economic costs of credit impairment can linger and hold back economic growth for decades (Reinhart and Rogoff, 2010; Reinhart et al., 2012).

Whilst prior studies have documented significant costs of sovereign default to the private sector by assessing the sensitivity of market-based prices to sovereign debt exposures and with the use of event studies and/or asset valuation models (Andrade and Chhaochharia, 2018; Jeanneret, 2017; Kaminsky and Schmukler, 2002) or examined the transfer of credit risk from sovereigns to corporates using changes in credit prices (Acharya et al., 2018; Augustin et al., 2018; Bedendo and Colla, 2015; Lee et al., 2016) or credit ratings (Borensztein et al., 2013; Jiang and Packer, 2019), the literature has been empirically challenged by the long-standing inability to disentangle the effects of a fundamental weakening in private sector credit quality arising in tandem with that of the public sector decline as the credit quality of the two sectors are intricately intertwined. This study offers new direct evidence on sovereign default costs through the lens of exogenous rating declines in the corporate sector via the credit rating industry's practice of the sovereign ceiling policy.

Credit ratings are one of the most salient measures of creditworthiness. They received widespread and unprecedented scrutiny following the 2008 Global Financial Crisis and the ensuing European sovereign debt crisis. Investors were shocked by the spate of sovereign debt

defaults that caused many countries' credit ratings to be downgraded for the first time in history. The extensive literature shows that these deteriorations in sovereign credit risk publicly reflected in sovereign rating downgrades have widespread ramifications for stock market performance (Brooks et al., 2004), corporate credit ratings of state-owned firms (Jiang and Packer, 2019) and also extends throughout the real sector through the sovereign ceiling channel (Almeida et al., 2017). Credit rating agencies' sovereign ceiling policies implicitly require corporate ratings to remain at or below the rating of their country of domicile. Sovereign ceiling policies were strictly enforced until late 1990s but are less strictly enforced in the last 2 decades. Almeida et al. (2017) find that bound firms have a 59% chance of obtaining a rating downgrade within the month of sovereign downgrade, compared to 9% and 4% for firms that are one and two notches below the sovereign rating, respectively. Furthermore, these bound firms significantly reduce their investment activities and reliance on credit markets due to the rising cost of debt capital following the rating downgrade. There is also much anecdotal evidence suggesting that many large and economically important firms have been directly affected through the sovereign ceiling channel. For example, several Russian gas and oil giants such as Gazprom and Rosneft were downgraded after Russia got downgraded by Standard & Poor's (S&P) from BBB- to BB+ in January 2015. With outstanding total debt estimated at over US\$40 billion at the time, Rosneft's financing activities were severely impacted by the forced rating downgrade which led the firm to subsequently alter its investment strategy. A senior spokesman of Rosneft stated "We have taken a decision to adjust our business plans to take into account the macro environment and optimize capital expenditures to prioritize upstream projects" (Reuters, 2015).

An important yet unexplored research question emanating from these observations is: How is corporate sector performance impacted by sovereign credit impairment? Are the sovereign bound firms that are forced to cut back on corporate investments performing worse due to the

increase in cost of capital? Does the institutional environment influence how sovereign credit impairment is transferred onto corporate performance? This paper addresses these specific questions by exploiting exogenous variations in the effects of sovereign downgrades to empirically examine a country's credit impairment on corporate performance. Whilst the effects of credit rating downgrades are widely understood, the wider implications of sovereign default risk in amplifying corporate sector decline has surprisingly, received relatively less attention to date. We attempt to fill this gap by studying the causal relation between sovereign credit impairment and corporate performance by adapting the framework of the quasi-natural experiment recently employed by Almeida et al. (2017) and Adelino and Ferreira (2016) for identifying the real effects on corporate investments and financial intermediation to further advance current knowledge on the far-reaching economic consequences of sovereign defaults.

Rating spillover effects from the public to the private sector are likely to be painfully manifested in weakening corporate sector performance even in the absence of a fundamental deterioration in private sector financial strength. Prior studies find that credit ratings play a critical role in affecting a firm's access to capital markets and in turn their financing policies (Kisgen, 2006). For example, Tang (2009) shows that firms that received higher refined ratings by Moody's experienced on average a 20 basis point drop in their corporate bond yields, while Kisgen and Strahan (2010) find that firms that received a one-notch higher rating from another rating agency experienced on average a 39 basis point reduction in their debt cost of capital. Recent studies have shown that this resulting change in the cost of debt financing has pushed managers to alter firms' financing and investment activities. Baghai et al. (2014) and Almeida et al. (2017) show that downgraded firms are forced to issue less debt and reduce corporate investment. Wang and Yang (2019) find that downgraded firms are forced to curb corporate innovation and hence spend less on R&D expenditures. Consistent with these studies, Harford and Uysal (2014) find that higher rated firms are better able to undertake corporate acquisitions. Motivated

by these extant findings, our central thesis in this paper is that sovereign credit rating downgrades will likely lead to a more costly deterioration in firm performance for sovereign bound firms relative to other firms in the economy through a rating pooling mechanism that increases the cost of external finance and *ceteris paribus* reduces the profitability of firm investments and generally makes doing business much more costly (for instance, through more stringent trading and financing terms).

We formally test this form of sovereign default cost transferred to the corporate sector by investigating the effect of sovereign ceilings on firm performance in a matched global sample of “treatment” firms (firms bound by the sovereign ceiling) and “control” firms (non-bound firms) from 1990 to 2016 using a difference-in-differences approach. We find that the performance of treatment firms deteriorates significantly more after a sovereign rating downgrade with their ROA decreasing from 16.25% to 14.41%, a reduction of 1.84 percentage points. In contrast, control firms’ ROA increase by 0.43 percentage points, from 12.08% before the rating downgrade to 12.51% after the rating downgrade. Overall, we obtain a difference-in-differences estimator of -2.27%, and the differential effects are statistically significant at the 1% level. These DID results lend consistently strong support to our central thesis on a costly rating pooling effect directly impacting corporate sector performance and our finding is unambiguously robust to various placebo tests and alternative model specifications and firm matching criteria.

To pinpoint the specific channels through which sovereign credit impairments harm the operating performance of treatment firms we conduct further cross-sectional tests. First, we expect our results to be driven by treatment firms that are likely to find it difficult to raise debt finance after a rating downgrade. We find that our results are concentrated in treatment firms with higher information asymmetry, which makes sense as debt providers are more likely to cut back their lending to these firms after a credit rating downgrade. Second, we expect our results

to be driven by treatment firms that find it difficult to raise additional finance, as firms operating in countries with highly developed banking systems and firms with good access to external capital markets should still be able to raise financing after a credit rating downgrade. We find that the negative effect of sovereign default risk on firm performance is concentrated in treatment firms with a non-investment grade credit rating and those operating in emerging markets and countries with less developed banking systems, as these firms have limited ability to access debt and equity capital markets. Third, we expect the negative effect of sovereign credit impairment on firm performance to be concentrated in firms operating in countries with lower investor protection, as external financial markets are more likely to penalize newly downgraded sovereign bound corporates in countries offering weaker levels of investor protection with the added uncertainty this brings for potential investors. While these results suggest that the adverse impact of sovereign ceiling policies on firm performance is driven by the contraction in debt capital supply, they need to be interrupted with caution due to the small sample size.

This study makes several key contributions to the extant literature. First, this study makes an important contribution to the literature strand that relates sovereign default risk to the real economy. By exploiting an identification strategy afforded to researchers by the sovereign ceiling policy used in the global credit rating industry, we are able to disentangle the fundamental firm-specific concerns that market participants have from the direct rating pooling effects arising from sovereign credit impairments on the corporate sector. With this empirical strategy, Adelino and Ferreira (2016) show that banks that are downgraded due to credit rating agencies' sovereign ceiling policies reduce their lending supply. Almeida et al. (2017) demonstrate that corporates that are downgraded as a result of sovereign ceiling policies reduce their debt issuance and investment, due to the increasing cost of debt. Similarly, Wang and Yang (2019) find a reduction in innovation in the downgraded corporates that are dependent on

external finance. In this study, we instead provide new insights that sovereign credit impairments are also economically costly on corporate performance through a direct rating spillover from public to private credit. There are strong policy implications from our study as our findings highlight that poor public debt management is burdensome and damaging for business performance in the real economy even before any ensuing changes to fiscal policy to redress the state of public finances, a country's tarnished international reputation and its ability to borrow for weathering future economic shocks. Sovereign default costs are thus amplified due to the inherent nature of ratings anchoring and pooling mechanisms.

Second, it adds to the literature that studies the effects of corporate credit rating changes on firm outcomes. Kisgen (2006) highlights that ratings are used as information signals regarding firm quality and firms are pooled together by investors based on credit rating levels. Hence, changes in ratings bring about discrete costs (in the case of downgrades and benefits in the case of upgrades). The prior literature documents that rating changes have a significant impact on firms' cost of borrowing (Tang, 2009; Kisgen and Strahan, 2010), capital structure (Kisgen, 2006, Baghai et al., 2014) and investment and financing decisions (Sufi, 2009; Harford and Uysal, 2014; Almeida et al., 2017). In this study, we extend beyond these effects to establish a plausibly causal link between direct sovereign-corporate rating spillovers and firm performance by exploiting the sovereign ceiling policy as an exogenous shock to corporate credit ratings.

The rest of the paper is organized as follows. Section 2 describes the data, sample selection, and matching methodology. Section 3 presents the main results. Section 4 examines the channels through which sovereign ceilings affect firm performance, and Section 5 concludes.

2. Data and Sample selection

In this section, we describe our data sources, sample coverage, and firm matching methodology used.

2.1. Data

Our extensive dataset comprises a global sample of firms from 1990 to 2016. Our firm fundamentals and markets data are sourced from Compustat and Compustat Global. The sovereign and corporate credit ratings data are obtained from Bloomberg, Capital IQ and Datastream and verified across these alternative databases wherever possible. Ratings issued by Standard and Poors (S&P) are used in our study as S&P are known to be more proactive in making rating revisions and the rating revisions are less likely to be anticipated by the market compared to other rating agencies (Reisen and Maltzan, 1999; Kaminsky and Schmukler, 2002). We exclude financial firms from our sample as these firms have different financial and investment policies. Firms with negative total asset values are also removed from our sample. Our sample comprises of 800,711 firm-year observations with 62,190 firms from 120 countries. Among them, we restrict our analyses on the sub-set of companies that have a credit rating history and operating in countries with a sovereign credit rating. We also collect government ownership data from Refinitiv Eikon and remove firms with government ownership as these firms are more likely to receive support from the government. Lastly, we restrict our sample to firms with non-missing matching and outcome variables around a 7-year window of a sovereign downgrade. Our final sample consists of 20,964 firm-year observations with 2,337 unique firms from 57 countries.¹

¹ We can ascertain that all 73 of Almeida et al.'s (2017) treatment firms are also included in our dataset.

2.2. Sample Selection

To study the impact of exogenous rating changes induced by sovereign ceiling policies on firm performance, we exploit the heterogeneity in corporate rating actions and compare the change in the performance of treatment firms with the change in performance of matched control firms around sovereign downgrade rating events. A treatment firm is defined as a firm that has a credit rating equal to or above its operating country's sovereign credit rating in the year before the sovereign downgrade. A bound firm do not need to be actually downgraded following a sovereign downgrade for it to be classified as a treatment firm as conditioning the definition of "Treatment" on whether firms are ex-post downgraded is statistically inappropriate for inference purposes. To ensure that treatment firms are correctly matched to similar non-treatment firms, we match each treatment firm with a rated control firm from the same country, GICS sector and year with the closest propensity score estimated with a probit model on pre-event firm size, firm age, tobin's q, cash, leverage, investment and foreign exchange exposure. To minimize the effect of outliers, we winsorize all continuous variables at the 1st and 99th percentile (see variable definitions in Table 1).

[Place Table 1 about here]

Table 2 provides our global sample of treatment firms at the sovereign ceiling and matched control firms from 1990 to 2016. There are a total of 66 treatment firms and the same number of matched control firms across 13 countries that have experienced sovereign downgrades during our sample period studied. Our sample contains firms from both emerging as well as developed markets. We report our list of treatment firms in the Appendix. Table 2 shows that there are multiple sovereign rating downgrades for the same country in our final sample, with

Brazil and Japan having four downgrades and Argentina, Indonesia, Italy, Russia and South Africa each having two downgrades. The average sovereign downgrade is of one notch.²

[Place Table 2 about here]

3. Sovereign Ceilings and Firm Performance

In this section, we examine the direct impact of sovereign credit impairment on firm performance. We first present the difference-in-differences test results and then present placebo test results to rule out that our findings are driven by general macroeconomic conditions unrelated to sovereign default risk.

3.1. Difference-in-Differences Test Results

Table 3 presents the difference-in-differences (DID) test results for the effect of sovereign credit impairment on firm performance. Panel A of Table 3 first provides summary statistics and tests of difference for the matching variables between the treatment and control group in the year prior to a sovereign downgrade. The matching variables are size, tobin's q, cash, leverage, investment, and foreign exchange exposure, where Size is defined as the logarithm of total assets; Age is defined as the natural logarithm of firm age (measured as the number of years since the firm's first appearance in Compustat Global); Tobin's Q is defined as total assets plus market value of common equity minus book value of common equity all divided by total assets; Cash is defined as cash scaled by lagged total assets; Leverage is defined as short term debt plus long term debt scaled by lagged total assets; Investment is defined as capital expenditure

² Following common practice adopted in the credit ratings literature, the credit ratings obtained are converted into numerical scores from 1-22, with 1 representing a AAA rating and 22 representing default. Observations with ratings of "NR (Not rated)" are excluded. The details of our linear conversions of credit ratings into numerical scores can be found in Table A1 in the Appendix.

scaled by lagged total assets; Foreign exchange exposure is defined as the absolute value of foreign exchange income scaled by lagged total assets. The univariate comparisons in Panel A of Table 3 show that there are no significant differences in the mean values of matching variables between the treatment and control group in the year before a sovereign downgrade, indicating that the matching procedure has removed most of the cross-sectional heterogeneity between the treatment and control firms.

[Place Table 3 about here]

Panel B of Table 3 reports the main DID results. Prior studies show that firms adjust their investment policies either in the year of an exogenous financial shock or in the year after an exogenous financial shock (Duchin et al., 2010; Derrien and Kecskes; 2013; Almeida et al., 2017). Thus, we expect the flow-on deterioration effect in firm performance to occur during the second year after a credit rating downgrade, and hence we concentrate on the change in firm performance from t-1 to t+2 in our baseline DID tests. The change in performance of the treatment firms is directly compared with the change in performance of the matched control firms in Panel B of Table 3. Standard errors are clustered by firm as a number of treatment firms appear more than once in our sample since a number of countries have been downgraded multiple times. We find that the performance of treatment firms systematically deteriorates relative to control firms after a sovereign rating downgrade. The performance reduction is economically significant as we find that the treatment firms experience a significant decrease in ROA from 16.25% to 14.41%, a reduction of 1.84 percentage points. In contrast, the ROA of control firms increases slightly from 12.08% before the sovereign downgrade to 12.51% after the sovereign downgrade and the change is insignificant. Overall, ROA reduces by 2.27% more for treatment firms relative to control firms, and the differential effects are significant at the 1% level.

The success of the DID estimation rests on the parallel trend assumption that the ROA of the treatment and control firms would have changed in a similar manner in the absence of the sovereign downgrade event. We follow the standard practice in the literature to test this assumption by looking at whether the trends in ROA are similar between treatment and control firms before a sovereign downgrade. Panel C of Table 3 presents the results. We do not find any significant differences for the change in ROA between the treatment and control group prior to a sovereign downgrade, indicating that the parallel trend assumption is satisfied.

To further validate a plausibly causal relation between sovereign credit impairment and firm performance, we plot the level of ROA for treatment firms and control firms from three years before a sovereign downgrade to three years after a sovereign downgrade in Figure 1, and conduct regression analysis in Table 4 to help us better understand the impact of rating downgrades. Figure 1 shows that the ROA levels for control firms are very steady around sovereign downgrades, whereas the ROA of treatment firms deteriorates significantly in the year after a sovereign downgrade and do not recover. The regression results in Table 4 present similar findings. In the odd columns we present DID regression results examining the effect of sovereign ceiling policies on the change in firm ROA from $t-1$ to $t+1$, $t-1$ to $t+2$, and $t-1$ to $t+3$, respectively. In the even columns we run the corresponding DID regressions with firm-level controls and control for country, sector, and year fixed effects. Our regression results yield the same finding as Figure 1. We find that the ROA of treatment firms deteriorates significantly compared to control firms in the year after a sovereign downgrade, and the effect is persistent.

[Place Table 4 about here]

3.3. Placebo Tests

Using a matched sample removes the systematic differences between the treatment and control group, but one potential concern is that the differences in the changes in operating performance

of treatment and control firms may not be due to the sovereign ceiling policy but rather to other confounding events that happened around the same time as the sovereign rating downgrades. For example, the treatment group consists of firms of national significance and may be more sensitive to economic downturns, which is when sovereign downgrades usually occur, and this latent factor may be driving our results. Hence, in order to ensure that this alternative mechanism is not driving our results, we conduct placebo tests to check whether there are differences in the changes in operating performance of treatment and control firms around the Global Financial Crisis (GFC) period, banking crises periods, systemic crises periods and currency crises periods, as these events are likely to also hamper firms' access to capital markets.

[Place Table 5 about here]

Panel A of Table 5 presents the results of the placebo test using the 2008 GFC period. We exclude firms in countries that experienced a downgrade during the GFC in this placebo test. We do not find any significant difference in the change in operating performance between the treatment and control firms. The DID estimator is -0.34 and is statistically insignificant indicating that our results are not driven by sovereign downgrades occurring during the recent 2007-2009 Global Financial Crisis. Panels B to D of Table 5 provides the results of the placebo test using banking crises periods, systemic crises periods, and currency crises periods without a sovereign rating downgrade. The crises indicators are obtained from Carmen Reinhart's website.³ For each country we exclude crises years in which the country is also downgraded. Our results presented in Panels B to D of Table 5 again show that there are no significant differences in the changes in operating performance between the treatment and control firms

³ Crises indicators are available from 1800 to 2016 on Carmen Reinhart's website at www.carmenreinhardt.com.

around the crises years, indicating that our results are not due to sovereign ratings occurring during periods of economic downturns.

4. Further Analysis

Our results so far show that the operating performance of firms at the sovereign bound deteriorates relative to firms below the sovereign bound after they experience a sovereign ceiling induced rating downgrade. In this section, we conduct cross-sectional tests to examine in detail the channels that are driving our results.

4.1. Information Asymmetry

The adverse rating spillover effect is likely to be concentrated in firms with higher information asymmetry as debt providers cannot gain a deep understanding of these opaque firms that are then pooled with a lower rating category and therefore are likely to cut back on debt financing first on these firms after a rating downgrade (Kisgen, 2006). On the other hand, for firms with lower information asymmetry there is a lot of information available other than the credit rating, allowing debt providers to better assess the quality of the firm and to reduce the reliance on credit rating information when making lending decisions. This is consistent with prior studies that document a positive relation between information asymmetry and cost of capital (Myers and Majluf, 1984; Diamond, 1985; Easley and O'hara, 2004). Following this line of thought, we should expect the deterioration in firm performance arising from sovereign rating spillover costs to be concentrated in opaque treatment firms affected by sovereign credit impairments.

To test this hypothesis, we split our sample of firms into high information firms and low information firms based on analyst forecast dispersion, analyst forecast error and earnings volatility measured in the year before a sovereign downgrade. Data on analyst forecast dispersion and analyst forecast errors is obtained from I/B/E/S, with analyst forecast dispersion

measured as the standard deviation of analyst forecasts scaled by the mean analyst forecast value and analyst forecast error measured as the absolute value of the difference between estimated realized earnings scaled by mean earnings forecast. Earnings volatility is calculated as the standard deviation of ROA during the three years prior to a sovereign downgrade. Table 6 shows the triple DID results. We find that the negative effect of sovereign rating spillovers on firm ROA is indeed stronger in treatment firms with higher information asymmetry.

[Place Table 6 about here]

4.2. Financial flexibility

The differential ability of treatment firms to raise finance through alternative sources should also affect sovereign rating spillover costs, since the reduction in debt financing access arising from sovereign rating spillover effects should only harm the performance of affected firms that find it difficult to raise alternative forms of financing to fund their positive NPV projects. For example, Almeida et al. (2017) show that sovereign bound firms reduce their debt issuance and increase equity issuance after a sovereign downgrade. Hence, we should expect the deterioration of operating performance to be stronger for treatment firms that have limited scope to raise additional finance. This severely restricts their ability to absorb higher costs charged by suppliers and in doing business more generally, following their downgrade.

To test our prediction, we first measure a firm's ability to raise finance by examining whether a firm still has an investment-grade credit rating after the sovereign rating downgrade. We expect that non-investment grade firms would find it much more difficult to raise additional finance after a rating downgrade compared to investment grade firms, as many institutions have rules that prohibit them from owning non-investment-grade debt. For example, when the bonds of General Motors got downgraded by S&P from BBB (investment grade) to BB (speculative grade), its bonds fell by 8% even though the default probabilities between BBB rated and BB

rated debt securities are not significantly different. One of the reasons provided for the significant fall was that the downgrade has sent many institutions running for the exits because many of them have rules that prohibit from owning non-investment-grade debt (Forbes, 2005). This is consistent with the findings of Lemmon and Roberts (2010) who show that speculative grade firms' investment fall by about 33% following the introduction of regulation restricting the flow of institutional capital to these firms. Column 1 of Table 7 presents the results. We find that the negative sovereign rating spillover cost on corporate sector performance is concentrated in non-investment grade treatment firms.

Second, we measure a firm's ability to raise additional finance by looking at whether the firm operates in an emerging market. Lins et al. (2005) show that it is very costly for emerging market firms to raise capital in its home country, while Bekaert et al. (2008 and 2011) similarly show that emerging market firms face a significant segmentation risk premium demanded by investors. Thus, we expect that firms operating in emerging markets would have much more difficulty in raising additional finance after a rating downgrade given emerging markets have less developed debt and equity capital markets. The emerging market status for our sample countries are sourced from the International Monetary Fund (2017). Column 2 of Table 7 presents the results. We find that the deterioration in firm performance is concentrated in treatment firms operating in emerging markets.

[Place Table 7 about here]

4.3. Banking sector development

We next focus our attention on investigating how a country's banking sector development plays a role in affecting sovereign rating spillover costs on firm performance. An extensive literature finds that banking sector development continuously drives economic growth (King and Levine, 1993; Jayaratne and Strahan, 1996; Beck et al. 2000). We expect that countries with more

developed banking systems are likely to have better policies and procedures in place to reduce credit supply risks associated with a sovereign rating downgrade. As a result, banks in these countries should have less need to cut financing to affected firms, thereby helping to reduce the sovereign rating spillover costs on firm performance in these countries.

To test our predictions, we examine sovereign rating spillover costs on firm performance conditional upon a country's banking sector development. We measure banking sector development using two measures. The first measure is bank credit to the private sector (as a proportion of GDP), obtained from the World Bank. It measures the financial resources provided by banks to the private sector through loans, purchases of nonequity securities, and trade credits and other accounts receivable. The second measure is the financial institutions development index, obtained from the International Monetary Fund (IMF). The financial institutions development index measures how developed financial institutions are in terms of their depth (size and liquidity), access (ability of individuals and companies to access financial services) and efficiency (ability of institutions to provide financial services at low costs and with sustainable revenues). We split our sample of firms according to their operating country's level of banking sector development in the year before the sovereign downgrade and define firms as operating in a developed (under-developed) banking system if they have a score above (below) the median values of bank credit to the private sector or financial institutions development index. Table 8 presents the results. We find that the adverse effect of sovereign rating spillovers on firm performance is indeed concentrated in treatment firms operating in countries with a less developed banking sector. In less developed banking systems, domestic banks are also likely to be relatively more exposed to sovereign default risk and the 'doom loop' between the banking and sovereign sectors as banks are likely to have weaker balance sheets and will be harder hit by deteriorations in the value of their sovereign's debt that they are holding when sovereign risk increases. As bank balance sheets are further weakened, they are

more likely to require costly government bailouts and so the vicious doom loop continues. Corroborating with prior studies, we show that a disruption in the financial intermediation channel contributes significantly to the costs of sovereign defaults (Acharya, Drechsler and Schnabl, 2014; Andrade and Chhaochharia, 2018; Gennaioli, Martin and Ross, 2014).

[Place Table 8 about here]

4.4. Investor protection

Finally, we examine the role investor protection play in affecting the impact of rating downgrades on firm performance. Johnson et al. (2000) show that countries with weaker corporate governance standards were hit harder during the Asian Financial Crisis as managers in these countries did not have an incentive to exert maximum effort to bounce back from the crisis, since they knew they were unlikely to be replaced. Similarly, Pinkowitz et al. (2006) find that managers in countries with poor investor protection are more likely to extract private benefits, and Doidge et al. (2007) demonstrate that country characteristics explain significantly more of the variance in corporate governance (39% to 73%) compared to observable firm characteristics (4% to 22%). Following this line of thought, we should expect the negative effect of sovereign ceilings on firm performance to be concentrated in treatment firms operating in countries with poor investor protection, since the corporate managers in these countries are less likely to lose their jobs, face career concerns with their social and political networks and therefore shareholders are less inclined to hold the equity that is declining in value. This exacerbates the decline in firm performance after a rating downgrade. On the other hand, corporate managers in countries with strong investor protection would try to do everything possible to minimize the impact of rating downgrades due to their job security concerns, and hence the performance deterioration of sovereign bound firms in those countries should be alleviated.

To test our prediction, we examine the effect of sovereign rating spillovers on firm performance conditional upon a country's corporate governance environment. The three measures we use to proxy for a country's corporate governance environment are the regulatory quality index, rule of law index and the control of corruption index, all obtained from the World Bank, first collected by Kaufmann et al. (2009). The regulatory quality index captures perceptions of the government's ability to implement sound policies that promote private sector development, rule of law index captures perceptions to which agents have confidence in the quality of contract enforcement, the police and the courts, and the likelihood of crime and violence within the country, and control of corruption captures perceptions to the extent to which public power is exercised for private gain. Johnson et al. (2000) show that countries with weaker rule of law and control of corruption suffered the most during the Asian Financial Crisis as the poor enforcement of contracts between management and investors in these countries resulted in expropriation by managers, while Beck et al. (2007) show that access to external finance is easier in countries with better regulatory quality. We split our sample of firms according to their index score and classify firms as having a low (high) level of investor protection if they have a score below (above or equal) the median values. Table 10 presents the triple DID results. We find that the negative effect of sovereign credit impairment on firm performance is concentrated in treatment firms operating in countries with weak investor protection indicating that sovereign rating spillovers are more costly in environments with poor legal institutions to protect the financial interests of investors.

[Place Table 9 about here]

5. Conclusion

This study examines the effect of sovereign credit impairment on firm performance and growth. Rating agencies' sovereign ceiling policies require firms' ratings to remain at or below the

rating of their country of domicile, thus providing an exogenous variation in corporate credit ratings when the sovereign ceiling is lowered. Using a difference-in-differences approach, we find that the performance of firms at the sovereign bound deteriorates relative to matched non-bound firms after a sovereign rating downgrade. This finding suggests a reduction in the profitability of firm investments due to a rating pooling effect that increases debt financing costs for sovereign bound corporate borrowers after a sovereign downgrade.

We then use cross-sectional tests to explore the channels through which CRA imposed sovereign ceilings affect firm performance. We find that the adverse effect on corporate performance is concentrated in bound firms with higher information asymmetry, limited financial flexibility, and those operating in countries with less developed banking systems and lower investor protection. Overall, our findings unambiguously show that sovereign credit impairment adversely impacts on the operating performance of firms. Future research in this area should focus on whether sovereign default risk spillovers affect other types of corporate policies, such as changes in managerial compensation structures to incentivize managers of affected firms to overcome the adverse effects brought on by sovereign credit impairment.

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Table 1: Variable Definitions

This table contains the definitions of all variables used throughout the paper.

Variable	Definition	Data Source
Sovereign Credit Rating	The long-term foreign currency issuer rating assigned to the sovereign by Standard & Poor's (S&P).	Bloomberg, Capital IQ and Datastream
Company Credit Rating	The long-term foreign currency issuer rating assigned to the company by Standard & Poor's (S&P).	Bloomberg, Capital IQ and Datastream
ROA	Operating income before depreciation (OIBDP) divided by lagged total assets (AT).	Compustat and Compustat Global
Size	Natural logarithm of total assets (AT) in US dollars	Compustat and Compustat Global
Age	Natural logarithm of firm age. Firm age is measured as the number of years since the firm's first appearance in Compustat Global	Compustat and Compustat Global
Tobin's Q	Total assets (AT) minus book value of common equity (CEQ) plus market value of common equity (PRCCD*CSHOC), all divided by total assets.	Compustat and Compustat Global
Cash	Cash (CH) divided by lagged total assets (AT)	Compustat and Compustat Global
Leverage	Book value of debt (DLTT + DLC) divided by lagged total assets (AT).	Compustat and Compustat Global
Investment	Capital expenditure (CAPX) divided by lagged total assets (AT).	Compustat and Compustat Global
Foreign exchange exposure	Absolute value of foreign exchange income (FCA) dividend by lagged total assets (AT).	Compustat and Compustat Global
Forecast dispersion	Standard deviation of earnings forecast divided by mean earnings forecast.	I/B/E/S
Forecast error	The absolute value of actual earnings minus mean earnings forecast, all divided by mean earnings forecast.	I/B/E/S
Earnings volatility	Standard deviation of earnings (OIBDP) for the past 3 years.	Compustat and Compustat Global
Bank credit to private sector	Domestic credit to private sector by banks as a percentage of GDP.	World Bank
Financial institutions development	A score summarizing how developed a country's financial institutions are in terms of their depth, access and efficiency.	International Monetary Fund
Investment grade	Indicator variable that equals one if the firm is rated as investment grade by S&P, and zero otherwise.	Bloomberg, Capital IQ and Datastream
Emerging market indicator	Emerging market indicators from International Monetary Fund (2017).	International Monetary Fund
Regulatory Quality	Regulatory quality index obtained from Worldwide Governance Indicators.	World Bank
Rule of Law	Rule of law index obtained from Worldwide Governance Indicators.	World Bank
Control of Corruption	Control of corruption index obtained from Worldwide Governance Indicators.	World Bank
Banking Crisis	Banking crisis yearly indicators from 1800 to 2016.	Carmen Reinhart's website
Systemic Crisis	Systemic crisis yearly indicators from 1800 to 2016.	Carmen Reinhart's website
Currency Crisis	Currency crisis yearly indicators from 1800 to 2016.	Carmen Reinhart's website

Table 2: Sample of Sovereign Credit Rating Downgrades

This table provides the sample of sovereign credit rating downgrades used in the study and the number of treatment firms over the period of 1990-2016. A treatment firm is defined as a firm that has a credit rating equal to or above its operating country's sovereign credit rating in the year before the sovereign downgrade. S&P's long-term foreign currency issuer ratings are used as measures of sovereign and firm credit ratings.

Country	Downgrade Year	Sovereign Credit Rating		Number of Treatment Firms
		Before Downgrade	After Downgrade	
Argentina	2000	BB	BB-	1
	2001	BB-	SD	1
Brazil	2002	BB-	B+	2
	2014	BBB	BBB-	2
	2015	BBB-	BB+	7
	2016	BB+	BB	3
Hong Kong (China)	1998	A+	A	1
Indonesia	1998	BB+	CCC+	2
	1999	CCC+	SD	1
Italy	2013	BBB+	BBB	1
	2014	BBB	BBB-	1
Japan	2001	AAA	AA	4
	2002	AA	AA-	5
	2011	AA	AA-	7
	2015	AA-	A+	12
Mexico	2009	BBB+	BBB	5
Philippines	2005	BB	BB-	1
Portugal	2010	A+	A-	1
Russia	2014	BBB	BBB-	1
	2015	BBB-	BB+	2
South Korea	1997	A+	B+	1
Thailand	1998	BBB	BBB-	1
United States	2011	AAA	AA+	4
Total				66

Table 3: Sovereign Rating Downgrades and Firm Performance

This table presents the difference-in-differences estimations of changes in firm performance following a sovereign credit rating downgrade. A treatment firm is defined as a firm that has a credit rating equal to or above its operating country's sovereign credit rating in the year before the sovereign downgrade. Each treatment firm is matched with a control firm with similar size, leverage, cash and tobin's q, investment and foreign exchange exposure from the same country, sector and year. Panel A reports and compares the mean differences between treatment and control firms' matching characteristics. Panel B shows the average change in ROA experienced by treatment and control firms around the sovereign downgrades as well as the diff-in-diff estimator. Detailed variable definitions can be found in Table 1. Robust standard errors clustered by firm are displayed in parentheses. ***, ** and * represent 1%, 5% and 10% significance levels, respectively.

Panel A: Post-Match Summary Statistics				
	Treated Firms (N=66)	Control Firms (N=66)	Diff	P-Value
Size	9.640	9.338	0.302	0.362
Age	2.714	2.655	0.059	0.590
Tobin's Q	2.143	1.654	0.489	0.435
Cash	0.097	0.084	0.013	0.483
Leverage	0.359	0.419	-0.060	0.251
Investment	0.083	0.074	0.008	0.589
Foreign exchange exposure	0.005	0.006	-0.001	0.614
Panel B: Diff-in-Diff Estimation				
	Year before Downgrade	Two Years after Downgrade	Diff	
Treated Firms (N=66)	16.25*** (0.98)	14.41*** (0.83)	-1.84*** (0.65)	
Control Firms (N=66)	12.08*** (0.80)	12.51*** (0.83)	0.43 (0.52)	
Diff	4.17*** (1.39)	1.90 (1.30)		
Diff-in-Diff				-2.27*** (0.83)
Panel C: Parallel Trend Test				
	Treated Firms (N=66)	Control Firms (N=66)	Diff	
ROA (T-3 to T-2)	0.22 (0.96)	0.69 (0.61)	-0.47 (1.12)	
ROA (T-2 to T-1)	0.48 (0.64)	-0.30 (0.65)	0.78 (0.85)	
ROA (T-3 to T-1)	0.70 (0.86)	0.39 (0.73)	0.31 (1.11)	

Table 4: Sovereign Rating Downgrades and Firm Performance: Regression Analysis

This table presents regression results of sovereign ceilings on firm performance. The sample consists of firms in our matched sample from 1990 to 2016. A treatment firm is defined as a firm that has a credit rating equal to or above its operating country's sovereign credit rating in the year before the sovereign downgrade. Each treatment firm is matched with a control firm with similar size, leverage, cash and tobin's q, investment and foreign exchange exposure from the same country, sector and year. Detailed variable definitions can be found in Table 1. Robust standard errors clustered by firm are displayed in parentheses. ***, ** and * represent 1%, 5% and 10% significance levels, respectively.

Dependent variable	ROA (T-1 to T+1)		ROA (T-1 to T+2)		ROA (T-1 to T+3)	
Treated	-1.25 (0.79)	-1.54* (0.87)	-2.27*** (0.83)	-2.14** (0.84)	-2.60** (1.09)	-2.33** (0.97)
Size		0.16 (0.49)		-0.14 (0.51)		-0.37 (0.69)
Age		-1.09 (1.76)		-1.22 (1.83)		0.59 (2.83)
Tobin's Q		0.30* (0.16)		0.23 (0.14)		0.08 (0.25)
Cash		-3.79 (4.47)		-9.12** (4.37)		-17.78** (8.16)
Leverage		-5.82** (2.50)		-1.18 (2.63)		-5.81 (3.52)
Investment		-20.68** (7.89)		-26.44*** (7.57)		-28.11** (11.82)
Foreign exchange exposure		-10.45 (36.70)		-2.73 (43.73)		38.53 (61.52)
Constant	-0.81* (0.46)	4.49 (6.36)	0.43 (0.52)	8.02 (7.15)	0.14 (0.72)	7.69 (9.64)
Country FE	N	Y	N	Y	N	Y
Industry FE	N	Y	N	Y	N	Y
Year FE	N	Y	N	Y	N	Y
N	132	130	132	130	132	130
Adjusted R ²	0.012	0.211	0.049	0.197	0.037	0.312

Table 5: Sovereign Rating Downgrades and Firm Performance: Placebo Tests

This table presents the difference-in-differences estimations of changes in firm performance following a sovereign credit rating downgrade during different placebo periods. A treatment firm is defined as a firm that has a credit rating equal to or above its operating country's sovereign credit rating in the year before the sovereign downgrade. Each treatment firm is matched with a control firm with similar size, leverage, cash and tobin's q, investment and foreign exchange exposure from the same country, sector and year. Panel A shows the results during the 2008 Global Financial Crisis. Countries which are downgraded during the crisis are excluded. Panel B presents results around banking crises without a sovereign downgrade. Panel C presents results around systemic crises without a sovereign downgrade. Panel D presents results around currency crises without a sovereign downgrade. Detailed variable definitions can be found in Table 1. Robust standard errors clustered by firm are displayed in parentheses. ***, ** and * represent 1%, 5% and 10% significance levels, respectively.

Panel A: 2008 Global Financial Crisis without a Sovereign Downgrade			
	2007	2010	Diff
Treated Firms (N=39)	16.92*** (1.34)	15.12*** (1.28)	-1.80** (0.79)
Control Firms (N=39)	13.28*** (1.01)	11.82*** (0.81)	-1.45* (0.76)
Diff	3.64** (1.67)	3.30** (1.52)	
Diff-in-Diff			-0.34 (1.10)
Panel B: Banking Crises without a Sovereign Downgrade			
	Year before Banking Crises	Two Years after Banking Crises	Diff
Treated Firms (N=86)	18.37*** (1.14)	17.95*** (1.21)	-0.42 (0.75)
Control Firms (N=95)	12.14*** (0.71)	12.07*** (0.83)	-0.07 (0.68)
Diff	6.23** (2.33)	5.88** (2.38)	
Diff-in-Diff			-0.35 (1.01)
Panel C: Systemic Crises without a Sovereign Downgrade			
	Year before Systemic Crises	Two Years after Systemic Crises	Diff
Treated Firms (N=43)	14.28*** (1.11)	15.39*** (1.30)	1.11 (1.22)
Control Firms (N=49)	10.79*** (0.89)	10.24*** (0.90)	-0.54 (0.63)
Diff	3.49* (1.92)	5.14** (2.49)	
Diff-in-Diff			1.65 (1.37)
Panel D: Currency Crises without a Sovereign Downgrade			
	Year before Currency Crises	Two Years after Currency Crises	Diff
Treated Firms (N=93)	13.80*** (0.94)	13.92*** (0.74)	0.12 (0.67)
Control Firms (N=78)	11.68*** (0.81)	11.47*** (0.79)	-0.21 (0.81)
Diff	2.12 (1.61)	2.45* (1.39)	
Diff-in-Diff			0.33 (1.04)

Table 6: Sovereign Rating Downgrades and Firm Performance conditional upon Firm Information Asymmetry

This table presents the difference-in-differences estimations of changes in firm performance following a sovereign credit rating downgrade conditional upon firm information asymmetry. A treatment firm is defined as a firm that has a credit rating equal to or above its operating country's sovereign credit rating in the year before the sovereign downgrade. Each treatment firm is matched with a control firm with similar size, leverage, cash and tobin's q, investment and foreign exchange exposure from the same country, sector and year. Detailed variable definitions can be found in Table 1. Robust standard errors clustered by firm are displayed in parentheses. ***, ** and * represent 1%, 5% and 10% significance levels, respectively.

Dependent variable	ROA (T-1 to T+2)					
	Treated	Control	Treated	Control	Treated	Control
Low Information Asymmetry	N=33	N=21	N=35	N=21	N=37	N=29
High Information Asymmetry	N=21	N=33	N=19	N=36	N=29	N=37
Treated x High Forecast Dispersion	-3.57*					
	(1.92)					
Treated x High Forecast Error			-4.01**			
			(1.87)			
Treated x High Earnings Volatility					-3.83**	
					(1.60)	
Treated	-1.26		-1.21		-0.48	
	(0.94)		(1.06)		(1.05)	
High Forecast Dispersion	-0.28					
	(1.04)					
High Forecast Error			0.65			
			(1.03)			
High Earnings Volatility					0.95	
					(1.09)	
Constant	0.94		0.58		-0.09	
	(0.77)		(0.84)		(0.84)	
N	108		111		132	
Adjusted R ²	0.133		0.123		0.086	

Table 7: Sovereign Rating Downgrades and Firm Performance Conditional Upon Firm Financial Flexibility

This table presents the difference-in-differences estimations of changes in firm performance following a sovereign credit rating downgrade conditional upon firm financial flexibility. A treatment firm is defined as a firm that has a credit rating equal to or above its operating country's sovereign credit rating in the year before the sovereign downgrade. Each treatment firm is matched with a control firm with similar size, leverage, cash and tobin's q, investment and foreign exchange exposure from the same country, sector and year. Detailed variable definitions can be found in Table 1. Robust standard errors clustered by firm are displayed in parentheses. ***, ** and * represent 1%, 5% and 10% significance levels, respectively.

Dependent variable	ROA (T-1 to T+2)			
	Treated	Control	Treated	Control
Low financial flexibility	N=10	N=33	N=29	N=29
High financial flexibility	N=56	N=33	N=37	N=37
Treated x Non-investment grade		-7.58*** (2.51)		
Treated x Emerging markets			-4.52** (1.81)	
Treated		-0.56 (0.89)		-0.28 (0.33)
Non-investment grade		1.61 (1.03)		
Emerging markets			1.24 (1.09)	
Constant		-0.38 (0.69)		-0.12 (0.67)
N		132		132
Adjusted R ²		0.152		0.103

**Table 8: Sovereign Rating Downgrades and Firm Performance Conditional Upon
Banking sector development**

This table presents the difference-in-differences estimations of changes in firm performance following a sovereign credit rating downgrade conditional upon country's banking sector development. A treatment firm is defined as a firm that has a credit rating equal to or above its operating country's sovereign credit rating in the year before the sovereign downgrade. Each treatment firm is matched with a control firm with similar size, leverage, cash and tobin's q, investment and foreign exchange exposure from the same country, sector and year. Detailed variable definitions can be found in Table 1. Robust standard errors clustered by firm are displayed in parentheses. ***, ** and * represent 1%, 5% and 10% significance levels, respectively.

Dependent variable	ROA (T-1 to T+2)			
	Treated	Control	Treated	Control
Low banking sector development	N=33	N=33	N=33	N=33
High banking sector development	N=33	N=33	N=33	N=33
Treated x Low bank credit to private sector		-3.31*		
		(1.61)		
Treated x Less developed financial institutions			-3.73**	
			(1.57)	
Treated	-0.61		-0.40	
	(0.39)		(0.23)	
Low bank credit to private sector	-0.49			
	(1.18)			
Less developed financial institutions			1.43	
			(1.12)	
Constant	0.67		-0.29	
	(0.39)		(0.83)	
N	132		132	
Adjusted R ²	0.117		0.076	

Table 9: Sovereign Rating Downgrades and Firm Performance Conditional Upon Investor Protection

This table presents the difference-in-differences estimations of changes in firm performance following a sovereign credit rating downgrade conditional upon investor protection. A treatment firm is defined as a firm that has a credit rating equal to or above its operating country's sovereign credit rating in the year before the sovereign downgrade. Each treatment firm is matched with a control firm with similar size, leverage, cash and tobin's q, investment and foreign exchange exposure from the same country, sector and year. Detailed variable definitions can be found in Table 1. Robust standard errors clustered by country are displayed in parentheses. ***, ** and * represent 1%, 5% and 10% significance levels, respectively.

Dependent variable	ROA (T-1 to T+2)					
	Treated	Control	Treated	Control	Treated	Control
Low Investor Protection	N=32	N=32	N=33	N=33	N=33	N=33
High Investor Protection	N=34	N=34	N=33	N=33	N=33	N=33
Treated x Poor Regulatory Quality	-3.95** (1.63)					
Treated x Poor Rule of Law			-3.73** (1.57)			
Treated x Poor Control of Corruption					-3.70** (1.57)	
Treated	-0.35 (0.26)		-0.40 (0.23)		-0.42* (0.22)	
Poor Regulatory Quality	1.44 (1.11)					
Poor Rule of Law			1.43 (1.12)			
Treated x Poor Control of Corruption					1.37 (1.11)	
Constant	-0.27 (0.79)		-0.29 (0.83)		-0.26 (0.81)	
N	132		132		132	
Adjusted R ²	0.082		0.076		0.076	

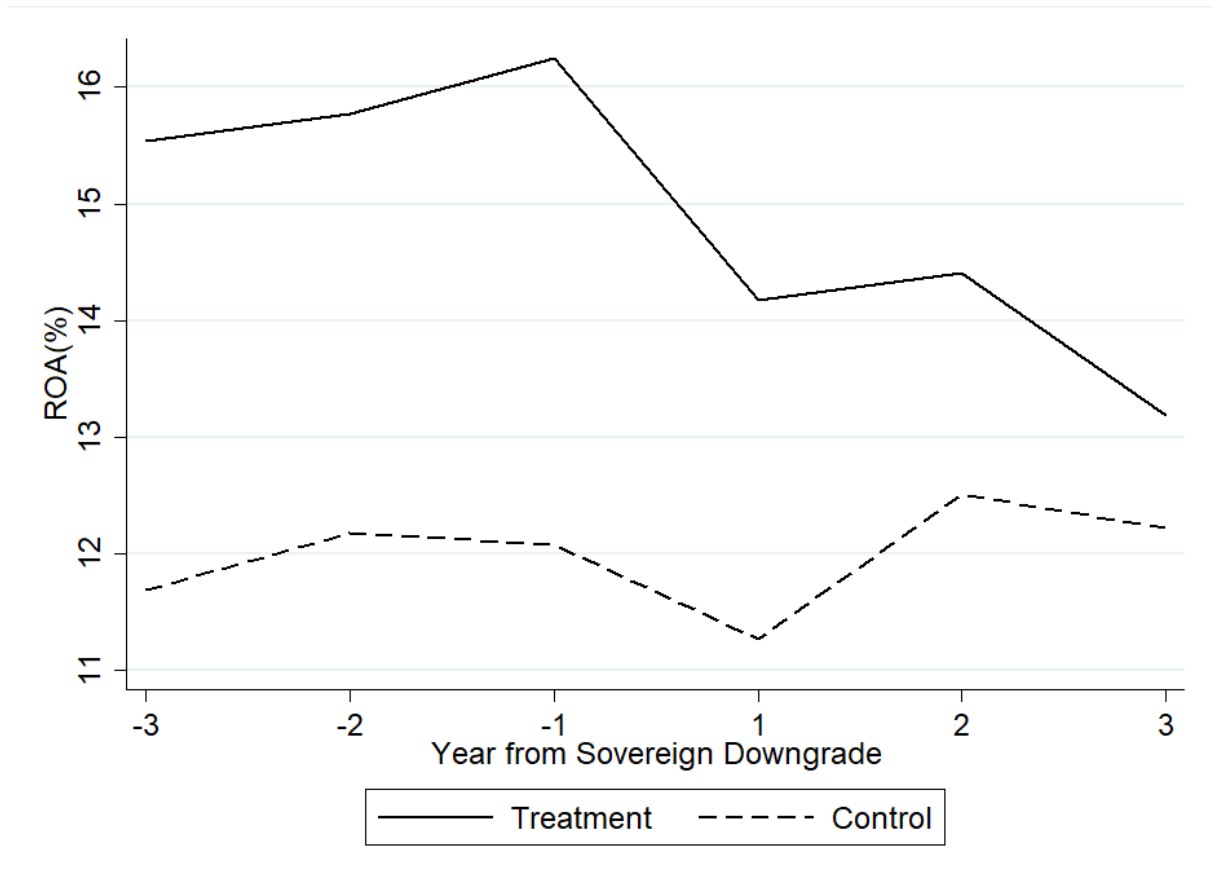


Figure 1: ROA around a sovereign rating downgrade. This figure presents the change in ROA for treatment firms and control firms around a sovereign downgrade. A treatment firm is defined as a firm that has a credit rating equal to or above its operating country’s sovereign credit rating in the year before the sovereign downgrade. Each treatment firm is matched with a control firm with similar size, leverage, cash, tobin’s q, investment and foreign exchange exposure firm from the same country, sector and year.

Appendix A1: Credit Rating Conversions

S&P Rating	Numerical Rating
AAA	1
AA+	2
AA	3
AA-	4
A+	5
A	6
A-	7
BBB+	8
BBB	9
BBB-	10
BB+	11
BB	12
BB-	13
B+	14
B	15
B-	16
CCC+	17
CCC	18
CCC-	19
CC	20
C	21
SD/D	22

Appendix A2: Institutional Background on the Sovereign Ceiling Policy

Sovereign credit ratings are issued by externally recognized credit rating agencies, such as Moody's, Standard & Poor's and Fitch, to provide a comprehensive measure of a national government's creditworthiness (Ferreira and Gama, 2007). Such ratings are important because they serve as anchors for credit assessments on all borrowers within a given country. The "sovereign ceiling policy" is one of the key policies known to be systematically applied by credit rating agencies. The "sovereign ceiling" rule implies that it is highly *unlikely* for an individual company to have a credit rating higher than the long-term government bond rating of its country of operation at any point in time, since macroeconomic conditions play a large role in a firm's operations.⁴ Moreover, Almeida et al. (2017) find clear empirical evidence to suggest that the sovereign ceiling policy is widely adopted in practice around the world. They find that within the month of a sovereign rating downgrade, 59% of the companies that have a better or equal credit rating as the country in which they operate in are also downgraded. Most importantly, this type of forced corporate rating downgrade for the bound firms are unlikely to be correlated with changes in firm fundamentals, allowing us to exploit these exogenous rating actions in our identification strategy to examine the causal effect of corporate rating downgrades on firm performance and growth.

⁴ Previously, S&P (2012) reported that only 113 private issuer ratings in the world exceeded their sovereign rating and showed that these are typically on debt issues made by multinational corporations.

Appendix A3: First stage of Propensity score matching

This table presents the results from the probit regression used in the first stage of propensity score matching. Standard errors are displayed in parentheses. ***, ** and * represent 1%, 5% and 10% significance levels, respectively.

	Pr (Treated = 1)
Size	0.08*** (0.02)
Age	-0.17*** (0.06)
Tobin's Q	0.01** (0.01)
Cash	-0.10 (0.29)
Leverage	-0.02 (0.11)
Investment	0.32 (0.36)
Foreign exchange exposure	21.56*** (1.84)
Constant	-2.77*** (0.21)
N	20964
Pseudo R ²	0.066

Appendix A4: List of Treated Firms

Company	Country	Year of Sovereign Downgrade	Company Rating before Downgrade	Company Rating after Downgrade
Metrogas SA	Argentina	2000	BBB-	BBB-
Metrogas SA	Argentina	2001	BBB-	CC
Fibria Celulose SA	Brazil	2002	BBB-	BBB-
Tele Norte Leste Participacoes SA	Brazil	2002	BB-	B+
Ultrapar Participacoes SA	Brazil	2014	BBB	BBB
Vale SA	Brazil	2014	A-	A-
BRF SA	Brazil	2015	BBB-	BBB
Gerdau SA	Brazil	2015	BBB-	BBB-
Klabin SA	Brazil	2015	BBB-	BBB-
Localiza Rent A Car SA	Brazil	2015	BBB-	BBB-
Rio Parapanema Com	Brazil	2015	BBB-	BBB-
Ultrapar Participacoes SA	Brazil	2015	BBB	BBB-
Vale SA	Brazil	2015	A-	BBB
Braskem SA	Brazil	2016	BBB-	BBB-
Rio Parapanema Com	Brazil	2016	BBB-	BB
Ultrapar Participacoes SA	Brazil	2016	BBB-	BB+
Hong Kong & China Gas Co., Ltd.	Hong Kong (China)	1998	A+	A+
Barito Pacific Tbk	Indonesia	1998	BB+	CCC-
PT Citra Marga Nusaphala Persada TBK	Indonesia	1998	BB+	CC
PT Berlian Laju Tanker TBK	Indonesia	1999	B+	B+
Luxottica Group SPA	Italy	2013	BBB+	BBB+
Luxottica Group SPA	Italy	2014	BBB+	A-
Chubu Electric Power Co., Inc.	Japan	2001	AA	AA-
Ntt Docomo Inc.	Japan	2001	AA	AA-
Seven-Eleven Japan Co., Ltd.	Japan	2001	AA	AA
Toyota Motor Corp.	Japan	2001	AAA	AAA
Denso Corp.	Japan	2002	AA+	AA+
Fujifilm Holdings Corp.	Japan	2002	AA	AA
Ito-Yokado Co., Ltd.	Japan	2002	AA	AA
Kao Corp.	Japan	2002	AA	AA
Toyota Motor Corp.	Japan	2002	AAA	AAA
Canon Inc.	Japan	2011	AA	AA
Chubu Electric Power Co., Inc.	Japan	2011	AA	A+
Chugoku Electric Power Co., Inc.	Japan	2011	AA	AA
Denso Corp.	Japan	2011	AA	AA-
Ntt Docomo Inc.	Japan	2011	AA	AA
Tokyo Gas Co., Ltd.	Japan	2011	AA	AA-
Toyota Motor Corp.	Japan	2011	AA	AA-
Canon Inc.	Japan	2015	AA	AA
Central Japan Railway Corp.	Japan	2015	AA-	AA-
Chugoku Electric Power Co., Inc.	Japan	2015	AA	AA
Denso Corp.	Japan	2015	AA-	AA-
Dentsu Inc.	Japan	2015	AA-	AA-
Fujifilm Holdings Corp.	Japan	2015	AA-	AA-
Kao Corp.	Japan	2015	AA-	AA-
Kyushu Electric Power Co., Inc.	Japan	2015	AA-	AA-
Ntt Docomo Inc.	Japan	2015	AA	AA-
Seven & I Holdings Co., Ltd.	Japan	2015	AA-	AA-
Toyota Industries Corp.	Japan	2015	AA-	AA-
Toyota Motor Corp.	Japan	2015	AA-	AA-
Coca-Cola Femsa SAB De CV	Mexico	2009	BBB+	BBB+
El Puerto De Liverpool SA Livepol Liverpool	Mexico	2009	BBB+	BBB+
Fomento Economico Mexican SAB de CV	Mexico	2009	BBB+	BBB+
Grupo Televisa SAB	Mexico	2009	BBB+	BBB+

Telefonos De Mexico SA Telmex	Mexico	2009	BBB	BBB
San Miguel Corp.	Philippines	2005	BB	BB-
Ren-Redes Energeticas Nacionais SGPS SA	Portugal	2010	A+	A-
Rosneft Oil Company	Russia	2014	BBB	BBB-
Mobile TeleSystems PJSC	Russia	2015	BBB-	BB+
Oil Co LUKOIL PJSC	Russia	2015	BBB-	BBB-
Posco	South Korea	1997	A+	B+
Advanced Info Service Public Co., Ltd.	Thailand	1998	BBB	BBB-
Automatic Data Processing Inc.	United States	2011	AAA	AAA
Exxon Mobil Corp.	United States	2011	AAA	AAA
Johnson & Johnson	United States	2011	AAA	AAA
Microsoft Corp.	United States	2011	AAA	AAA
