# Creditor rights and corporate risk-taking[1]

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## Abstract

We propose that stronger creditor rights in bankruptcy reduce corporate risk-taking. Employing country-level data, we find that strong creditor rights are associated with a greater propensity of firms to engage in diversifying mergers, and this propensity changes in response to changes in the country creditor rights. Also, in countries with stronger creditor rights companies' operating risk is lower, and acquirers with low-recovery assets prefer targets with high-recovery assets. These relationships are strongest in countries where management is dismissed in reorganization, suggesting an agency-cost effect. Our results suggest that there might be a "dark" side to strong creditor rights in that they can induce costly risk avoidance in corporate policies. Thus, stronger creditor rights may not necessarily be optimal.

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## 1. Introduction

Stronger legal rights of securities holders are generally considered a good thing. Stronger creditor rights may reduce the costs that result from the conflict of interests between owners and financiers (for example, by limiting the ability of owners to appropriate firm's cash flows) and thus lower the firm's cost of capital. This paper proposes that strong creditor rights may have a "dark side" in that they affect the corporate investment policy: stronger creditor rights induce firms and managers to reduce their operating risk and engage in risk-reducing, potentially inefficient, investments. Strong creditor rights cause inefficient liquidations that extinguish the continuation option of firm's enterprise and impose private costs on management if these rights mandate the replacement of management. In response, shareholders and management reduce the likelihood of distress by cutting down on risk-taking activities. They may thus prefer a risk-reducing corporate action – diversification or reducing operating risk – that would otherwise not be taken. We provide cross-country as well as within-country empirical evidence in support of this thesis.

Our empirical evidence employs three different measures of corporate risk-taking whose variation across countries we seek to explain. We find the following:

(1) Creditor rights affect the nature of mergers and acquisitions (M&A) activity – whether it is focusing or diversifying across industries. Stronger creditor rights in a country are associated with a greater propensity to do diversifying mergers. Furthermore, changes in a country's creditor rights affect the M&A activity in a similar direction: diversification increases following the strengthening of creditor rights and declines if they are weakened.

(2) In countries with stronger creditor rights, there is a lower level of operating risk, measured by the standard deviation of firms' ROA.

Overall, these results are strongest (statistically as well as economically) for the creditor rights corresponding to whether there is no automatic stay on secured creditors

(*AUTOSTAY*) and whether management is replaced in bankruptcy (*MANAGES*). For example, *MANAGES* affects the likelihood of a merger being in the same industry by 6.6% (based on Table 3) where the standard deviation of this likelihood across countries is 10.3%. Similarly, *MANAGES* lowers the operating risk measured at the country level by around 3% (based on Table 8) where the cross-country standard deviation of operating risk is 2%. Thus, the effect of creditor rights on corporate investment policy seems reasonably large.

Since countries differ in the composition of their industries, and since the propensity to diversify or reduce risk may differ across industries, we test the relationship between creditor rights and diversifying mergers after controlling for the industry effect following the methodology of Rajan and Zingales (1998). We find that after controlling for the industry effect, the findings in (1) and (2) above still hold.

(3) In countries with strong creditor rights, target firms whose assets have high recovery value in default (or distress) are more likely to be acquired by firms whose assets have low recovery value. This is because high recovery value of assets may enable firms in distress to defer default by liquidating some of these assets and using the proceeds to service the debt. Thus, by acquiring a high-recovery target, a low-recovery firm reduces the likelihood of default in case of distress.

Our analysis focuses on M&As since they provide a unique opportunity to observe the type of a major corporate investment and its potential effect on corporate risk – whether the acquisition is diversifying (across industries) or focusing (within-industry). In M&As, we can also identify clearly the nature of the assets in which the company is investing – whether they have high or low recovery value. Also important, especially for our setting, corporate investment in the form of M&A is not tainted by cross-country differences in accounting and disclosure practices that affect other measures of investment such as capital expenditures and R&D. However, we recognize that firms employ other, likely difficult to observe, means to reduce risks, and therefore we also analyze the overall operating risk of firms.

Our paper is related to both the literature on diversification by firms and on the effect of creditor rights of a country on firm's investment and financial choices. On the diversification front, Amihud and Lev (1981) propose and provide evidence that managers, as opposed to stockholders, engage in conglomerate mergers to reduce their largely undiversifiable employment risk. A wave of literature since then has examined which managerial agency problem – aversion to risk or empire-building – leads to conglomeration and has by and large ended up with mixed conclusions (see, for example, Aggarwal and Samwick, 2003). Our paper suggests that managerial aversion to risk is at play in the decision to conglomerate and to reduce the firm's operational risk.

Throughout the paper, we exploit as explanatory variable the variation across countries in rights accorded to creditors in their bankruptcy codes. Djankov et al. (2007a) show evidence that creditor rights have changed little between late 1970s and early 1990s, the beginning of our dataset. Therefore, we can consider creditor rights in a country to be a function of its legal origin and largely exogenous to the nature of the country's overall corporate investment. Even the few creditor right changes within a country, whose effects we analyze, are often motivated by exogenous forces such as promoting employment, recovering from crises, transition from socialist to capitalist regimes, among others.

In the strand of the literature that has examined the impact of creditor rights on investment policy a number of recent studies are of relevance. Manso (2005) and Landier (2006) focus theoretically on the de-motivating effect on innovation and entrepreneurship of tough outcomes for entrepreneurs upon failure (strong creditor rights, being an example). Acharya and Subramanian (2007) embed the choice of leverage as well as innovation in a theoretical setting and also show empirically that strong creditor rights bear significantly negatively on corporate innovation, measured by the intensity of patent creation and citation by firms. While their evidence is based on cross-country and time-series analysis, Chava and Roberts (2006) and Nini, Smith and Sufi (2006) consider the effect on firm-level investments of creditor rights, exploiting the within-US variation in the form of covenants and capital expenditure restrictions explicitly contained in debt contracts.

In one set of complementary papers, there has been an increased interest in the impact of creditor rights and their enforcement on debt financing (see Haselmann, Pistor and Vig, 2006, and Djankov, McLeish, and Shleifer, 2007a, 2007b). This literature, by and large, has focused on financing choices taking as given the investment choices of firms. Our paper argues that investment choices of firms also respond to creditor rights.

Finally, another set of complementary papers examines legal institutions other than creditor rights in bankruptcy. Rossi and Volpin (2004) document that strong shareholder rights play an important role in determining the volume and number of mergers and acquisitions across countries. John, Litov and Yeung (2007) show evidence that investor protection is an important determinant of the risk-taking incentives of corporate insiders.

The outline of the paper is as follows. Section 2 presents a model of the causal effect of creditor rights on corporate investment choice. Section 3 discusses the data and empirical design and presents the results. Section 4 offers concluding remarks.

## 2. Model

We present a stylized model to analyze the effect of creditor rights on firm's risk-taking incentives. In particular, the model examines the effect of reorganization outcomes for management and shareholders of a distressed firm on the ex-ante investments of the firm. The time-line of the model is presented in Figure 1.

INSERT FIGURE 1 HERE.

Consider a firm at date 0 that is run by an owner/entrepreneur (the "manager" of the firm). The firm has some existing debt in place of face value $F$ which is maturing at date 1. The manager can choose the risk of the firm's cash flows from date 0 to date 1. We adopt the technology for choice of risk from a part of the banking literature, starting with the models of Blum (1999, 2002) and Allen and Gale (2000). The investment

choices at date 0 are indexed by $y \geq 0$, which represents the firm's cash flow in case the investment succeeds at date 1. Success is likely with probability $p(y)$, where $0 < p(y) < 1$, $p'(y) < 0$, and $p''(y) < 0$. With remaining likelihood, $[1 - p(y)]$, the investment fails at date 1 and produces cash flow of zero. Thus, $y$ is also an index for the risk of default of the firm: Greater $y$ reduces the likelihood of success $p(y)$ (in a concave fashion). Agents are risk-neutral and the risk-free rate of interest is zero.

In case of failure at date 1, the continuation prospects of the firm are as follows. If the firm is continued, then it yields a cash flow $a_h L$ or $a_l L$ with probability 0.5 each, where $a_h > 1 > a_l > 0$ and $L$ is the amount that represents the outside opportunity for the firm (e.g., proceeds from a sale to a competitor or piece-meal liquidation). Thus, when continuation prospect is $a_h$, it is efficient to continue the firm, whereas when it is $a_l$, it is efficient to liquidate the firm through the outside opportunity. We assume that $a_l L < F < a_h L$, so that there is default on debt in at least some states of the world and there is at least one continuation outcome from distress under which firm owners have some residual value. It turns out not too important in our model whether $L$ is greater or smaller than $F$. Hence, we set $L > F$, an assumption that leads to more parsimonious expressions.

We consider first the benchmark case in the absence of any leverage and distress-related inefficiencies. In this case, the expected value of firm's cash flows is given by

$$y\,p(y) + [1-p(y)]\,[\,0.5a_hL + 0.5L\,]\,, \tag{1}$$

which reflects the efficient continuation and liquidation of the firm when the investment produces the low cash flow at date 1 and continuation prospects are respectively, $a_h$ and $a_l$. The efficient choice of $y$, denoted as $y^*$, which determines the firm's risk of default at date 0, maximizes this expected value. The efficient risk $y^*$ is thus given by the first-order condition:

$$p(y) + p'(y)\,[\,y - 0.5\,L\,(1 + a_h)\,] = 0\,. \tag{2}$$

Note that as $y$ increases from its lowest value of 0, initially $y < 0.5\,L\,(1 + a_h)$ and since $p'(y) < 0$, the left-hand side of this first-order condition is positive. Thus, at very low $y$, it

is optimal to increase risk further. Eventually, $y$ exceeds $0.5\ L\ (1 + a_h)$. In this case, the second term on the left-hand side of the first-order condition becomes negative whereas the first term is always positive. We assume that the range of $y$ is high enough so that the first-order condition is met exactly at some risk level $y^*$.

The second-order derivative of the objective with respect to $y$ is

$$2\ p'(y) + p''(y)\ [\ y - 0.5\ L\ (1 + a_h)\ ]\ . \qquad (3)$$

As argued above, $y^* > 0.5\ L\ (1 + a_h)$ so this second-order condition is always negative, implying that the first-order condition indeed gives the optimum that maximizes expected firm value.

Consider now the firm with leverage. In this case, the choice of risk at date 0 is made by the owner/manager who maximizes equity value net of creditor payments, and anticipates the outcomes from resolution of distress (if any) at date 1. It is possible to build a model where the continuation versus liquidation choices at date 1 depend upon the extent of leverage and whether control rights are conferred by the bankruptcy code on creditors or owners/management (see, for example, Acharya, Sundaram and John (2004) or Acharya and Subramanian (2007), and the references therein). We adopt a reduced-form approach instead since our primary goal in this paper is empirical.

We assume that in the low state at date 1, with probability $q$, the management of the firm is fired. In other words, creditors take over the firm. Assuming that creditors do not have the expertise to continue the firm, the firm is simply liquidated at value $L$. If management is fired, we assume it suffers a private, reputation cost denoted as $m > 0$. Alternatively, $m$ represents the loss of private benefits of control.

With probability $(1-q)$, the management of the firm stays in place. However, the firm need not necessarily get reorganized in an efficient manner. In particular, with probability $r$, and independent of whether the continuation prospect is $a_h$ or $a_l$, the efficient decision to continue or liquidate is not undertaken. That is, if continuation prospect is $a_h$, then with probability $r$, the firm is inefficiently liquidated, and with probability $(1-r)$, the reorganization is efficient and the firm is continued under existing management yielding $a_h L$. However, if the continuation prospect is $a_l$, then the firm is

always liquidated since even under continuation, firm's equity is under water and management has no incentives to run the firm.

Two observations are in order. First, the inefficiency in reorganization arises from the fact that creditors might fail to reach a reorganization outcome that enables the firm to continue as an ongoing concern when it is efficient to do so. Second, the probabilities *q* and *r* are assumed to be a property of the legal environment in which the firm operates, namely of the country's creditor rights. The reader can notice that modeling directly the probabilities of firing the management and of failing to reach reorganization in distress helps map these outcomes to their empirical counterparts of creditor right scores (as measured, for example, in LaPorta, Lopez-de-Silanes, Shleifer, and Vishny (1998)). The first empirical counterpart is the score *MANAGES,* which is one if management is not retained in bankruptcy. The second counterpart is the set of other creditor right scores, namely *AUTOSTAY*, *SECURED* and *REORG*. These correspond to there being no automatic stay on secured creditors' rights, secured creditors being paid first, and reorganization requiring creditors' consent. These features confer control rights upon creditors and are more likely to result in inefficient liquidations of the firm.

With this motivation of the modeling choices, we revert to analysis of the model with leverage. In this case, the owner/manager chooses the risk *y* to maximize the expected value of equity net of the private costs from distress, given as:

$$p(y)\,[y - F] + [1\text{-}p(y)]\,[\,-\,q\,m + (1\text{-}q)\,(1 - r)\,0.5\,(a_h L - F)\,]. \qquad (4)$$

This expression reflects the fact that management suffers a private cost *m* when fired and has residual value in distress only with probability [*(1-q) (1-r) 0.5*], or in other words, only when they are not fired, there is a successful reorganization, and the continuation value of the firm is high. The optimal choice of risk for the levered firm $y^{**}$ is thus given by the first-order condition:

$$p(y) + p'(y)\,[\,y - F + q\,m - (1\text{-}q)\,(1\text{-}r)\,0.5\,(a_h L - F)\,] = 0\,, \qquad (5)$$

and, the second-order derivative is

$$2\,p'(y) + p''(y)\,[y - F + q\,m - (1-q)\,(1-r)\,0.5\,(a_h L - F)]\,. \qquad (6)$$

Note that since $p'(y) < 0$ at the optimal risk choice $y^{**}$, we must have $[y - F + q\,m - (1-q)\,(1-r)\,0.5\,(a_h L - F)] > 0$, so that the second-order derivative above is negative and the first-order condition indeed gives the optimum that maximizes the objective of manager.

Comparing the first-order conditions for unlevered firm's choice $y^*$ and the levered firm's choice $y^{**}$ is instructive. The three terms after $y$ inside [.] in the condition (5) for $y^{**}$ illustrate the additional effects on risk-taking for a levered firm. The first term, $-F$, reflects the fact that a levered firm has incentives to shift risk given equity's "option" like payoff at date 1. This effect is however not sensitive to creditor right parameters $q$ and $r$. The second term $q\,m$ reflects the risk-aversion induced in managerial objective by the fact that management suffers a private cost upon being fired. This effect is increasing in $q$, the likelihood that management is fired in bankruptcy, assumed to be a property of the creditor rights of the country. The third term $-(1-q)\,(1-r)\,0.5\,(a_h L - F)$ also corresponds to a risk-shifting incentive. This is the "option" effect from date 2 when the firm is continued. Crucially, the strength of this effect diminishes in $q$ as well as in $r$, the likelihood that the firm fails to be efficiently reorganized in bankruptcy.

To summarize, creditor rights that replace management in distress and that are less likely to lead to a reorganization outcome discourage ex-ante risk-taking by firm's management. We can prove these two results formally as follows. Denoting the first-order condition for management's optimization as $f(y^{**}(q,r), q, r) = 0$, the second-order condition implies $\delta f / \delta q < 0$. In turn, taking the derivative of $f$ with respect to $q$ or $r$, and applying the implicit-function theorem gives

(i) $sign\,(dy^{**}/dq) = sign\,(\delta f / \delta q)$, which is negative since
$\delta f / \delta q = p'(y)\,[\,q\,m + (1-r)\,0.5\,(a_h L - F)] < 0$,

and, similarly,

(ii) $sign\,(dy^{**}/dr) = sign\,(\delta f / \delta r)$, which is also negative since

$$\delta f / \delta r = p'(y) [ (1-q) 0.5 (a_h L - F)] < 0.$$

Thus, the risk undertaken by a levered firm declines in the likelihood that management is fired in distress and that reorganizations promoting continuations of the firm do not materialize. These two implications constitute the center stage of our empirical investigation.

## 3. Data and Empirical Design

In studying the effects of creditor rights on corporate propensity to take risk, we conduct a number of tests. First, we examine whether the propensity of firms to diversify through mergers and acquisitions and test if this propensity increases as a function of the country's creditor rights, both in the cross-section of countries and in time-series, around changes in creditor rights of a country. Here, we directly observe the action that companies take in order to affect their risk. Since most companies can reduce their risk by applying other means that may be difficult to observe directly, we also conduct a second test of whether companies' operating risk is decreasing in creditor rights. Both of these tests are conducted in two ways. In one, the unit of observation is a transaction, and in the other, we look at country averages.

The results of these tests are overall consistent with our model. In countries with strong creditor rights, there is greater propensity of companies to do diversifying acquisitions. In general, operating risk is lower in countries with strong creditor rights. Below, we describe our data, tests and results in greater detail. Details of how our various variables are constructed are provided in Table 1.

INSERT TABLE 1 HERE.

### 3.1. Creditor Rights

The data on creditor rights is taken from LaPorta, Lopez-de-Silanes, Shleifer, and Vishny (1998), whose sample contains data for 49 countries, and records creditor rights provisions in the cross-country sample as of 1994. The variable *CRIGHTS* is the sum of four provisions: *AUTOSTAY*, the absence of automatic stay on the assets of the debtor in reorganization; *REORG*, the requirement of creditors' consent or minimum dividend for a debtor to file for reorganization; *SECURED*, ranking secured creditors first in the disposition of assets of the bankrupt firm upon filing for reorganization; and *MANAGES*, the removal of management from managing the activities of the firm upon filing for reorganization. Each of these provisions takes a value of 1, if it is present in the country's bankruptcy code or zero if it is absent. Consequently, the range of values for *CRIGHTS* is 0 through 4. We also use the extended sample and detailed creditor rights data of Djankov et al. (2007a) to examine the impact of changes in creditor rights on the subsequent corporate risk-taking.

### 3.2. Creditor rights and diversification in M&A activity

The data on acquisitions is obtained from the Securities Data Corporation (SDC)'s Platinum Mergers & Acquisitions database for the period 1994-2004. We consider only mergers where both the acquirer and the target are in the same country, thus being under the same jurisdiction as it applies to creditor rights. We exclude mergers where acquirer comes from the financial industry (SIC header 6) or a regulated industry (SIC headers 48 and 49) since for such acquirers, the motives for diversification may be linked to regulatory requirements to reduce risk and therefore may differ from those presented in our model. We further exclude transactions where the acquirer and the target are the same company (repurchases recorded as acquisitions), transactions where the acquirer is a mutual company, investment company, subsidiary, or state-owned enterprise, and transactions in which the percentage acquired from the target is less than

20 percent.[2] Finally, we include only countries with more than 50 transactions that satisfy the above criteria in our sample period. Additional data requirements related to the control variables, in particular the value of creditor rights as of 1994, reduce our sample to 38 countries, for which we present descriptive statistics in Table 2.

INSERT TABLE 2 HERE.

Our first set of tests is based on measuring corporate risk reduction through diversification, using the nature of mergers and acquisitions activity in countries.

**Hypothesis I**: The propensity to do diversifying acquisitions increases in the strength of the country's creditor rights.

We test Hypothesis I by an empirical specification that estimates the likelihood of same-industry merger in a country as a function of the creditor rights in that country, and a set of control variables. A merger between two companies that is not in the same industry (defined by 2-digit SIC code) is considered a diversifying merger.[3] Under our hypothesis, the likelihood of same-industry mergers in a country should be a decreasing function of the strength of creditor rights. We study this likelihood at the level of individual mergers and at the aggregate level of countries. For individual mergers data, we examine the likelihood of a merger being in the same industry as the acquirer (Table 3). For the aggregate country level, we analyze the proportion of the same-industry domestic mergers from all domestic mergers in the sample period (Tables 4 and 5).

Before presenting the results, we discuss the explanatory variables we employ in our analysis. First and foremost is the measure of creditor rights, the *CRIGHTS* score from La Porta et al. (1998), and its components, *AUTOSTAY, REORG, SECURED* and *MANAGES*. The prediction is that the likelihood of same-industry mergers is lower in countries with stronger creditor rights.

[2]Our results are robust to a less conservative selection approach, e.g. if we consider all transactions with at least 10% acquired. Our results are also unchanged when we examine a more conservative sample, e.g. consider only transactions in which the acquirer obtains at least 51% of the company, the transaction value is at least 1 million US$, the transaction represents at least 1% of the total assets of the acquirer, and the transaction is completed within three years of the announcement of the deal. These latter selection criteria are similar to those in Moeller, Schlingemann, and Stulz (2004).

[3] The results are qualitatively similar when we employ industry classification at the 3-digit SIC level.

We also employ a number of other control variables. We include shareholder rights index, *SHRIGHTS*, which may have a positive effect on the likelihood of same-industry mergers if they are perceived beneficial to shareholders' wealth (Rossi and Volpin, 2004). We include *Rule of Law* as a proxy for the character of legal rules and the quality of law enforcement, which could influence the development of financial markets (La Porta et al., 1997), and through that channel influence growth and the nature of mergers.[4] We also control for *Legal Origin*, as creditor- and shareholder rights are both influenced by the legal origins (La Porta et al., 1998). These three control variables are obtained from Levine and Demirguc-Kunt (2001) and LaPorta et al. (1998).

In additional controls, we employ macroeconomic volatility, as it may impact the risk-taking of corporate insiders. We include a direct measure of the country's macroeconomic risk, *MacroRisk*, the standard deviation of quarterly changes in the country's index of industrial production.[5] We expect it to have a negative coefficient, implying that firms do more diversifying mergers in riskier countries. We also include the logarithm of the country's average real *GDP per-capita* over 1994-2000 from the Penn World Table Version 6.1 as a proxy for the degree of economic development. The latter control is necessary as developed and developing countries may have different investment opportunity sets (Acemoglu and Zilibotti, 1997). Furthermore, this variable is used in other studies of cross-country comparisons and is perceived to reflect hard-to-quantify country-level characteristics. Finally, in the individual merger regression (Table 3), we also control for the logarithm of the *Transaction Value* (a measure of size) in US dollars, as there is significant heterogeneity across that measure in our sample. To address concerns of covariance across residuals of same-country cases, we follow Bertrand, Duflo and Mullainathan (2004) in clustering the standard errors at the country level (in the OLS regressions). The estimated model is

$$Pr(\text{same industry merger}) = \alpha * CRIGHTS + \text{control variables}. \quad (7)$$

[4] LaPorta et al. (1997) point out that stock market capitalization or the total assets of financial institutions are endogenous to economic development, shareholder rights, creditor rights, rule of law, and legal origins. Therefore, we do not control for these variables. Instead of including these (outcome) proxies for equity and debt market development, we include only the (primitive) institutional variables as controls.

[5] See Table 1 for details.

The dependent variable equals 1 if the merger is in the same 2-digit industry. Our hypothesis implies that $\alpha < 0$.

INSERT TABLE 3 HERE.

The results, presented in Table 3, strongly support our hypothesis. The coefficient of *CRIGHTS* is negative and statistically significant (column 1), meaning that stronger creditor rights are associated with lower probability of same-industry merger in the country. The creditor rights components that affect this result most significantly (columns 5 through 6) are *AUTOSTAY* and *MANAGES*. The latter, representing the requirement that management does not retain administration of the firm pending the resolution of the reorganization, is the most important determinant (both statistically and economically) of the decision to merge within the same industry, with its effect being more than thrice as strong as the overall effect of *CRIGHTS.* The results remain the same when we exclude the United States from the sample which has by far the largest number of mergers (column 6).

This result is unchanged when we test our hypothesis by a different specification, a random effects Probit model (Guilkey and Murphy, 1993). The results, presented in columns (7) and (8), are consistent with the previous OLS results that stronger creditor rights are associated with a lower propensity for same-industry mergers. The coefficient on creditor rights is highly statistically significant in both specifications, regardless whether we include all 38 countries or only 37, excluding the U.S.

Regarding the other variables, *SHRIGHTS* has positive – although not always significant – coefficient. The contrast between the signs of *CRIGHTS* and *SHRIGHTS* highlights the conflict of interests between creditors and shareholders when it comes to risk-taking in corporations. *MacroRisk* has negative coefficient, as expected, meaning that in countries with greater macroeconomic risk, mergers tend to be more diversifying (i.e., lower probability of same-industry merger).[6]

[6] We re-examine the evidence in Table 3 with additional controls that capture such cultural differences, following Stulz and Williamson (2003). In particular, we control for the religious composition of the population, Our main result is qualitatively unchanged.

Next, we test our hypothesis at the aggregate *country level*, where each country is one observation. Here, large and small countries are treated alike. We calculate for each country the measure *PROP*, the proportion of same-industry domestic mergers from all domestic mergers in the sample period. Since *PROP* is a ratio bounded between 0 and 1, we employ the Theil transformation of the share of same industry mergers:

$$PROP = \ln [ SAME / (1\text{-}SAME) ], \quad (8)$$

where *SAME* is the proportion of mergers in the same two-digit SIC code industry.

INSTER TABLE 4 HERE

Table 4 presents the results for the model (*c* denoting a country):

$$PROP_c = \beta_0 + \beta_1 * CRIGHTS_c + controls. \quad (9)$$

Our hypothesis that $\beta_1 < 0$ is again supported by the data. The coefficient of *CRIGHTS* is negative and significant (column 1). When looking at the components (columns 2 through 5), we observe that *AUTOSTAY* and *MANAGES* again have negative coefficients, although only *MANAGES* is highly statistically significant and its effect is four times as large as the overall effect of *CRIGHTS.* The coefficient of *SECURED* is also negative and significant. If secured creditors are always paid first, then violations of absolute priority rule are smaller and management and shareholders anticipate receiving less in a reorganization of the firm. The results are similar in column (6), when using the weighted average *CRIGHTS* over the sample period. The weights are the number of transaction in the years following the year of change in one of the *CRIGHTS* components, since a change in the law is reflected in transactions in subsequent years. The calculation of this variable employs the time series data of the *CRIGHTS* components in Djankov et al. (2007a).

Figure 2 plots the variable *PROP* for different countries as a function of their *CRIGHTS* and also shows the best fit implied by column (1) of Table 4, illustrating well

the negative relationship between strength of creditor rights and the extent of same-industry mergers.

INSERT FIGURE 2 HERE.

To check the robustness of the main results to sample period selection, we again estimate the relationship between *PROP* and *CRIGHTS* across countries, splitting the sample period into two, 1994-1999 and 2000-2004, and calculating *PROP* for each subperiod. In this regression, we allow for unbalanced panel, excluding one sub-period for a given country if it does not have at least 30 transactions in that sub-period. The results, presented in Table 5, again support our hypothesis: creditor rights (especially, no automatic stay on secured creditors and no stay for management in distress) have a significant negative effect on the proportion of same-industry mergers.

INSERT TABLE 5 HERE.

### 3.3. The effects of *changes* in creditor rights on diversification in M&A activity

Our analysis so far has shown a negative association between a country's creditor rights and the propensity of firms to engage in same-industry mergers. Six countries in our sample underwent changes in their creditor rights provisions during our sample period: Indonesia, Israel, Japan, Russia[7], Sweden, and Thailand. The changes in all these countries implied a decrease by one unit in creditor rights, except for Russia which had a decrease in 1998 and an increase in 2002. We use these changes in creditor rights to examine whether the propensity of firms to engage in same-industry mergers responded to changes in *CRIGHTS*. This would strengthen the case for causality running from *CRIGHTS* to risk reduction via diversifying M&As. The changes in the bankruptcy code in these countries can be reasonably assumed to be largely exogenous. They were driven mainly by financial crises (Indonesia, Russia, and Thailand), the need to collect state tax

[7] Russia is included only in this table's regressions, not in any other estimation, since it has a unique legal origin. Then, its inclusion with a unique dummy variable for its legal origin will not change any of the results reported.

(Russia, 1998) or emulation of the U.S. when switching from more centrally-controlled economy.

Given this backdrop of creditor rights changes in our sample, we estimate the following regression which is a variant of the estimation employed in Table 3:

$$Pr(\text{same industry merger}) = \alpha * \Delta CRIGHTS_c + \text{control variables}. \quad (10)$$

The change in *CRIGHTS* of country c, denoted $\Delta CRIGHTS_c$, equals 1 in the period when *CRIGHTS* changes to be stronger and 0 in the period when *CRIGHTS* changes to become weaker. As discussed, all changes in *CRIGHTS* during the sample period but one made them weaker, in which case $\Delta CRIGHTS = 1$ prior to the change and $\Delta CRIGHTS = 0$ thereafter. For most countries in our sample, $\Delta CRIGHTS = 0$ for the entire sample period (i.e., no change). By our hypotheses, we expect that $\alpha < 0$. That is, the propensity to engage in same-industry mergers rises if *CRIGHTS* declines from 1 to 0.

The control variables are, primarily, the industry fixed effects, the legal origins and the logarithm of acquisition size. We further include year fixed effects and country fixed effects in line with the difference-in-differences methodology. We estimate the regression by both linear probability (OLS) and Probit models. We have in this regression 29,567 observations.[8]

INSERT TABLE 6 HERE.

The regression results in Table 6 show that both in OLS as well as in the random effects Probit analysis, the coefficient on changes in creditor rights is negative and statistically significant, as hypothesized. In particular, the reported coefficient from the random effects Probit model corresponds to a marginal effect of -0.240 with *z*-stat of -2.48. The results thus strongly support our hypothesis that *changes* in CRIGHTS, which make them less restrictive, reduce the propensity of acquirers to engage in same-industry

[8] Our observation count in the changes regression is lower than in Table 3 because of data requirement: having creditor rights data from Djankov et al. (2007a) on an *annual* basis for the sample period 1994-2004. This study's data however ends in 2002.

mergers. Alternatively – as was the case – the weakening of CRIGHTS increased the likelihood of same-industry mergers.

### 3.4. Creditor rights and firms' operating risk

We now present a new and independent test of the relationship between creditor rights and corporate risk. So far we have shown that the propensity to engage in diversifying mergers is greater in countries in which creditor rights are strong. However, diversifying acquisitions are not the only means for companies to reduce their risk. Firms can reduce risk by other means which are not directly observed. Therefore, we now measure directly the level of corporate risk and relate it to the creditor rights in the country.

**Hypothesis II:** The volatility of return on firms' assets is decreasing in the strength of the country's creditor rights.

The risk of corporate operations of firm $j$ in country $c$, $RISK_{j,c}$, is computed as the standard deviation of corporate return on assets, using data from Compustat Global Vantage. We first calculate the ratio $E_{j,c,t} = EBITDA_{j,c,t} / ASSETS_{j,c,t}$ where $EBITDA_{j,c,t}$ is the sum of operating income after depreciation (data item #14) and depreciation and amortization expenses (data item #11),[9] and $ASSETS_{i,c,t}$ is the contemporaneous total assets (data item #89). Data are annual. $E_{j,c,t}$ is calculated for the years 1992-2005, and the entire sample of $E_{j,c,t}$ is winsorized at 0.5% in both tails of the distribution to account for possible data errors and large outliers. Then, $RISK_{j,c}$ is calculated as the standard deviation of the $E_{j,c,t}$ series. The entire sample of $RISK_{j,c}$ is again winsorized at 1% in both tails of its distribution to eliminate outliers. We include only firms in the manufacturing industries with data for at least eight years in 1992-2005.

The estimation model regresses *RISK* on *CRIGHTS* and a set of control variables:

$$RISK = \gamma * CRIGHTS + control\ variables. \quad (11)$$

[9] We use *EBITDA* rather than *EBIT* since countries differ in the way they recognize accounting depreciation, which affect the smoothing of earnings over time.

As in the case of diversifying M&A, we estimate this model at two levels of aggregation: at the firm level (Table 7) and at the country level (Table 8), using the average risk of the firms in the country. By our hypothesis, the coefficient $\gamma$ of *CRIGHTS* is negative.

Model (11) includes two new control variables. One is the instrumented value of initial firm leverage (as of the beginning of the time period for which we have data for company *j*; leverage is in book value). Since leverage and risk are determined simultaneously by the firm, we use for the firm's instrumented leverage the average leverage of the other firms in the same 2-digit industry for which data are available. This instrumented leverage value is then used in the second stage regression of *RISK* on *CRIGHTS*. Recalling that *RISK* is the total asset risk, we expect that it is lower if the company's (instrumented) initial leverage is higher. The other control variable is company's size, measured by its initial total assets (as of the beginning of the period from which we calculate *RISK*). It is commonly assumed that larger firms are less risky.

The estimation of the model of single-firm risk level is done as a panel regression, and the residual standard errors are country-clustered. This regression includes only 35 countries because three countries have insufficient data (we require at least 6 firms in a country), giving us a total of 5,376 firms for the firm-level analysis.

INSERT TABLE 7 HERE.

The firm-level results in Table 7, columns (1) through (5), support our hypothesis. The coefficient of *RISK* on *CRIGHTS* is negative and significant. As in the earlier results on same-industry mergers (Tables 3-5), the most significant components of *CRIGHTS* that negatively affect *RISK* are *AUTOSTAY* and *MANAGES*. The effect of *MANAGES,* in particular, remains far larger than the overall effect of *CRIGHTS,* as in Tables 3-5 and larger than the effect of *AUTOSTAY* or any other component of *CRIGHTS.* The results on the effect of *CRIGHTS* are qualitatively unchanged when the U.S. is excluded from the regression (column (6)). The validity of the instrumental variable that we use is evident in all models from the over-identification test (Hansen's J-test). Furthermore, our

instrument has significant explanatory power, as indicated by the excluded instruments F-statistic and the partial R-squared.[10]

INSERT TABLE 8 HERE.

In Table 8, we estimate the *RISK*-*CRIGHTS* relationship at the *country* level, rather than at the company level as in Table 7. Here, all countries are treated alike, each being a single observation. The dependent variable is $RISK^*$, the average of the individual firms' risk measure *RISK*. The results again support our hypothesis. The coefficient of *CRIGHTS* is negative and significant at better than 5%, even though we have only 25 degrees of freedom in this regression. As before, the significant components of *CRIGHTS* are *AUTOSTAY* and *MANAGES*, with the latter being the most effective component of *CRIGHTS*.

In an un-reported robustness test, we use alternative definitions of *RISK*, such as logarithm of *RISK* and the definition of operating risk variability from John, Litov and Yeung (2007).[11] Our results are qualitatively unchanged.

We have thus established through an independent test that in countries with stronger creditor rights, companies have lower operating risk.

### 3.5. Industry-adjusted propensity to reduce risk

Since countries may differ in the intensities of different industries in them, differences between countries may reflect differences in industries between them rather than differences in the countries' *CRIGHTS*. Firms in each industry may have intrinsic or technological (industry-specific) propensity to merge within the industry and to choose certain level of risk (for example, due to the industry's production function). To account for this consideration, we employ the method of Rajan and Zingales (1998). We compare the *realized* propensity of acquirers to choose targets in the same industry, and of firms to

[10] In unreported results, we further examine the Cragg and Donald (1993) weak identification test and confirm that our instrument has sufficiently high explanatory power.

[11] In John, Litov, Yeung (2007), the annual firm's return-on-asset ratio is calculated as the deviation of the firm's *EBITDA/ASSET* from the country's corresponding average ratio for that year. The standard deviation is calculated from these deviations.

choose some level of operating risk, with the *inherent* such characteristic of the industry, and relate the difference between the two to difference in the countries' *CRIGHTS*.

As proxy for the inherent industry characteristic – the industry propensity to do within-industry mergers and to choose some level of operational risk – we use the respective characteristic in the United States, as do Rajan and Zingales (1998). The United States is appropriate because (i) for the US, *CRIGHTS* is low (it equals 1) and hence, the industry characteristics in it is relatively less likely to manifest corporate or management aversion to risk-taking induced by creditors' rights; and (ii) the US has the most developed financial market and most active takeover market. Consequently, we employ the proportion of same-industry M&A acquisitions in the US as a proxy for the technological or inherent propensity of firms in an industry to merge within the industry, and we use the average of operating risk of the firms in US industries as a proxy of the industry inherent risk.

For the inherent propensity of a firm to do within-industry mergers we calculate $PROP_{j,US}$ ($j$ is the acquirer's industry), the ratio of the same industry mergers from total mergers for 2-digit SIC code industries in the US for the period 1994-1997. We compute similarly $PROP_{j,c}$ for all other countries for the subsequent period, 1998-2004. The criterion for including an industry from a given country is having at least six qualified transactions in that industry during the period 1998-2004, and the calculation of $PROP_{j,US}$ requires at least six qualified transactions in that industry during 1994-1997. Following the model in Rajan and Zingales (1998), we then estimate the model

$$PROP_{j,c} = \beta_0 + \beta_1 * PROP_{j,US} + \beta_2 * CRIGHTS_c * PROP_{j,US} + \beta_3 * CRIGHTS_c + controls \quad (12)$$

In this regression, an observation is related to industry $j$ in country $c$. The United States is excluded from the sample. The control variables are the legal origins of the country (the estimated values of the key three coefficients are unchanged when this control variable is removed.) We cluster-adjust the standard errors at the country level

since our industry-country panel is unbalanced. There are 623 industry-country observations, and the estimation is a panel regression.[12]

We expect that $\beta_1 > 0$ because the propensity to do same-industry mergers in industry $j$ in any country $c$ is positively related to the propensity counterpart in the U.S. We further expect $\beta_2 < 0$, since stronger creditor rights in the country mitigates the propensity to do same-industry mergers. We also expect that $\beta_3 < 0$, as before, although our focus is on the sign of $\beta_2$.

INSERT TABLE 9 HERE.

The results strongly support our hypothesis. Consider first Panel A of Table 9, which examines the proportion of same-industry mergers in each industry. The estimation in column (1) follows the Rajan-Zingales (1998) specification which includes country fixed effects to control for country-specific factors. The estimated $\beta_1$ is highly statistically significant, suggesting that the inherent likelihood of acquirers in various industries to do same-industry mergers in different countries is strongly related to the likelihood of the U.S. acquirers doing same-industry mergers. But importantly, the inherent likelihood of doing same-industry mergers by acquirers is significantly reduced in countries with strong creditor rights: $\beta_2$ is negative and highly significant. One standard deviation increase in the interacted term is associated with 7.2% drop from the mean value of *PROP*. The same results are obtained in columns (2) and (3), with additional country-specific variables (but without country fixed effects). The coefficient $\beta_3$ of *CRIGHTS* is negative and significant in a 10% one-tail test.

Panel B of Table 9 examines the industry operating risk (related to the analysis in Tables 7 and 8), relating it to the industry risk level in the US, denoted $RISK_{j,US}$, and to *CRIGHTS*. $RISK_{j,US}$ is the average of *RISK* of firms within industry $j$ for each 2-digit SIC code industry in the US during the period 1992-1998. Similarly, $RISK_{j,c}$ is the average level of *RISK* of firms in similar industries in other countries, calculated over the *following* period 1999-2005. We then perform the following regression:

[12] We cluster at the country-level by allowing block-diagonal structure in the variance-covariance matrix, where each identity sub-matrix corresponds to each country in our dataset.

$$RISK_{j,c} = \delta_0 + \delta_1 * RISK_{j,US} + \delta_2 * CRIGHTS_c * RISK_{j,US} + \delta_3 * CRIGHTS_c + controls. \quad (13)$$

As in specification (12), an observation represents industry *j* in country *c*, excluding the US. An industry from the US that is included in the analysis needs to have at least three companies with available *RISK* measures. Finally, the standard errors are cluster-adjust at the country level. There are 718 industry-country observations, and the estimation is a (unbalanced) panel regression.

The results support our hypothesis. The estimated coefficient $\delta_1$ is positive and significant and, central to our hypothesis, the estimate coefficient $\delta_2$ is negative and significant. The effect is robust to substituting *CRIGHTS* in (13) with country fixed effects, as verified in column (1) in Table 9, Panel B.

### 3.6. Risk reduction and industry recovery rates

As a final test, we examine another aspect of the acquirers' attitude towards risk: the choice of target in a merger or acquisition by the recovery rate of its assets in default (henceforth recovery). In time of financial distress, a firm with high-recovery assets can liquidate some assets and use the proceeds to avoid default, i.e., to extend the life of the implicit call option that is embedded in the firm's equity. Bidder firms whose assets have low recovery value are therefore more vulnerable to default risk because they are less able to defer default by asset liquidation.

We therefore propose the following hypothesis.

**Hypothesis III:** In economies with strong creditor rights, target firms in high-recovery industries are more likely to be acquired by firms in low-recovery industry.

An acquirer in low-recovery industry, being more vulnerable to default, seeks high-recovery assets that can be more easily liquidated in time of financial distress. The dependent variable in the test of this hypothesis is $\Pr(TH \cap AL|TH)$, the probability of acquisition by an acquirer in low recovery industry (AL) of a target in high recovery industry (TH) within the set of all TH transactions. By our hypothesis, this probability is

positively associated with *CRIGHTS*.

For industry-level recovery we use the rankings of Acharya, Bharath and Srinivasan (2006, Table 2) which employs historical experience on defaults in the United States over the period 1982-1999. Low recovery industries (in terms of 2-SIC code headers) are: transportation (37, 40, 41, 42, 44, 45, 46, 47), high technology and office equipment (35, 36, 38), consumer/ service sector (52, 53, 54, 55, 56, 57, 58, 59, 72, 73, 75, 76, 78, 79), and leisure time/ media (27, 48, 70). High recovery industries are: energy and natural resources (10, 12, 13, 14, 24), building products/ homebuilders (8, 15, 17, 24, 28, 29, 32, 34), and healthcare/ chemicals (28, 80.)[13]

INSERT TABLE 10 HERE

The results in Table 10 support our hypothesis. The coefficient of *CRIGHTS* is positive and significant. That is, the stronger are the creditor rights, the more likely it is that a target with high-recovery assets is acquired by a low-recovery firm. In these regressions, the universe is all targets with high recovery, and the bidders are either low-recovery (dependent variable = 1), or high recovery (dependent variable = 0). Columns (1) and (2) are single-acquisition regressions, where column (2) excludes the U.S. (which has by far the largest number of acquisitions), and column (3) presents country-level regressions, where the dependent variable is the proportion of all high-recovery targets acquired by low-recovery bidders. The results are consistent throughout all three columns.[14]

This is additional evidence that creditor rights affect the choice of an acquisition target particularly by low-recovery acquirers, which seek to acquire high-recovery targets. As we argue throughout, if the choice of an acquisition partner is constrained by creditor rights, it may be suboptimal from an overall economic viewpoint.

[13] We have alternatively followed Dyck and Zingales (2004) and characterize as low recovery rate industries the following ones: mining, manufacturing, and transportation. Our results are similar.

[14] We further conduct a test in the spirit of this hypothesis, examining the proportion among all low-recovery bidders that seek high-recovery targets. In this regression, the effect of *CRIGHTS* is insignificant.

## 4. Conclusions

An interesting possibility that emerges from our results is that strong creditor rights may have a "dark" side in terms of their effect on corporate investments and attitude towards risk. Employing several methods, we find that stronger creditor rights in a country induce firms to take less risk and prefer diversifying acquisitions. If these actions would not have otherwise been taken by the firms, it follows that creditor rights have real effect on corporate decisions whose value effects may be questionable.

The existing finance and economics literature generally views strong creditor rights as a positive feature of the law in that they enable firms to raise greater external financing. Our model and empirical work imply that the same creditor rights may destroy firms' incentives to undertake value-enhancing but risky projects, and may induce firms to do value-reducing diversifying acquisitions. Thus, stronger creditor rights are not always optimal. The optimal level of creditor rights may thus have to balance the positive effect on debt capacity of firms and the negative effect on their investment choices. In future work, it would be interesting to get directly at this important tradeoff.

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**Table 1.** Variable Definitions

| Main Variables | Definition | Source |
|---|---|---|
| **Risk-reduction measures** | | |
| *PROP* | Theil transformation of the share of same industry mergers, per country. We define it as follows: PROP = ln [SAME/(1-SAME)]. SAME is the proportion of same 2-digit SIC code industry mergers. | SDC Platinum Mergers & Acquisitions. |
| Firm risk (*RISK*) | $RISK_{i,c} = \left(\frac{1}{T-1}\sum_{t=1}^{T}\left[E_{i,c,t} - \frac{1}{T}\sum_{t=1}^{T}E_{i,c,t}\right]^2\right)^{0.5}$, where $T \geq 8$ and $E_{i,c,t} = \frac{EBITDA_{i,c,t}}{A_{i,c,t}}$ is the earnings scaled by assets of firm *i* from country *c* in year *t*. Data are annual, and the sample period is 1992-2005. The entire data of $E_{i,c,t}$ is winsorized at 0.5% in both tails to account for extreme observations. The entire firm sample of $RISK_{i,c}$ is then Winsorized at 1% in both sides of the sample distribution. | Compustat Global Industrial/Commercial Annual Database. |
| Country risk ($RISK^*$) | The average of $RISK_{i,c,}$ across firms in country c. | |
| **Creditor- Rights Variables** | | |
| Creditor rights (*CRIGHTS*) | An index aggregating creditor rights, following La Porta and others (1998). It is the sum of the four indexes that follow. *CRIGHTS* then ranges between 0 and 4. | La Porta *et al.* (1998), Djankov, McLeish, and Shleifer (2007a) |
| No automatic stay (*AUTOSTAY*) | Equals one if the reorganization procedure does not impose an automatic stay on the assets of the firm upon filing the reorganization petition, secured creditors are able to seize their collateral after the reorganization petition is approved. It equals zero if such restriction does exist in the law. | La Porta *et al.* (1998) |
| Reorganization (*REORG*) | Equals one if the reorganization procedure imposes restrictions, such as creditors' consent or minimum dividend for a debtor to be able to file for reorganization. It equals zero for countries without such restrictions. | La Porta *et al.* (1998) |
| Secured debt first (*SECURED*) | Equals one if secured creditors are ranked first in the distribution of the proceeds that result from the disposition of the assets of a bankrupt firm, as opposed to other creditors such as employees or government. Equals zero if non-secured creditors, such as the government and workers, are given absolute priority. | La Porta *et al.* (1998) |
| No management stay (*MANAGES*) | Equals one if an official appointed by the court, or by the creditors, is responsible for the operation of the business during reorganization, that is management does not retain administration of its property pending the resolution of the reorganization. Equivalently, this variable equals one if the debtor does not keep the administration of its property pending the resolution of the reorganization process, and zero otherwise. | La Porta *et al.* (1998) |
| **Control Variables** | | |
| GDP-per-capita (in US dollars) (*GDP*) | Natural logarithm of the average real GDP per capita in US$, 1994-2000. | Penn World Tables, Version 6.1 |
| Macroeconomic Risk (*MacroRisk*) | The standard deviation of the quarterly growth in real industrial production for each country in the period 1990-2004. For some countries, we use instead the index of manufacturing production: Argentina, Chile, Greece, Hong Kong, Indonesia, New Zealand, Peru, Philippines, Singapore and South Africa. For Argentina, Canada, Taiwan and Thailand, data are from the international database of Global Insight. The variable is measured in decimal points. | International Financial Statistics of IMF. |
| Rule of Law (*LAW*) | The assessment of the law and order tradition of the country. Calculated as "average of the months of April and October of the monthly index between 1982 and 1995. Scale from zero to 10, with lower scores for less tradition for law and order." | International Country Risk Guide; La Porta et al. (1998). |
| Legal Origins | A dummy variable that identifies the legal origin of the Company law or Commercial Code of each country. The detailed origins are French, German, Nordic (default is Common) | La Porta et al. (1998) and the CIA Factbook 2003. |
| Shareholder rights *(SHRIGHTS*) | An index that aggregates shareholder rights. "The index is formed by adding one when: (1) the country allows shareholders to mail their proxy vote to the firm, (2) shareholders are not required to deposit their shares prior to the general shareholders' meeting, (3) cumulative voting or proportional representation of minorities in the board of directors is allowed, (4) an oppressed minorities mechanism is in place, (5) the minimum percentage of share capital that entitles a shareholder to call for an extraordinary shareholders' meeting is less than or equal to 10 percent (the sample median), or (6) shareholders have preemptive rights that can be waived only by a shareholders' vote. The index ranges from zero to six." | Quotation is from La Porta et al. (1998). |

**Table 2. Overall descriptive statistics**

Table 2 describes the total number of domestic mergers in the sample countries for 1994-2004. The sample presented consists of the countries for which we have La Porta et al. (1998) data on creditor rights. We exclude countries that have less than 50 qualified transactions in the sample period. A transaction is qualified if the percentage of acquired shares is at least 20%. We exclude financial industry (SIC header 6) and regulated industry companies (SIC headers 48 and 49) from the country transaction count. The mergers and acquisition data is from SDC Platinum Mergers and Acquisitions database. The year of creditor rights change is the one from the Djankov et al. (2007a) study. We also present data on the average country operating risk proxy, $RISK^{*}$.

| Acquirer's Country | Year of creditor rights change | # Mergers | # Same Industry Mergers | Operating Risk Proxy | Shareholder Rights | Creditor Rights | Macroeconomic Volatility | $ GDP per capita |
|---|---|---|---|---|---|---|---|---|
| | *LAW CHANGE* | *COUNT* | *SAME* | *RISK* | *SHRIGHTS* | *CRIGHTS* | *MacroRisk* | *GDP* |
| Argentina | - | 150 | 55.33% | 0.058 | 4 | 1 | 0.07 | $7,801 |
| Australia | - | 2,939 | 61.72% | 0.121 | 4 | 1 | 0.04 | $20,948 |
| Austria | - | 217 | 64.52% | 0.036 | 2 | 3 | 0.09 | $26,220 |
| Belgium | - | 325 | 57.54% | 0.043 | 0 | 2 | 0.08 | $24,649 |
| Brazil | - | 343 | 70.26% | 0.070 | 3 | 1 | 0.03 | $4,143 |
| Canada | - | 3,798 | 61.37% | 0.094 | 5 | 1 | 0.01 | $20,647 |
| Chile | - | 76 | 61.84% | 0.033 | 5 | 2 | 0.04 | $4,604 |
| Denmark | - | 402 | 56.47% | 0.049 | 2 | 3 | 0.07 | $32,434 |
| Finland | - | 881 | 54.60% | 0.054 | 3 | 1 | 0.08 | $23,856 |
| France | - | 2,666 | 59.79% | 0.045 | 3 | 0 | 0.1 | $24,033 |
| Germany | - | 3,524 | 55.31% | 0.057 | 1 | 3 | 0.04 | $26,443 |
| Greece | - | 324 | 47.22% | 0.043 | 2 | 1 | 0.06 | $11,219 |
| Hong Kong | - | 343 | 34.11% | 0.064 | 5 | 4 | 0.13 | $23,850 |
| India | - | 470 | 57.87% | 0.051 | 5 | 4 | 0.07 | $423 |
| Indonesia | 1998 | 76 | 60.53% | . | 2 | 4 | 0.07 | $868 |
| Ireland | - | 206 | 63.59% | . | 4 | 1 | 0.08 | $21,376 |
| Israel | 1996 | 110 | 45.45% | 0.075 | 3 | 4 | 0.02 | $16,391 |
| Italy | - | 876 | 53.31% | 0.038 | 1 | 2 | 0.12 | $19,814 |
| Japan | 2000 | 3,301 | 46.80% | 0.022 | 4 | 2 | 0.03 | $36,616 |
| Malaysia | - | 1,207 | 25.27% | 0.066 | 4 | 4 | 0.05 | $3,982 |
| Mexico | - | 147 | 62.59% | 0.049 | 1 | 0 | 0.03 | $4,421 |
| Netherlands | - | 846 | 57.80% | 0.059 | 2 | 2 | 0.11 | $24,802 |
| New Zealand | - | 343 | 57.73% | 0.073 | 4 | 3 | 0.06 | $15,528 |
| Norway | - | 341 | 58.94% | 0.079 | 4 | 2 | 0.07 | $33,844 |
| Peru | - | 51 | 68.63% | 0.058 | 3 | 0 | 0.07 | $2,296 |
| Philippines | - | 75 | 56.00% | 0.080 | 3 | 0 | 0.18 | $1,041 |
| Portugal | - | 147 | 65.31% | 0.036 | 3 | 1 | 0.06 | $10,782 |
| Singapore | - | 407 | 32.19% | 0.064 | 4 | 4 | 0.06 | $22,916 |
| South Africa | - | 612 | 49.84% | 0.061 | 5 | 3 | 0.02 | $3,413 |
| South Korea | - | 314 | 32.48% | 0.051 | 2 | 3 | 0.06 | $9,545 |
| Spain | - | 1,122 | 64.08% | 0.040 | 4 | 2 | 0.08 | $14,535 |
| Sweden | 1996 | 680 | 58.53% | 0.067 | 3 | 2 | 0.16 | $26,812 |
| Switzerland | - | 463 | 57.67% | 0.046 | 2 | 1 | 0.07 | $37,908 |
| Taiwan | - | 98 | 44.90% | 0.039 | 3 | 2 | 0.06 | $12,580 |
| Thailand | 1999 | 157 | 43.95% | 0.065 | 2 | 3 | 0.05 | $2,396 |
| Turkey | - | 52 | 50.00% | 0.097 | 2 | 2 | 0.07 | $2,810 |
| United Kingdom | - | 9,446 | 58.61% | 0.071 | 5 | 4 | 0.05 | $21,767 |
| United States | - | 40,656 | 59.07% | 0.088 | 5 | 1 | 0.01 | $30,899 |

**Table 3. Merger-level analysis: proportion of same-industry mergers**

Regressions of the incidence of same-industry mergers on creditor rights, components of creditor rights and controls. The dependent variable equals 1 if both acquirer and target are in the same industry, using 2-digit SIC code. A transaction is included if the percentage of acquired shares is at least 20%. Excluded are transactions where the acquirer is from the financial industry (SIC header 6) or regulated industry (SIC headers 48 and 49). *CRIGHTS* are as of 1994. The control variables include shareholder rights, rule of law, macroeconomic risk, legal origins, the logarithm of average real GDP-per-capita (1994-2000) in US$ and the logarithm of transaction value. All variables are defined in Table 1. The OLS regression include year fixed effects (not reported). Models (1) through (5) include all countries. Model (7) excludes the United States. Models (7) and (8) present estimation based on random probit model; (7) includes all countries and (8) excludes the United States. *t*-statistics are in parentheses. The OLS *t*-statistics are based on robust standard errors that are cluster-adjusted at the country level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Sample period is 1994-2004.

| | OLS | | | | | | Probit | |
|---|---|---|---|---|---|---|---|---|
| | All countries | | | | | Excluding US | All countries | Excluding US |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| *CRIGHTS* | -0.019** | | | | | -0.02** | -0.083*** | -0.086*** |
| | (2.28) | | | | | (2.21) | (5.20) | (4.80) |
| *AUTOSTAY* | | -0.053** | | | | | | |
| | | (2.58) | | | | | | |
| *REORG* | | | -0.024 | | | | | |
| | | | (1.21) | | | | | |
| *SECURED* | | | | -0.013 | | | | |
| | | | | (0.35) | | | | |
| *MANAGES* | | | | | -0.066*** | | | |
| | | | | | (2.81) | | | |
| *SHRIGHTS* | 0.011 | 0.007 | 0.005 | 0.004 | 0.019 | 0.012 | 0.017 | 0.017 |
| | (0.83) | (0.57) | (0.41) | (0.30) | (1.53) | (0.85) | (0.92) | (0.82) |
| *Rule of Law* | 0.134*** | 0.146*** | 0.124*** | 0.119*** | 0.124*** | 0.119*** | 0.249*** | 0.237*** |
| | (3.93) | (4.30) | (3.35) | (3.14) | (3.63) | (2.85) | (4.05) | (3.56) |
| *French Legal Origin* | 0.153*** | 0.167*** | 0.178*** | 0.185*** | 0.151*** | 0.149*** | 0.311*** | 0.325*** |
| | (3.14) | (3.67) | (3.40) | (3.62) | (2.9) | (3.20) | (4.18) | (4.02) |
| *German Legal Origin* | -0.058** | -0.069** | -0.079*** | -0.077*** | -0.018 | -0.069** | -0.097 | -0.072 |
| | (2.16) | (2.63) | (3.12) | (2.93) | (0.51) | (2.17) | (1.52) | (1.00) |
| *Nordic Legal Origin* | 0.040 | 0.031 | 0.072 | 0.082 | 0.026 | 0.043 | 0.103 | 0.120 |
| | (0.64) | (0.51) | (1.06) | (1.18) | (0.46) | (0.70) | (1.30) | (1.44) |
| *MacroRisk* | -1.42*** | -1.506*** | -1.817*** | -2.107*** | -1.273*** | -1.44*** | -3.118*** | -2.931*** |
| | (3.33) | (3.93) | (4.28) | (6.41) | (3.10) | (3.33) | (4.83) | (4.26) |
| *Log GDP per capita* | -0.067*** | -0.071*** | -0.055** | -0.048** | -0.066*** | -0.056** | -0.157*** | -0.156*** |
| | (3.58) | (3.96) | (2.50) | (2.10) | (3.73) | (2.18) | (3.96) | (3.54) |
| *Log( Transaction Value)* | 0.008** | 0.009** | 0.009** | 0.009** | 0.008* | 0.003 | 0.021*** | 0.002 |
| | (2.03) | (2.08) | (2.15) | (2.20) | (1.86) | (0.58) | (6.25) | (0.39) |
| Sample period | 1994-2004 | 1994-2004 | 1994-2004 | 1994-2004 | 1994-2004 | 1994-2004 | 1994-2004 | 1994-2004 |
| Year Fixed Effect | Yes | Yes | Yes | Yes | Yes | Yes | No | No |
| Number of countries | 38 | 38 | 38 | 38 | 38 | 37 | 38 | 37 |
| Observations | 35,165 | 35,165 | 35,165 | 35,165 | 35,165 | 17, 030 | 35,165 | 17, 030 |
| R-squared | 1.60% | 1.60% | 1.50% | 1.50% | 1.60% | 2.00% | - | - |
| Chi-squared | - | - | - | - | - | - | 179.62 | 108.76 |

**Table 4. Country-level analysis: proportion of same-industry mergers**

The dependent variable is the fraction of same-industry mergers (2-digit SIC code) out of all mergers in the country, employing Theil's transformation of the fraction. A country is included in our sample if it has at least 50 qualified transactions over the sample period. A qualified transaction is where at least 20% of the target is acquired. Excluded are acquirers from the financial industry (SIC header 6) and regulated industry companies (SIC headers 48 and 49). The sample period is 1994-2004. All variables are defined in Table 1. Model (6) uses a value-weighted average of the country creditor rights time series (from Djankov et al. (2007a)), where the weights are the number of M&A transactions within a given country in the subsequent year. *t*-statistics (in parentheses) are based on robust standard errors. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| *CRIGHTS* | -0.141** | | | | | |
| | (2.43) | | | | | |
| *VW CRIGHTS* | | | | | | -0.127** |
| | | | | | | (2.16) |
| *AUTOSTAY* | | -0.226 | | | | |
| | | (1.55) | | | | |
| *REORG* | | | -0.087 | | | |
| | | | (0.67) | | | |
| *SECURED* | | | | -0.236* | | |
| | | | | (1.89) | | |
| *MANAGES* | | | | | -0.539*** | |
| | | | | | (3.37) | |
| *SHRIGHTS* | 0.034 | 0.027 | 0.057 | 0.062* | 0.043 | 0.044 |
| | (0.91) | (0.57) | (1.51) | (1.84) | (1.35) | (1.21) |
| *Rule of Law* | 0.167* | 0.173* | 0.168* | 0.182** | 0.079 | 0.176** |
| | (1.91) | (1.89) | (1.83) | (2.06) | (0.95) | (2.09) |
| *French Legal Origin* | 0.325* | 0.44** | 0.579*** | 0.542*** | 0.226 | 0.406** |
| | (1.92) | (2.23) | (3.02) | (3.02) | (1.51) | (2.22) |
| *German Legal Origin* | 0.053 | 0.112 | 0.123 | 0.166 | -0.034 | 0.071 |
| | (0.23) | (0.47) | (0.48) | (0.68) | (0.18) | (0.30) |
| *Nordic Legal Origin* | 0.243 | 0.252 | 0.384* | 0.38* | 0.090 | 0.209 |
| | (1.38) | (1.28) | (1.77) | (1.83) | (0.59) | (1.05) |
| *MacroRisk* | -1.856 | -1.871 | -2.149 | -2.260 | -2.272** | -1.703 |
| | (1.45) | (1.3) | (1.3) | (1.43) | (2.13) | (1.25) |
| *Log GDP per capita* | -0.165 | -0.155 | -0.137 | -0.136 | -0.116 | -0.133 |
| | (1.43) | (1.37) | (1.23) | (1.16) | (1.11) | (1.25) |
| Sample period | 1994-2004 | 1994-2004 | 1994-2004 | 1994-2004 | 1994-2004 | 1994-2004 |
| Observations | 38 | 38 | 38 | 38 | 38 | 38 |
| R-squared | 42.9% | 35.9% | 32.2% | 34.7% | 51.0% | 38.5% |

**Table 5. Country-level analysis across two sub-periods: proportion of same-industry mergers**

The dependent variable is the proportion of same-industry mergers (2-digit SIC code) out of all mergers in the country, employing Theil's transformation. This table is identical to Table 4, except that the proportion of same-industry mergers is calculated separately for each of the two subperiod, 1994-1999 and 2000-2004. A country in included in the sample if it has at least 30 qualified transactions for each sub-period. The rest is as in Table 4.

| Variable | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| *CRIGHTS* | -0.138*** | | | | |
| | (3.20) | | | | |
| *AUTOSTAY* | | -0.253** | | | |
| | | (2.25) | | | |
| *REORG* | | | -0.067 | | |
| | | | (0.66) | | |
| *SECURED* | | | | -0.198 | |
| | | | | (1.40) | |
| *MANAGES* | | | | | -0.55*** |
| | | | | | (4.63) |
| *SHRIGHTS* | 0.022 | 0.008 | 0.043 | 0.048 | 0.028 |
| | (0.51) | (0.18) | (0.95) | (1.06) | (0.71) |
| *Rule of Law* | 0.161** | 0.175** | 0.168** | 0.178** | 0.068 |
| | (2.47) | (2.59) | (2.4) | (2.55) | (1.06) |
| *French Legal Origin* | 0.305* | 0.392** | 0.553*** | 0.522*** | 0.198 |
| | (1.94) | (2.47) | (3.81) | (3.6) | (1.34) |
| *German Legal Origin* | 0.048 | 0.099 | 0.119 | 0.155 | -0.044 |
| | (0.3) | (0.6) | (0.69) | (0.91) | (0.29) |
| *Nordic Legal Origin* | 0.247 | 0.234 | 0.376* | 0.376* | 0.091 |
| | (1.34) | (1.19) | (1.93) | (1.96) | (0.51) |
| *Macro Risk* | -1.996 | -1.951 | -2.284 | -2.373 | -2.433* |
| | (1.45) | (1.36) | (1.54) | (1.63) | (1.9) |
| *Log GDP per capita* | -0.181** | -0.181** | -0.156* | -0.153* | -0.133* |
| | (2.34) | (2.25) | (1.88) | (1.88) | (1.86) |
| Sample Period | *1994-1999 & 2000-2004* | *1994-99 & 2000-04* | *1994-99 & 2000-04* | *1994-99 & 2000-04* | *1994-99 & 2000-04* |
| Fixed Effect | Yes | Yes | Yes | Yes | Yes |
| Observations | 74 | 74 | 74 | 74 | 74 |
| R-squared | 37.3% | 32.7% | 27.8% | 29.5% | 45.6% |

**Table 6. Causality Regressions, merger-level analysis of changes in bankruptcy law**

The dependent variable equals 1 for same-industry acquisition (using 2-digit SIC code). The creditor rights change dummy, *ΔCRIGHTS*, represents a dummy variable with value zero for the control sample (no change in creditor rights) and for the treatment sample (countries in which there was change in *CRIGHTS*) prior to an increase in creditor rights strength or after a decrease in the creditor rights strength if the change reduced the strength of *CRIGHTS*. This dummy variable equals one following an increase in the creditor rights strength, and preceding a decrease in the creditor rights strength. Included are all merger and acquisitions where the acquired percentage shares is at least 20%, the transaction has a disclosed value, and the time changes in creditor rights are available in Djankov et al. (2007a). In part I, model 1 utilizes linear probability model (OLS), while model 2 is based on random probit regressions. For the latter we report the marginal effects. Excluded are transactions where the acquirer is in the financial industry (SIC header 6) or regulated industry (SIC headers 48 and 49). The sample period is 1994-2004. *t*-statistics are in parentheses. In model (1), Part I, standard errors are cluster-adjusted at the country level. Included (but not reported for brevity) are fixed effects for country, year and 2-digit SIC code fixed effects for the acquirer's industry, and legal origins following the difference-in-differences methodology of Bertrand, Duflo, and Mullainathan (2004). In model (2) we include random effects at the country, year, and 2-digit industry code level. $^{***}$, $^{**}$, and $^{*}$ indicate significance at the 1%, 5%, and 10% levels, respectively.

| | ***Part I. Mutivariate Analysis*** | |
|---|---|---|
| | (1) | (2) |
| | ***Linear probability models*** | ***Probit models*** |
| | Pr(*SAME*) | Pr(*SAME*) |
| $\Delta CRIGHTS_{c,t}$ | -0.069*** | -0.240*** |
| | (3.19) | (2.48) |
| *Log (Transaction Value)* | 0.01* | 0.034*** |
| | (1.88) | (8.57) |
| Fixed Effects | Yes: country, year, and industry | No |
| Random Effects | No | Yes: country, year, and industry |
| Observations | 29,567 | 29,548 |

| | ***Part II. Details of Creditor Rights Changes*** | |
|---|---|---|
| | Year of law change | Detail of change |
| Indonesia | 1998 | Change to *SECURED* = 0 |
| Israel | 1996 | Introduction of automatic stay, i.e. *AUTOSTAY* = 0 |
| Japan | 2000 | Change to *SECURED* = 0 |
| Russia | 1998 and 2002 | 1998: Change to *MANAGES* = 0.<br>2002: Re-instating *MANAGES* = 1. |
| Sweden | 1996 | Change to *REORG* = 0. |
| Thailand | 1999 | Change to *REORG* = 0. |

**Table 7. Operating risk and creditor rights: RISK at firm level**

*RISK* is the standard deviation of the firm profitability defined as *EBITDA/ASSETS* (see definition in Table 1). The instrument for initial book leverage is the average book leverage value of other companies from the same country in the same 2-digit SIC code industry. The partial R-squared is the fraction of the variation of book leverage explained by the instrument, net of its effect through the exogenous variables. The test of over-identifying restrictions (Hansen J-test) tests the joint null hypothesis that the excluded instrument is uncorrelated with the error term and is correctly excluded from the second-stage equation. We also include one-digit SIC code industry effects (not reported). The sample period is 1992-2005. Included are companies from the manufacturing industry only (SIC 2000 – 3999). The *t*-statistics (in parentheses) are based on robust standard errors cluster-adjusted at the country level. The $^{***}$, $^{**}$, and $^{*}$ indicate significance at the 1%, 5%, and 10% levels, respectively.

| | All countries | | | | | Exclude US |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (7) |
| *CRIGHTS* | -0.007*** | | | | | -0.005** |
| | (3.79) | | | | | (-2.35) |
| *AUTOSTAY* | | -0.016*** | | | | |
| | | (2.81) | | | | |
| *REORG* | | | -0.004 | | | |
| | | | (0.62) | | | |
| *SECURED* | | | | -0.011 | | |
| | | | | (1.17) | | |
| *MANAGES* | | | | | -0.029*** | |
| | | | | | (8.09) | |
| *SHRIGHTS* | -0.005 | -0.006** | -0.003 | -0.003 | -0.001 | -0.005* |
| | (1.52) | (2.02) | (1.12) | (1.19) | (0.51) | (1.83) |
| *Rule of Law* | -0.002 | 0.000 | 0.004 | 0.006 | -0.011** | 0.0010 |
| | (0.37) | (0.01) | (0.76) | (1.04) | (2.20) | (0.2) |
| *French Legal Origin* | -0.031*** | -0.028*** | -0.013 | -0.016 | -0.031*** | -0.032*** |
| | (2.6) | (2.59) | (1.07) | (1.59) | (3.49) | (2.85) |
| *German Legal Origin* | -0.033*** | -0.037*** | -0.030*** | -0.028*** | -0.02*** | -0.032*** |
| | (3.56) | (3.80) | (3.04) | (3.17) | (3.12) | (3.37) |
| *Nordic Legal Origin* | -0.019* | -0.022** | -0.011 | -0.011 | -0.021** | -0.021* |
| | (1.69) | (2.05) | (0.86) | (0.94) | (2.06) | (1.92) |
| *MacroRisk* | -0.038 | -0.069 | -0.122 | -0.142 | -0.027 | 0.015 |
| | (0.44) | (0.81) | (1.09) | (1.54) | (0.40) | (0.20) |
| *Log GDP per capita* | 0.005 | 0.004 | 0.002 | 0.0010 | 0.010** | 0.0020 |
| | (1.07) | (0.82) | (0.40) | (0.22) | (2.39) | (0.39) |
| *Instrumented initial book leverage* | -0.035 | -0.025 | -0.037 | -0.038 | -0.049* | -0.066** |
| | (1.33) | (0.91) | (1.19) | (1.17) | (1.96) | (2.06) |
| *Log of initial total assets* | -0.013*** | -0.013*** | -0.013*** | -0.013*** | -0.013*** | -0.008*** |
| | (4.04) | (4.22) | (3.94) | (3.90) | (3.74) | (4.30) |
| Observations | 5,376 | 5,376 | 5,376 | 5,376 | 5,376 | 3,806 |
| R-squared | 24.3% | 25.5% | 23.0% | 22.9% | 22.3% | 18.1% |
| Number of countries | 35 | 35 | 35 | 35 | 35 | 34 |
| Excluded instruments robust F-statistic (p-value) | 190.96 (0.00) | 172.11 (0.00) | 192.59 (0.00) | 193.25 (0.00) | 192.86 (0.00) | 115.85 (0.00) |
| Partial R-squared | 4.45% | 4.32% | 4.46% | 4.45% | 4.46% | 6.08% |
| Hansen J-test (p-value) | 0 (1.0) | 0 (1.0) | 0 (1.0) | 0 (1.0) | 0 (1.0) | 0 (1.0) |

**Table 8. Country-level operating risk, *RISK**, and creditor rights:**

*RISK** is the average for each country of the variable *RISK* of the firms in the country, where *RISK* is the standard deviation of the firm profitability. Included are companies from the manufacturing industry only (SIC 2000 – 3999). All variables are defined in Table 1. The *t*-statistics (in parentheses) are based on robust standard errors. The ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| *CRIGHTS* | -0.008** | | | | |
| | (2.47) | | | | |
| *AUTOSTAY* | | -0.018** | | | |
| | | (2.32) | | | |
| *REORG* | | | -0.0030 | | |
| | | | (0.38) | | |
| *SECURED* | | | | -0.0050 | |
| | | | | (0.58) | |
| *MANAGES* | | | | | -0.031*** |
| | | | | | (3.72) |
| *SHRIGHTS* | -0.0020 | -0.0030 | -0.0010 | -0.0010 | -0.0010 |
| | (0.87) | (1.22) | (0.37) | (0.33) | (0.67) |
| *Rule of Law* | -0.0020 | -0.0010 | -0.0010 | 0.0000 | -0.007** |
| | (0.6) | (0.33) | (0.2) | (0.12) | (2.14) |
| *MacroRisk* | 0.0460 | 0.0480 | 0.0100 | 0.0050 | 0.0310 |
| | (0.66) | (0.56) | (0.1) | (0.05) | (0.44) |
| *Log GDP per capita* | 0.0010 | 0.0000 | 0.0000 | 0.0000 | 0.0040 |
| | (0.2) | (0.07) | (0.05) | (0.09) | (0.94) |
| *French Legal Origin* | -0.041*** | -0.038*** | -0.024** | -0.024*** | -0.048*** |
| | (3.44) | (3.51) | (2.32) | (2.72) | (4.66) |
| *German Legal Origin* | -0.041*** | -0.04*** | -0.035*** | -0.034*** | -0.045*** |
| | (3.91) | (3.33) | (3.07) | (3.23) | (4.92) |
| *Nordic Legal Origin* | -0.023* | -0.025** | -0.0130 | -0.0130 | -0.033*** |
| | (1.86) | (1.97) | (1.11) | (1.12) | (2.64) |
| Observations | 35 | 35 | 35 | 35 | 35 |
| R-squared | 47.0% | 45.1% | 34.0% | 34.3% | 56.2% |

**Table 9. Industry-level regressions (Rajan-Zingales (1998) methodology)**

**Panel A: Industry level of same-industry mergers**

The dependent variable is $PROP_{j,c}$, the proportion of same-industry mergers in industry *j* (the acquirer's) in country *c* (2-digit SIC). $PROP_{j,US}$ is the share of same-industry mergers in industry *j* in the US, which proxies for the inherent propensity for same-industry mergers. $PROP_{j,\mathrm{US}}$ is calculated for the period 1994-1997, and the cross-section regression of $PROP_{j,\mathrm{c}}$ is estimated for all other countries for the period 1998-2004. An industry is included if it has at least six qualified transactions during 1998-2004 (for $PROP_{j,\mathrm{US}}$, at least 6 qualified transactions in 1994-1997). A transaction is qualified if the percentage of acquired shares is at least 20%. Excluded are transactions in which the acquirer is in the financial industry (SIC header 6) or regulated industry (SIC headers 48 and 49). A country is included if it has at least two industries that satisfy the above criteria. All variables are defined in Table 1. The *t*-statistics (in parentheses below the coefficients) are based on robust standard errors cluster-adjusted at the country level. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

| | (1) | (2) | (3) |
|---|---|---|---|
| $PROP_{j,US}$ | 1.158*** | 1.175*** | 1.173*** |
| | (7.82) | (7.75) | (7.72) |
| $CRIGHTS * PROP_{j,US}$ | -0.199*** | -0.21*** | -0.209*** |
| | (4.56) | (4.45) | (4.43) |
| *CRIGHTS* | | -0.280 | -0.267 |
| | | (1.63) | (1.64) |
| *French Legal Origin* | | | 0.047 |
| | | | (0.19) |
| *German Legal Origin* | | | -0.312 |
| | | | (0.62) |
| *Nordic Legal Origin* | | | 0.023 |
| | | | (0.05) |
| Country Fixed Effects | Yes | No | No |
| Observations | 623 | 623 | 623 |
| R-squared | 27.1% | 13.4% | 13.6% |

**Panel B: Industry average risk**

The dependent variable is $RISK_{j,\mathrm{c}}$, the average of $RISK_{i,\mathrm{j,c}}$, the standard deviation of *EBITDA/ASSETS* of firm *i* in industry *j* in country *c*. $RISK_{j,\mathrm{US}}$ is the same measure for the US, serving as a proxy for the inherent industry risk. $RISK_{j,US}$ is computed over 1992-1998, where an included firm should have at least five annual observations. $RISK_{j,\mathrm{c}}$ Is calculated over the period 1999-2005. The unit of observation is 2-digit SIC code industry. Excluded industries are as in Panel A. An included industry needs to have at least two firms with available *RISK*.

| | | | |
|---|---|---|---|
| $RISK_{j,US}$ | 0.862*** | 0.953*** | 0.921*** |
| | (4.49) | (4.63) | (4.77) |
| $CRIGHTS * RISK_{j,US}$ | -0.158** | -0.177** | -0.173** |
| | (2.16) | (2.38) | (2.38) |
| *CRIGHTS* | | 0.012*** | 0.008* |
| | | (3.01) | (1.92) |
| *French Legal Origin* | | | -0.023** |
| | | | (2.57) |
| *German Legal Origin* | | | -0.026*** |
| | | | (2.77) |
| *Nordic Legal Origin* | | | 0.000 |
| | | | (0.03) |
| Country Fixed Effects | Yes | No | No |
| Observations | 802 | 802 | 802 |
| R-squared | 30.2% | 10.5% | 10.7% |

**Table 10. Recovery rates and mergers and acquisitions**

OLS linear probability models. The dependent variables in models (1) and (1) equals 1 if (TH ∩ AL|TH), i.e., if the target is in a high-recovery industry and the acquirer is in a low-recovery industry. The universe is all target firms in high recovery industry. In model (3), the dependent variable is the country-level proportion of mergers between high-recovery target and low-recovery acquirer out of all acquisitions of high-recovery targets. The proportion employs Theil's transformation. Included are all transactions where the percentage of acquired shares is at least 20%. Excluded are transactions involving acquirers financial industry (SIC header 6) and regulated industry companies (SIC headers 48 and 49). A transaction is qualified if the percentage of acquired shares is at least 20%. We exclude transactions involving acquirers financial industry (SIC header 6) and regulated industry companies (SIC headers 48 and 49). The following industries are classified as low recovery (2-SIC code headers): transportation (37, 40, 41, 42, 44, 45, 46, 47), high technology and office equipment (35, 36, 38), consumer/ service sector (52,53,54,55,56,57,58,59,72,73,75,76,78,79), or leisure time/ media (27, 48, 70). The following industries are classified as high recovery (2-SIC code headers): energy and natural resources (10,12,13,14,24), building products/ homebuilders (8,15,17,24,28,29,32,34), or healthcare/ chemicals (28,80) . This classification follows Acharya, Bharath and Srinivasan (2006). All variables are defined in Table 1. The sample period is 1994-2004. The absolute values of the t-statistics are shown in parentheses below the coefficients and are based on robust standard errors that are cluster-adjusted at the country level. We include a year fixed effect (not reported). ***, **, and * indicate significance at the 1%, 5%, and 10% levels, correspondingly. The table further reports the number of observations and R-squared.

| | Dependent variable = 1 for (TH ∩ AL\|TH) | | Dependent variable = proportion of (TH ∩ AL\|TH) |
|---|---|---|---|
| | All countries | Excl. U.S. | Countries |
| | (1) | (2) | (3) |
| *CRIGHTS* | 0.027*** | 0.036*** | 0.325*** |
| | (3.26) | (5.78) | (4.49) |
| *SHRIGHTS* | 0.015 | 0.002 | -0.006 |
| | (1.16) | (0.17) | (0.06) |
| *Rule of Law* | -0.174*** | -0.046 | -0.1653* |
| | (3.19) | (1.29) | (1.78) |
| *French Legal Origin* | -0.123** | -0.043 | -0.124 |
| | (2.07) | (1.05) | (0.33) |
| *German Legal Origin* | 0.018 | 0.091*** | -0.027 |
| | (0.54) | (3.64) | (0.08) |
| *Nordic Legal Origin* | 0.144 | 0.157* | 0.401 |
| | (1.67) | (1.87) | (1.49) |
| *MacroRisk* | 1.314*** | 1.234*** | 1.798 |
| | (2.83) | (2.82) | (0.73) |
| *Log GDP per capita* | 0.153*** | 0.068*** | 0.5081*** |
| | (3.9) | (3.06) | (3.89) |
| *Log (Transaction Value)* | -0.007* | -0.004** | - |
| | (1.82) | (2.15) | - |
| Sample period | 1994-2004 | 1994-2004 | |
| Year Fixed Effect | Yes | Yes | |
| Number of countries | 38 | 37 | 38 |
| Observations | 7,099 | 3,709 | |
| R-squared | 3.2% | 6.5% | 61.4% |

**Figure 1.** Timeline of the model.

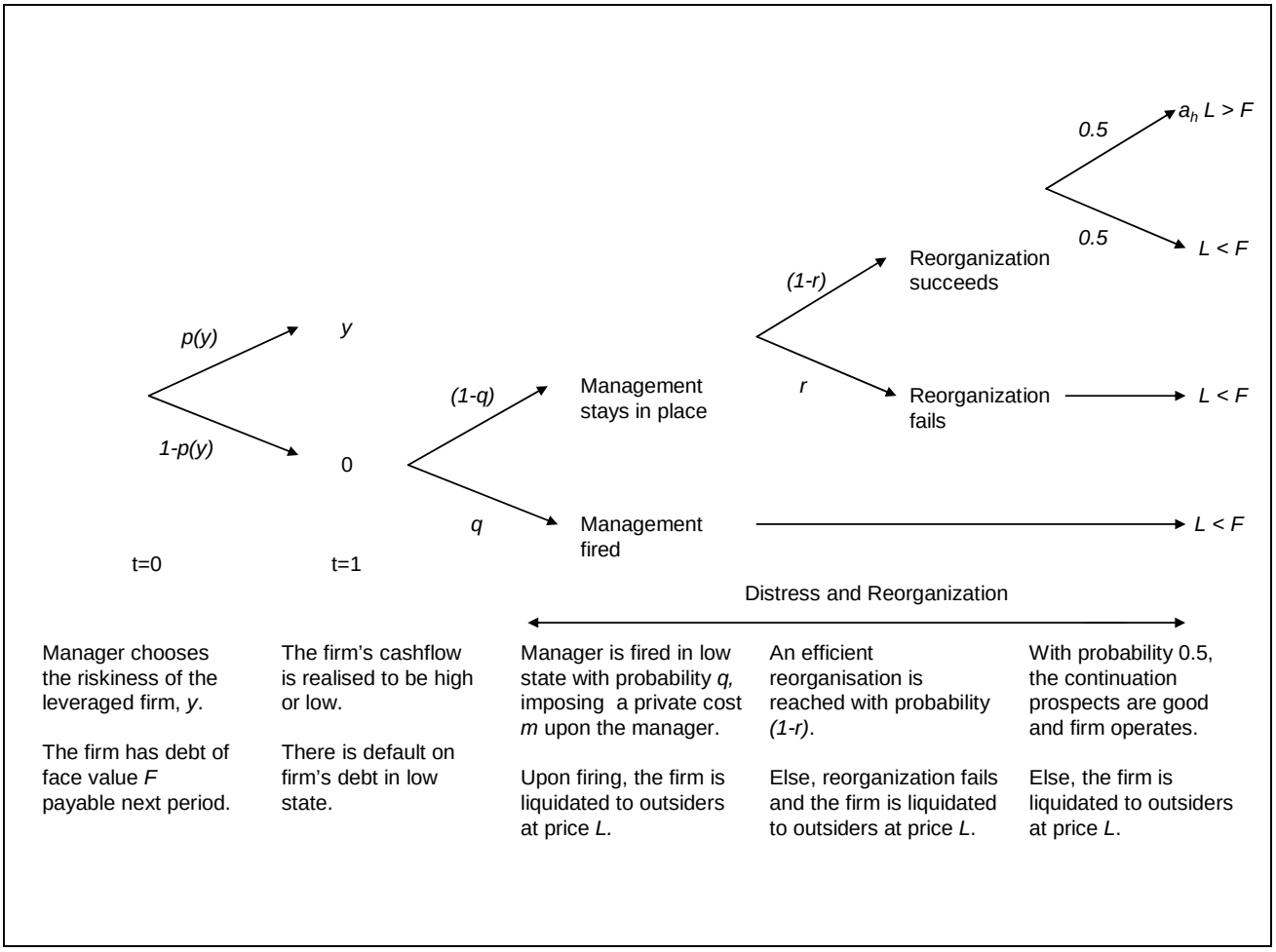

**Figure 2.** Theil transformation of the share of same industry mergers, *PROP*, and creditor rights, *CRIGHTS*.
The fitted line represents the slope from an OLS regression of the Theil transformation of the share of same industry mergers on a constant and the creditor rights index. Note that the transformed ratio *PROP* may be negative.