Creditor rights, financial health, and corporate investment efficiency

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ABSTRACT

This paper analyzes the influence of creditor rights on investment efficiency and how firms' financial health shapes this influence. Using time-series changes within a country and cross-country variations in creditor rights, I find that stronger protection of creditors improves investment efficiency in healthy firms but worsens it in distressed firms. The impact on investment efficiency operates more through changes in overinvestment than in underinvestment. Alternative proxies for creditor rights control for both contractual and enforcement rights. The results are robust to alternative model specifications and to controls for omitted variables.

1. Introduction

The law and finance literature has recently highlighted the relevance of creditor rights for affecting corporate investment decisions by reducing corporate risk-taking (Acharya, Amihud, & Litov, 2011) and innovation (Acharya & Subramanian, 2009). This negative effect does not rule out the possibility that stronger creditor rights may have other positive effects on corporate investment. In particular, I propose that arguments used by Acharya and Subramanian (2009) and Acharya et al. (2011) to explain that stronger creditor rights affect corporate investment by reducing corporate risk-taking may also lead creditor rights to promote greater investment efficiency in financially healthy firms. This paper provides empirical evidence to this effect and aims to answer the following questions: How does a country's creditor protection affect firms' investment efficiency? Is the influence different for financially healthy and financially distressed firms? Are these changes in investment efficiency driven by changes in overinvestment and/ or in underinvestment? Answers to these questions would help in the policy debate about the optimal regulation of creditor rights.

I initially focus on investment efficiency to capture the net effect of any investment-related agency behavior. I then analyze if changes in investment efficiency are driven by changes in overinvestment and/or underinvestment. Following the majority of the empirical literature on investment, I analyze investment efficiency through the sensitivity of capital expenditures to investment opportunities (Lang, Ofek, & Stulz, 1996; Chen, Sun, Tang, & Wu, 2011; Mclean, Zhang, & Zhao, 2012). I use an international sample of 8207 firms across 34 countries over the 2003–2011 period and apply alternative empirical strategies to identify causality from creditor rights to investment efficiency and overcome challenges related to the omission of explanatory variables. First, I exploit changes in countries' legal reforms to perform a difference-in-differences (DID, henceforth) analysis. I use the legal rights index drawn up by the World Bank until 2012. This analysis is especially designed to deal with omitted variables. Comparing the same country in periods with different regulation on creditor rights and using countries without changes in creditor rights as a control group allow us to control for unobserved country-level factors. This analysis, however, makes it necessary to deal with endogeneity concerns.

Countries could change creditor rights following the onset of the crisis aiming to improve investment efficiency in periods of greater financial distress. The endogeneity of these changes might impede capturing causality from creditor rights to investment efficiency. I use one lag of the annual indicator for creditor rights to reduce simultaneity with corporate investment and endogeneity concerns. Additionally, I check that the results are robust when I focus on changes in creditor rights before the onset of the global financial crisis, excluding countries with changes in creditor rights after the end of 2007, and when I exclude the crisis years from the regressions.

Second, I conduct cross-sectional regressions to test how the protection of creditor rights is associated with investment efficiency. In particular, I use the level of creditor rights at the beginning of the analysis period (beginning of 2003). This analysis is especially designed to control for endogeneity concerns in changes in creditor rights. The legal protection of creditor rights may vary over time depending on the business cycle or the intensity of financial distress problems. However, we can assume that creditor rights at the beginning of the analysis period are less dependent on the particular business cycle affecting our sample. Regressions control for the traditional determinants of corporate investment (leverage, size, tangibility, and cash reserves) and any unobserved effect at firm and year level. Additionally, all the regressions include industry-year and country-year dummy variables to control for time-varying variables at industry and country level. This type specification reduces typical concerns related to the potential omission of variables. It is unlikely that other country characteristics, apart from creditor rights, cause the impact on investment efficiency attributed to creditor rights in these cross-country regressions. In all the cases, I use alternative proxies for creditor rights to capture both creditors' contractual rights and their enforcement rights.

The overall results suggest that stronger protection of creditor rights is associated on average with better investment efficiency. The strengthening (weakening) of creditor rights is associated with an increase (reduction) in the relationship between investment opportunities and capital expenditures. Cross-country regressions provide similar results because countries with stronger (weaker) protection of creditor rights at the beginning of the analysis period have a more (less) positive relationship between capital expenditures and investment opportunities. However, there are differences depending on firms' financial health. Healthy firms drive the results found in the whole sample because creditor rights are associated with better investment efficiency in healthy firms. However, I find that stronger creditor rights are associated with lower investment efficiency in the sub-sample of financially distressed firms.

I analyze if the effects described above of creditor rights on investment efficiency are caused by changes in overinvestment and/or in underinvestment. I measure over- and underinvestment by comparing actual and expected investment. The results indicate that the impact on investment efficiency operates more through changes in overinvestment than in underinvestment. In particular, I find that stronger creditor rights reduce overinvestment but do not affect the likelihood of underinvestment. Moreover, this positive effect decreases when the firm's financial distress increases. These results are consistent with a less positive impact of creditor rights on investment efficiency in financially distressed firms.

The above results are robust to several additional checks. The results remain after controlling for the positive impact of country shareholder protection on investment efficiency. The results are also robust to alternative proxies for firms' investment opportunities and financial health. Nor do they change when countries without changes in creditor rights are excluded or when countries such as Japan, UK, and US are not included in the regressions to avoid potential bias caused by their over-representation in the sample. Finally, the results are robust to alternative specifications of the dummy control variables and clusters of standard errors.

The rest of the paper is organized as follows. Section 2 discusses the potential effects of creditor rights on investment efficiency depending on firms' financial health and the related literature. Section 3 describes the data, sample, and variables. Section 4 explains the empirical analysis, and presents the results and robustness checks. Finally, Section 5 concludes.

2. Hypotheses and related literature

2.1. Hypotheses

There is a vast agency literature discussing the investment distortions caused by shareholder-creditor conflicts. Literature also highlights that these conflicts are more intense in financially distressed firms (Jensen, 1986; Myers & Majluf, 1984). Shareholders (or managers acting in their interests) in financially distressed firms have incentives to pay out the value of the company through dividends and to refuse to contribute equity capital to positive NPV projects if they are not risky enough (underinvestment problem) (Myers & Majluf, 1984). Shareholders also have incentives to undertake risky projects even if they are negative NPV projects (overinvestment and risk-shifting problems) (Jensen, 1986; Parrino & Weisbach, 1999). The relevance of creditor rights for investment efficiency would be associated with their suitability for solving these conflicts of interest between shareholders and creditors (Gertner & Scharfstein, 1991). Although such conflicts are more intense in financially distressed firms, creditor rights also affect the funding and investment decisions of healthy firms because the shareholders and managers of these firms anticipate different bankruptcy costs depending on the protection of creditor rights.

We can use similar arguments to Acharya and Subramanian (2009) and Acharya et al. (2011) to forecast a positive relationship between creditor rights and investment efficiency in healthy firms. Shareholders in non-financially distressed firms anticipate that strong creditor rights in default may lead to inefficient liquidation, which extinguishes the continuation option of a firm's business and thus hurts shareholder value. Also, creditor rights that mandate the dismissal of management in bankruptcy impose private costs on managers. To avoid these costs, shareholders and managers in non-financially distressed firms would have incentives to lower the likelihood of distress by increasing the efficiency of capital allocation. For this reason, I hypothesize that strong creditor rights

improve investment efficiency in non-financially distressed firms. This hypothesis extends the traditional control hypothesis highlighted by Jensen (1986) for debt. I now argue that the benefits of debt for motivating managers and shareholders to be efficient and for reducing the agency costs of free cash-flow would be greater in countries with stronger creditor rights.

Less clear are the effects of the protection of creditor rights on investment efficiency in financially distressed firms. On the one hand, strong creditor rights increase the expected return for creditors in bankruptcy and allow them to more credibly threaten shareholders and managers with liquidation of the firm. They give creditors stronger bargaining power to reach a private agreement, shorten restructuring process, and liquidate unprofitable projects in financially distressed firms (Davydenko & Franks, 2008). Nini, Smith, and Sufi (2009) show that lenders regularly impose explicit limits on capital expenditures after a borrower's quality deteriorates, and that capital expenditure restrictions reduce firm investment. Shareholders would therefore have fewer opportunities to underinvest and/or overinvest. The consequence would be greater investment efficiency in financially distressed firms in countries with strong protection of creditor rights. On the other hand, as managers and shareholders anticipate greater losses in bankruptcy in countries with stronger protection of creditor rights, they would have more incentives to underinvest and/or overinvest once they anticipate that the firm is likely to become financially distressed. Favara, Morellec, Schroth, and Valta (2017) develop a theoretical model consistent with these predictions. Managers and shareholders could then follow their more distorted incentives as long as financial distress is not identified by creditors. In fact, Pryshchepa, Aretz, and Banerjee (2013) find that investment distortions associated with the conflict between shareholders and creditors only exist when financial distress is not identified by creditors.[1] In this case, unexpected wealth transfers from creditors would be greater in countries with strong protection of creditor rights and a negative relationship would be forecast for investment efficiency and creditor rights in financially distressed firms.

The above predictions emerge when we only consider conflicts between shareholders and debtholders. Literature analyzing the effects of creditor rights on corporate capital structure and investment do not usually consider how conflicts between shareholders and managers or between minority shareholders and controlling shareholders influence the above predictions (Djankov, McLiesh, & Shleifer, 2007; Acharya & Subramanian, 2009; Acharya et al., 2011; Cho, El Ghoul, Guedhami, & Suh, 2014). However, shareholders are not a homogeneous group and academic literature has focused on the problem of investor expropriation by managers, controlling shareholders, or both. Managers and/or controlling shareholders might seek strategies to maximize their own benefits rather than increasing the efficiency of capital allocation (Djankov, La Porta, Lopez-de-Silanes, & Shleifer, 2008). Such conflicts are greater in healthy firms because financial distress reduces conflicts between shareholders and managers on free cash-flow (Jensen, 1986). Empirical evidence shows that investment distortions caused by conflicts between managers/controlling shareholders and minority shareholders also vary across countries depending on shareholder protection. Stronger shareholder protection increases investment efficiency because managers and controlling shareholders are less likely to expropriate the firm's resources and more likely to invest in projects that benefit shareholders (Wurgler, 2000; Shleifer & Wolfenzon, 2002; Mclean et al., 2012; Levine, Lin, & Xie, 2016).

For the above reasons, this paper also analyzes whether the influence of creditor rights on investment efficiency remains after controlling for country shareholder protection as well as how shareholder protection shapes this influence. Although managers and/or controlling shareholders have different objectives to those of minority shareholders, they all share the same interest in avoiding the increased bankruptcy costs that come with the protection of creditor rights. However, expropriation from minority shareholders by managers and/or controlling shareholders, sometimes referred to as self-dealing or tunneling, may mitigate or exacerbate the expected positive effect of creditor rights on investment efficiency. On the one hand, shareholder protection may act as a substitute of creditor rights to improve investment efficiency. The greater investment efficiency in countries with stronger shareholder protection may reduce the ability of managers and/or controlling shareholders to improve investment efficiency when the country strengthens creditor protection. In this case, stronger shareholder protection would reduce the positive marginal effect of creditor rights on investment efficiency. On the other hand, shareholder protection may act as a complement of creditor rights and help managers and/or controlling shareholders to transfer to corporate decisions any change in the minority shareholders' interest. In this case, stronger shareholder protection would increase the positive marginal effect of creditor rights on investment efficiency.[2]

2.2. Related literature

The paper contributes to the literature in several ways. First, it contributes to the agency literature by examining distortional investment behavior caused by conflicts between shareholders and creditors. Empirical studies show that conflicts on overinvestment, underinvestment, and risk-shifting increase in financially distressed firms (Parrino & Weisbach, 1999; Eisdorfer, 2008; Pryshchepa et al., 2013). For this reason, creditors are more likely to impose restrictions on firms' capital expenditure as borrowers' quality deteriorates (Nini et al., 2009). Jensen (1986) highlights that debt not only generates agency costs between shareholders and creditors but also helps motivate managers and shareholders to be more efficient and reduce the free cash-flow. This paper shows that countries' creditor rights shape agency benefits and costs of debt. Stronger creditor rights increase the benefits of debt in financially

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[1] If creditors anticipate actions by shareholders to reduce the value of debt, they can try to prevent them by imposing restrictive covenants on investment and dividends, threatening to fire managers or tying managerial compensation to creditor welfare (Nini et al., 2009; Pryshchepa et al., 2013). The endogenous choice of capital structure through secured debt, convertible debt, and debt maturity also reduces unexpected wealth transfers from shareholders to creditors (Parrino & Weisbach, 1999).

[2] Internal governance characteristics, such as ownership structure, composition of the board of directors, and/or executive compensation may also affect potential expropriation by managers and/or controlling shareholders. I control for the omission of these variables in regressions by applying alternative strategies, such as clustering standard errors by firm and year, or including firm-fixed effects.

healthy firms but also increase the agency costs of debt in financially distressed firms.

Second, the paper contributes to the law and finance literature by analyzing the relevance of the legal protection of creditor rights for corporate finance. Empirical evidence shows that stronger protection of creditor rights increases the supply of credit (Djankov et al., 2007; Haselmann, Pistor, & Vig, 2010), reduces the demand for credit and corporate leverage ratios (Vig, 2013; Cho et al., 2014), reduces the cost of public debt (Boubakri & Ghouma, 2010), reduces dividend payments (Brockman & Unlu, 2009), increases cash holdings (Yung & Nafar, 2014), and fosters economic growth (Houston, Chen, Ping, & Yue, 2010). On the negative side, strong creditor rights tend to promote greater bank risk-taking by inducing banks to provide loans to a wider and riskier set of borrowers (Houston et al., 2010), whereas they reduce corporate risk-taking (Acharya et al., 2011) and innovation (Acharya & Subramanian, 2009).

The law and finance literature also provides evidence on the impact of shareholder protection laws on capital allocation. Wurgler (2000) and Mclean et al. (2012) show that strong minority investor rights are associated with greater investment sensitivity to Tobin's q. More recently, Levine et al. (2016) show that the adverse consequences of banking crises on investment efficiency are smaller in countries with stronger shareholder protection laws. However, none of the above papers empirically analyze the impact of creditor rights on capital allocation.

Finally, the paper also contributes to the extensive theoretical literature by analyzing optimal bankruptcy codes. This literature highlights that the protection of creditor rights in bankruptcy plays an important role by affecting both the efficiency of ex-post resolution of distressed corporations and the ex-ante behavior of firms (Franks & Loranth, 2014). Franks, Nyborg, and Torous (1996) compare these costs in the insolvency codes of United Kingdom, Germany, and United States. Gertner and Scharfstein (1991) theoretically identify situations in which chapter 11 of US Law increases or decreases investment efficiency. Despite this theoretical literature, there are no empirical studies analyzing the impact of legal protection of creditor rights on investment efficiency both before and during financial distress.

The paper closest to mine is Favara et al. (2017), who show in a sample of firms across 41 countries that stronger creditor rights reduce corporate investment and asset growth but increase equity risk as firms approach financial distress. However, they focus on financially distressed firms and do not directly analyze the effect of creditor rights on investment efficiency. The reduction found in corporate investment may be caused by greater underinvestment (lower investment efficiency) or by creditors imposing additional restrictions on capital expenditures in financially distressed firms to reduce overinvestment (higher investment efficiency). I now identify opposite effects of strong creditor rights on investment efficiency depending on firms' financial health: strong protection of creditor rights improves investment efficiency by reducing overinvestment in healthy firms but worsens it in financially distressed firms.

3. Data, sample selection, and variables

3.1. Data and sample selection

The initial sample includes publicly traded firms listed on the COMPUSTAT Global Vantage Database using information from balance sheets and income statements in dollars and real prices. COMPUSTAT Global provides data on publicly traded companies in more than 80 countries, representing over 90% of the world's market capitalization, and covering over 96% of European market capitalization and 88% of Asian market capitalization. I use the legal rights index developed by the World Bank to annually measure countries' overall creditor rights (*CREDR*) until 2012.[3]

I initially selected the 49 countries considered by La Porta, Lopez-de-Silanes, and Shleifer (1998) from 2003 to 2011, but then eliminated 10 of them because of lack of data for some firm or country-level variables used in the paper (Ecuador, Mexico, Nigeria, Singapore, South Africa, Sri Lanka, Taiwan, Uruguay, Venezuela, and Zimbabwe). I also eliminated five countries for not having more than 45 observations in the baseline estimation (Colombia, Egypt, Jordan, Kenya, and Luxembourg). The final number of countries considered is therefore 34, including both developed and developing countries. I exclude firms with negative assets or negative debt. Further, I only retain firms that have no missing data for all the variables needed for the baseline empirical specification. I exclude firms whose investment decisions may reflect special factors: the financial industry (SIC codes 6000–6999), regulated enterprises (SIC codes 4000–4999) and not-for-profit organizations and governmental enterprises (SICs greater than 8000). I select firms belonging to 20 industrial sectors on a two-digit SIC level. I winsorize all variables at the 5th and 95th percentile to lessen the influence of outliers. The final sample contains 8207 firms from 34 countries over the 2003–2011 period. Table 1 reports overall descriptive statistics and correlations.

3.2. Variables

a) Capital expenditures and investment opportunities

I proxy for investment efficiency using the sensitivity of investment to investment opportunities. Following previous studies, I measure firms' actual investment by gross capital expenditures divided by book value of total assets at the beginning of the year (*INV*). I check that the results are similar when I scale capital expenditures by property, plant, and equipment at the beginning of the

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[3] In 2013 the World Bank changed the methodology to compute the index of legal rights. Data from 2013 onward are not comparable with data before 2013 due to methodological changes, which limits the possibility of extending the analysis period.

Table 1
Overall descriptive statistics and correlations.

Panel A: Overall descriptive statistics

	INV (1)	QTOBIN (2)	CREDR (3)	CREDR-RoL (4)	CREDR-2003 (5)	CREDR-RoL2003 (6)	ZSCORE (7)	DISTRESS Altman (8)
Mean	0.0960	1.3327	7.4845	9.0985	7.0239	6.9656	3.0989	0.3014
Median	0.0686	1.0657	7	9.2350	6	6.8153	2.4318	0
Max	1.008	69.2590	10	19.3632	10	17.8609	952.9291	1
Min	-0.2589	0.0978	3	-5.8608	3	-4.5235	-60.7976	0
Standard dev	0.1851	1.1117	1.6641	5.0087	1.9020	5.2206	7.2913	0.4589

Panel B: Correlations

	INV (1)	QTOBIN (2)	CREDR (3)	CREDR-RoL (4)	CREDR-2003 (5)	CREDR-RoL2003 (6)	ZSCORE (7)	DISTRESS Altman (8)
QTOBIN	0.1541***							
CREDR	0.0338**	0.0677***						
CREDR-RoL	-0.0436***	0.1014***	0.4642***					
CREDR2003	0.0330***	0.0815***	0.9170***	0.6014***				
CREDR-RoL2003	-0.0583**	0.0988***	0.6059***	0.7468***	0.5243***			
ZSCORE	0.0622***	0.4443***	0.0391***	0.0507***	0.0449***	0.0470***		
DISTRESSAltman	-0.0905***	-0.2006***	-0.0685***	-0.1349***	-0.0664***	-0.1331***	-0.1910***	
DISTRESSTercil	-0.1009***	-0.2759***	-0.0040	-0.0073	-0.0088*	-0.0059	-0.2493***	0.7230***
LEV	-0.0320***	-0.0816***	-0.1545***	-0.0608****	-0.1623***	-0.0427***	-0.2205***	0.3707***
SIZE	0.0174***	0.0415***	-0.0072	0.1989***	0.0077	0.2225***	-0.0262***	-0.0518***
TANG	-0.0183***	-0.0929***	-0.0577***	-0.1865***	-0.0466***	-0.1240***	-0.0345***	0.2020***
CASH	0.0344***	0.1813***	0.0427***	0.1505***	-0.0042	0.0574***	0.1285***	-0.1722***
ANTI-SELF-DEALING	0.0479***	0.0372***	0.6002***	0.1662***	0.6269***	0.1436***	0.0376***	-0.0273***
ANTI-DIRECTOR	0.0124***	0.1030***	0.4487***	0.2641***	0.3337***	0.1917***	0.0493***	-0.1134***
INVPROTECTION	0.0636***	0.1771***	0.5408***	0.2860***	0.5222***	0.2658***	0.0738***	-0.1057***

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Table 1 (*continued*)

Panel A: Overall descriptive statistics

	DISTRESS Tercil (9)	LEV (10)	SIZE (11)	TANG (12)	CASH (13)	ANTI-SELF-DEALING	ANTI-DIRECTOR	INVPROTECTION
Mean	1.9928	0.5254	6.0045	0.3090	0.1017	0.5660	3.7299	0.5687
Median	2	0.5341	5.8171	0.2829	0.0728	0.4986	4	0.4167
Max	3	0.9991	12.7931	0.9989	0.9893	0.9625	5	1
Min	1	0.0038	-0.6502	0.00001	0.0000	0.2027	0	0
Standard dev	0.8300	0.1880	1.8614	0.2014	0.0106	0.1790	1.2201	0.2655

Panel B: Correlations

	DISTRESS Tercil (9)	LEV (10)	SIZE (11)	TANG (12)	CASH (13)	ANTI-SELF-DEALING	ANTI-DIRECTOR
QTOBIN							
CREDR							
CREDR-RoL							
CREDR2003							
CREDR-RoL2003							
ZSCORE							
DISTRESSAltman							
DISTRESSTercil							
LEV	0.4841***						
SIZE	0.0347***	0.2193***					
TANG	0.1953***	0.0421***	0.0073				
CASH	-0.2359***	-0.2576***	-0.1135***	-0.3159***			
ANTI-SELF-DEALING	-0.0029	-0.1676***	-0.0987***	0.0455***	-0.0498***		
ANTI-DIRECTOR	-0.0081*	-0.0515***	0.1121***	0.0146***	0.0743***	0.4977***	
INVPROTECTION	-0.0110**	-0.1204***	0.1127***	-0.0120**	-0.0205***	0.6072***	0.7952***

Panel A reports the country-level averages of variables. Panel B reports correlations. INV is the ratio of gross capital expenditures to book value of total assets at the beginning of the year. QTOBIN is the average annual market-to-book ratio. CREDR is the legal rights index developed annually by the World Bank to measure a borrower country's overall legal creditor rights. CREDR-RoL is the interaction of the legal rights index with the rule of law measure provided by the World Bank. CREDR-2003 is the value of CREDR at the beginning of 2003. CREDR-RoL2003 is the value of CREDR-RoL at the beginning of 2003. ZSCORE is the Altman's Z-score. DISTRESSAltman is a dummy variable identifying financially distressed firms with a Z-score lower than 1.81. Its mean value indicates the percentage of financially distressed firms per country in the sample. DISTRESSTercil is a dummy variable that takes the value of 1 if the firm's Z-score is above the 65th percentile in a specific industry in a country in each particular year, 2 when it is between the 35th and 65th percentile, and 3 when it is below the 35th percentile. LEV is the corporate ratio of the book value of total debt to book value of total assets. SIZE is the natural logarithm of total assets. TANG is the percentage of property, plant and equipment in total assets. CASH is the ratio of cash reserves to total assets. QTOBIN, LEV, SIZE, TANG, and CASH are lagged by one year compared to INV. ANTI-SELF-DEALING, ANTIDIRECTOR, and INVPROTECTION are the three proxies for country shareholder protection. Average values are computed over the 2003–2011 period.

Table 2
Changes in creditor rights and financial health.

	# observations	CREDR	CREDR-RoL	CREDR-2003	CREDR-RoL2003	Year of change in CREDR	Type of change in CREDR	ZSCORE	DISTRESSAltman	DISTRESSTercil
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Argentina	116	4	-2.6164	4	-2.7906			3.0457	0.1724	1.9569
Australia	1,187	9	15.7461	9	11.0173			5.5894	0.2704	1.9781
Austria	211	7	13.0720	7	10.7484			2.5023	0.2322	2.0095
Belgium	293	6	7.9052	6	7.0615			3.1815	0.2867	1.9795
Brazil	254	3	-0.7070	3	-0.4586			2.8088	0.3425	1.9449
Canada	713	7	12.3649	7	9.6182			6.8595	0.2314	1.9776
Chile	356	4.2584	5.4686	4	4.6476	2011	+2	3.0695	0.1517	2.0056
Denmark	322	8.7329	16.9894	8	13.6368	2007	+1	3.7874	0.1801	1.9907
Finland	512	8	15.5883	8	13.8040			3.4768	0.1758	1.9766
France	1,931	6.1652	8.9617	4	4.2885	2006; 2007	+2, +1	2.5271	0.3604	2.0114
Germany	1,620	7.4864	12.5301	8	11.2409	2008	-1	3.0209	0.2808	1.9883
Greece	353	4	3.0073	4	1.9084			2.4171	0.5127	1.9660
Hong Kong	361	10	15.3015	10	9.3436			2.8167	0.4543	2.0111
India	2,652	7.4819	0.4792	6	-0.1349	2006;2007	+1, +1	3.1744	0.3311	1.9823
Indonesia	554	3	-2.0519	3	-2.2588			2.7995	0.3881	1.9837
Ireland	88	9	15.2640	9	12.1993			3.1889	0.2273	1.9773
Israel	193	9	7.7482	9	6.1038			2.3990	0.4145	1.9896
Italy	714	3	1.2703	3	1.7801			1.9691	0.5266	1.9902
Japan	13,714	6.8742	8.9697	6	6.2354	2005	+1	2.6499	0.2994	2.0021
Malaysia	2,443	10	5.1227	10	3.7007			2.6765	0.4318	2.0069
Netherlands	399	6	10.6551	6	9.8452			2.9720	0.2155	1.9974
New Zealand	116	10	18.6630	10	11.2401			3.1580	0.2155	2.0172
Norway	220	6	11.5555	6	8.1282			2.7245	0.3500	1.9545
Pakistan	341	6	-5.1828	6	-1.9633			2.8545	0.3959	1.9971
Peru	142	6.0986	-4.1142	3	-1.3187	2006	+4	4.0773	0.2253	2.0211
Philippines	182	4	-2.0512	4	-1.5475			2.2429	0.4780	2.0055
Portugal	113	3	3.1688	3	3.7104			1.5078	0.6460	1.8849
South Korea	3,807	8	7.5650	8	5.7824			2.2995	0.4536	2.0113
Spain	350	6	6.8326	6	6.5442			2.4490	0.4857	1.9571
Sweden	653	7.3292	13.9755	6	9.0741	2005;2009	+1, +1	3.4411	0.1593	1.9939
Thailand	1,033	5	-0.5047	5	1.1519			2.9789	0.3456	2.0203
Turkey	207	4	0.3587	4	-0.1338			4.7568	0.3285	2.0241
UK	1,874	10	16.8138	10	13.1579			3.2979	0.2268	1.9717
US	7,370	9	14.1052	9	12.1978			4.0034	0.1577	1.9727

This table reports the indicators of creditor rights and financial health by country. CREDR is the mean value of the legal rights index developed annually by the World Bank to measure a borrower country's overall legal creditor rights. CREDR-RoL is the interaction of the legal rights index with the rule of law measure provided by the World Bank. CREDR-2003 is the value of the legal rights index at the beginning of 2003. CREDR-RoL2003 is the value of CREDR-RoL at the beginning of 2003. Changing year indicates the years in which the country changes the value of the legal rights index developed by the World Bank. Average values are computed over the 2003–2011. ZSCORE is the Altman's Z-score. DISTRESSAltman is the dummy variable identifying financially distressed firms with a Z-score lower than 1.81. Its mean value indicates the percentage of financially distressed firms per country in the sample. DISTRESSTercil is a dummy variable that takes the value of 1 if the firm's Z-score is above the 65th percentile in a specific industry in a country in each particular year, 2 when it is between the 35th and 65th percentile, and 3 when it is below the 35th percentile.

year.[4] Table 1 shows that the mean of *INV* in the whole sample during the 2003–2011 period is 0.0960 with a standard deviation of 0.1851.

I use average Tobin's Q as a proxy for investment opportunities (*QTOBIN*). It is measured as the market value of equity, minus book value of equity, plus book value of assets, all divided by book value of assets, following, among others, Rajan and Zingales (1995), Eisdorfer (2008), Chen et al. (2011), Mclean et al. (2012), and Eisdorfer, Giaccotto, and White (2013). Following Biddle, Hilary, and Verdi (2009), I report similar results using sales growth as an alternative proxy for investment opportunities.

b) Creditor rights

The legal rights index developed by the World Bank measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders in bankruptcy. Higher values indicate that collateral and bankruptcy laws are better designed to protect creditors. Table 2 reports the values of these indicators by country. This indicator ranges from a minimum value of 3 in Brazil, Indonesia, Italy, and Portugal to a maximum value of 10 in Hong Kong, Malaysia, New Zealand, and UK. Eight countries experienced

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[4] Kaplan and Zingales (1997), Mayers (1998), and Eisdorfer et al. (2013), among others, measure corporate investment in the same way as in this paper. Duchin et al. (2010) and Kahle and Stulz (2013) use this proxy to specifically analyze investment by US industrial firms during the recent financial crisis.

a change in *CREDR* over the analysis period (Chile, Denmark, France, Germany, India, Japan, Peru, and Sweden). Seven countries strengthened their legal protection of creditor rights while Germany alone weakened them when it changed the law in 2008. France, India, and Sweden experienced changes in creditor rights in more than one year. Eight changes in creditor rights occurred before the onset of the financial crisis (before the end of 2007) and three after it. After the crisis, Germany weakened creditor rights in 2008 whereas Sweden and Chile strengthened them in 2009 and 2011, respectively. The fact that most of the changes in creditor rights occurred before the onset of the crisis (eight out of eleven) reduces concerns about the endogeneity of changes in creditor rights and its potential dependence on the global financial crisis. Moreover, I check that the results do not change when the three countries that changed creditor rights during the crisis period (Chile, Germany, and Sweden) are not included in the regressions.

I use several variants of the legal rights index to capture both the contractual and enforcement rights of creditors. As effective protection of creditor rights requires both explicit legal protection and enforcement of the law (Bae & Goyal, 2009), I interact the legal rights index with the rule of law measure provided by the World Bank in Kaufman, Kraay, and Mastruzzi (2009). This index (*CREDR-RoL*) ranges from a maximum value of 18.6630 in New Zealand to a minimum of -5.1828 in Pakistan. As the indicator of rule of law changes annually, all countries experience changes in *CREDR-RoL* over the analysis period. I report results using this index as the main indicator because it captures effective changes in the protection of creditor rights better by taking into account not only regulatory changes in creditor rights but also enforcement of the law. Anyway, I show that the results are similar using both *CREDR-RoL* and *CREDR*.

Additionally, I use the value of creditor rights at the beginning of the analysis period (end of 2002) (*CREDR-Rol2003* and *CREDR2003*) in regressions analyzing how cross-country differences in creditor rights explain cross-sectional differences in investment efficiency. The simultaneity of the global crisis increasing firms' financial constraints across countries makes it possible to assume that country characteristics before the onset of the crisis are predetermined and reduces concerns about potential endogeneity affecting changes in creditor rights. Although not reported to save space, I also check that the results do not change when creditor rights are measured at the end of the analysis period (2011) using both the legal protection of creditor rights (*CREDR2011*) and the interaction of *CREDR* with the rule of law index (*CREDR-RoL2011*). Panel B in Table 1 shows that all the proxies for the protection of creditor rights are positively correlated at the 1% level.

c) Financial health

I use Altman's Z-score (*ZSCORE*), a widely-used model for bankruptcy prediction, for measuring the firm's level of financial distress. The Z-score is constructed using the formula proposed in Altman (1968):

$$Z - score_{it} = 1.2\frac{WC_{it}}{TA_{it}} + 1.4\frac{RE_{it}}{TA_{it}} + 3.3\frac{EBIT}{TA_{it}} + 0.6\frac{E_{it}}{D_{it}} + 0.999\frac{S_{it}}{TA_{it}} \quad [1]$$

where WC_{it} is the working capital of firm i in year t, RE_{it} is retained earnings, $EBIT_{it}$ is earnings before interest and taxes, E_{it} is the market value of equity, D_{it} is total liabilities, S_{it} is sales, and TA_{it} is total assets.

I use alternative strategies to identify firms in financial distress. First, as higher values of *ZSCORE* indicate greater financial soundness, I use the inverse of *ZSCORE* (*ZSCOREinv*) in regressions as a continuous variable positively related to a firm's financial distress. Second, following studies in the US, I consider that a firm is in financial distress if the value of the Z-score is below 1.81(Altman, 1968; Pryshchepa et al., 2013). I thus define a dummy variable *DISTRESSAltman* that takes the value of one if the firm's Z-score is below 1.81. Otherwise, it takes the value of zero. Third, as the benchmark of 1.81 cannot be suitable for all the countries and/or years, I define terciles by industry, country, and year, and define *DISTRESSTercil* as a dummy variable that takes the value of 1 if the firm's Z-score is above the 65th percentile in our sample, 2 when it is between the 35th and 65th percentile, and 3 when it is below the 35th percentile. Thus, higher values in this variable indicate less financial soundness or more financial distress. I check that the results do not change when I use quartiles instead of terciles. Table 2 shows the mean values by country of *ZSCORE*, *DISTRESSAltman*, and *DISTRESSTercil*.

d) Control variables

I follow previous studies to define firm-level control variables potentially affecting corporate investment (Eisdorfer, 2008; Duchin, Ozbas, & Sensoy, 2010; Eisdorfer et al., 2013). I include leverage, size, asset tangibility, and cash reserves. All firm-level control variables are measured at the end of the previous year to reduce simultaney. I use the ratio of the book value of total debt to the book value of total assets (*LEV*) to control for corporate leverage. A negative relation is expected when leverage induces under-investment by shareholders and managers, and/or attenuates overinvestment by managers (Lang et al., 1996). I measure size as the natural logarithm of total assets (*SIZE*). There is no clear expected influence for *SIZE*. On the one hand, larger firms could invest relatively less as it is more difficult for them to find profitable investment opportunities in proportion to their current assets. On the other hand, fewer information asymmetries between insiders and the capital market may reduce the cost of capital and facilitate greater investments in larger firms (Rajan & Zingales, 1995). I use the percentage of property, plant, and equipment in total assets as a proxy for asset tangibility (*TANG*). Fixed assets are positively related to collateral value and reduce the cost of capital (Rajan & Zingales, 1995). I therefore expect a positive influence of asset tangibility on corporate investment. Finally, I use cash reserves (*CASH*) to capture the influence of internal funds on corporate investment. Capital rationing models predict that internal resources should be greater following a contraction in the supply of external financing (Duchin et al., 2010). I therefore expect a positive coefficient for this variable, especially during the crisis period.

I use country-year and industry-year dummy variables to control for country and industry omitted variables, both time-variant and invariant. However, I additionally check that results do not change when I explicitly control for country shareholder protection. I use three proxies for shareholder protection (*SHAREHOLDERPROTEC*): the anti-self-dealing, anti-director rights, and investor protection indexes. The anti-self-dealing index (*ANTI-SELF-DEALING*), created by Djankov et al. (2008), measures the degree to which

minority shareholders are protected from large shareholders engaging in self-dealing transactions that benefit large shareholders at the expense of small ones. The anti-self-dealing index captures both the strength of anti-self-dealing laws and their enforcement. It ranges from zero to one, with higher values indicating stronger legal protection of minority shareholders. The anti-director rights and the investor protection indexes come from La Porta, Lopez-de-Silanes, and Shleifer (2006). The index of anti-director rights (*ANTI-DIRECTOR*) measures the protection afforded to shareholders through statutory corporate law. It ranges from 0 to 5 with higher values indicating stronger shareholder protection. The investor protection index (*INVPROTECTION)* is the principal component of the indices of disclosure requirements, liability standards, and anti-director rights used in La Porta et al. (2006). It ranges from 0 to 10 with higher values indicating stronger investor protection.

4. Empirical analysis and results

4.1. Empirical strategy

I follow the majority of the investment literature by using average Tobin's q as a proxy for investment opportunities and analyzing the sensitivity of investment expenditure to Tobin's q as a measure of investment efficiency (Lang et al., 1996; Chen et al., 2011; Hovakimian, 2011; Mclean et al., 2012; Levine et al., 2016; Jiang, Cai, Wang, & Zhu, 2018). I extend this literature by testing whether the sensitivity of capital expenditures to investment opportunities depends on countries' creditor rights. The availability of a panel dataset allows us to analyze the impact of creditor rights to better identify their causal effect on investment efficiency and overcome challenges related to the omission of explanatory variables and the endogeneity of countries' creditor rights. I apply two alternative empirical strategies. First, I exploit changes in countries' legal reforms to perform a DID analysis. Countries that did not change the legal protection of creditor rights over the analysis period act as control group. By comparing the same country in periods with different laws regulating creditor rights allows us to control for country-level unobserved factors. Second, I conduct cross-sectional regressions to test how the protection of creditor rights is associated with investment efficiency. In particular, I use the level of creditor rights at the beginning of the analysis period (beginning of 2003). Moreover, I explicitly control in the regressions for other traditional firm-level variables explaining corporate investment, cluster standard errors by firm and time to capture unobserved firm and time effects, and control for additional unobserved heterogeneity including industry and country time-variant characteristics. Therefore, I use the following specification to explain the influence of creditor rights on investment efficiency:

$$INV_{it} = \alpha_0 + \alpha_1 QTOBIN_{it-1} + \alpha_2 CREDITORS_{kt-1} + \alpha_3 QTOBIN_{it-1} * CREDITORS_{kt-1} + \alpha_4 DISTRESS_{it-1} + \alpha_5 Firm\ controls_{it-1}$$
$$+ \lambda_{jt} + \theta_{kt} + \mu_i \qquad [2]$$

where subscripts i, j, k, and t indicate, respectively, firm, industry, country, and year. *INV* is the main measure of corporate investment. *QTOBIN* is Tobin's Q at the beginning of year t. *CREDITORS* is a set of alternative proxies for legal protection of creditor rights in the country at the beginning of year t. *DISTRESS* is the set of alternative proxies used to identify financial distress. *Firm controls* refers to the set of firm-specific control variables, which include leverage, size, asset tangibility, and cash reserves. I lag all firm-control variables by one year in order to avoid simultaneity with corporate investment. Under this specification, α_1 captures investment efficiency (sensitivity of capital expenditures to investment opportunities) in countries with the weakest protection of creditor rights. α_3 captures how different investment efficiency is when the country strengthens its protection of creditor rights.

I use alternative specifications of dummy variables to control for potentially omitted firm, industry, and country effects, both time invariant and time variant. Initially, I cluster standard errors by firm and time to capture unobserved firm and time effects. Petersen (2009) shows that this procedure is the most suitable to account for the data dependence that is common in a panel data set and to produce unbiased estimates in the presence of unobserved firm and time effects. This procedure is suitable whether the firm and time effects are fixed or not. Alternatively, I check the robustness of the results including dummy variables for each firm (e.g., fixed effects or within estimation) and year. This procedure is suitable only if firm and time effects are fixed.[5] Additionally, all regressions include industry-year (λ_{jt}) and country-year (θ_{kt}) dummy variables. The industry-year specific effect controls for worldwide industry shocks. The country-year specific effects control for aggregate country-specific shocks and changes in other institutional and regulatory country characteristics apart from legal protection of creditor rights. Country-year variables could partially absorb the effect of creditor rights when I use time-variant indicators of creditor rights. For this reason, I check that the results from regressions using annual indicators of creditor rights do not change when country-year dummy variables are excluded. The clustering of standard errors and the set of dummy variables included in the regressions should control for most shocks affecting corporate investment and should reduce potential omitted variable biases.[6] Moreover, they make it unnecessary to include additional country and industry time-varying variables in the regressions.

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[5] Corporate governance variables, such as ownership structure, the characteristics of the board of directors, and/or executive retribution are omitted in the regressions. This omission may mean that residuals are correlated across years for a given firm, and clustering standard errors by firm should provide unbiased estimates as they account for the residual dependence created by the firm effect. As governance characteristics are usually stable over time, the firm effect may be fixed and firm dummy variables would also be suitable to control for the time-series dependence of residuals.

[6] Mclean et al. (2012) apply a similar structure of dummy variables to analyze the impact of investor protection on investment, finance, and growth in regressions using firm-level data from 44 countries.

Table 3
Investment efficiency and creditor rights.

	(1)	(2)	(3)	CREDR-RoL Excluding Chile, Germany, and Sweeden (4)	Excluding crisis years (08–09) (5)	Only countries with changes in creditor rights (6)	CREDR (7)	CREDR-RoL2003 (8)	CREDR-2003 (9)
$QTOBIN_{t-1}$	0.0075**	0.0008	0.0086***	0.0074**	0.0056*	0.0251***	-0.01856***	0.0129***	-0.0174***
	(2.55)	(0.56)	(2.68)	(2.52)	(1.90)	(5.64)	(-3.64)	(3.22)	(-2.95)
$QTOBIN_{t-1}$* $CREDITORS_{t-1}$	0.0020***	0.0024***	0.0022***	0.0021***	0.0020***	0.0009*	0.0061***	0.0013***	0.0062***
	(6.28)	(7.56)	(6.74)	(6.23)	(5.47)	(1.73)	(7.80)	(3.48)	(6.85)
$CREDITORS_{t-1}$	-0.0067***	-0.0106***	-0.0054***	-0.0068***	-0.0048***	-0.0081***	-0.0133***	-0.0053***	-0.0152***
	(-10.73)	(-3.15)	(-10.16)	(-10.25)	(-6.03)	(-9.66)	(-8.09)	(-8.25)	(-8.43)
$DISTRESS_{t-1}$	-0.00004	-0.00007	-0.00004	-0.00005	-0.0002	-0.0002	-0.00004	-0.00005	-0.00004
	(-0.24)	(-0.55)	(-0.25)	(-0.27)	(-1.35)	(-1.09)	(-0.25)	(-0.26)	(-0.25)
LEV_{t-1}	-0.0666***	-0.2157***	-0.0750***	-0.0644***	-0.0580***	-0.0632***	-0.0664***	-0.0674***	-0.0669***
	(-13.95)	(-14.59)	(-15.57)	(-13.23)	(-8.88)	(-9.94)	(-13.92)	(-14.10)	(-14.03)
$SIZE_{t-1}$	-0.0005	-0.2212***	-0.0048***	-0.0001	-0.0019***	-0.0052***	-0.0010**	-0.00005	-0.0009*
	(-1.13)	(-36.11)	(-9.74)	(-0.25)	(-2.96)	(-7.88)	(-2.02)	(-0.11)	(-1.85)
$TANG_{t-1}$	0.0070	0.0254	0.0072	0.0105**	-0.0016	-0.0305***	0.0099***	0.0071	0.0099**
	(1.49)	(1.29)	(1.51)	(2.18)	(-0.25)	(-4.32)	(2.13)	(1.52)	(2.13)
$CASH_{t-1}$	0.0092	-0.0236	-0.0446***	0.0176	-0.0362**	-0.0907***	0.0059	0.0145	0.0064
	(0.77)	(-1.12)	(-4.00)	(1.42)	(-2.20)	(-6.06)	(0.50)	(1.19)	(0.54)
Intercept	0.1761***	1.6083***	0.1542***	0.1025*	0.0957*	0.2153***	0.2340***	0.1669***	0.2430***
	(4.12)	(25.61)	(7.79)	(1.79)	(1.71)	(3.32)	(5.50)	(4.17)	(5.70)
Country-year fixed effects	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster by firm and year	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-fixed effects	No	Yes	No	No	No	No	No	No	No
Year-fixed effects	No	Yes	No	No	No	No	No	No	No
R-Square	0.1939	0.3169	0.0991	0.1971	0.1836	0.1507	0.1934	0.1918	0.1933
N Obs	45,394	45,394	45,394	42,765	26,438	21,390	45,394	45,394	45,394
N Firms	8,207	8,207	8,207	7,725	7,586	3,587	8,207	8,207	8,207

This table reports results for model [2]. The dependent variable is INV, defined as the ratio of gross capital expenditures to book value of total assets. The annual market-to-book asset ratio. CREDITORS is the indicator of the country's creditor rights and four indicators are used: 1) CREDR-RoL is the interaction of the legal rights index with the rule of law measure provided by the World Bank, lagged by one year; 2) CREDR is the legal rights index developed by the World Bank, lagged by one year; 3) CREDR-RoL2003 is the value of CREDR-RoL at the beginning of 2003; and 4) CREDR-2003 is the value of CREDR at the beginning of 2003. DISTRESS is the variable identifying financial distress. The estimations use the inverse of the Altman's Z-score (ZSCOREinv). LEV is the corporate ratio of the book value of total debt to book value of total assets. SIZE is the natural logarithm of total assets. TANG is the percentage of property, plant and equipment in total assets. CASH is the ratio of cash reserves to total assets. The firm-level explanatory variables are lagged by one year compared to INV. The main regressions include country-year and industry-year dummy variables, and control for firm and time effects by clustering standard errors by firm and year. Additional robustness excludes country-year dummy variables and includes firm and year dummy variables as an alternative to clustering standard errors by firm and year to control for firm and year-fixed effects. ***, **, * indicate significance at 1%, 5%, and 10% respectively.

4.2. Creditor rights and investment efficiency

I now analyze the average influence of the legal protection of creditor rights on investment efficiency. Table 3 reports the results of model [2] using sample variations and alternative proxies for countries' protection of creditor rights.

Column (1) reports the results for the whole sample using lagged annual values of the indicator of creditor rights (*CREDR-RoL*) to compare investment efficiency before and after the change in creditor rights. I use the inverse of the Z-Score as a proxy for firms' financial distress. The positive coefficient of *QTOBIN* and the positive coefficient of *QTOBIN*CREDITORS* in column (1) suggest that strengthening (weakening) of creditor rights improves (worsens) on average the efficiency of corporate investment. The negative coefficient of *CREDITORS* suggests that stronger protection of creditor rights is associated with lower corporate investment and is consistent with papers showing that strong creditor protection discourages firms from using debt because managers and shareholders aim to avoid the higher risk of losing control in case of financial distress (Acharya et al., 2011; Vig, 2013; Cho et al., 2014; González, 2016).

I report several robustness tests. The results are similar in column (2) when I include firm and time dummy variables instead of clustering standard errors by firm and year to control for unobserved fixed firm and time effects. Nor do the results change in column (3) when country-year dummy variables are not included in the regression to avoid bias caused by their potential correlation with the country's protection of creditor rights. The results are also similar in column (4) when countries changing the protection of creditor rights after the onset of the global financial crisis (Chile, Germany, and Sweden) are excluded. These changes in creditor rights would give rise to the greatest endogeneity concerns because they more likely to be the consequence of the reduction in the investment opportunity set after the onset of the crisis. The results do not change in column (5) when the crisis years (2008 and 2009) are excluded to control for the greater reduction in investment opportunities during these years. Although not reported, the results remain similar when the whole period after the onset of the crisis (2008–2011) is excluded from the regressions.[7] The results remain in column (6) when regressions only include firms in countries that have changed creditor rights over the analysis period, i. e.., when countries without changes in their creditor rights are not used as control group.

The results are also robust in column (7) when I focus on changes in the legal protection of creditor rights and *CREDR* does not interact with the rule of law indicator to define the proxy for creditor rights. Columns (8) and (9) confirm that the results are also similar when instead of applying a DID analysis and focusing on changes in creditor rights, I focus on cross-country differences in creditor rights and measure them at a particular moment in time. I respectively use the value of the legal protection of creditor rights at the beginning of 2003 (*CREDR-2003*) and its interaction with the rule of law index, also at the beginning of 2003 (*CREDR-RoL2003*). These cross-country estimations show the robustness of the positive influence of creditor rights on investment efficiency and suggest that the results are not biased by the potential endogeneity of changes in creditor rights during the crisis period. Finally, although not reported to save space, the results are similar when *DISTRESSAltman* and *DISTRESSTercil* are used as alternative proxies to the inverse of Z-score (*ZSCOREinv*) for firms' financial distress.

The influence of the protection of creditor rights on the efficiency of corporate investment is economically significant. For instance, using the estimates in column (1), a one standard deviation increase in *CREDR-RoL* (5.0087) increases the sensitivity of capital expenditures to investment opportunities 1.33 times (= 5.0087*0.0020/0.0075). The average positive influence of the protection of creditor rights on investment efficiency is consistent with managers and shareholders making more profitable investments to reduce the higher expected costs that they would suffer in distress in countries with stronger protection of creditor rights.

The firm-level control variables have the expected coefficients. The negative coefficients of *LEV* are consistent with leverage inducing underinvestment by shareholders and managers and/or attenuating overinvestment by managers. The negative coefficients of *SIZE*, significant at conventional levels in six of the nine estimations, are consistent with larger firms facing more difficulties for finding profitable investments in proportion to their current assets. The influence of TANG and *CASH* is less clear because their coefficients are less significant. The positive and significant coefficients of TANG in three estimations are consistent with a higher value of assets as collateral reducing the cost of capital and increasing corporate investment. However, the coefficient of TANG is negative and significant in column (6) when only countries with changes in creditor rights are included in the regressions. The coefficients of CASH are negative and significant in three estimations and non-significant in the remaining estimations

4.3. Financial health, creditor rights, and investment efficiency

The above analysis shows that corporate investment efficiency improves on average when countries strengthen their protection of creditor rights. However, it does not consider interactions between firms' financial health and countries' creditor rights. This section analyzes these interactions and, therefore, whether the impact of changes in countries' creditor rights on investment efficiency depends on firms' financial health.

I apply several analyses. First, I perform a sub-sample analysis. Table 4 reports the results of the influence of countries' creditor rights for different sub-samples of firms depending on their financial health. Panel A reports estimates for healthy firms: firms with a Z-score higher than 1.81 at the beginning of the particular year (*DISTRESSAltman = 0*), or firms with a Z-score above the 65th percentile of the industry in a country in each particular year (*DISTRESSTercil = 1*). Panel B reports results for distressed firms: firms with a Z-score lower than 1.81 at the beginning of the particular year (*DISTRESSAltman = 1*), or firms with a Z-score below the 35th

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[7] The inclusion of country-year and industry-year dummy variables control for most time-variant shocks at country and industry level affecting corporate investment. Therefore, they should control for the impact of the crisis in regressions including crisis years.

Table 4
Investment efficiency and creditor rights in distressed and healthy firms.

	Panel A: Healthy Firms				Panel B: Distressed Firms			
	CREDR-RoL		CREDR-RoL Only countries with changes in creditor rights		CREDR-RoL		CREDR-RoL Only countries with changes in creditor rights	
	DISTRE-SSAltman = 0	DISTRE-SSTercil = 1	DISTRE-SSAltman = 0	DISTRE-SSTercil = 1	DISTRE-SSAltman = 1	DISTRE-SSTercil = 3	DISTRE-SSAltman = 1	DISTRE-SSTercil = 3
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$QTOBIN_{t-1}$	0.0048**	0.0041**	0.0220***	0.0167***	0.0991***	0.1022***	0.1480***	0.1467***
	(2.41)	(2.40)	(4.97)	(3.62)	(7.00)	(6.99)	(6.08)	(6.56)
$QTOBIN_{t-1} * CREDITORS_{t-1}$	0.0020***	0.0014***	0.0009*	0.0010*	-0.0030**	-0.0026**	-0.0078***	-0.0080***
	(7.37)	(5.52)	(1.80)	(1.85)	(-2.41)	(-2.16)	(-3.04)	(-3.29)
$CREDITORS_{t-1}$	-0.0076***	-0.0062***	-0.0077***	-0.0082***	-0.0014	-0.0019	-0.0031	-0.0025
	(-10.87)	(-6.89)	(-7.94)	(-6.13)	(-0.98)	(-1.34)	(-0.57)	(-0.56)
LEV_{t-1}	-0.0173***	0.0232**	-0.0192**	0.0122	-0.0669***	-0.0734***	-0.0697***	-0.0791***
	(-2.77)	(2.46)	(-2.24)	(0.94)	(-5.93)	(-6.70)	(-4.48)	(-5.29)
$SIZE_{t-1}$	-0.0036***	-0.0061***	-0.0084***	-0.0106***	0.00289***	0.0020***	0.1480***	0.0021***
	(-5.95)	(-6.74)	(-9.95)	(-8.27)	(3.52)	(2.64)	(6.08)	(2.14)
$TANG_{t-1}$	0.0186***	0.0002	-0.0159	-0.0227	0.0402***	0.0451***	0.0021**	0.0229**
	(3.01)	(0.02)	(-1.64)	(-1.58)	(5.26)	(6.31)	(2.19)	(2.12)
$CASH_{t-1}$	-0.0096	-0.0093	-0.0972***	-0.0820***	0.0146	-0.0161	0.0324***	-0.0461
	(-0.73)	(-0.57)	(-5.55)	(-3.69)	(0.55)	(-0.65)	(2.95)	(-1.54)
Intercept	0.1631***	0.6133***	0.2795***	0.5528***	-0.0446	0.1344	-0.2908***	-0.0169
	(2.61)	(5.25)	(3.49)	(3.94)	(-0.95)	(0.84)	(-5.37)	(-0.14)
Country-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster by firm and year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Square	0.2061	0.2008	0.2049	0.2084	0.1882	0.1833	0.2821	0.2742
N Obs	31,675	16,024	14,875	7,544	13,719	15,288	6,515	7,302
N Firms	6,785	4,351	3,004	1,868	4,212	4,475	1,849	1,927

Panel A reports coefficient estimates of model [2] for the sub-sample of healthy firms. Panel B reports the results for the sub-sample of distressed firms. The dependent variable is INV, defined as the ratio of gross capital expenditures to book value of total assets. QTOBIN is the annual market-to-book asset ratio. CREDITORS is the indicator of country's creditor rights. In particular, the estimations reported use the interaction of the legal rights index with the rule of law measure provided by the World Bank (CREDR-RoL), lagged by one year. DISTRESS is the variable identifying financial distress in each year. Two indicators are used: 1) DISTRESSAltman is the dummy variable identifying financially distressed firms that takes value one for firms with a Z-score lower than 1.81.Otherwise, it takes value zero; and 2) DISTRESSTercil is a dummy variable that takes the value of 1 if the firm's Z-score is above the 65th percentile in a country in each particular year, 2 when it is between the 35th and 65th percentile, and 3 when it is below the 35th percentile. LEV is the corporate ratio of the book value of total debt to book value of total assets. SIZE is the natural logarithm of total assets. TANG is the percentage of property, plant and equipment in total assets. CASH is the ratio of cash reserves to total assets. The firm-level explanatory variables are lagged one year compared to INV. Regressions include country-year and industry-year dummy variables, and control for firm and time effects by clustering standard errors by firm and year. ***, **, * indicate significance at 1%, 5%, and 10% respectively.

Table 5
Investment efficiency and creditor rights in permanently distressed and healthy firms.

	Panel A: Healthy Firms				Panel B: Distressed Firms			
	CREDR-RoL		CREDR-RoL Only countries with changes in creditor rights		CREDR-RoL		CREDR-RoL Only countries with changes in creditor rights	
	DISTRE-SSAltman = 0 (1)	DISTRE-SSTercil = 1 (2)	DISTRE-SSAltman = 0 (3)	DISTRE-SSTercil = 1 (4)	DISTRE-SSAltman = 1 (5)	DISTRE-SSTercil = 3 (6)	DISTRE-SSAltman = 1 (7)	DISTRE-SSTercil = 3 (8)
$QTOBIN_{t-1}$	0.0052** (2.20)	0.0099*** (3.54)	0.0203*** (4.10)	0.0158*** (2.62)	0.1248*** (5.14)	0.1182*** (5.19)	0.2607*** (5.57)	0.1952*** (5.34)
$QTOBIN_{t-1}$ * $CREDITORS_{t-1}$	0.0018*** (5.59)	0.0009*** (2.99)	0.0009 (1.49)	0.0008 (1.11)	-0.0048** (-2.43)	-0.0033* (-1.87)	-0.0150*** (-2.96)	-0.0078** (-1.97)
$CREDITORS_{t-1}$	-0.0070*** (-7.94)	-0.0074*** (-5.68)	-0.0079*** (-6.34)	-0.0079*** (-3.59)	-0.0013 (-0.56)	-0.0013 (-0.63)	-0.0088 (-1.28)	-0.0099* (-1.74)
LEV_{t-1}	-0.0288*** (-4.02)	-0.0008 (-0.06)	-0.0378** (-3.76)	-0.0555*** (-3.27)	-0.0806*** (-5.45) (-4.38)	-0.0885*** (-5.45)	-0.1211*** (-5.75)	-0.1058*** (-5.61)
$SIZE_{t-1}$	-0.0037*** (-5.53)	-0.0048*** (-3.78)	-0.0076*** (-7.70)	-0.0091*** (-5.21)	0.0054*** (4.51)	0.00314*** (2.85)	0.0037*** (3.12)	0.0026*** (2.30)
$TANG_{t-1}$	-0.0037 (-0.53)	0.0045 (0.32)	-0.0277** (-2.52)	-0.0230 (1.22)	0.0271** (2.25)	0.0319*** (2.96)	0.0485*** (3.29)	0.0392*** (2.76)
$CASH_{t-1}$	-0.0051 (-0.35)	0.0177 (0.83)	-0.0888*** (-4.54)	-0.0548** (-1.96)	0.0762 (1.49)	0.0074 (0.16)	0.0797 (1.55)	0.0729 (1.51)
Intercept	0.0831** (2.12)	0.6133*** (5.25)	0.0714** (1.97)	0.1248*** (5.39)	0.0557 (0.79)	0.1414 (1.25)	0.2084 (1.58)	-0.2885*** (-6.80)
Country-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster by firm and year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Square	0.2238	0.2621	0.1660	0.2646	0.2223	0.2190	0.3815	0.3546
N Obs	20,894	7,042	9,864	3,828	5,635	6,547	2,871	3,559
N Firms	3,660	1,298	1,635	652	1,202	1,369	516	629

This table reports results using only firms that do not change their financial health over the analysis period. Panel A reports coefficient estimates of model [2] for the sub-sample of healthy firms. Panel B reports the results for the sub-sample of distressed firms. The dependent variable is INV, defined as the ratio of gross capital expenditures to book value of total assets at the beginning of the year. QTOBIN is the annual market-to-book asset ratio. CREDITORS is the indicator of the country's creditor rights. In particular, the estimations reported use the interaction of the legal rights index with the rule of law measure provided by the World Bank (CREDR-RoL), lagged by one year. DISTRESS is the variable identifying financial distress and two indicators are used: 1) DISTRESSAltman is the dummy variable identifying financially distressed firms that takes value one for firms with a Z-score lower than 1.81.Otherwise, it takes value zero; and 2) DISTRESSTercil is a dummy variable that takes the value of 1 if the firm's Z-score is above the 65th percentile in a specific industry in a country in each particular year, 2 when it is between the 35th and 65th percentile, and 3 when it is below the 35th percentile. LEV is the corporate ratio of the book value of total debt to book value of total assets. SIZE is the natural logarithm of total assets. TANG is the percentage of property, plant and equipment in total assets. CASH is the ratio of cash reserves to total assets. The firm-level explanatory variables are lagged one year compared to INV. Regressions include country-year and industry-year dummy variables, and control for firm and time effects by clustering standard errors by firm and year. ***, **, * indicate significance at 1%, 5%, and 10% respectively.

percentile of the industry in a country in each particular year (*DISTRESSTercil = 3*). I again apply a DID analysis using the annual changes in *CREDR-RoL*. Columns (1)-(2) and (5)-(6) apply a conventional DID analysis using firms in countries without changes in creditor rights as a control group. Columns (3)-(4) and (7)-(8) show the robustness of the results when I focus only on countries changing the legal protection of creditor rights and do not include firms in countries without changes in the legal protection of creditor rights as a control group.

Panel A in Table 4 reports positive coefficients for *QTOBIN* and positive coefficients for *QTOBIN*CREDITORS* in the sub-samples of healthy firms using alternative proxies for firms' financial health and both using and not using firms in countries without changes in creditor rights as a control group. These coefficients suggest that stronger protection of creditor rights improves investment efficiency in healthy firms. The results are different in Panel B for the sub-sample of financially distressed firms. The coefficients of *QTOBIN* are positive but the coefficients of *QTOBIN*CREDITORS* are significant and negative in all the estimations. The negative coefficients of *QTOBIN*CREDITORS* suggest that strengthening creditor rights worsens investment efficiency in financially distressed firms. In economic terms, using coefficients in columns (1) and (5), one standard deviation increase in *CREDR-RoL* (5.0087) increases investment efficiency 2.08 times (=5.0087*0.0020/0.0048) in healthy firms but diminishes investment efficiency 0.15 times (=5.0087*(-0.0030)/0.0991) in financially distressed firms.

I check the robustness of the results using only firms that are always classified as healthy or distressed over the analysis period. Focusing on firms whose financial health does not change, I reduce endogeneity concerns because initial financial health in these firms would be exogenous to any change in corporate investment efficiency over the analysis period. The results in Table 5 confirm a different impact of creditor rights in financially healthy and distressed firms. The coefficients of *QTOBIN* and *QTOBIN*CREDITORS* continue to be positive in healthy firms when I apply a DID analysis and use firms in countries without changes in legal rights as a control group. The coefficients of *QTOBIN*CREDITORS* are now non-significant at conventional levels when I analyze countries with changes in creditor rights and do not use a control group. The coefficients of *QTOBIN* are again positive in financially distressed firms and the coefficients of *QTOBIN*CREDITORS* are again negative and significant in all the estimations for financially distressed firms.

Although not reported, I find similar results for both tables when I focus on changes in contractual, and not enforcement, rights (CREDR) or when I focus on cross-country differences in creditor rights using the values of contractual and enforcement rights at the beginning of 2003 (*CREDR-2003 and CREDR-RoL2003*), without considering changes in creditor rights over the analysis period.

Second, additionally to the sub-sample analysis, I run regressions using the whole sample and including interactions of *QTOBIN* not only with *CREDITORS* but also with *DISTRESS*. In particular, I estimate the following model:

$$
\begin{aligned}
INV_{it} = {} & \alpha_0 + \alpha_1 QTOBIN_{it-1} \\
& + \alpha_2 QTOBIN_{it-1} * CREDITORS_{kt-1} \\
& + \alpha_3 QTOBIN_{it-1} * CREDITORS_{kt-1} * DISTRESS_{it-1} \\
& + \alpha_4 QTOBIN_{it-1} * DISTRESS_{it-1} \\
& + \alpha_5 CREDITORS_{kt-1} * DISTRESS_{it-1} \\
& + \alpha_6 CREDITORS_{kt-1} + \alpha_7 DISTRESS_{it-1} + \alpha_8 Firm\ controls_{it-1} + \lambda_{jt} + \theta_{kt} + \mu_{it}
\end{aligned}
\tag{3}
$$

Under this specification, α_2 captures the influence of creditor rights on investment efficiency in healthy firms and α_3 captures the difference in the influence of creditor rights on investment efficiency when firms' financial distress increases. Table 6 reports the results using *DISTRESSAltman* as a proxy for firms' financial health although the results do not change using any of the alternative proxies described in the paper.

The interaction *QTOBIN*CREDITORS* in column (1) retains the significant positive coefficient found in Table 3 and the coefficients of *QTOBIN*DISTRESS*CREDITORS* are negative and significant, at conventional levels, in all the estimations. These results confirm that the positive effect of stronger protection of creditors on investment efficiency diminishes when a firm becomes financially distressed. The positive coefficients of *QTOBIN*DISTRESS* in all the estimations suggest greater investment efficiency in periods of financial distress and are consistent with financial distress restricting the free cash-flow under managers' discretion to reduce overinvestment and perquisite consumption. The negative coefficients of *DISTRESS* and *CREDITORS* and the positive coefficients of *CREDITORS*DISTRESS*, significant at conventional levels in all the estimations, indicate that the reduction in capital expenditures during financial distress is lower in countries with stronger protection of creditor rights.

These results are robust to alternative specifications of dummy control variables in columns (2) and (3), when countries changing their protection of creditor rights after the onset of the global financial crisis (Chile, Germany, and Sweden) are excluded in column (4), when the crisis years (2008 and 2009) are excluded in column (5), and when I only include countries experiencing changes in creditor rights over the analysis period in column (6). Finally, the results are also robust in column (7) when I use index of the legal protection of creditor rights without interacting it with the index of the rule of law (*CREDR*), and in columns (8) and (9) when I focus on cross-country differences in creditor rights and measure both proxies for creditor rights, *CREDR-RoL* and *CREDR*, at the beginning of 2003 instead of using their annual values.

These results confirm that the influence of creditor rights on investment efficiency depends on firms' financial health. Greater investment efficiency in healthy firms in countries with stronger creditor rights is consistent with the managers and shareholders of these firms anticipating higher losses if the firm becomes distressed. To avoid such losses, they have incentives to reduce the likelihood of distress by behaving more efficiently. However, the negative effect of the protection of creditor rights on investment efficiency in financially distressed firms is consistent with stronger protection of creditor rights increasing the incentives of managers and shareholders to underinvest and/or overinvest in financially distressed firms when they anticipate greater losses in bankruptcy and when legal rights do not prevent these investment distortions before the identification of financial distress by creditors and courts.

Table 6
Financial health, creditor rights, and investment efficiency: Interaction effects.

	CREDR-RoL			Excluding Chile, Germany, and Sweden	Excluding crisis years (08–09)	Only countries with changes in creditor rights	CREDR	CREDR-RoL2003	CREDR-2003
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$QTOBIN_{t-1}$	0.0050**	0.0006	0.0061***	0.0049**	0.0032	0.0205***	-0.0190***	0.0101***	-0.01808***
	(2.38)	(0.43)	(2.58)	(2.34)	(1.55)	(5.20)	(-4.55)	(3.13)	(-3.63)
$QTOBIN_{t-1}*CREDITORS_{t-1}$	0.0020***	0.0023***	0.0022***	0.0021***	0.0020***	0.0006	0.0796***	0.0015***	0.0059***
	(7.39)	(7.51)	(7.68)	(7.14)	(6.32)	(1.42)	(2.88)	(4.18)	(7.26)
$QTOBIN_{t-1}*DISTRESS_{t-1}$	0.0747***	0.0691***	0.0588***	0.0751***	0.0926***	0.1007***	0.0058***	0.0433***	0.0725***
	(5.87)	(4.00)	(4.63)	(5.91)	(5.19)	(4.43)	(8.37)	(4.29)	(2.93)
$QTOBIN_{t-1}*CREDITORS_{t-1}*DISTRESS_{t-1}$	-0.0042***	-0.0031*	-0.0031***	-0.0043***	-0.0058***	-0.0077***	-0.0066*	-0.0019*	-0.0059*
	(-3.68)	(-1.93)	(-2.73)	(-3.70)	(-3.76)	(-3.08)	(-1.92)	(-1.85)	(-1.85)
$CREDITORS_{t-1}*DISTRESS_{t-1}$	0.0059***	0.0028	0.0047***	0.0062***	0.0084***	0.0090***	0.0100***	0.0045***	0.0084**
	(4.79)	(1.62)	(3.80)	(4.91)	(4.93)	(3.62)	(2.83)	(3.59)	(2.53)
$CREDITORS_{t-1}$	-0.0076***	-0.0097***	-0.0066***	-0.0077***	-0.0063***	-0.0144***	-0.0148***	-0.0062***	-0.0164***
	(-12.05)	(-2.90)	(-11.33)	(-11.41)	(-7.60)	(-6.63)	(-8.78)	(-9.77)	(-8.97)
$DISTRESS_{t-1}$	-0.1371***	-0.1031***	-0.1156***	-0.1388***	-0.1726***	-0.1567***	-0.1529***	-0.1095***	-0.1384***
	(-11.15)	(-5.93)	(-9.35)	(-11.30)	(-9.97)	(-7.06)	(-5.53)	(-10.42)	(-5.56)
LEV_{t-1}	-0.0257***	-0.1876***	-0.0408***	-0.0230***	-0.0083	-0.0164**	-0.0251***	-0.0241***	-0.0254***
	(-4.78)	(-12.08)	(-7.50)	(-4.17)	(-1.12)	(-2.36)	(-4.67)	(-4.48)	(-4.71)
$SIZE_{t-1}$	-0.0016***	-0.2183***	-0.0059***	-0.0012**	-0.0033***	-0.0019**	-0.0019***	-0.0010**	-0.0019***
	(-3.29)	(-35.78)	(-12.07)	(-2.31)	(-4.98)	(-3.09)	(-4.03)	(-2.13)	(-3.92)
$TANG_{t-1}$	0.0264***	0.0420**	0.0246***	0.0298***	0.0215***	0.0180***	0.0293***	0.0281***	0.0294***
	(5.58)	(2.13)	(5.12)	(6.14)	(3.33)	(2.61)	(6.21)	(5.73)	(6.24)
$CASH_{t-1}$	-0.00003	-0.0303	-0.0554***	0.0076	-0.0438***	-0.0281*	-0.0017	0.0020	-0.0016
	(-0.00)	(-1.44)	(-5.02)	(0.62)	(-2.71)	(1.84)	(-0.14)	(0.17)	(-0.14)
Intercept	0.1941***	1.5843***	0.1637***	0.1322***	0.2293***	0.1146**	0.2511***	0.1857***	0.2582***
	(4.58)	(23.81)	(8.10)	(2.27)	(4.95)	(2.27)	(6.02)	(4.68)	(6.16)
Country-year fixed effects	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster by firm and year	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes
Firm-fixed effects	No	Yes	No	No	No	No	Yes	No	No
Year-fixed effects	No	Yes	No	No	No	No	No	No	No
R-Square	0.2073	0.3214	0.1101	0.2107	0.2014	0.2949	0.2054	0.2056	0.2054
N Obs	45,394	45,394	45,394	42,765	26,438	21,390	45,394	45,394	45,394
N Firms	8,207	8,207	8,207	7,725	7,586	3,587	8,207	8,207	8,207

Panel A reports coefficient estimates of model [3]. The dependent variable is INV, defined as the ratio of gross capital expenditures to book value of total assets. QTOBIN is the annual market-to-book asset ratio. CREDITORS is the indicator of the country's creditor rights and four indicators are used: CREDR-RoL is the interaction of the legal rights index with the rule of law measure provided by the World Bank, lagged by one year; CREDR is the legal rights index developed by the World Bank one-year lagged; CREDR-RoL2003 is the value of CREDR-RoL at the beginning of 2003; and CREDR-2003 is the value of CREDR at the beginning of 2003. DISTRESS is a dummy variable identifying firms in financial distress and takes the value of 1 if the firm's Z-score in a particular year is below 1.81. Otherwise, it takes 0 (DISTRESSAltman). LEV is the corporate ratio of the book value of total debt to book value of total assets. SIZE is the natural logarithm of total assets. TANG is the percentage of property, plant and equipment in total assets. CASH is the ratio of cash reserves to total assets. The firm-level explanatory variables are lagged one year compared to INV. The main regressions include country-year and industry-year dummy variables, and control for firm and time effects by clustering standard errors by firm and year. Additional robustness excludes country-year dummy variables and includes firms and year dummy variables as an alternative to clustering standard errors by firm and year to control for firm and year-fixed effects. ***, **, * indicate significance at 1%, 5%, and 10% respectively.

Table 7
Financial health, creditor rights, and investment efficiency: Controlling for shareholder protection.

	Panel A: all firms						Panel B: Healthy Firms			Panel C: Distressed Firms		
	ANTI-SELF-DEALING		ANTI-DIRECTOR		INVPROTECTION		ANTI-SELF-DEALING	ANTI-DIR-ECTOR	INVPROT-ECTION	ANTI-SELF-DEALING	ANTI-DIRE-CTOR	INVPROTEC-TION
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$QTOBIN_{t-1}$	-0.0034	-0.0319***	-0.0019	-0.0105***	0.0032	-0.0131***	-0.0022	-0.0030	0.0015	0.0707***	0.1096***	0.1055***
	(-0.52)	(-3.77)	(-0.49)	(-2.60)	(0.87)	(-2.71)	(-0.35)	(-1.09)	(0.57)	(3.64)	(4.87)	(5.52)
$QTOBIN_{t-1}*CREDITORS_{t-1}$	0.0016***	0.0047***	0.0015***	0.0033***	0.0017***	0.0036***	0.0018***	0.0015***	0.0017***	-0.0041***	-0.0028**	-0.0028**
	(6.30)	(4.81)	(5.79)	(5.79)	(5.87)	(7.34)	(8.01)	(6.39)	(6.78)	(-3.02)	(-2.19)	(-2.16)
QTOBIN*SHAREHOLDERP-ROTEC	0.0249**	0.0851***	0.0038***	0.0071***	0.0114**	0.0502***	0.0161	0.0032***	0.0086*	0.0665**	-0.0031	-0.0125
	(2.03)	(4.94)	(3.84)	(4.71)	(2.18)	(4.46)	(1.29)	(3.54)	(1.70)	(2.09)	(-0.53)	(-0.46)
CREDITORS*SHAREHOLD-ERPROTEC		0.0314***		-0.0003		-0.0054**						
		(9.23)		(-0.88)		(-2.25)						
QTOBIN*CREDITORS*SHA-REHOLDERPROTEC		-0.0058***		-0.0005***		-0.0039***						
		(-3.17)		(-2.94)		(-4.14)						
$CREDITORS_{t-1}$	-0.0664***	-0.0225***	-0.0066***	-0.0059***	-0.0064***	-0.0036***	-0.0077***	-0.0074***	-0.0074***	-0.0004	-0.0025*	-0.0016
	(-13.92)	(-12.16)	(-11.34)	(-4.84)	(-10.73)	(-2.62)	(-11.55)	(-10.93)	(-10.83)	(-0.24)	(-1.75)	(-1.13)
SHAREHOLDERPROTEC	-0.0165	-0.3599***	0.0062***	0.0118***	0.0429***	0.1135***	0.0080	0.0060***	0.0512***	-0.0655*	0.0184**	0.0789*
	(-0.81)	(-10.30)	(3.02)	(3.19)	(3.75)	(3.86)	(0.35)	(2.75)	(4.02)	(-1.72)	(2.85)	(2.39)
$DISTRESS_{t-1}$	-0.00004	-0.00004	-0.00004	-0.00004	-0.00004	-0.00004						
	(-0.24)	(-0.22)	(-0.22)	(-0.21)	(-0.23)	(-0.21)						
LEV_{t-1}	-0.0664***	-0.0663***	-0.0638***	-0.0642***	-0.0638***	-0.0639***	-0.0166***	-0.0140**	-0.0135**	-0.0684***	-0.0665***	-0.0658***
	(-13.92)	(-13.92)	(-13.40)	(-13.48)	(-13.37)	(-13.41)	(-2.65)	(-2.25)	(-2.15)	(-6.09)	(-5.89)	(-5.78)
$SIZE_{t-1}$	-0.0006	-0.0009*	-0.0007	-0.0008*	-0.0006	-0.0008	0.0176***	-0.0038***	-0.0037***	0.0029***	0.0029***	0.0029***
	(-1.19)	(-1.85)	(-1.51)	(-1.77)	(-1.32)	(-1.60)	(2.85)	(-6.31)	(-6.19)	(3.56)	(3.53)	(3.56)
$TANG_{t-1}$	0.0065	0.0070	0.0048	0.0055	0.0045	0.0050	0.0176***	0.0167***	0.0159***	0.0396***	0.0360***	0.0375***
	(1.39)	(1.50)	(1.02)	(1.19)	(0.96)	(1.06)	(2.85)	(2.71)	(2.58)	(5.20)	(4.71)	(4.91)
$CASH_{t-1}$	0.0087	0.0038	0.0069	0.0044	0.0091	0.0069	-0.0091	-0.0108	-0.0090	0.0107	0.0105	0.0147
	(0.72)	(0.32)	(0.58)	(0.37)	(0.76)	(0.58)	(-0.68)	(-0.82)	(-0.68)	(0.40)	(0.39)	(0.54)
Intercept	0.1879***	0.2228***	0.1442***	0.1343***	0.1162***	0.0231	0.1696***	0.1367**	0.1103*	-0.0170	-0.1280**	-0.0972*
	(4.09)	(3.96)	(3.43)	(3.18)	(2.75)	(0.54)	(2.58)	(2.22)	(1.81)	(-0.34)	(-2.41)	(-1.92)
Country-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster by firm and year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-fixed effects	No	No	No	No	No	No	No	No	No	No	No	No
Year-fixed effects	No	No	No	No	No	No	No	No	No	No	No	No
R-Square	0.1944	0.1984	0.1962	0.1973	0.1953	0.1973	0.2066	0.2082	0.2077	0.1888	0.1908	0.1896
N Obs	45,394	45,394	45,394	45,394	45,394	45,394	31,675	31,675	31,675	13,719	13,719	13,719
N Firms	8,207	8,207	8,207	8,207	7,586	8,207	6,785	6,785	6,785	4,212	4,212	4,212

This table reports results for models [2] and [3] including additional controls for shareholder protection. Panel A, B, and C report coefficient estimates for, respectively, all, healthy, and distressed firms. The dependent variable is INV, defined as the ratio of gross capital expenditures to book value of total assets at the beginning of the year. QTOBIN is the annual market-to-book asset ratio. CREDITORS is the indicator of country's creditor rights. In particular, the estimations reported use the interaction of the legal rights index with the rule of law measure provided by the World Bank (CREDR-RoL), lagged by one year. SHAREHOLDERPROTECT refers to the particular country variable used in the regressions as a proxy for shareholder protection. I use three proxies for shareholder protection: the anti-self-dealing index *(ANTI-SELF-DEALING)*, the anti-director index *(ANTI-DIRECTOR)*, and the investor protection index *(INVPROTECTION)*. DISTRESS is a dummy variable identifying firms in financial distress. I use the inverse of Altman's Zscore (ZSCOREinv) in estimations reported in columns (1)-(6) and *DISTRESSAltman* in columns (7)-(12). LEV is the corporate ratio of the book value of total debt to book value of total assets. SIZE is the natural logarithm of total assets. TANG is the percentage of property, plant and equipment in total assets. CASH is the ratio of cash reserves to total assets. The firm-level explanatory variables are lagged one year compared to INV. The main regressions include country-year and industry-year dummy variables, and control for firm and time effects by clustering standard errors by firm and year. ***, **, * indicate significance at 1%, 5%, and 10% respectively.

4.4. Financial health, creditor rights, and investment efficiency: The role of shareholder protection

Managers and controlling shareholders may seek expropriation strategies from minority shareholders, instead of improving investment efficiency, to maximize their own benefit. Empirical evidence shows that stronger shareholder protection in a country reduces potential expropriation by managers and/or controlling shareholders (Wurgler, 2000; Shleifer & Wolfenzon, 2002; Mclean et al., 2012; Levine et al., 2016). Therefore, I now analyze whether the influence of creditor rights on investment efficiency remains after explicitly controlling for shareholder protection as well as how shareholder protection shapes this influence.

I extend models [2] and [3] to include country shareholder protection in the regressions. Table 7 reports the results using three proxies for shareholder protection: the anti-self-dealing, the anti-director, and the investor protection indexes. Columns (1)-(6) report the results for the whole sample. The coefficients of *QTOBIN*CREDITORS* remain positive and significant in columns (1), (3), and (5), confirming the average positive effect of the legal protection of creditor rights on corporate investment efficiency after explicitly controlling for shareholder protection. The coefficients of *SHAREHOLDERPROTEC* and the positive coefficients of *QTOBIN*SHAREHOLDERPROTEC* in these three estimations are consistent with the positive influence of shareholder protection on investment efficiency previously found by Wurgler (2000), Shleifer and Wolfenzon (2002), Mclean et al. (2012). The results in columns (2), (4), and (6) show how creditor and shareholder protection interact to affect investment efficiency. The positive and significant coefficients of *QTOBIN*CREDITORS* and *QTOBIN*SHAREHOLDERPROTEC*, and the negative coefficients of *QTOBIN*CREDITORS*SHAREHOLDERPROTEC* indicate that shareholder protection acts as a substitute of creditor rights to improve investment efficiency. Greater investment efficiency in countries with stronger shareholder protection reduces the positive marginal effect of creditor rights on investment efficiency.

Columns (7)-(9) and (10)-(12) report separately the results for healthy and distressed firms, respectively. I use *DISTRESSAltman* as a proxy for identifying healthy and distressed firms in a particular year. The results for the influence of creditor rights on investment efficiency are similar to those found in Tables 4 and 5. The positive coefficients of *QTOBIN*CREDITORS* for healthy firms and their negative coefficients for distressed firms confirm that the different effect of creditor rights on investment efficiency depending on firm's financial health remains after controlling for shareholder protection. The coefficients of *QTOBIN*SHAREHOLDERPROTEC* do not suggest a different influence of shareholder protection on investment efficiency depending on firms' financial health. They are positive and significant in columns (8), (9), and (10), and non-significant in columns (7), (10), and (11). These coefficients are consistent with a positive influence of shareholder protection on investment efficiency, in both healthy and distressed firms.

4.5. Investment efficiency: Underinvestment and/or overinvestment?

In this section, I analyze if the effects of creditor rights on investment efficiency found in the above sections are caused by changes in underinvestment and/or in overinvestment. Following previous literature, I measure investment distortions (under- and over-investment) by the difference between actual and expected investment (Richardson, 2006; Biddle et al., 2009; Eisdorfer et al., 2013). Following Lang et al. (1996) and Eisdorfer et al. (2013), I estimate a firm's expected investment by the median investment in industry in each country in a particular year. For robustness, I use two alternative proxies for expected investment, and because all three proxies are highly correlated and produce similar results, I report only those based on the main proxy.[8]

I then classify firms based on the magnitude of the difference between actual and expected investment (i.e., investment distortions) and use these groups as the dependent variable. Specifically, following Biddle et al. (2009), I sort firms into yearly quartiles based on the difference between actual and expected investment. Firm-year observations in the bottom quartile (i.e., the most negative differences) are classified as underinvesting, observations in the top quartile (i.e., the most positive differences) are classified as over-investing, and observations in the middle two quartiles are classified as the benchmark group. I estimate a multinomial logit model that predicts the likelihood that a firm will be in either the first or the last quartile as opposed to the middle quartiles. Specifically, I form a variable (*INVQ*) that takes the value of one if the difference between actual and expected investment is in the bottom quartile of the distribution (i.e., firms classified as underinvesting), two if it is in the middle two quartiles, and three if it is in the top quartile (i.e., firms classified as over-investing). This specification considers simultaneously, but separately, the likelihood of under- and overinvestment. I use firms' financial health and countries' creditor rights as explanatory variables, and the same control variables as in model [2]. All estimations include country-year, industry-year dummy variables, and cluster standard errors by firm and year.

Table 8 reports the results using alternative proxies for countries' creditor rights and firms' financial distress. Panel A presents the results regarding underinvestment and Panel B those regarding overinvestment. Panel A reports significant and negative coefficients for *QTOBIN* in column (1)-(4) and significant and positive coefficients for *DISTRESS* in columns (2)-(4). These results indicate that the likelihood that a firm is in the underinvestment quartile is negatively associated with investment opportunities and positively associated with the firm being in financial distress. However, *CREDITORS* and *CREDITORS*DISTRESS* do not have statistically

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[8] The first alternative proxy is the fitted value from firm-year cross-sectional regressions of the firms' actual investment on Tobin's Q ratios (measured by the market-to-book asset ratio as of the beginning of the year). The second alternative proxy is the fitted value from a pooled regression of the firm's actual investment not only on Tobin's Q ratios but also on the set of variables that have been found to explain investment in prior studies and in this paper: leverage, size, asset tangibility, and cash-flow from operations (see, for example, Eisdorfer, 2008; Duchin et al., 2010; Lang et al., 1996). All explanatory variables are lagged by one year. Regressions include country-year, industry-year, year-dummy variables, and control for firm-specific effects.

Table 8
Deviations from expected investment.

	PANEL A: Underinvestment versus normal investment				PANEL B: Overinvestment versus normal investment			
	CREDR-RoL		CREDR-RoL.2003		CREDR-RoL		CREDR-RoL.2003	
	DISTRESSAltman (1)	DISTRESSTercil (2)	DISTRESSAltman (3)	DISTRESSTercil (4)	DISTRESSAltman (5)	DISTRESSTercil (6)	DISTRESSAltman (7)	DISTRESSTercil (8)
$QTOBIN_{t-1}$	-0.1904***	-0.0983***	-0.1899***	-0.0988***	0.2553***	0.2136***	0.2491***	0.2101***
	(-5.05)	(-2.60)	(-5.06)	(-2.63)	(7.16)	(5.72)	(7.02)	(5.65)
$CREDITORS_{t-1}$	0.0033	-0.0048	-0.0059	-0.0144**	-0.0182***	-0.0117	-0.0409***	-0.0489***
	(0.54)	(-0.56)	(-1.48)	(-2.06)	(-3.13)	(-1.48)	(-11.44)	(-8.05)
$CREDITORS_{t-1} * DISTRESS_{t-1}$	0.0011	-0.0007	0.0048	0.0032	0.0097*	0.0007	0.0229***	0.0076***
	(0.21)	(-0.24)	(0.93)	(1.14)	(1.65)	(0.24)	(3.88)	(2.72)
$DISTRESS_{t-1}$	0.0011	0.3983***	0.5283***	0.3682***	-0.4204***	-0.2621***	-0.4872***	-0.3073***
	(0.21)	(11.81)	(11.60)	(12.72)	(-7.09)	(-7.60)	(-9.77)	(-10.39)
LEV_{t-1}	0.7620***	0.4903***	0.7604***	0.4907***	0.2857***	0.5486***	0.2798***	0.5355***
	(9.65)	(5.61)	(9.62)	(5.62)	(3.83)	(6.61)	(3.76)	(6.47)
$SIZE_{t-1}$	-0.1509***	-0.1534***	-0.1497***	-0.1521***	-0.1161***	-0.1165***	-0.1072***	-0.1080***
	(-19.93)	(-20.37)	(-19.62)	(-20.05)	(-15.452)	(-15.51)	(-14.21)	(-14.32)
$TANG_{t-1}$	-0.3687***	-0.3914***	-0.3745***	-0.3923***	-0.1576**	-0.1032	-0.1751***	-0.1206*
	(-5.51)	(-5.85)	(-5.59)	(-5.86)	(-2.35)	(-1.53)	(-2.62)	(-1.79)
$CASH_{t-1}$	1.4352***	1.4965***	1.4282***	1.4803***	0.8848***	0.8599***	0.8265***	0.8190***
	(9.24)	(9.66)	(9.19)	(9.55)	(5.48)	(5.37)	(5.11)	(5.10)
Intercept	-1.2184*	-1.8442***	-1.1105*	-1.7859***	0.1603	0.5001	0.2947	0.7715
	(-1.86)	(-2.83)	(-1.71)	(-2.78)	(0.37)	(1.15)	(0.70)	(1.83)
Country-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster by firm and year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wald Chi2	7,814,50***	8.107,11***	7,754.28***	7,909.98***	7,814,50***	8.107,11***	7,754.28***	7,909.98***
Pseudo RSquare	0.0578	0.0601	0.0592	0.0613	0.0578	0.0601	0.0592	0.0613
N Obs	45,394	45,394	45,394	45,394	45,394	45,394	45,394	45,394
N Firms	8,207	8,207	8,207	8,207	8,207	8,207	8,207	8,207

This table reports coefficient estimates of a multinomial logit that predicts the likelihood that a firm is over or underinvesting. The dependent variable, INVQ, takes the value of one if the difference between actual and expected investment is in the bottom quartile of the distribution (i.e., firms classified as underinvesting), and three if in the top quartile (i.e., firms classified as overinvesting). Otherwise, INVQ takes the value of two. QTOBIN is the annual market-to-book asset ratio. CREDITORS is the indicator of the country's creditor rights and two indicators are used: 1) CREDR-RoL is the interaction of the legal rights index with the rule of law measure provided by the World Bank, lagged by one year; and 2) CREDR-RoL2003 is the value of CREDR-RoL at the beginning of 2003. DISTRESS is the variable identifying financial distress and two indicators are used: 1) DISTRESSAltman is the dummy variable identifying financially distressed firms that takes value one for firms with a Z-score lower than 1.81.Otherwise, it takes value zero; and 2) DISTRESSTercil is a dummy variable that takes the value of 1 if the firm's Z-score is above the 65th percentile in a specific industry in a country in each particular year, 2 when it is between the 35th and 65th percentile, and 3 when it is below the 35th percentile. LEV is the corporate ratio of the book value of total debt to book value of total assets. SIZE is the natural logarithm of total assets. TANG is the percentage of property, plant and equipment in total assets. CASH is the ratio of cash reserves to total assets. The firm-level explanatory variables are lagged one year compared to INVQ. All the regressions include country-year and industry-year dummy variables, and standard errors are clustered by firm and year levels. ***, **, * indicate significance at 1%, 5%, and 10% respectively.

significant coefficients in most of these estimations. These non-significant coefficients suggest that strong protection of creditor rights is not associated with the likelihood that a firm will be in the underinvestment quartile, when it is either healthy or financially distressed. Only the significant and negative coefficient of *CREDITORS* in column (4) suggests that stronger creditor rights reduce underinvestment in healthy firms. This result would be consistent with the positive effect of creditor rights on investment efficiency in healthy firms. Regarding control variables, the coefficients indicate that, as expected, more leveraged firms have a greater likelihood of underinvestment. A higher likelihood of underinvestment is also associated with smaller firm size, a lower proportion of tangible assets, and more cash reserves.

Regarding the likelihood that a firm will be in the overinvestment quartile, the positive coefficients of *QTOBIN* in columns (5)-(8) in Panel B indicate that greater investment opportunities increase the probability that a firm's investment will exceed the expected investment. The significant and negative coefficients of *DISTRESS* in all the estimations suggest that financial distress improves investment efficiency by reducing overinvestment. The significant and negative coefficients of *CREDITORS* in columns (5) and (7)-(8) indicate that stronger protection of creditor rights reduces the likelihood of overinvestment in healthy firms, whereas the positive coefficients of *CREDITORS*DISTRESS* suggest that the reduction in the probability of overinvestment when firms become financially distressed is lower in countries with stronger protection of creditor rights. The coefficients of *CREDITORS* and *CREDITORS*DISTRESS* retain similar signs in column (6), although they are not significant at conventional levels.

The effects of protection of creditor rights and financial distress on the likelihood of overinvestment are consistent with the influence found in previous sections for both these variables on investment efficiency. These results now reveal that the less positive impact of creditor rights on investment efficiency in financially distressed firms is caused by stronger creditor rights reducing overinvestment less in these firms. However, creditor rights are not associated with cross-country differences or changes in underinvestment in both healthy and distressed firms.

4.6. Additional robustness checks

The sensitivity of real investment to Tobin's q has been a common measure of investment efficiency (Lang et al., 1996; Chen et al., 2011; Hovakimian, 2011; Mclean et al., 2012; Levine et al., 2016). However, Tobin's q is not problem-free because studies use average and not marginal q. As a consequence, a firm's size influences the value of Tobin's q with underinvestment increasing the average value of Tobin's q (Dybvig & Warachka, 2015). Therefore, I check whether the results are robust to alternative proxies for firms' investment opportunities. In particular, I follow Biddle et al. (2009) and Billett, Garfinkel, and Jiang (2011) using the natural logarithm of sales growth (*LNSALESG*) as proxy for investment opportunities. The results reported in Table 9 confirm the main results. Columns (1)-(4) confirm the average positive effect of creditor rights on capital allocation, and the coefficients of the interaction terms in columns (5)-(11) confirm that the positive effect of creditor rights on capital allocation diminishes when a firm becomes financially distressed.

Although not reported to save space, I perform several additional robustness checks. First, in previous sections, I assumed that firms' financial health is exogenous to country characteristics. However, I cannot totally rule out that firms' financial health might be influenced by countries' creditor rights. For instance, stronger protection of creditor rights promoting lower risk-taking (Acharya et al., 2011) and/or greater investment efficiency may affect the probability of a firm being in financial distress. This influence could bias the different effects previously attributed to creditor rights depending on firms' financial health. I check the robustness of the results after controlling for the dependence of firms' financial distress on the country's creditor rights. I apply a two-stage analysis. In a first stage, I estimate a probit using the protection of creditor rights as an explanatory variable. The other explanatory variables are those used to construct the Z-score. In a second stage, I use the forecasted values for financial distress as explanatory variables to estimate models [2] and [3]. The results of this two-stage procedure are similar to those found in previous sections and suggest that findings in previous sections are not biased by firms' financial health being endogenous to country's creditor rights.

Second, I check that the results do not change when countries such as Japan, UK, and US are not included in the regressions to avoid potential bias caused by their over-representation in the sample. Finally, I additionally check the robustness of the results using alternative variables for identifying financially distressed firms. In particular, I use three alternative proxies. First, I consider that a firm is in financial distress if it had negative net income in the previous year (John, Lang, & Netter, 1992). Second, I restrict the above definition by considering that a firm is in financial distress when the net income of the two previous years is negative. Third, I consider that a firm is in financial distress in year t if its coverage ratio, defined as the sum of income before extraordinary items and interest expense divided by interest expense, is less than or equal to one (Andrade & Kaplan, 1998).

5. Conclusions

This paper analyzes the influence of countries' creditor rights on investment efficiency and how firms' financial health shapes this influence. Using both time-series changes within a country and cross-country variation in creditor rights in a panel data set of 8,207 firms across 34 countries, I find that stronger protection of creditor rights is associated with better investment efficiency, especially in financially healthy firms. This finding is consistent with creditor rights disciplining manager and shareholder behavior before financial distress to avoid the higher expected losses of bankruptcy. However, creditor rights improve investment efficiency less, and may even worsen it, in financially distressed firms. This finding suggests that greater losses anticipated by managers and shareholders in bankruptcy increase investment distortions once the firm is in financial distress. The above influence of creditor rights remains after controlling for the positive influence of shareholder protection on investment efficiency. The results also indicate that the

Table 9
Financial health, creditor rights, and investment efficiency: using the growth of sales.

	CREDR-RoL	CREDR	CREDR-RoL2003	CREDR-2003	CREDR-RoL	Excluding Chile, Germany, and Sweden	Excluding crisis years (08–09)	Only countries with changes in creditor rights	CREDR	CREDR-RoL2003	CREDR-2003
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
$LNSALESG_{t-1}$	0.0157***	0.0097**	0.0177***	0.0076**	-0.0034	-0.0037	0.0010	-0.0018	-0.0027	-0.0010	-0.0039
	(6.95)	(2.30)	(9.69)	(2.10)	(-1.06)	(-1.14)	(0.24)	(-0.35)	(-0.52)	(-0.36)	(-0.85)
$LNSALESG_{t-1}*CREDITORS_{t-1}$	0.0006***	0.0014***	0.0005**	0.0018***	0.0029***	0.0029***	0.0030***	0.0032***	0.0040***	0.0025***	0.0043***
	(2.83)	(2.87)	(2.09)	(3.91)	(8.78)	(8.59)	(7.16)	(5.27)	(6.42)	(7.24)	(7.08)
$LNSALESG_{t-1}*DISTRESS_{t-1}$					0.0091***	0.0093***	0.0092***	0.0134***	0.0068***	0.0088***	-0.0057***
					(7.24)	(7.23)	(5.61)	(6.77)	(3.16)	(8.17)	(-12.51)
$LNSALESG_{t-1}*CREDITORS_{t-1}*DISTRESS_{t-1}$					-0.0013***	-0.0014***	-0.0013***	-0.0022***	-0.0016***	-0.0012***	-0.0016***
					(-8.65)	(-8.58)	(-6.95)	(-8.15)	(-5.34)	(-7.33)	(-5.40)
$CREDR_{t-1}*DISTRESS_{t-1}$	-0.0023***	-0.013	-0.0026***	-0.0032*	-0.0035***	-0.0037***	-0.0036***	-0.0047***	-0.0056***	-0.0030***	-0.0057***
	(-3.54)	(-0.76)	(-5.12)	(-1.80)	(-11.03)	(-10.90)	(-9.12)	(-9.13)	(-12.78)	(-8.05)	(-12.51)
$CREDITORS_{t-1}$	0.00003	0.00003	0.00003	0.00003	0.0037***	0.0036	0.0059***	0.0004	0.0085***	0.0022***	0.0070***
	(0.17)	(0.18)	(0.17)	(0.18)	(4.31)	(3.99)	(5.51)	(0.12)	(4.36)	(-2.71)	(3.56)
$DISTRESS_{t-1}$					-0.0274***	-0.0277***	-0.0362***	-0.0209***	-0.0219***	-0.0309***	-0.0229***
					(-8.74)	(-8.53)	(-9.20)	(-5.14)	(-6.92)	(-9.97)	(-7.26)
LEV_{t-1}	-0.0666***	-0.0664***	-0.0679***	-0.0665***	0.0155**	0.0219***	0.0307***	0.0231***	0.0197***	0.0098	0.0193***
	(11.49)	(11.46)	(-11.73)	(-11.48)	(2.31)	(3.17)	(3.58)	(2.62)	(2.93)	(1.45)	(2.88)
$SIZE_{t-1}$	-0.0017***	-0.0019***	-0.0011*	-0.0018***	-0.0028***	-0.0026**	-0.0039***	-0.0024***	-0.0030***	-0.0022***	-0.0029***
	(-2.97)	(-3.25)	(-1.86)	(-3.16)	(-4.92)	(-4.30)	(-5.37)	(-3.29)	(-5.25)	(-3.82)	(-5.16)
$TANG_{t-1}$	0.0004	0.0021	-0.0002	0.0020	0.0306***	0.0337***	0.0278***	0.0326***	0.0337***	0.0293***	0.0335***
	(0.07)	(0.38)	(-0.04)	(0.37)	(5.37)	(5.75)	(3.80)	(3.81)	(5.91)	(5.14)	(5.89)
$CASH_{t-1}$	0.0645***	0.0630***	0.0575***	0.0624***	0.0378***	0.0468***	-0.0054	0.0167	0.0364***	0.0369***	0.0366***
	(4.69)	(4.57)	(4.53)	(4.20)	(2.78)	(3.32)	(-0.31)	(0.88)	(2.67)	(2.71)	(2.68)
Intercept	0.2325***	0.2462***	0.2358***	0.2527***	0.2173***	0.0084	0.0982***	0.1248*	0.2291***	0.2218***	0.2350***
	(4.92)	(5.11)	(5.00)	(5.27)	(4.76)	(0.12)	(2.04)	(1.74)	(4.91)	(4.89)	(5.07)
Country-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster by firm and year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-fixed effects	No	No	No	No	No	No	No	No	No	No	No
Year-fixed effects	No	No	No	No	No	No	No	No	No	No	No
R-Square	0.2066	0.2055	0.2087	0.2061	0.2250	0.2289	0.2214	0.3158	0.2250	0.2252	0.2256
N Obs	32,862	32,862	32,862	32,862	32,862	30,886	21,048	15,592	32,862	32,862	32,862
N Firms	7,811	7,811	7,811	7,811	7,811	7,356	7,218	3,468	7,811	7,811	7,811

Columns (1)–(4) report coefficient estimates of model [2]. Columns (6)–(11) report coefficient estimates of model [3]. The dependent variable is INV, defined as the ratio of gross capital expenditures to book value of total assets at the beginning of the year. LNSALESG is the natural logarithm of annual growth of sales. CREDITORS is the indicator of the country's creditor rights and four indicators are used: CREDR-RoL is the interaction of the legal rights index with the rule of law measure provided by the World Bank, lagged by one year; CREDR is the legal rights index developed by the World Bank one-year lagged; CREDR-RoL2003 is the value of CREDR-RoL at the beginning of 2003; and CREDR-2003 is the value of CREDR at the beginning of 2003. DISTRESS is a dummy variable identifying firms in financial distress and takes the value of 1 if the firm's Z-score in a particular year is below 1.81. Otherwise, it takes 0 (DISTRESSAltman). LEV is the corporate ratio of the book value of total debt to book value of total assets. SIZE is the natural logarithm of total assets. TANG is the percentage of property, plant and equipment in total assets. CASH is the ratio of cash reserves to total assets. The firm-level explanatory variables are lagged one year compared to INV. The main regressions include country-year and industry-year dummy variables, and control for firm and time effects by clustering standard errors by firm and year. ***, **, * indicate significance at 1%, 5%, and 10% respectively.

influence of creditor rights on investment efficiency in both healthy and distressed firms operates more through changes in over-investment than in underinvestment.

In terms of policy implications, the paper suggests additional trade-off effects for creditor rights. On the positive side, strong creditor rights not only extend credit supply and foster bank development and economic growth, as shown by Djankov et al. (2007), Haselman et al. (2010), and Houston et al. (2010), but also promote greater investment efficiency in financially heathy firms. This positive effect for creditor rights is in contrast to the negative effects found by Acharya and Subramanian (2009) and Acharya et al. (2011) on corporate investment resulting from reduced corporate risk-taking and innovation. On the negative side, this paper shows that strong creditor rights not only promote greater bank risk-taking, as Houston et al. (2010) show, but also worsen investment efficiency in financially distressed firms. This implies that the strengthening of creditor rights should be accompanied by measures reinforcing financial stability. Otherwise, there will be greater negative effects in terms of bank instability and investment distortions for firms in financial distress.

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