# How Creditor Rights Affect the Issuance of Public Debt: The Role of Credit Ratings

Xian Gu[1]
Central University of Finance and Economics
39 College South Road, Haidian District, Beijing, China
xiangu@cufe.edu.cn

Padma Kadiyala
Pace University
1 Pace Plaza, New York, NY, US
pkadiyala@pace.edu

Xin Wu Mahaney-Walter
Cornerstone Research
599 Lexington Avenue, New York, NY, US
carriexw@gmail.com

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# How Creditor Rights Affect the Issuance of Public Debt: The Role of Credit Ratings

**Abstract:** We propose that credit ratings act as an information channel which, combined with more power being given to creditors by countries strengthening creditor rights, leads to an increase in the supply of *public* debt. From a firm-level dataset covering 51 developed and developing countries for 1989 through 2013, we find that in countries with stronger creditor rights, firms tend to have higher credit ratings. We confirm that in these countries, firms with higher credit ratings exhibit a greater issuance of public debt than that of equity. As further evidence that credit ratings reduce agency costs of debt, we find that improvements in creditor rights and resulting higher credit ratings increase capital expenditures among firms experiencing severe bondholder-shareholder conflicts.

JEL Classification: G31; G32; E22

Keywords: Creditor rights; Credit rating; Bond; Investment

## 1. Introduction

The study examines the relationship between creditor rights, credit ratings and the issuance of public debt. There is an extensive literature on the association between creditor rights and private debt. Research shows that protections offered by the legal system to creditors lead to an increase in the level of private credit (LLSV, 1998; Djankov et al., 2007). Less well-understood is the effect of stronger creditor rights on arms' length public debt. Unlike banks, atomistic bondholders cannot effectively coordinate with one another to monitor a firm. The importance of studying the impact of creditor rights on different forms of debt is bolstered by evidence in Rauh and Sufi (2010) that lower quality firms have significant levels of debt heterogeneity in their capital structures. We examine whether stronger creditor rights are sufficient to overcome information asymmetries between shareholders and bondholders such that firms are encouraged to issue public debt. For instance, the bankruptcy code of a country may permit secured creditors to seize collateral from a financially distressed firm, but when equity holders engage in asset substitution and when public debtholders cannot monitor against such substitution, they may be reluctant to lend even when creditor rights are strengthened by law. We propose that firm-level credit ratings act as an information channel to mitigate information asymmetries between shareholders and bondholders and encourage firms to issue debt when country-level creditor rights are strengthened.

Rating agencies specialize in gathering information and evaluating the information gathered to provide reliable measures of a firm's creditworthiness (Millon and Thakor, 1985). CFOs surveyed by Graham and Harvey (2001) ranked credit ratings as an important consideration in setting their debt policies. Kisgen (2006) finds that firms on the cusp of a ratings downgrade or upgrade postpone debt issuance, demonstrating the importance of

credit ratings in decisions to issue debt. We extend this literature by establishing firm-level credit ratings as information channels that translate country-level changes in the strength of creditor rights to a firm's decision to issue public debt. The international evidence given in this study has policy implications that extend beyond those of firm-level debt policies. Shen, Huang and Hasan (2012) demonstrate that there are significant cross-country differences in the assignment of firm-level credit ratings. The results of this study imply that countries that are contemplating changes to their bankruptcy codes should take into account how cross-country variations in the assignment of credit ratings may affect the translation of their bankruptcy laws into firm-level debt policies.

The economic framework for the study is the notion that the amount of credit extended by the financial system to the private sector works is determined through two channels. The *power* theory of credit formalized by Townsend (1979) and Aghion and Bolton (1992) suggests that when laws strengthen their power, creditors are more willing to extend credit because they have the power to force repayment, to grab collateral or even to gain control of a firm. The *information* theory of credit pioneered by Jaffee and Russel (1976) and Stiglitz and Weiss (1981) suggests that when lenders have more information on borrowers (e.g., information on their credit histories), they will be less concerned regarding the lemons problem of financing nonviable projects and thus more likely to extend credit. Djankov et al. (2007) find that both theories of credit offer significant explanatory power in explaining cross-country variations observed in the size of private credit markets. Within this economic framework, our study examines whether credit ratings are effective in channeling *information* that public debt holders require to supply credit when the bankruptcy code increases the *power* of creditors.

Our empirical study relies on a large dataset covering all rated, nonfinancial firms around the globe for 1989 to 2013. We obtain firm-level data from various sources such as Compustat and Capital IQ. Our first set of results relates stronger creditor rights to higher credit ratings. Such an association is robust when we use different estimation methods including ordinary least squares (OLS) and weighted least squares (WLS). Of the four subindices of creditor rights, the subindex that measures whether secured creditors are paid first out of liquidation proceeds enters with a significantly positive sign at the 1% level followed by the subindex that measures whether creditor consent is required when a debtor files for reorganization.

The second set of results relates creditor rights, bond ratings, and bond issuance. While we find that the direct effect of creditor protections on bond issuance is weak, stronger creditor protections significantly promote bond issuance relative to equity issuance through the information channel. Heterogenous effects observed show that such impacts through the information channel are stronger and more significant in countries with fewer information asymmetries. This finding is consistent with that of Gu and Kowalewski (2014), who document that bond markets are more developed than equity markets in countries with stronger creditor rights relative to shareholder rights. To address potential endogeneity issues, we exploit exogenous shifts to country creditor protection and employ a difference-in-difference strategy to further confirm the robustness of the relation between creditor rights and debt issuance through the information channel.

The third set of results relates creditor rights, credit ratings, and firm investment policy. We find that in countries with more creditor protection, firms with higher bond ratings tend to have higher net fixed investments. In further support of our argument that the power and

information channels reinforce one another, we find that investments made by firms facing higher agency costs respond most strongly to creditor rights.

The results given here are consistent with those of other studies. Harford and Uysal (2014) show that rated firms are more likely to undertake acquisitions than nonrated firms. Roberts and Sufi (2009) show that the effect of creditor actions on debt policy is strongest when the borrower's alternative sources of finance are costly. Mclean et al. (2012) suggest that investor protections promote accurate share prices, reduce financial constraints and encourage efficient investment. Faulkeder and Peterson (2006) find that firms with a debt rating have significantly more leverage.

The remainder of the paper proceeds as follows. Section 2 presents a theoretical background and our hypotheses. Section 3 describes the data, variables and empirical design used. Section 4 discusses our empirical results on creditor rights, credit ratings and capital structure and describes our robustness tests. Section 5 further discusses the relationship between credit rights, ratings and firm investments. Section 6 presents the study's conclusions.

## 2. Hypotheses

The power theory of credit predicts that strong creditor rights should mitigate moral hazard by borrowers and lower deadweight costs of liquidation. Moral hazard is also expected to decline when stronger creditor rights create few incentives for managers to take risks (Acharya et al., 2011b). The resulting reduction in agency costs reduces the need for credit rating agencies to intensively monitor how changes in firm investment and financing decisions affect credit quality. The *information* theory of credit predicts that

lower costs of monitoring should result in higher credit ratings. The hypotheses are as following.

**Hypothesis 1a: In countries with stronger creditor rights, firms tend to have higher credit ratings.**

**Hypothesis 1b: Changes in creditor rights are expected to be positively associated with changes in credit ratings.**

The next two hypotheses relate creditor rights to bond issuance. Credit rating agencies specialize in information gathering. Thus, they provide information on the quality of a firm beyond publicly available information (Milon and Thakor, 1985; Boot, Milbourn and Schmeits, 2006). Without monitoring provided by credit rating agencies, a firm may suffer from "credit rationing" (Stiglitz and Weiss, 1981), which denotes the inability of a firm to raise debt capital during difficult economic periods. In countries with strong creditor rights, firms with higher credit ratings have better credit quality. Consequently, the firms' borrowing costs are lower, and they exhibit expansive debt capacities. On the other hand, as stronger creditor rights can cause managers to stifle non-opportunistic risk taking, equity valuations should be negatively affected (Acharya et al., 2011b). Firms should respond to higher bond values and lower equity values by increasing bond issuance relative to equity issuance.

**Hypothesis 2a: In countries with stronger creditor rights, firms tend to have higher ratios of bond issuance to equity issuance.**

**Hypothesis 2b: In countries with stronger creditor rights, firms with higher credit ratings tend to have higher ratios of bond issuance to equity issuance.**

The last set of hypotheses addresses the relationship between creditor rights, credit

ratings, and capital expenditure investments made by a firm. Theoretical studies show that in the presence of conflicts of interest between creditors and equity-holders, debt agreements may limit investment policies made even outside of payment default states (Jensen and Meckling, 1976; Aghion and Bolton, 1992). Empirical studies confirm these theoretical results. Nini et al. (2009) use a large sample of private credit agreements made between banks and public firms and document that conflicts of interest between creditors and borrowers have a significant impact on firm investment restrictions, which further spur a reduction in firm capital expenditures. Monitoring provided by credit rating agencies mitigates conflicts of interest between equity holders and creditors. Higher credit ratings signal lower agency costs arising from asset substitution. Hence, we predict that stronger creditor rights and higher credit ratings should encourage firms to invest more in fixed assets, which are less risky than other risk-shifting investments, such as M&A activities.

**Hypothesis 3a: In countries with stronger creditor rights, firms with higher credit ratings tend to make more fixed-asset investments.**

**Hypothesis 3b: Improvements in creditor rights and credit ratings promote capital expenditures more significantly for firms facing severe bondholder-stockholder problems.**

## 3. Data, variables and empirical methodologies

### 3.1 Sample construction

To investigate the effect of creditor rights on firms' decisions on financing and investments via credit ratings we assemble a large international dataset on creditor rights, credit ratings, capital structures and investments from different sources. In turn, we use 16,855 firm-year observations from 1,331 public firms covering 51 developed and

developing countries for 1989 to 2013 as our baseline sample. We obtain detailed information on credit ratings and capital structures from the Capital IQ database, which provides extensive financial information for over 50,000 public and private firms around the world. We focus on publicly listed firms, as these firms are more likely to obtain public debt financing than private firms. Other financial data are collected from Compustat Global and North America, which cover most of the fundamental financial information on listed firms around the world. Legal variables that control for creditor rights are drawn from LLSV (1998) and Djankov et al. (2007).

To be retained in the sample, a firm's capital structure, credit rating, financial information and legal information must be listed in Capital IQ, Compustat and other sources like Djankov et al. (2007). We exclude financial firms and firms without positive book values of equity. Our final sample thus consists of 1,331 firms covering 51 countries. The number of firms per country ranges from 1 in Sri Lanka to 345 in the US as reported in Table A.1 of the Appendix.

We also control for systemic banking crises, as they may also influence firms' credit ratings or financing decisions. We follow Laeven and Valencia (2008, 2012) and refer to a systemic banking crisis occurring when a country's corporate and financial sectors experience several defaults. Table 1 presents descriptions of the variables used in this study.

[TABLE 1]

### 3.2 Variables

#### 3.2.1 Measures of legal determinants

We mainly use the *creditor rights index* developed by Djankov et al. (2007) as a measure of the legal rights of creditors across countries. The index, which has been used

as a measure of creditor power and which has been demonstrated to remain remarkably stable over time, measures the number of laws and regulations that limit expropriation from secured lenders in a country. As Djankov et al. (2007) show, this aggregate index measures four actions of secured lenders under conditions of bankruptcy: (1) whether there are restrictions when a debtor files for reorganization; (2) whether secured creditors are able to obtain their collateral when reorganization is approved; (3) whether secured creditors are paid first out of proceeds derived from liquidating a bankrupt firm; and (4) whether an administrator (not a manager) is responsible for running the business during reorganization. Based on the above four features of the aggregate index, the subindices capture the four choices of secured lenders, which are written as CR1, CR2, CR3 and CR4 in this paper, respectively. A value of one is ascribed to the index when a country's laws and regulations offer each of these rights to secured lenders. The creditor rights index aggregates the scores and hence ranges from 0 (weakest creditor rights) to 4 (strongest creditor rights).

We also control for shareholder protection in our empirical investigations using the *Corrected Anti-director Rights Index (Corrected ADRI)* developed by Spamann (2010). The *original anti-director rights index* was first proposed by LLSV (1998), which aggregates six dimensions of shareholder protection rules. Of the six components, three are concerned with shareholder voting, including voting by mail, voting without blocking shares and calling an extraordinary meeting, the others are concerned with minority protection, including proportional board representation, preemptive rights and judicial remedies. Spamann (2010) further improves the index for leading local lawyers and developed a *Corrected ADRI* for forty-six countries.

### 3.2.2 Measures of credit rating

We first use the entity credit rating developed by Capital IQ to examine the effects of

national creditor rights on firms' credit ratings. In accordance with the literature we convert a firm's letter ratings to a numerical scale where 1 is equivalent to D, 2 is equivalent to CCC-, and the pattern continues. We also employ a rating change to analyze when creditor right improvements spur a credit rating upgrade. A *credit rating change* is formally defined as the difference in rating levels observed between the end and start of a year. We also differentiate between investment and speculative grade ratings. An *Investment grade rating* is a dummy variable equal to 1 when a rating exceeds BBB- (AAA to BBB-), and a *Speculative grade rating* is a dummy variable equal to 1 when a rating is less than BB+ (BB+ to D).

### 3.2.3 Measures of capital structure

Regarding capital structure, we focus on bond issuance relative to equity issuance. For each sampled firm, Capital IQ reports its total debt, different types of debt incurred and the amount of each type. With this database we can divide Total Debt into Term Loans, Revolving Credit, Senior Bonds and Notes, Subordinated Bonds and Notes, Commercial Paper, Capital Leases and Other Debt. To examine choices made between bond and equity issuance we construct two measures: the ratio of *public debt to equity (bond/equity)* and the ratio of *senior public debt to equity (srbond/equity)*. Public debt is calculated as the sum of senior bonds and notes, subordinated bonds and notes and commercial paper; senior public debt refers to senior bonds and notes. We also use *NETDIss*, which is defined as the difference between the change in debt and the change in equity over total assets, rather than as the ratio of public debt to equity, to conduct a robustness check.

### 3.2.4 Measures of investment and other firm variables

Following Baker et al. (2003) and Mclean et al. (2012), we define *Investment* as firm capital expenditures made over total assets. In our empirical tests we use firm-level controls

for firm size, profitability and liquidity. *Firm size* is the logarithm of total assets. To measure firm profitability we use *Return on Assets (ROA),* which denotes net earnings before interest, taxes, depreciation and amortization during year *t* divided by total assets at the close of year *t-1*. To measure firm liquidity conditions we use the *Cash flow ratio*, which is equal to net earnings determined after dividends in year *t* plus depreciation and amortization divided by total assets at the close of year *t-1*. *Tangibility* is measured as net property, plant and equity for year *t* divided by total assets at the close of year *t-1*.

### 3.2.5 Banking crisis event window

In a systemic banking crisis, the number of nonperforming loans made increases dramatically and most aggregate banking system capital is quickly exhausted. A systemic banking crisis also always leads to output losses in the economy. In this work we use the starting dates of systemic banking crises provided by Laeven and Valencia (2012) though we focus only on those banking crises resulting in an output loss of over 10%, as we assume that only a significant banking crisis can lead to a credit rating change and shape firms' financing decisions. Based on these criteria and the database developed by Laeven and Valencia (2012) we identify 93 systemic banking crises occurring across countries from 1989 to 2011. We mainly refer crisis episodes [t, t+3] as systemic banking crisis periods.

### 3.2.6 Other national characteristics

We also control for potential effects of other national characteristics (*GDP growth* and *Inflation*) to isolate effects of macroeconomy volatility. *GDP Growth* is the annual growth rate of gross national product in current US dollars. *Inflation* is the annual growth rate of the consumer price index.

## 3.3 Descriptive statistics

Tables 2 and 3 present descriptive statistics and correlations for the main variables used

in the following regression analyses. The statistics show high levels of heterogeneity. For instance, *Creditor rights* index values range from 0 to 4 with an average of 1.766, showing that there are more countries around the globe with lower creditor rights. The *Corrected ADR* index ranges from 2 to 6 with an average of 3.639. Changes in the creditor rights index (*CRight change*) range from -1 to 1 with an average of -0.003, showing that there have been more creditor right downgrades than upgrades in different countries over the last two decades. The *Credit rating* score ranges from 0 to 26 with a sample mean of 16.762 and with a standard deviation of 3.905. Changes in rating scores (*CRating change*) range from -18 to 12 with a mean of -0.087 and with a standard deviation of 1.005. Regarding firm characteristics and operating performance, measures of *Firm size* range from 3.161 to 21.776 with an average of 10.115; *ROA* values range from -1.339 to 0.885 with a mean of 0.124; *Cash flow to total assets* values range from -1.507 to 1.375 with an average of 0.026. *Investment* values range from 0 to 0.874, implying that some firms make no investments in certain years. To limit potential effects of outliers, we winsorize firm-level variables at the 1% and 99% levels.

[TABLE 2]

Table 3 shows correlations between key variables examined in our study. The results first show that a country's level of creditor protection is highly and positively correlated with firm credit ratings, and an improvement in creditor protections is also highly and positively correlated with an improvement of firm credit ratings; second, firm investment is highly and positively correlated with creditor protections though the correlation between investment and credit ratings is not significant.

[TABLE 3]

### 3.4 Empirical design

The baseline specification relating country-level creditor rights to firm-level credit ratings is as follows:

$$Credit\_rating_{i,t} = \alpha_0 + \alpha_t + \alpha_i + \alpha_c + \alpha_l + \beta_1 * Cright_{c,t} + \beta_2 * Corr\_ADR_{c,t} + \beta_3 * Macro\_controls_{c,t} + \beta_4 * Firm\_controls_{i,t} + \varepsilon_{i,t} \quad (1)$$

where $Credit\_rating_{i,t}$ refers to credit ratings for firm *i* in year *t*; where $Cright_{c,t}$ refers to the creditor rights index for country *c* in year *t*; and where $Corr\_ADR_{c,t}$ refers to the corrected anti-director rights index for country *c* in year *t*. In the regressions, we also employ the subindex of creditor rights, rather than the aggregated index, to measure robustness. $\alpha_0$is the constant term; $\alpha_t$ denotes year fixed effects; $\alpha_i$ denotes firm fixed effects; $\alpha_l$ denotes industry fixed effects; and $\alpha_c$ denotes country fixed effects to account for heterogeneities observed across time, firms, industries and countries. $Macro\_controls_{c,t}$ denotes a set of country-level controls including GDP and CPI growth. $Firm\_controls_{i,t}$ denotes a series of time-varying firm characteristics including ~~those of~~ firm size, ROA and cash flows to assets. $\varepsilon_{i,t}$ is the error term.

Our empirical tests revolve around equation (2), which is a revised and augmented version of equation (1) in that it uses credit rating changes as a dependent variable and credit rights change as the main explanatory variable while also including ~~more~~ additional interaction terms.

$$Credit\_rating\_change_{i,t} = \alpha_0 + \alpha_t + \alpha_i + \alpha_c + \alpha_l + \beta_1 * Cright\_change_{c,t} + \beta_2 * Crisis_{c,t} + \beta_3 * Cright\_change_{c,t} * Crisis_{c,t} + \beta_4 * Macro\_controls_{c,t} + \beta_5 * Firm\_controls_{i,t} + \varepsilon_{i,t} \quad (2)$$

where $Credit\_rating\_change_{i,t}$ refers to changes in credit rating scores; where

$Cright\_change_{c,t}$ refers to changes in the creditor rights index; and where $Crisis_{c,t}$ is the systemic banking crisis dummy variable, which is equal to one in the first year of a crisis, *t*, in country *c* and for the next three years and which is equal to zero otherwise.

To test translation of country-level creditor rights on firms' capital structure choices made via the information channel provided by firm-level credit ratings, we estimate the following specification:

$$Bond/equity_{i,t}\ (or\ Investment_{i,t}) = \alpha_0 + \alpha_t + \alpha_i + \alpha_c + \alpha_l + \beta_1 * Cright_{c,t} + \beta_2 * Credit\_rating_{i,t} + \beta_3 * Cright_{c,t} * Credit\_rating_{i,t} + \beta_4 * Macro\_controls_{c,t} + \beta_5 * Firm\_controls_{i,t} + \varepsilon_{i,t} \quad (3)$$

where $Bond/equity_{i,t}$ refers to the book value of the bonds to book value of equity for firm *i* in year *t* and where $Investment_{i,t}$ refers to capital expenditures of firm *i* in year *t*.

Throughout our analyses we use ordinary least squares (OLS) with heteroskedasticity robust standard errors clustered at the country level to account for potential correlations among firms within a country consistent with the recommendations of Petersen (2009)[1].

## 4. Empirical results

### 4.1 Baseline results

In this section, we present the main results derived from our baseline model. We regress credit ratings on the creditor rights index, on the shareholder rights index and on a set of control variables including country and firm characteristics. The results shown in columns (1) and (2) in Table 4 illustrate that coefficients on creditor rights are positive and statistically significant after controlling for time and firm fixed effects, indicating that in

[1] We also estimate our standard errors with additional clusters by either firm or year and find that the results still hold.

countries with stronger creditor protections, firms tend to have higher credit ratings. The magnitude of the coefficients indicates that a one standard deviation increase in creditor rights improves firm credit rating scores by 0.704 holding all the other factors as constant. Results reported in columns (3) and (4) are derived from a regression supplemented with firm factors including firm size, ROA and cash flow ratios as well as country characteristics such as GDP growth and inflation. These findings show that the positive relation between creditor rights and credit ratings remains statistically significant after the inclusion of firm and country factors. In columns (5) to (8), we replace firm fixed effects in the regressions with industry and country fixed effects, and the main results still hold, and the coefficients of creditor rights remain nearly unaffected. Additionally, using the baseline model we also test the impact of shareholder rights on credit ratings. We include the corrected anti-director rights index as a control variable in the baseline regression. We find that shareholder rights do not have a significant effect on credit ratings.

[TABLE 4]

The firm-level regressions apply equal weight to each firm across countries and in the full sample. Given that a large number of firms are from the US and UK, the idiosyncratic aspects of the US or UK may drive our results. We check the robustness of our results in two ways: first, we estimate the regression with a subsample that excludes firms from these two countries and second, we estimate a weighted least squares (WLS) regression with the number of firms used as weights. Columns (1) and (2) of Table 5 report results derived from the subsample excluding US and UK firms. The coefficient on creditor rights remains statistically significant but is smaller in magnitude, suggesting that a one standard deviation increase in creditor rights improves a firm's credit rating score by 0.268

holding all the other factors as constant. Our results also hold when employing WLS as shown in columns (3) and (4), in which coefficients on creditor rights are indeed economically larger. Overall, Table 5 shows that the association between creditor rights and firms' credit ratings is robust when controlling for potentially confounding factors in the full sample and in the subsample excluding US and UK firms.

[TABLE 5]

Table 6 shows results derived from the subindex of creditor rights CR1, CR2, CR3 and CR4 for robustness. CR1, CR2 and CR3 enter with positive and significant signs while CR4 enters with an insignificant sign, indicating that restrictions (e.g., creditor consent when a debtor files for reorganization, an automatic stay imposed by the court and creditors being paid first out of liquidation proceeds) matter for firms' credit ratings. On the other hand, court-appointed administration during business reorganization matter less. In this instance, we do not control for country fixed effects, as the subindices do not vary over time. Overall, we confirm a strong and positive association between country creditor protection and firm credit ratings.

[TABLE 6]

### 4.2 Effects of changes in creditor rights

In Table 7 we present results derived from an estimation of equation (2), which relates the change observed in firm credit ratings to changes in country creditor protections. Column (1) shows that stronger country creditor rights tend to be associated with higher firm credit ratings after considering year and firm fixed effects. In terms of economic impact, a one unit increase in creditor rights tends to enhance changes in credit rating scores

by 0.781 when holding the other factors as constants. In column (2), we replace firm fixed effects with industry and country fixed effects. The results remain consistent, meaning that the effect of changes in creditor protections on changes in credit ratings remains statistically significant and economically meaningful after controlling for industry- and country-level heterogeneities. In column (3), we include a banking crisis dummy and its interaction with changes in creditor rights. We exclude GDP and CPI growth as independent variables, as they are highly correlated with the crisis dummy. All specifications account for time effects through the inclusion of year fixed effects. The results first show that during crises, firms tend to have lower credit ratings. Second, the coefficient of the interaction term between a change in creditor rights and the banking crisis dummy is positive and statistically significant. This finding also suggests that during crises, the impact of improvements in creditor rights on credit ratings is amplified. We hypothesize that during systemic banking crises the accompanying economic downturn and resulting asset impairment magnifies the importance of creditor protections. The estimated coefficient observed suggests that an increase of one unit of creditor rights index change occurring during a crisis should enhance the change in credit scores by 0.956. In column (4), we exclude firm fixed effects to consider industry and country fixed effects; our results continue to hold. Overall, this finding suggests that country creditor protection is positively associated with firm credit ratings.

[TABLE 7]

### 4.3 Creditor rights, credit ratings and capital structures

We now investigate how creditor rights interact with credit ratings to influence capital structure in terms of bond issuance relative to equity issuance. The power channel

of credit predicts an increase in a borrowers' debt capacity when stronger creditor protections enable lenders to force repayment by seizing collateral. The information channel works through credit ratings to reinforce the power channel's effect on the borrower's debt capacity. Rating agencies perform a monitoring role on behalf of widely dispersed bond holders. Concurrently, demand for monitoring decreases, as managers have fewer incentives to take risks when creditor protections are strengthened (Acharya et al., 2011b). Thus, strong creditor protections may affect firm financing decisions through both power and information channels, which is to say that creditor protection may directly influence the capital structure by making creditors more powerful in cases of bankruptcy or reorganization or through rating agencies' information disclosures.

Table 8 shows the results of regressions using the model given in equation (3). In columns (1) to (2), we use *bond/equity* as the dependent variable, and in columns (3) and (4), we use *srbond/equity* as dependent variables for a robustness check. The main explanatory variables used are the creditor rights index and its interactions with firm credit ratings. We interact country creditor rights and firm credit ratings to measure how creditor protection affects capital structure through the information channel. We also control for credit ratings, as they may have an effect on capital structure that is independent of creditor rights. For example, Kisgen (2006) shows that credit ratings are an important consideration in manager's financing decisions due to the discrete costs or benefits associated with obtaining different levels of ratings. The results shown in Table 8 illustrate that coefficients on creditor rights are positive but statistically insignificant, suggesting that after controlling for year, country and industry heterogeneities and other firm characteristics, the power channel alone is not strong enough to encourage firms to issue more debt relative to equity

in response to stronger creditor rights. The coefficient on the interaction term is positive and statistically significant, which suggests that in countries with more creditor protection, firms with higher credit ratings tend to issue more bonds relative to equity, indicating a strong and significant effect delivered through the information channel. Using *srbond/equity* as a dependent variable does not change our results, as shown in columns (3) and (4). Moreover, the interaction term enters with an economically larger coefficient, suggesting that the information channel effect is stronger for senior bond issuance than for equity issuance. Overall these results confirm that the impact of country creditor rights on firm bond issuance through the information channel is statistically significant and economically meaningful.

[TABLE 8]

To further explore heterogenous effects observed through the informational channel, we divide our sample into countries with different degrees of information asymmetry. Previous studies suggest that rating criteria used for firms in less developed countries differ from those used for firms in developed countries due to differences in information asymmetries (e.g. Shen, Huang and Hasan, 2012). As in Shen et al., we proxy the degree of information asymmetry by income and divide our sample into high- and low-income countries using the World Bank's definition of national income. High-income countries are expected to present low levels of information asymmetry, while low-income countries are expected to present high levels of information asymmetry. Columns (5) and (6) show the corresponding results with *bond/equity* used as the dependent variable. We find that coefficients on the interaction term are only statistically significant for high-income countries, where information asymmetries are expected to be low. The coefficient

is also economically larger for high-income countries. The *Chi-sq.* test results (p-value of 0.4852) do not suggest a statistically significant difference in economic impact. Overall, the results given in Table 8 confirm that country-level creditor protections are translated into firm-level decisions to issue bonds through information channels supplied by firm-level credit ratings and that such an effect is more significant when levels of country information asymmetry are low and when information transfer is more complete.

However, it may still be that it is not country-level creditor rights but other unobserved country heterogeneities that drive these results. To address potential endogeneities and to offer causal evidence, we exploit country-level exogenous changes in creditor rights and employ a difference-in-difference strategy following Acharya and Subramanian (2009). Over our sample period, seven countries (Canada, Finland, Indonesia, Russia, Israel, India and Sweden) experienced a decline in creditor rights index values by one unit[2]. Table A.2 lists these countries and the years in which changes to creditor rights were made. These are considered 'treated' countries while countries that did not experience such a change in creditor rights during the same time period are defined as 'control' countries. We compare changes in capital structures for firms in the two sets of countries. Due to a paucity of observations with data available to construct a *bond/equity* ratio for the control sample, here we use *NETDIss*, defined as firms' net debt issuance over total assets, as a dependent variable. Corresponding results are presented in Table 9. $After_{i,t}$, the difference-in-difference estimator, takes a value of 1(0) for years following a decline in creditor rights for the treated (control) countries. In column (1), we use the full sample for

[2] Ireland also experienced a one unit decrease in the creditor rights index in 1990 in our sample period. However, we did not include it into our treated sample, as we do not have enough observations for the period preceding the treatment for Ireland.

the regression. Consistent with our hypothesis the results show that after a decline in creditor protection, net debt issuance in treated countries is significantly lower than that observed in control countries, suggesting a positive association between creditor rights and debt issuance. To address any residual omitted variable bias that may remain, we employ a one-to-one propensity score matching algorithm to define control countries based on GDP per capita, GDP growth, CPI growth and firm size. Column (2) shows results derived from the matched sample. The coefficient on *After* continues to be negative and statistically significant with a higher absolute value, suggesting that weaker creditor rights reduce firms' net debt issuance more for the matched sample. Overall the results shown in columns (1) and (2) confirm the positive impact of creditor rights on net debt issuance.

[TABLE 9]

To further examine the impact through the information channel, we divide our sample into high- vs. low-income countries. As is shown above, information asymmetries are expected to be less significant in high-income countries (Shen, Huang and Hasan, 2012). Therefore, the information channel should be stronger in translating stronger creditor rights to net debt issuance among high-income countries. In columns (3) and (4) we find results consistent with our hypotheses. The coefficients of *After* are significantly negative for both subsamples of high- and low-income countries; however, the absolute value is significantly larger for the subsample of high-income countries (-0.0515 vs. -0.0135). The *Chi-sq*. test of the coefficient suggests that such difference in economic impact is statistically significant at the 1% level. These results offer further causal evidence of the impact of creditor rights on net debt issuance through the information channel.

## 5. Creditor rights, ratings and investments

We next examine whether there is support for *Hypothesis 3A* that creditor protections and credit ratings interact to influence firm investment decisions. We estimate equation (3) with firm investment used as a dependent variable. The coefficient estimate of the interaction term between creditor rights and credit ratings captures the extent to which firm investments are influenced by creditor rights through the information channel. For all of the specifications we control for country, year, and industry heterogeneity, as well as for other macro controls, and firm characteristics, such as levels of tangibility. Table 10 reports the results. In column (1) we use the full sample for the regression. The results suggest that stronger creditor rights affect firm investments through the power and information channels. The coefficient on creditor rights is positive and significant, suggesting that stronger creditor rights improve firm capital expenditure overall. Moreover, the interaction term of creditor rights and credit ratings enters with a significant and positive sign, showing that creditor rights significantly affect firm investments through the information channel.

We extend the analyses and examine cross-sectional variations in investment reactions. Given the robust evidence on information effects of creditor protection through ratings on firms' investment decisions, we examine whether information disclosure truly benefits bondholders. According to *Hypothesis 3B* we should find that firms with more severe bondholder-stockholder conflicts should exhibit stronger investment responses. Based on the seminal work of Jensen and Meckling (1976), Myers (1977) and Smith and Warner (1979) we assume that firms of low credit quality face stronger bondholder-stockholder conflicts than firms of impeccable credit quality. Therefore, we employ a dummy for speculative-grade ratings as a proxy for agency conflicts and then divide the

full sample into firms with investment-grade ratings and firms with speculative-grade ratings. The regressions also incorporate country, year and industry fixed effects. The results given in columns (2) and (3) of Table 10 show that the coefficients of creditor rights are not significant for high- or low-rated firms. However, the interaction term enters positively and significantly into the sample of firms with speculative-grade ratings but insignificantly into the other sample, which suggests that for firms of low credit quality and experiencing more severe bondholder-stockholder conflicts, the effects of creditor protections on firm investments are more dependent on the monitoring and information disclosure functions of credit ratings.

[TABLE 10]

De Jong, Kabir and Nguyen (2008) show that asset tangibility can have a positive impact on firm leverage, which introduces an endogeneity bias into the above results. To address this concern, we run regressions using a two-stage model with the results presented in Table 11. In the first stage, the dependent variable used is *Investment*, and the key explanatory variable used is *Leverage* as shown in column (1). The residual from the first-stage regression becomes the dependent variable in the second-stage regression, which is shown in column (2). Using the two-staged procedure we isolate the impact of leverage on net fixed investments. The results given in column (2) show that the coefficient on the interaction term between creditor rights and credit ratings remains positive and statistically significant. This evidence confirms that the impact of creditor rights on firm investment through the information channel is robust to potential endogeneities introduced by a positive association between leverage and firm capital expenditures.

[TABLE 11]

## 6. Conclusions

This paper demonstrates the important role of credit ratings in translating stronger creditor protections into greater reliance on public debt. Previous studies have examined the role of the power channel of credit (Aghion and Bolton, 1992) in encouraging the issuance of private debt following the strengthening of creditor rights. We argue that a second channel, the information channel, works through the intermediation of credit rating agencies, which efficiently monitor a firm to disseminate information to bond holders. In combination with the power channel concentrating more power into the hands of creditors and the information channel offering efficient monitoring, firms are encouraged to issue bonds relative to equity. We further find that the information channel allows firms to increase capital expenditures when creditor rights are strengthened. As further evidence of credit ratings fulfilling information functions, our results are enhanced for firms facing a pronounced agency problem. These results have broader policy implications. Countries that wish to encourage firms to diversify their lending sources should strengthen creditor rights which, as our study shows, encourages firms to issue corporate debt.

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**Table 1 Definitions of the main variables**

This table lists the variables, definitions and data sources used.

| Variable | Definition | Source |
|---|---|---|
| **Country Characteristics** | | |
| *Law* | | |
| Creditor rights index | An index aggregating creditor rights. The index ranges from 0 (weakest creditor rights) to 4 (strongest creditor rights) | Djankov et al. (2007) |
| CR1 | A subindex of creditor rights in terms of reorganization approval. The index ranges from 0 (weakest creditor rights) to 4 (strongest creditor rights) | |
| CR2 | A subindex of creditor rights in terms of whether secured creditors are able to obtain their collateral when reorganization is approved. The index ranges from 0 (weakest creditor rights) to 4 (strongest creditor rights) | |
| CR3 | A subindex of creditor rights in terms of whether secured creditors are paid first. The index ranges from 0 (weakest creditor rights) to 4 (strongest creditor rights) | |
| CR4 | A subindex of creditor rights in terms of whether a magager would be out. The index ranges from 0 (weakest creditor rights) to 4 (strongest creditor rights) | |
| Corrected anti-director rights index (Corrected ADRI) | An additional corrected index of the original anti-director rights index based on improved data collection, coding and documentation methods | Spamann (2010) |
| *Crises* | | |
| Systemic banking crisis dummy | Equal to one in the first year of a crisis and three years after | Laeven and Valencia (2012) |
| *Macroeconomic control variables* | | |
| GDP growth | Growth rate of gross national product (current US dollars) | WDI |
| CPI growth | Inflation rate | WDI |
| **Firm Characteristics** | | |
| Credit rating score | Equal to 1 for a ratings of D up to a value of 23 for a rating of AAA+ | S&P Capital IQ |
| Credit rating | Long-term credit rating ranging from D to AAA+ | S&P Capital IQ |
| Firm size | Natural logarithm of total assets | Compustat Global |
| ROA | EBITDA (Earnings before interest, taxes, depreciation and amortization)/total assets | Compustat Global |
| Cash flow to assets | (Income before extraordinary items + Depreciation and Amortization)/total assets | Compustat Global |
| Investment | Capital expenditures/total assets | Compustat Global |
| Leverage | Total debt/total assets | Compustat Global |
| Tangibility | Net property, plant, and equipment/total assets | Compustat Global |

| | | |
|---|---|---|
| Public debt | Senior bonds and notes + subordinated bonds and notes + commercial paper | S&P Capital IQ |
| Senior public debt | Senior bonds and notes | S&P Capital IQ |
| Bond to equity | Public debt /common equity | S&P Capital IQ |
| Senior bond to equity | Senior public debt / common equity | S&P Capital IQ |
| NETDIss | $(\Delta\text{Debt} - \Delta\text{Equity})$ / total assets | S&P Capital IQ |

**Table 2 Summary statistics**

This table reports summary statistics for the main variables.

| Variable | Obs | Mean | Std. Dev. | Min. | Max. |
|---|---|---|---|---|---|
| Creditor rights | 16,129 | 1.766 | 1.070 | 0 | 4 |
| Corrected ADRI | 15,323 | 3.639 | 1.291 | 2 | 6 |
| Credit rating | 16,855 | 16.762 | 3.905 | 0 | 26 |
| CRight change | 16,502 | -0.003 | 0.070 | -1 | 1 |
| CRating change | 15,529 | -0.087 | 1.005 | -18 | 12 |
| NETDIss | 16,830 | -0.002 | 0.083 | -2.914 | 2.460 |
| Firm size | 16,830 | 10.115 | 2.742 | 3.161 | 21.776 |
| ROA | 16,811 | 0.124 | 0.079 | -1.339 | 0.885 |
| Cash flow to assets | 16,830 | 0.026 | 0.065 | -1.507 | 1.375 |
| Investment | 4,400 | 0.066 | 0.058 | 0.000 | 0.874 |
| Tangibility | 4,499 | 0.389 | 0.238 | 0.023 | 0.886 |

**Table 3 Correlation**

This table reports correlations of the main variables.

| | Creditor rights | Corrected ADRI | Credit rating | CRight change | CRating change | Firm size | ROA | CF ratio | Investment | Tangibility |
|---|---|---|---|---|---|---|---|---|---|---|
| Creditor rights | 1.0000 | | | | | | | | | |
| Corr ADR | 0.5594* | 1.0000 | | | | | | | | |
| | (0.0000) | | | | | | | | | |
| Credit rating | 0.2294* | 0.2836* | 1.0000 | | | | | | | |
| | (0.0000) | (0.0000) | | | | | | | | |
| CRight change | -0.0010 | -0.0704* | -0.0135 | 1.0000 | | | | | | |
| | (0.8931) | (0.0000) | (0.0000) | | | | | | | |
| CRating change | 0.0088 | 0.0394* | 0.4358* | 0.0477* | 1.0000 | | | | | |
| | (0.3081) | (0.0000) | (0.0000) | (0.0000) | | | | | | |
| Firm size | 0.1471* | 0.4888* | 0.2333* | -0.0501* | 0.0931* | 1.0000 | | | | |
| | (0.0000) | (0.0000) | (0.0000) | (0.0000) | (0.0000) | | | | | |
| ROA | -0.0042 | -0.0581* | 0.2163* | 0.0375* | 0.2296 * | -0.0246 | 1.0000 | | | |
| | (0.7792) | (0.0002) | (0.0000) | (0.0127) | (0.0000) | (0.0000) | | | | |
| CF ratio | -0.1608* | -0.3096* | 0.1790* | 0.0225 | 0.1350* | -0.1461* | 0.3080* | 1.0000 | | |
| | (0.0000) | (0.0000) | (0.0000) | (0.1253) | (0.0000) | (0.0000) | (0.0000) | | | |
| Investment | 0.0569* | -0.0094 | 0.0312 | 0.0172 | 0.0746* | -0.0158 | 0.2476* | 0.0621* | 1.0000 | |
| | (0.0002) | (0.5543) | (0.0382) | (0.2625) | (0.0001) | (0.2954) | (0.0000) | (0.0000) | | |
| Tangibility | 0.0275 | -0.0408* | -0.0044 | -0.0407* | -0.0730* | -0.0328* | 0.0473* | 0.0030 | 0.2621* | 1.0000 |
| | (0.0711) | (0.0092) | (0.7660) | (0.0071) | (0.0000) | (0.0277) | (0.0015) | (0.8425) | (0.0000) | |

**Table 4 Creditor rights and credit ratings: baseline results**

This table reports the results of the regression:
$\text{Credit rating}_{i,t} = \alpha_0 + \alpha_t + \alpha_i + \alpha_l + \alpha_c + \beta_1 * \text{Creditor rights}_{c,t} + \beta_2 * \text{Corrected ADR}_{c,t} + \beta_3 * \text{Macro\_controls}_{c,t} + \beta_4 * \text{Firm\_controls}_{i,t} + \varepsilon_{i,t}$. The dependent variable is firms' credit ratings. i index firms, l index industries, c index countries and t index year; $Creditor\ right_{c,t}$ and $Corrected\ ADR_{c,t}$ denote countries' creditor and shareholder protections, respectively; $Macro\_controls_{c,t}$ include country-level GDP growth and CPI growth; $Firm\_controls_{i,t}$ include firm-level firm sizes, ROA and cashflow ratios; $\alpha_t, \alpha_c, \alpha_l$ and $\alpha_i$ denote year, country, industry and firm fixed effects, respectively; $\varepsilon_{i,t}$ is the error term covering unobservable shocks that affect firm credit ratings. All variables are defined in Table 1. Robust standard errors are reported in parentheses. ***, ** and * imply significance at 1%, 5% and 10% levels, respectively.

| Dep. Var. | *Credit rating* | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Creditor rights | 0.658*** | | 0.283** | | 0.680*** | | 0.289** | |
| | (0.118) | | (0.113) | | (0.118) | | (0.113) | |
| Corrected ADR | | 0.0973 | | 0.102* | | 0.0899 | | 0.105* |
| | | (0.0617) | | (0.0579) | | (0.0615) | | (0.0582) |
| GDP growth | | | 0.0525*** | 0.0718*** | | | 0.0513*** | 0.0697*** |
| | | | (0.00828) | (0.00918) | | | (0.00835) | (0.00926) |
| CPI growth | | | -0.0626*** | -0.0633*** | | | -0.0633*** | -0.0653*** |
| | | | (0.00474) | (0.00703) | | | (0.00478) | (0.00707) |
| Firm size | | | 0.596*** | 0.611*** | | | 0.658*** | 0.697*** |
| | | | (0.0196) | (0.0221) | | | (0.0181) | (0.0202) |
| ROA | | | 3.200*** | 3.204*** | | | 3.811*** | 3.836*** |
| | | | (0.231) | (0.241) | | | (0.230) | (0.240) |
| CF ratio | | | 1.826*** | 1.814*** | | | 1.969*** | 1.941*** |
| | | | (0.253) | (0.249) | | | (0.254) | (0.251) |
| Cons | 16.88*** | 17.97*** | 11.67*** | 11.88*** | 17.26*** | 9.304*** | 11.03*** | 11.43*** |
| | (0.302) | (0.299) | (0.338) | (0.355) | (1.769) | (0.940) | (1.417) | (0.523) |
| Country FE | N | N | N | N | Y | Y | Y | Y |
| Year FE | Y | Y | Y | Y | Y | Y | Y | Y |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Gsector FE | N | N | N | N | Y | Y | Y | Y |
| Firm FE | Y | Y | Y | Y | N | N | N | N |
| R-sq. | 0.1403 | 0.1544 | 0.2183 | 0.2214 | 0.1404 | 0.1549 | 0.2171 | 0.2203 |
| # of Obs. | 16,129 | 15,323 | 15,715 | 14,914 | 16,129 | 15,323 | 15,715 | 14,914 |

**Table 5 Creditor rights and credit ratings: excluding US and UK firms and WLS**

This table reports the results of the regression:
$\text{Credit rating}_{i,t} = \alpha_0 + \alpha_t + \alpha_i + \alpha_l + \alpha_c + \beta_1 * \text{Creditor rights}_{c,t} + \beta_2 * \text{Corrected ADR}_{c,t} + \beta_3 * \text{Macro\_controls}_{c,t} + \beta_4 * \text{Firm\_controls}_{i,t} + \varepsilon_{i,t}$. The dependent variable is firms' credit ratings. i index firms, l index industries, c index countries and t index year. The key explanatory variable is the creditor rights index. All variables are defined in Table 1. Columns (1) and (2) report results derived from the sample excluding U.S. and U.K. companies. Columns (3) and (4) report results derived from the weighted least square regressions by firm number to account for the large number of U.S. and U.K. companies in our sample. Robust standard errors are reported in parentheses. ***, ** and * imply significance at 1%, 5% and 10% levels, respectively.

| Dep. Var. | *Credit rating* | | | |
|---|---|---|---|---|
| | Sample excl. US and UK firms | | Weighted least squares | |
| | (1) | (2) | (3) | (4) |
| Creditor rights | 0.250** | | 0.904*** | |
| | (0.116) | | (0.199) | |
| Corrected ADR | | 0.215 | | -0.460*** |
| | | (0.165) | | (0.129) |
| GDP growth | 0.0402*** | 0.0639*** | 0.0416 | 0.0132 |
| | (0.00847) | (0.00938) | (0.0325) | (0.0339) |
| CPI growth | -0.0590*** | -0.0567*** | -0.0278 | 0.0261 |
| | (0.00467) | (0.00689) | (0.0183) | (0.0295) |
| Firm size | 0.522*** | 0.515*** | 1.061*** | 1.065*** |
| | (0.0197) | (0.0227) | (0.0289) | (0.0290) |
| ROA | 3.354*** | 3.350*** | 13.17*** | 13.18*** |
| | (0.271) | (0.289) | (1.646) | (1.652) |
| CF ratio | 1.473*** | 1.453*** | 4.507*** | 4.497*** |
| | (0.525) | (0.509) | (1.521) | (1.521) |
| Cons | 13.41*** | 13.69*** | 4.879*** | 9.066*** |
| | (1.594) | (0.745) | (1.007) | (0.756) |
| Country FE | Y | Y | Y | Y |
| Year FE | Y | Y | Y | Y |
| Gsector FE | Y | Y | Y | Y |
| Firm FE | N | N | N | N |
| R-sq. | 0.1801 | 0.1736 | 0.4661 | 0.4653 |
| # of Obs. | 10,198 | 9,397 | 13,850 | 13,173 |

**Table 6 Creditor rights and credit rating: robustness**

This table reports the results of the regression:
$\text{Credit rating}_{i,t} = \alpha_0 + \alpha_t + \alpha_i + \alpha_l + \alpha_c + \beta_1 * \text{Creditor rights}_{c,t} + \beta_2 * \text{Corrected ADR}_{c,t} + \beta_3 * \text{Macro\_controls}_{c,t} + \beta_4 * \text{Firm\_controls}_{i,t} + \varepsilon_{i,t}$. The dependent variable is firms' credit ratings. i index firms, c index countries and t index year. The key explanatory variable is the subindices of creditor rights, CR1, CR2, CR3 and CR4. All variables are defined in Table 1. Robust standard errors are reported in parentheses. ***, ** and * imply significance at 1%, 5% and 10% levels, respectively.

| Dep. Var. | *Credit rating* | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| CR1(Reorg) | 0.442** | | | |
| | (0.196) | | | |
| CR2 (Autostay) | | 0.894*** | | |
| | | (0.162) | | |
| CR3 (Secured) | | | 1.025*** | |
| | | | (0.205) | |
| CR4 (Manages) | | | | -0.00183 |
| | | | | (0.154) |
| GDP growth | 0.0304*** | 0.0292*** | 0.0319*** | 0.0313*** |
| | (0.00819) | (0.00819) | (0.00818) | (0.00819) |
| CPI growth | -0.0783*** | -0.0786*** | -0.0758*** | -0.0775*** |
| | (0.00466) | (0.00465) | (0.00466) | (0.00465) |
| Firm size | 0.551*** | 0.556*** | 0.546*** | 0.549*** |
| | (0.0161) | (0.0160) | (0.0160) | (0.0165) |
| ROA | 3.546*** | 3.556*** | 3.559*** | 3.551*** |
| | (0.231) | (0.231) | (0.231) | (0.231) |
| CF ratio | 2.069*** | 2.121*** | 1.998*** | 2.043*** |
| | (0.254) | (0.254) | (0.254) | (0.254) |
| Cons | 11.68*** | 11.53*** | 11.05*** | 11.82*** |
| | (0.379) | (0.374) | (0.405) | (0.376) |
| Country FE | N | N | N | N |
| Year FE | Y | Y | Y | Y |
| Gsector FE | Y | Y | Y | Y |
| Firm FE | N | N | N | N |
| R-sq. | 0.2430 | 0.2561 | 0.2507 | 0.2411 |
| # of Obs. | 15,735 | 15,735 | 15,735 | 15,735 |

**Table 7 Effects of creditor right changes**

This table reports the effects of creditor right changes on credit rating changes in all periods and over crisis episodes [t, t+3] where *t* is the starting year of a systemic banking crisis defined in Laeven and Valencia (2012). The dependent variable is the change in firms' credit ratings. The key variable is the change in creditor rights and corresponding interactions with crises. All variables are defined in Table 1. Robust standard errors are reported in parentheses. ***, ** and * imply significance at 1%, 5% and 10% levels, respectively.

| Dep. Var. | *Credit rating change* | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| CRight change | 0.781*** | 0.828*** | 0.322* | 0.375* |
| | (0.203) | (0.196) | (0.160) | (0.194) |
| CRight change * Crisis | | | 0.956** | 0.912** |
| | | | (0.457) | (0.444) |
| Crisis | | | -0.102* | -0.103** |
| | | | (0.0535) | (0.0455) |
| GDP growth | 0.0487*** | 0.0483*** | - | - |
| | (0.00936) | (0.00894) | - | - |
| CPI growth | -0.0412*** | -0.0381*** | - | - |
| | (0.0102) | (0.00952) | - | - |
| Firm size | -0.00730 | -0.000838 | -0.0108 | 0.000757 |
| | (0.0192) | (0.00494) | (0.0187) | (0.00553) |
| ROA | 1.780*** | 1.281*** | 1.987*** | 1.396*** |
| | (0.410) | (0.231) | (0.548) | (0.275) |
| CF ratio | 1.634*** | 1.298*** | 1.850*** | 1.393*** |
| | (0.542) | (0.391) | (0.682) | (0.472) |
| Cons | -0.112 | -0.669*** | -0.252 | -0.410*** |
| | (0.241) | (0.248) | (0.238) | (0.154) |
| Country FE | N | Y | N | Y |
| Year FE | Y | Y | Y | Y |
| Gsector FE | N | Y | N | Y |
| Firm FE | Y | N | Y | N |
| R-sq. | 0.0642 | 0.0631 | 0.0477 | 0.0464 |
| # of Obs. | 14,566 | 14,566 | 11,797 | 11,797 |

**Table 8 Creditor rights, credit ratings and capital structures**

This table reports results of regression $Bond\_to\_equity_{i,t} = \alpha_0 + \alpha_t + \alpha_i + \alpha_l + \alpha_c + \beta_1 * Cright_{c,t} + \beta_2 * Credit\_rating_{i,t} + \beta_3 * Cright_{c,t} * Credit\_rating_{i,t} + \beta_4 * Firm\_controls_{i,t} + \varepsilon_{i,t}$. $i$ index firms, $l$ index industries, $c$ index countries and $t$ index year. The dependent variable denotes firm bond value to equity value or senior bond value to equity value. The key explanatory variable is the creditor right index and its interaction with firm credit ratings. All variables are defined in Table 1. Robust standard errors are reported in parentheses. ***, ** and * imply significance at 1%, 5% and 10% levels, respectively.

| Dep. Var. | *Bond/equity* | | *Srbond/equity* | | *Bond/equity* | |
|---|---|---|---|---|---|---|
| | Full sample | | | | High income | Low income |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Creditor rights | 0.228 | 0.166 | 1.081 | 0.172 | -0.0987 | -1.708 |
| | (1.599) | (0.392) | (2.619) | (0.972) | (5.549) | (5.785) |
| Credit rating | | -0.456*** | | -0.708*** | -1.634*** | -0.359 |
| | | (0.176) | | (0.270) | (0.592) | (0.342) |
| CRight * CRating | | 0.230** | | 0.362** | 0.637*** | 0.224 |
| | | (0.0939) | | (0.143) | (0.222) | (0.313) |
| Firm size | -0.235 | -0.102 | -0.424 | -0.192 | -1.811* | 0.546* |
| | (0.250) | (0.296) | (0.389) | (0.468) | (1.094) | (0.290) |
| ROA | -11.57** | -11.86* | -18.80** | -17.75* | -11.66 | -3.317 |
| | (5.739) | (6.158) | (8.799) | (9.710) | (16.86) | (6.314) |
| CF ratio | 1.580 | 3.244 | 2.802 | 4.571 | 16.31 | -1.320 |
| | (4.859) | (4.891) | (6.596) | (6.623) | (34.68) | (4.150) |
| Cons | 3.499 | 9.659 | 4.455 | 13.57 | - | 2.764 |
| | (11.47) | (11.96) | (19.54) | (20.10) | - | (10.38) |
| Chi-sq. | | | | | | 0.49 |
| (P-value) | | | | | | (0.4852) |
| Country FE | Y | Y | Y | Y | Y | Y |
| Year FE | Y | Y | Y | Y | Y | Y |
| Gsector FE | Y | Y | Y | Y | Y | Y |
| Firm FE | N | N | N | N | N | N |
| R-sq. | 0.0203 | 0.0248 | 0.0292 | 0.0364 | 0.0741 | 0.0231 |
| # of Obs. | 1,725 | 1,725 | 1,127 | 1,127 | 540 | 905 |

**Table 9 Creditor rights, credit ratings and capital structures: Difference-in-difference**

This table reports the robustness results for creditor rights, credit ratings and capital structures using a difference-in-difference strategy. The regression is $NETDIss_{i,t} = \alpha_0 + \alpha_t + \alpha_l + \beta_1 * after_{c,t} + \beta_2 * Firm\_controls_{i,t} + \varepsilon_{i,t}$. The dependent variable is firms' net debt issuance over total assets. *i* index firms, *l* index industry, *c* index countries and *t* index year. The key explanatory variable is $after_{c,t}$, which is equal to one for years following a decrease in creditor rights for treated countries or which is equal to zero otherwise. The matched sample is defined by a one-to-one propensity score matching algorithm based on country characteristics (log of GDP per capita, GDP growth, and CPI growth) and firm sizes. All variables are defined in Table 1. Robust standard errors are reported in parentheses. ***, ** and * imply significance at 1%, 5% and 10% levels, respectively.

| Dep. Var. | *NETDIss* | | | |
|---|---|---|---|---|
| | Full sample | Matched sample | High income | Low income |
| | (1) | (2) | (3) | (4) |
| After | -0.0251* | -0.0341** | -0.0515*** | -0.0135*** |
| | (0.0120) | (0.0153) | (0.00739) | (0.00485) |
| Firm size | 0.115 | 0.00210 | 0.00816*** | 0.00132 |
| | (0.185) | (0.00280) | (0.00199) | (0.00348) |
| ROA | 3.799*** | -0.0133 | 0.301*** | -0.0147 |
| | (0.675) | (0.0192) | (0.0816) | (0.0201) |
| CF ratio | 0.0655 | 0.0128 | 0.104 | 0.0126 |
| | (0.0879) | (0.0186) | (0.0633) | (0.0186) |
| Cons | -4.830 | -0.00462 | -0.0710** | -0.000459 |
| | (5.267) | (0.0221) | (0.0277) | (0.0260) |
| Chi-sq. | | | | 19.05*** |
| (P-value) | | | | (0.000) |
| Year FE | Y | Y | Y | Y |
| Country FE | N | N | N | N |
| Gsector FE | Y | Y | Y | Y |
| Firm FE | N | N | N | N |
| R-sq. | 0.0189 | 0.0196 | 0.1650 | 0.0172 |
| # of Obs. | 271,616 | 55,034 | 9,772 | 42,628 |

**Table 10 Creditor rights, credit ratings and firm investments**

This table reports the results of regression $Investment_{i,t} = \alpha_0 + \alpha_t + \alpha_i + \alpha_l + \alpha_c + \beta_1 * Cright_{c,t} + \beta_2 * Credit\_rating_{i,t} + \beta_3 * Cright_{c,t} * Credit\_rating_{i,t} + \beta_4 * Firm\_controls_{i,t} + \beta_5 * Macro\_controls_{c,t} + \varepsilon_{i,t}$. The dependent variable is firm investments. *i* index firms, *l* index industries, *c* index countries and *t* index year. Key explanatory variables are creditor rights and their interactions with credit ratings. All variables are defined in Table 1. Robust standard errors are reported in parentheses. ***, ** and * imply significance at 1%, 5% and 10% levels, respectively.

| Dep. Var. | *Investment* | | |
|---|---|---|---|
| | Full sample | Investment grade | Speculative grade |
| | (1) | (2) | (3) |
| Creditor rights | 0.00622** | 0.0110 | -0.00405 |
| | (0.00227) | (0.0123) | (0.0140) |
| Credit rating | 0.00161*** | - | - |
| | (0.000403) | - | - |
| CRight * CRating | 0.000412* | 0.000130 | 0.00116** |
| | (0.000217) | (0.000223) | (0.000538) |
| Tangibility | 0.0250** | 0.0443*** | 0.0145 |
| | (0.0110) | (0.0112) | (0.0171) |
| CF ratio | -0.00905 | -0.00177 | -0.0116 |
| | (0.0181) | (0.0113) | (0.0223) |
| ROA | 0.0904*** | 0.149*** | 0.0540** |
| | (0.0181) | (0.0198) | (0.0273) |
| Firm size | -0.00136 | 0.000651 | -0.00159 |
| | (0.000825) | (0.000892) | (0.00152) |
| GDP growth | 0.000849 | -0.000830 | 0.00207*** |
| | (0.000651) | (0.000992) | (0.000780) |
| CPI growth | -0.000199 | 0.000720 | -0.0000296 |
| | (0.000408) | (0.00102) | (0.000496) |
| Cons | 0.154*** | 0.0824*** | 0.212*** |
| | (0.0173) | (0.0237) | (0.0325) |
| Country FE | Y | Y | Y |
| Year FE | Y | Y | Y |
| Gsector FE | Y | Y | Y |
| Firm FE | N | N | N |
| R-sq (within) | 0.2531 | 0.3103 | 0.2877 |
| # of Obs. | 4,058 | 2,462 | 1,596 |

**Table 11 Creditor rights, credit ratings and firm investments: robustness**

This table reports the results for regressions of the two-stage model. In the first stage, the dependent variable is firm investment; in the second stage, the dependent variable is the residual of the first stage. Key explanatory variables are creditor rights and their interactions with credit ratings. All variables are defined in Table 1. Robust standard errors are reported in parentheses. ***, ** and * imply significance at 1%, 5% and 10% levels, respectively.

| Dep. Var. | *Investment* | *Resid* |
|---|---|---|
| | (1) | (2) |
| Leverage | 0.00116 | |
| | (0.000827) | |
| Creditor rights | | 0.00996 |
| | | (0.00757) |
| CRight * CRating | | 0.000486** |
| | | (0.000226) |
| Credit rating | | 0.00176*** |
| | | (0.000379) |
| CF ratio | 0.00482 | -0.0186 |
| | (0.0210) | (0.0180) |
| ROA | 0.100*** | -0.00285 |
| | (0.0233) | (0.0191) |
| Firm size | -0.00161* | -0.0000918 |
| | (0.000807) | (0.000769) |
| GDP growth | 0.000773 | 0.0000949 |
| | (0.000755) | (0.000660) |
| CPI growth | -0.000752* | 0.000570 |
| | (0.000440) | (0.000395) |
| Cons | 0.194*** | -0.0335** |
| | (0.0115) | (0.0161) |
| Country FE | Y | Y |
| Year FE | Y | Y |
| Gsector FE | Y | Y |
| Firm FE | N | N |
| R-sq. | 0.2331 | 0.0244 |
| # of Obs. | 4,100 | 4,094 |

**Appendix:**

**Table A.1 List of countries and number of firms**

| Country | Number of firms | Country | Number of firms |
|---|---|---|---|
| Argentina | 12 | Lithuania | 1 |
| Australia | 61 | Malaysia | 8 |
| Austria | 6 | Mexico | 34 |
| Belgium | 8 | Netherlands | 28 |
| Brazil | 41 | New Zealand | 13 |
| Bulgaria | 1 | Nigeria | 1 |
| Canada | 28 | Norway | 9 |
| Chile | 15 | Philippines | 6 |
| China | 9 | Poland | 4 |
| Colombia | 2 | Portugal | 4 |
| Czech Republic | 3 | Russian Federation | 24 |
| Denmark | 3 | Saudi Arabia | 2 |
| Egypt, Arab Rep. | 2 | Singapore | 9 |
| Finland | 9 | South Africa | 6 |
| France | 56 | Spain | 12 |
| Germany | 46 | Sri Lanka | 1 |
| Greece | 3 | Sweden | 23 |
| Hungary | 2 | Switzerland | 27 |
| India | 11 | Thailand | 11 |
| Indonesia | 25 | Turkey | 5 |
| Ireland | 9 | Ukraine | 1 |
| Israel | 1 | United Arab Emirates | 3 |
| Italy | 24 | United Kingdom | 105 |
| Japan | 244 | United States | 345 |
| Kazakhstan | 2 | Venezuela, RB | 2 |
| Korea, Rep. | 24 | **TOTAL** | **1,331** |

**Table A.2 Countries that underwent a decline in creditor rights over the sample period**

| Country name | Year of decrease |
|---|---|
| Canada | 1992 |
| Finland | 1993 |
| Indonesia | 1998 |
| Israel | 1995 |
| India | 1993 |
| Sweden | 1995 |
| Russian Federation | 1998 |