LEVERAGE AND CORPORATE PERFORMANCE: INTERNATIONAL EVIDENCE

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Leverage and corporate performance: International evidence

Víctor M. González*

Abstract

This paper analyzes the effect of financial leverage on firm operating performance in industry downturns and how this effect varies across countries depending on their legal origin. Results for 10,375 firms in 39 countries over the period 1995-2004 indicate that the operating performance of firms with greater leverage is significantly reduced compared to their competitors as a consequence of industry downturns. This effect, which is consistent with the importance of the indirect costs of financial distress, varies according to the legal origin of the countries. Leverage in French civil law countries has a positive effect on operating performance when the industry has suffered a downturn. Our results highlight that the protection of shareholder rights and the strength of legal enforcement are the variables explaining the effect of financial leverage on firm operating performance. These findings suggest the relevance of institutional characteristics to explain the effects of leverage on corporate performance.

Key words: leverage, corporate performance, industry downturns, financial structure, financial development.

JEL classification: G18, G32.

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1. Introduction

Financial literature has traditionally analyzed the relationship between leverage and corporate performance from the point of view of how corporate performance affects the level of firm debt. Most studies have revealed a negative relation. This result is consistent with the pecking order theory for the reason that higher profitability increases the possibility of retaining earnings and reduces the need for debt.

In this paper, we address the question of the relationship between leverage and corporate performance from the perspective of how financial leverage affects the operating performance of firms. Financial distress has been considered an important determinant of the optimal capital structure of firms. Financial distress has both direct and indirect costs. Distressed firms incur direct expenses for lawyers, financial advisers and accountants, among others. Since Warner (1977), different papers have estimated the direct costs of reorganizing firms, mainly in Chapter 11. Altman and Hotchkiss (2006) survey different studies that estimate the direct costs of financial distress. For instance, Bris *et al.* (2006) document direct costs of on average 8.1% (median 2%) of pre-bankruptcy assets for a sample of 225 smaller firms. Most of the evidence shows that the direct costs of distress are relatively small. Indirect costs, such as suboptimal investment policies or inefficient asset sales (Shleifer and Vishny, 1992) due to insufficient liquidity and limited ability to obtain financing, or lost sales driven by the firm's deteriorating financial condition (Opler and Titman, 1994) and lack of management attention to the business itself, are believed to be more important. These costs are, however, unobservable and therefore more challenging to estimate. Andrade and Kaplan (1998) report that distressed firms cut capital expenditures, sell assets, and delay restructuring of filing for Chapter 11 in a way that appears to be costly. In fact, they estimate losses in value given distress in the order of 10% to 23% of pre-distress firm value. Almeida and Philippon (2007) find that the traditional practice of using historical default rates severely underestimates the average value of distress costs. In fact, they show that marginal distress costs can be as great as the marginal tax benefits of debt derived by Graham (2000).

Jensen (1986) and Stulz (1990), on the other hand, emphasize the disciplinary role of debt. By issuing debt in exchange for stock, managers are bonding their promise to pay out future cash flows. This promise is stronger than the promise to pay out future cash flows by announcing an increase in the dividend because dividends can be reduced in the future. Debt reduces the agency costs of free cash flow by reducing the cash flow available for spending at the discretion of managers. Additionally, debt, via the threat caused by failure, serves as an effective motivating force to make firms more efficient. Several authors also stress the benefits of financial distress and its positive effect on internal capital markets and organizational efficiency (Jensen, 1989; Wruck, 1990). Wruck (1990) suggests that debt may serve as a valuable driver for operational and organizational change. Financial distress may thus entail benefits such as anticipated changes in management, corporate governance, and organization strategy and structure. Lang *et al.* (1996) have provided evidence in line with the idea that firm leverage might be beneficial for shareholders, limiting the growth for low-q firms. Gilson (1989) finds that executives in financially distressed firms are more likely to lose their jobs than their counterparts in firms that are not financially distressed. These findings suggest that leverage could force managers or shareholders to make value-maximizing decisions, which they would otherwise avoid. Hence, although lower financial leverage may reduce the costs of financial distress, important benefits are foregone by the suboptimal use of debt financing.

Opler and Titman (1994) have provided evidence on how financial leverage affects corporate performance. Their results show that highly leveraged firms lose market share to their more conservatively financed counterparts, even in good times. Additionally, there is a positive relationship between the firm's financial condition and its performance in industry downturns. During downturns, more highly leveraged firms tend to lose market share and experience lower operating profits than their competitors.

As the importance of financial distress costs and the disciplinary role played by debt may vary between countries, this paper analyses how leverage affects firm operating performance in industry downturns in different institutional environments. We use an international panel database of 10,375 firms in 39 developing and developed countries over the period 1995-2004. The availability of an international database allows us to analyze how the effect of leverage on corporate operating performance varies across countries. Our paper makes several main contributions. First, we analyze the effect of leverage on operating performance in an international context. The use of an international sample allows an enhancement of previous research given that financial distress costs and the role of debt as a mechanism of control vary between countries. Second, we analyze how legal origin and financial structure and development influence the effect of leverage on corporate operating performance. Third, we study whether the differences in the effect of leverage on firm operating performance is a function of investor protection and legal enforcement. Finally, we account for dynamic processes using the generalized-method-of-moments (GMM) estimators developed by Arellano and Bond (1991) for dynamic panel data. GMM models are designed to handle autoregressive properties in the dependent variable and control for the endogeneity of the explanatory variables and unobserved firm-specific characteristics. We include country and industry dummies to prevent the coefficients of supervisory and institutional variables from being biased by the incorporation of confusing effects from other omitted country variables.

We follow the line of research designed by Opler and Titman (1994) to minimize the problem of reverse causality between operating performance and financial distress. We first identify industries that have experienced economic distress and investigate whether firms in those industries with high prior financial leverage fare differently from their less leveraged counterparts. Our results for 10,375 firms in 39 countries indicate that the operating performance of more leveraged firms is significantly reduced compared to their competitors as a consequence of industry downturns, in line with the results provided by Opler and Titman (1994) for US firms. However, these effects vary across countries, according to their legal origin. In the opposite sense to the results for the total sample, leverage in French civil law countries has a positive effect on operating performance in industry downturns. The results also show that the protection of shareholder rights and the strength of legal enforcement explain these differences in the results. However, the protection of creditor rights does not seem to be relevant.

The rest of the paper is organized as follows. Section 2 discusses the influence of leverage on corporate operating performance and the hypotheses tested in the paper. Section 3 describes the database, methodology, and main variables used in the paper. Section 4 discusses the empirical results. Finally, Section 5 provides the conclusions reached.

2. Theoretical background and hypotheses

The potential influence of leverage on firm performance will depend on two opposite effects. On the one hand, it has been more often argued that financial distress is costly and constitutes an important determinant of corporate capital structure. Financial distress is costly for the reason that it may provide an incentive to make decisions that are harmful to creditors and other stakeholders such as customers, employees and suppliers. Moreover, it also implies potential aggressive behavior by competitors aimed at obtaining a greater market share.

On the other hand, it has likewise been argued that debt can improve the value of a firm because it forces managers to take value-maximizing decisions (Jensen, 1989; Wruck, 1990). As a consequence, the net effect of leverage on firm performance will be the result of the stronger of these effects. If financial distress is costly and more important than the disciplinary role of debt, then more highly leveraged firms will have the greatest operating difficulties in a downturn. Conversely, if financial distress benefits firms by forcing efficient operating changes to a greater extent than the costs of financial distress, then more highly leveraged firms will perform better than less leveraged firms. This was the idea tested by Opler and Titman (1994) for US firms. Their results show that highly leveraged firms tend to lose market share and experience lower operating profits than their competitors. This implies that the costs of financial distress more than counterweigh the benefits for US firms.

Bankruptcy law and related out-of-court mechanisms provide a general structure that helps claimholders resolve conflicts that arise when the firm defaults on its debt payments. Moreover, bankruptcy law also determines the allocation of control over the distressed firm to its diverse claimholders. The design of bankruptcy procedures varies widely throughout the world. Some countries have laws that address the continuation of the firm as an ongoing business. This is the case of the United States and France, for example. Other countries, like the UK or Sweden, have procedures aimed at allocating the distressed firm's assets. The relative efficiency of the existing alternatives that govern financial distress has constituted an important academic issue. Institutional aspects of countries such as the protection of creditor interest, the magnitude of the potential inefficiencies in different bankruptcy systems or the efficiency of the judicial system may affect the costs of financial distress.

La Porta *et al.* (1998) provide evidence consistent with the idea that countries develop substitute mechanisms for poor investor protection. For instance, ownership concentration in civil law countries is a response to poor investor protection. Concentration of ownership of a firm's shares is normally efficient to provide managers with incentives to work and large investors with incentives to monitor the managers (Jensen and Meckling, 1976; Shleifer and Vishny, 1986). When other control mechanisms fail, debt may play an active role as another adaptive response to poor investor protection.

Since both the costs and benefits of financial distress may vary with the institutional characteristics of individual countries, it is worth analyzing how leverage influences corporate operating performance. This paper analyses the link between financial distress and corporate finance around the world. The paper tests whether firms with high leverage are more likely to experience performance losses in industry downturns than other firms, taking into account the legal origin and the institutional characteristics of the countries under study.

3. Database and methodology

Our source for firm data is the Worldscope database, which contains financial statement data and stock prices from many countries in comparable form. We initially selected the 49 countries considered by La Porta *et al.* (1998) over the period 1995-2004, but eliminated 10 of them because of lack of data: Colombia, Ecuador, Egypt, Jordan, Kenya, Nigeria, Sri Lanka, Uruguay, Venezuela, and Zimbabwe. The number of countries finally considered is therefore 39, including both developed and developing countries. We excluded financial firms (SIC codes 6000 – 6999). Since we apply the GMM first-difference estimator with one lag of the dependent variable, the number of firms included in the paper is 10,375 with 40,886 firm-year observations.

The first step in the study is the definition of "economically distressed industries". An industry (3-digit SIC level) is considered economically distressed if the median sales growth is negative and the median stock returns are below -30 percent. Other less strict criteria have also been considered and the results obtained are similar.

Appendix A describes how we define the variables used in the empirical analysis and their sources. Firm performance has been measured by changes in operating performance relative to industry averages, where changes in firm operating performance are industry adjusted by removing the 3-digit SIC industry mean change in performance. The measure of operating performance is the change in the ratio between earnings before interest and taxes plus depreciation expenses and provisions (non-cash deductions from earnings) and total assets. The change in firm performance is measured in each year as the growth in operating performance from a year before until a year after (from year -1 to year +1).

Financial leverage is measured two years prior to the first date of operating performance as the ratio between the book value of financial debt (short- and long-term debt) and the book value of total assets. On the one hand, the use of book values rather than market values of financial leverage avoids the problem that the market value of equity may forecast future operating performance. On the other hand, the prior measure of financial leverage seeks to avoid the effect resulting from the increase in borrowing of poorly performing firms.

Our firm control variables are similar to those used by Opler and Titman (1994). We control for size, asset sales, prior investment rates and profitability. The control for asset sales allows us to reduce the effect of divestitures on sales. Investment rates and profitability can be important determinants of sales growth.

Table 1. Descriptive Statistics

The table reports the descriptive statistics of the main variables. Leverage (LEV) is measured two years prior to the first date of operating performance and is defined as the ratio between the book value of financial debt (short- and long-term debt) and the book value of total assets. DLEV is a dummy variable that takes the value of 1 if the firm belongs to the deciles 8 to 10 of leverage, and 0 otherwise. Variation in operating performance (VOP) is the change in the ratio between earnings before interest and taxes plus depreciation expenses and provisions adjusted by removing the 3-digit SIC industry mean change in performance. CRED measures the legal rights of creditors against defaulting debtors. ANTIDIRECTOR measures the legal protection of shareholder rights. RIGHTS is an index of the degree to which private property rights are protected. LE measures the enforcement of the legal system. Panel B to Panel E present the descriptive statistics of these variables according to legal origin.

		Mean	Median	Std. Dev.	First quartile	Third quartile
PANEL A	LEV (%)	22.64	20.36	18.90	7.10	34.79
	DLev (%)	18.79	0	39.06	0	0
Total	VOP (%)	-0.82	0.23	94.70	-4.30	4.58
Sample	CRED	1.95	2	1.10	1	3
	ANTIDIRECTOR	3.18	3	1.35	2	4
	RIGHTS	4.24	4.62	0.87	3.48	5
	LE	7.77	7.95	1.97	6.28	9.48
PANEL B	LEV (%)	20.92	18.25	19.59	4.51	32.91
	DLev (%)	16.36	0	36.99	0	0
Common law	VOP (%)	-0.58	0.07	63.50	-5.02	5.00
legal origin	CRED	2.5	3	1.16	1.25	3
	ANTIDIRECTOR	4.29	4.50	0.91	4.00	5.00
	RIGHTS	4.37	5	0.94	3.59	5
	LE	7.95	8.59	1.81	6.76	9.38
PANEL C	LEV (%)	21.19	19.00	16.08	8.05	31.63
	DLev (%)	14.53	0	35.24	0	0
French	VOP (%)	-0.32	0.12	53.98	-4.56	4.48
legal origin	CRED	1.33	1	0.90	1	2
	ANTIDIRECTOR	2.53	3.00	1.29	2.00	3.00
	RIGHTS	3.72	3.60	0.82	3.13	4
	LE	6.67	6.52	2.00	5.56	7.91
PANEL D	LEV (%)	27.18	25.78	18.57	11.70	40.37
	DLev (%)	26.23	0	43.99	0	1
Germanic	VOP (%)	0.91	0.48	153.93	-2.94	3.287
legal origin	CRED	2.33	2.50	0.82	2	3
	ANTIDIRECTOR	2.33	2.00	1.03	2.00	2.75
	RIGHTS	4.78	4.81	0.23	4.64	4.98
	LE	8.72	9.37	1.33	7.89	9.45
PANEL E	LEV (%)	21.03	17.02	17.64	6.09	33.33
	DLev (%)	18.61	0	38.92	0	0
Scandinavian	VOP (%)	0.69	0.53	38.76	-5.01	5.91
legal origin	CRED	1.75	1.50	0.96	1	2.25
	ANTIDIRECTOR	3.00	3.00	0.82	2.75	3.25
	RIGHTS	4.90	5	0.20	4.90	5
	LE	9.82	9.80	0.07	9.79	9.83

Table 1 provides descriptive statistics of the variables used in the study. Panel A describes all the firms included in the sample. Panel B to Panel E present the descriptive statistics according to legal origin. The mean (median) leverage of the sample is 22.64 (20.36) percent. Countries of Germanic legal origin present the highest leverage; in fact the mean (median) is 27.18 (25.78) percent. Leverage ratios are quite similar for countries of UK, French or Scandinavian legal origin.

We apply generalized-method-of-moments (GMM) estimators developed for dynamic models of panel data by Arellano and Bond (1991). This methodology is specifically designed to address three particular econometric issues: (i) the presence of unobserved firm-specific effects, eliminated by taking first differences of the variables; (ii) the autoregressive process in the data regarding operating performance; and (iii) the likely endogeneity of the explanatory variables. We control for the potential endogeneity of explanatory variables in the GMM estimations by using two- to four-period lags of the same variables as instruments. The country and the dummy variables are initially considered exogenous.

We use one-step estimation and specify the robust estimator of the variance-covariance matrix of the parameters. We also examine the hypothesis that there is no second-order serial correlation in the first-difference residuals (m_2). In our models, this hypothesis of the absence of second-order serial correlation is not rejected. First-order serial correlation (m_1) in the differentiated residuals is attributable to the first difference of models. We report results using one lag of the dependent variable depending on their statistical significance.

4. Results

4.1. Leverage and corporate performance in economic downturns

Table 2 presents the results of the effect of leverage on firm performance, and whether this effect is greater when industries experience poor performance. Column (1) in Table 2 highlights the estimated coefficient when economic downturns in the industries are not considered. The effect of leverage on firm performance is negative. Although this negative coefficient suggests that highly leveraged firms experience a loss in operating performance compared to their more conservatively financed competitors even in non-distressed situations, the coefficient is not statistically significant at standard levels.

Table 2
Leverage and corporate performance

Regressions are estimated using the Arellano and Bond (1991) one-step GMM difference estimator for panel data with lagged dependent variables. The dependent variable is the change in the ratio between earnings before interest and taxes plus depreciation expenses and provisions adjusted by removing the 3-digit SIC industry mean change in performance. Leverage (LEV) is measured two years prior to the first date of operating performance and is defined as the ratio between the book value of financial debt (short- and long-term debt) and the book value of total assets. DLEV is a dummy variable that takes the value of 1 if the firm belongs to the deciles 8 to 10 of leverage, and 0 otherwise. Economically distressed industries had negative mean sales growth and mean stock returns below -30 percent (DID_1), -20 percent (DID_2) and -10 percent (DID_3). T-statistics are in parentheses. ***, ** and * represent significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)
Intercept	0.0957 (0.85)	0.0955 (0.85)	0.0521 (0.56)	0.0949 (0.84)	0.0920 (0.82)
VOP_{t-1}	-0.4915*** (-40.67)	-0.4914*** (-40.65)	-0.4906*** (-40.34)	-0.4916*** (-40.72)	-0.4918*** (-40.77)
Sales	0.4005** (2.45)	0.3953** (2.43)	0.4068** (2.43)	0.3973** (2.44)	0.4001** (2.45)
Profit	1.1141*** (12.54)	1.1137*** (12.51)	1.1132*** (12.57)	1.1139*** (12.52)	1.1140*** (12.54)
Invest	0.0629 (1.51)	0.0620 (1.50)	0.0611 (1.47)	0.0623 (1.51)	0.0629 (1.52)
Asset sale rate	-0.1650** (-2.03)	-0.1623** (-2.00)	-0.1663** (-2.08)	-0.1642** (-2.02)	-0.1641** (-2.03)
Lev	-0.0308 (-1.60)	-0.0249 (-1.32)		-0.0227 (-1.18)	-0.0217 (-1.09)
Did_1		0.1913*** (4.54)	0.1378*** (4.06)		
Lev x Did_1		-0.3644*** (-3.71)			
DLev			-0.0036 (-1.09)		
DLev x Did_1			-0.1216*** (-3.47)		
Did_2				0.1510*** (5.00)	
Lev x Did_2				-0.2751*** (-3.90)	
Did_3					0.0937*** (4.44)
Lev x Did_3					-0.1640*** (-3.24)
Country dummies	Yes	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes
m_1	-1.77*	-1.76*	-1.77*	-1.77*	-1.77*
m_2	-1.19	-1.18	-1.19	-1.19	-1.19
Wald test (df)	2,618 (60)	2,640 (62)	2,644 (62)	2,662 (62)	2,654 (62)
# observations	40,886	40,886	40,886	40,886	40,886
# firms	10,375	10,375	10,375	10,375	10,375

The distressed industry dummy and the interaction of this dummy with firm leverage have been included in column (2). The sign of the coefficients of the control variables and their statistical significance do not change when these two variables are included. The coefficients obtained for variables DID_1 and LEVxDID_1 are respectively positive and negative and statistically significant. As in column (1), the influence of leverage on firm operating performance is negative, although the coefficient is not statistically significant.

The positive coefficient of the economically distressed industry dummy (DID_1) implies that, in the presence of low levels of leverage, industry downturns generate a positive influence on corporate performance as a result of forcing managers to take value-maximizing decisions. On the other hand, the coefficient of the interaction variable between firm leverage and the distressed industry dummy is negative, in line with the idea that the negative effect of leverage on firm performance is greater when industries experience poor performance.

This result is likewise maintained when using a dummy variable to measure leverage, rather than a continuous variable.[1] DLEV is a dummy variable that takes the value of 1 if the firm belongs to the deciles 8 to 10 of leverage, and 0 otherwise. According to the results presented in the column (3), industry-adjusted operating performance is 12.16 percent lower for firms in leverage deciles 8 to 10 in distressed industries than for firms belonging to leverage deciles 1 to 7.

The results obtained do not vary when the dummy variable for a distressed industry is defined in a different way. DID_2 and DID_3 are alternative dummy variables, with a less strict definition of industry downturn used to identify a 3-digit SIC industry as a distressed industry. DID_2 is a dummy variable that takes the value of 1 if the median sales growth of the industry is negative and when it experiences median stock returns below -20 percent. DID_3 is a dummy variable that takes the value of 1 if the median sales growth of the industry is negative and when the industry suffers median stock returns below -10 percent. On the one hand, the coefficients of DID_2 and DID_3 are positive, being consistent with firms whose industry undergoes a downturn experiencing a positive effect on future operating performance regardless of their level of leverage. On the other hand, the coefficient of the interaction variable between firm leverage and the distressed industry dummy is negative, indicating that the effect of leverage on firm performance is greater when industries experience poor performance.

Summing up, the main result brought to light by the estimations in Table 2 is that the effect of leverage on firm performance is greater when industries suffer an economic downturn. If leverage is high, an economic downturn has a negative influence on firm

[1] This allows us to consider that the relation between leverage and firm operating performance could be nonlinear.

operating performance. Moreover, firms that undergo a downturn also experience a positive effect on their future operating performance regardless of the level of leverage. Finally, although highly leveraged firms experience a loss in operating performance compared to their more conservatively financed competitors even in non-distressed situations, the effect is not statistically significant. These results are similar to those obtained by Opler and Titman (1994) for US firms.

4.2. Leverage and corporate performance according to legal origin and financial structure and development

4.2.1. Influence of the legal origin of the country

The results presented in Table 3 analyze the effect of leverage on firm performance when industries experience poor performance according to the legal origin of the country. A single continuous variable is now used to measure firm leverage (LEV) and the dummy of distressed industry DID_1 is the only one considered in the estimations carried out from this point on.

The results show that the legal origin of the country influences the effect of leverage on corporate operating performance. Columns (1) and (2) present the results for the countries with a common law and civil law origin, respectively. These results are significantly different. In common law countries, we obtain a similar sign of the influences of the dummy variable for a distressed industry and of its interaction with the level of debt compared to the results shown in Table 2.[2] However, the results shown in column (2) for civil law countries reveal that there is no effect of leverage on firm operating performance in industries with poor performance. This implies that the effect of leverage on operating performance when industries experience poor performance depends on the legal origin of the country.

In order to analyze this difference in the results between common and civil law countries in greater detail and due to the differences in institutional characteristics among civil law countries, we divided the civil law countries into those of French, Germanic and Scandinavian legal origin. Columns (3) to (5) respectively show the results for these groups. There is no significant effect of leverage on operating performance in industry downturns for countries of Germanic or Scandinavian legal origin, in line with the results for civil law countries. However, the results change

[2] This estimation has to be considered with caution, as it presents positive levels of autocorrelation in m_2.

significantly when we refer to countries of French legal origin. According to the estimations in column (3), the effect of leverage on operating performance is negative when there is no economic downturn in the industry. This effect is in line with the predominance of financial distress costs over the benefits of the disciplinary role of debt and suggests that the operating performance of more leveraged firms is significantly reduced compared to their competitors even in good times.

Table 3
Leverage and corporate performance in different legal origins

Regressions are estimated using the Arellano and Bond (1991) one-step GMM difference estimator for panel data with lagged dependent variables. The dependent variable is the change in the ratio between earnings before interest and taxes plus depreciation expenses and provisions adjusted by removing the 3-digit SIC industry mean change in performance. Leverage (LEV) is measured two years prior to the first date of operating performance and is defined as the ratio between the book value of financial debt (short- and long-term debt) and the book value of total assets. Economically distressed industries had negative mean sales growth and mean stock returns below -30 percent (DID_1). T-statistics are in parentheses. ***, ** and * represent significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-0.0174 (-0.78)	0.0501 (0.56)	-0.0184 (-0.41)	-0.0205 (-0.53)	0.1050 (1.409	0.0580 (0.59)
VOP_{t-1}	-0.5202*** (-9.18)	-0.4805*** (-41.59)	-0.4728*** (-55.90)	-0.2854** (-1.96)	-0.4411*** (-3.03)	-0.4914*** (-40.64)
Sales	0.1643** (2.54)	0.4227 (1.30)	-0.0162 (-0.13)	0.2672 (1.29)	-0.0553 (-0.40)	0.3954** (2.42)
Profit	1.5453*** (19.26)	1.0177*** (32.02)	0.9424*** (61.11)	0.9718*** (3.20)	0.9569** (2.19)	1.1137*** (12.48)
Invest	-0.0123 (-0.33)	0.0087 (0.28)	-0.0061 (-0.23)	0.0367 (0.56)	0.1321 (1.18)	0.0622 (1.50)
Asset sale rate	-0.1114*** (-2.70)	-0.1279 (-0.78)	-0.2770*** (-2.99)	-0.0262 (-0.18)	0.0997 (0.87)	-0.1622** (-2.01)
Lev	0.0038 (0.46)	-0.0600 (-1.29)	-0.0274** (-2.33)	-0.0885 (-1.03)	-0.0769* (-1.93)	-0.0258 (-1.12)
Did_1	0.2700*** (5.77)	0.0163 (0.42)	-0.1250*** (-2.81)	0.0569 (1.58)	0.0213 (0.21)	0.2194*** (4.97)
Lev x Did_1	-0.6221*** (-4.54)	0.0961 (0.90)	0.4953** (2.11)	0.0815 (0.62)	0.0881 (0.21)	-0.4285*** (-4.14)
Lev x LOF						0.0092 (0.23)
Did_1 x LOF						-0.3026*** (-4.48)
Lev x Did_1 x LOF						0.9239*** (3.26)
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
m_1	-6.40***	-1.20	-1.13	-0.97	-0.30	-1.76*
m_2	-3.22**	-1.08	-1.04	-0.02	-1.24	-1.18
Wald test (df)	931 (34)	7,240 (45)	149,257 (35)	1,131 (26)	5,601 (24)	2,620 (62)
# observations	21,499	19,361	6,658	10,804	1,899	40,860
# firms	5,238	5,132	1,761	2,898	473	10,370

Furthermore, the effect of leverage on corporate operating performance is positive when a prior economic downturn has taken place in the industry. The higher the prior firm leverage in countries of French legal origin, the higher the firm operating performance in the case of an economic downturn. This result seems to reveal the different pattern of French legal origin insofar as financial distress seems to benefit firms by forcing efficient operating changes.

The same conclusions are obtained when we compare the results between countries of French legal origin and the remaining countries using a dummy variable. Column (6) shows the results when the variables LEV, DID_1 and LEVxDID_1 are considered in themselves and also when multiplied by a dummy variable (LOF) that takes the value of 1 if the country is of French legal origin, and 0 otherwise. The variables LEVxLOF, DID_1xLOF and LEVxDID_1xLOF capture the differential effect of variables LEV, DID_1 and LEVxDID_1 for countries of French legal origin. Thus, LEVxDID_1xLOF in column (6) indicates the difference in the impact of leverage on corporate operating performance when industries experience poor performance in countries of French legal origin compared to this effect in countries of UK, Germanic or Scandinavian legal origin.

The results in column (6) highlight the existence of a positive influence of the dummy variable DID_1 and a negative effect of leverage on corporate operating performance in industry downturns. These results are the same as those shown in Table 2. In addition, when we interact the dummy variable of French legal origin (LOF) with the variables DID_1 and LEVxDID_1, the coefficients thus obtained are respectively negative and positive. The positive coefficient of LEVxDID_1xLOF suggests that the benefits of the disciplinary role of debt have more importance in countries of French legal origin. La Porta *et al.* (1998) show that countries develop substitute mechanisms for poor investor protection. The higher disciplinary role of debt in countries of French legal origin may be the consequence of the deficient functioning of other control mechanisms in these countries. In this context, debt seems to operate as a disciplinary mechanism in the greater concentration of debt ownership.

4.2.2. Influence of the financial structure and development

We have also analyzed whether the financial structure and development of the country have any influence on the effect of leverage on firm operating performance. As a measure of the financial structure of the country, we have considered three proxies: (1) the variable STRUCT, which measures the market orientation of the financial system; (2) the dummy variable MARKET, which takes the value of 1 if the country has a market-oriented system, and 0 otherwise; and (3) the variable BANK WEIGHT, which is the ratio between the private credit by deposit money banks and the value of listed shares.

The results obtained for the three proxies of financial structure (FS) are shown in columns (1) to (3) in Table 4. Columns (1) and (2) present the results when the variables used to distinguish the financial structure of the country are STRUCT and MARKET, respectively. Higher values of both variables indicate a greater degree of stock market development compared to the development of the banking system. Column (3) shows the results for the variable BANK WEIGHT. Higher values of this variable imply a greater weight of the banking system compared to the development of the stock market.

The negative coefficient of LEVxDID_1xFS in columns (1) and (2) and its positive coefficient in column (3) reveal that the operating performance of more leveraged firms in economies with a higher degree of stock market development compared to the development of the banking system is reduced compared to their competitors as a consequence of industry downturns. The higher the weight of financial markets, the lower the benefits of debt in terms of the disciplinary role of debt and the greater the predominance of financial distress costs.

An additional aspect to the financial structure of the country is the degree of concentration of its banking system. Seeing as higher bank concentration could influence debt concentration, it would accordingly affect the disciplinary role of debt. We have considered whether bank concentration influences the relationship between leverage and operating performance. We follow Demirgüc-Kunt *et al.* (2004) and Beck *et al.* (2006) and measure bank concentration (BC) as the fraction of bank assets held by the three largest commercial banks in the country. The variable BC is interacted with LEV, DID_1 and LEVxDID_1 to consider what the differential effect of leverage on firm operating performance is when bank concentration is high.

The positive coefficient of LEVxDID_1xBC in column (4) shows that the operating performance of the more leveraged firms in economies with a higher bank concentration increases compared to their competitors as a consequence of industry downturns. This result is consistent with the greater predominance of benefits arising from the disciplinary role of debt in more concentrated banking systems.

Table 4
Leverage and corporate performance according to financial structure and development

Regressions are estimated using the Arellano and Bond (1991) one-step GMM difference estimator for panel data with lagged dependent variables. The dependent variable is the change in the ratio between earnings before interest and taxes plus depreciation expenses and provisions adjusted by removing the 3-digit SIC industry mean change in performance. Leverage (LEV) is measured two years prior to the first date of operating performance and is defined as the ratio between the book value of financial debt (short- and long-term debt) and the book value of total assets. Economically distressed industries had negative mean sales growth and mean stock returns below -30 percent (DID_1). T-statistics are in parentheses. ***, ** and * represent significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.0985 (0.83)	0.1071 (0.87)	0.0670 (0.63)	0.1030 (0.88)	0.0952 (0.85)	0.0944 (0.83)
VOP_{t-1}	-0.4902*** (-42.48)	-0.4923*** (-40.66)	-0.4924*** (-40.50)	-0.4914*** (-40.74)	-0.4905*** (-42.75)	-0.4920*** (-40.47)
Sales	0.3569** (2.08)	0.3878** (2.34)	0.3694** (2.20)	0.4007** (2.43)	0.3534** (2.08)	0.3835** (2.29)
Profit	1.1114*** (12.93)	1.1129*** (12.47)	1.1126*** (12.55)	1.1132*** (12.46)	1.1120*** (12.88)	1.1129*** (12.55)
Invest	0.0361 (1.13)	0.0597 (1.46)	0.0567 (1.47)	0.0616 (1.51)	0.0371 (1.13)	0.0597 (1.48)
Asset sale rate	-0.1592* (-1.95)	-0.1633** (-1.97)	-0.1578** (-1.97)	-0.1608** (-1.98)	-0.1596* (-1.94)	-0.1654** (-2.03)
Lev	-0.0284 (-1.17)	-0.0973 (-1.17)	0.0219 (0.39)	0.0520 (1.27)	-0.0299 (-1.31)	-0.0220 (-0.85)
Did_1	0.1266*** (3.57)	-0.0849 (-1.32)	0.3924*** (4.28)	0.4289*** (4.48)	0.0669 (1.58)	-0.2486 (-1.01)
Lev x Did_1	-0.2033** (-2.11)	0.3511* (1.68)	-0.8478*** (-3.80)	-0.9746*** (-3.63)	-0.0439 (-0.34)	0.6143 (0.77)
Lev x FS	0.0212 (0.54)	0.1038 (1.07)	-0.0462 (-0.66)			
Did_1 x FS	0.1726*** (3.79)	0.3760*** (3.54)	-0.2137*** (-3.44)			
Lev x Did_1 x FS	-0.3740*** (-3.02)	-0.9581*** (-3.40)	0.5089*** (2.78)			
Lev x BC				-0.1627 (-1.36)		
Did_1 x BC				-0.5409*** (-3.60)		
Lev x Did_1 x BC				1.4011** (2.46)		
Lev x FD					0.0098 (0.59)	-0.0050 (-0.12)
Did_1 x FD					0.2247*** (3.98)	0.4751* (1.87)
Lev x Did_1 x FD					-0.5455*** (-3.36)	-1.0306 (-1.28)
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
m_1	-1.72*	-1.75*	-1.75*	-1.77*	-1.72*	-1.76*
m_2	-1.18	-1.18	-1.18	-1.18	-1.18	-1.18
Wald test (df)	3,503 (61)	2,624 (61)	2,938 (61)	2,597 (62)	3,429 (61)	2,625 (61)
# observations	38,748	39,553	38,925	40,761	38,887	39,553
# firms	9,938	9,990	9,976	10,368	9,939	9,990

The next step is to analyze the role of financial development in the relationship between leverage and corporate performance. As a measure of the financial development (FD) of the economies under study, we have considered two proxies: (1)

the variable FINAN, which measures the country's financial development; and (2) the dummy variable DEVELOP, which takes the value of 1 if the country's financial system is developed, and 0 otherwise. The results for these two variables are presented in columns (5) and (6) in Table 4. According to the coefficient of the variable LEVxDID_1xFD in column (5), the negative influence of leverage on firm operating performance when an industry downturn takes place is only characteristic of financially developed economies. In line with the previous results, it could be the consequence of the lesser relevance of the disciplinary role of debt in more financially developed countries, insofar as other mechanisms exist to protect investors. In financially underdeveloped economies, the benefits of debt in terms of its disciplinary role counterweigh the negative influence of financial distress costs.

4.3. Leverage and corporate performance according to institutional and legal characteristics

In this section, we investigate whether the differences in the results according to legal origin and financial structure and development are related to the protection of investor rights and legal enforcement. La Porta *et al.* (1998) show that there are important differences between common law and civil law countries in terms of aspects such as investor protection and legal enforcement. We next analyze whether or not these differences explain the different results between common law and civil law countries shown in Table 3 and between financial structure and development of countries shown in Table 4.

4.3.1. Influence of the protection of creditor rights

La Porta *et al.* (1998) and Djankov *et al.* (2007) show that common law countries protect creditors the most, while French civil law countries protect them the least. German and Scandinavian civil law countries are situated in between. In fact, the mean country values for our sample are the following: 2.5 is the mean value of creditor rights for common law countries; 1.33 for French civil law countries; 2.33 for German civil law countries and 1.75 for Scandinavian civil law countries. Since the protection of creditor rights is one of the main differences between countries when considering the legal origin of the country, we have analyzed whether this aspect influences the relationship between financial leverage and firm operating performance.

To do so, we have used the creditor rights index compiled by Djankov *et al.* (2007). This index measures the legal rights of creditors against defaulting debtors and follows the index constructed by La Porta *et al.* (1998), although in the former case the creditor rights index is constructed in January each year. Higher values indicate stronger creditor rights or stronger protection against borrower expropriation.

The results presented in Table 5 analyze the effect of leverage on firm performance in industry downturns according to the protection of creditor rights. This effect has been analyzed by multiplying the main variables in the estimation by the value of the protection of creditor rights. Three new variables have been included in column (1) which are the result of multiplying LEV, DID_1 and LEV x DID_1 by the protection of creditor rights (CRED). None of these three new variables has a significant coefficient. This suggests that the protection of creditor rights is not a determinant of the effect of leverage on corporate operating performance. Summing up, the protection of creditor rights is not the cause of the differences between common law and French civil law countries shown in Table 3.

4.3.2. Influence of the protection of property rights

La Porta *et al.* (1998) also show that common law countries have the relatively strongest and French civil law countries the weakest protection of shareholders. In fact, the mean country values of the shareholder rights using the index designed by La Porta *et al.* (1997) (ANTIDIRECTOR) for our sample are the following: 4.29 is the mean value of protection of shareholder rights for common law countries; 2.53 for French civil law countries; 2.33 for German civil law countries and 3.00 for Scandinavian civil law countries. Seeing as the protection of shareholder rights is another of the main differences between countries when considering the legal origin of the country, we have analyzed whether this aspect exerts an influence over the relationship between financial leverage and firm operating performance in industry downturns.

We measure the protection of property rights by two different measures: (1) the index of shareholder rights elaborated by La Porta *et al.* (1998) (ANTIDIRECTOR); and (2) the index of private property rights published by the Heritage Foundation (RIGHTS). The first is an index that ranges from zero to six, a high score indicating greater legal protection of shareholder rights. The second is an annual indicator of the degree to which private property rights are protected and the degree to which the government enforces laws that protect private property. It also accounts for the possibility that private property may be expropriated, and analyzes the independence of the judiciary, corruption within the judiciary, and the ability of individuals and businesses to enforce contracts.

Table 5
Leverage and corporate performance according to institutional and legal characteristics

Regressions are estimated using the Arellano and Bond (1991) one-step GMM difference estimator for panel data with lagged dependent variables. The dependent variable is the change in the ratio between earnings before interest and taxes plus depreciation expenses and provisions adjusted by removing the 3-digit SIC industry mean change in performance. Leverage (LEV) is measured two years prior to the first date of operating performance and is defined as the ratio between the book value of financial debt (short- and long-term debt) and the book value of total assets. Economically distressed industries had negative mean sales growth and mean stock returns below -30 percent (DID_1). T-statistics are in parentheses. ***, ** and * represent significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	0.0971 (0.84)	0.1305 (0.93)	0.0936 (0.83)	0.0963 (0.85)	0.0972 (0.84)	0.0824 (0.71)	0.0951 (0.84)
VOP_{t-1}	-0.4913*** (-40.61)	-0.4919*** (-41.00)	-0.4917*** (-40.71)	-0.4913*** (-40.61)	-0.4913*** (-40.60)	-0.4920*** (-41.02)	-0.4915*** (-40.66)
Sales	0.3956** (2.39)	0.3949** (2.48)	0.3994** (2.43)	0.3980** (2.42)	0.3955** (2.38)	0.3976** (2.48)	0.4000** (2.42)
Profit	1.1136*** (12.50)	1.1143*** (12.39)	1.1142*** (12.49)	1.1134*** (12.54)	1.1137*** (12.49)	1.1144*** (12.39)	1.114*** (12.51)
Invest	0.0624 (1.52)	0.0615 (1.48)	0.0614 (1.49)	0.0619 (1.50)	0.0623 (1.52)	0.0623 (1.49)	0.0620 (1.50)
Asset sale rate	-0.1621** (-2.01)	-0.1636** (-2.00)	-0.1627** (-2.00)	-0.1649** (-2.04)	-0.1620** (-2.01)	-0.1629** (-1.98)	-0.1649** (-2.03)
Lev	-0.0101 (-0.53)	-0.2714 (-1.18)	-0.1260*** (-2.78)	-0.0029 (-0.04)	-0.0102 (-0.50)	-0.1979 (-1.21)	-0.0449 (-1.19)
Did_1	0.2248*** (2.97)	-0.4223*** (-3.39)	-0.9712*** (-3.22)	-0.8121*** (-2.97)	0.1809** (2.38)	-0.3939*** (-3.66)	-0.5381*** (-3.03)
Lev x Did_1	-0.3586* (-1.92)	1.1730*** (2.93)	2.9301*** (3.06)	2.0334** (2.41)	-0.2428 (-1.23)	1.0742*** (3.14)	1.5560*** (2.68)
Lev x CRED	-0.0070 (-0.44)				-0.0008 (-0.41)		
Did_1 x CRED	-0.0205 (-0.54)				0.0008 (0.17)		
Lev x Did_1 x CRED	0.0023 (0.02)				-0.0082 (-0.63)		
Lev x ANTIDIRECTOR/RIGHTS		0.0615 (1.15)	0.0219* (1.92)			0.0048 (1.18)	0.0005 (0.39)
Did_1 x ANTIDIRECTOR/RIGHTS		0.1485*** (3.96)	0.2495*** (3.71)			0.0156*** (4.36)	0.0173*** (3.91)
Lev x Did_1 x ANTIDIRECTOR/RIGHTS		-0.3723*** (-3.62)	-0.7037*** (-3.41)			-0.0382*** (-4.01)	-0.0452*** (-3.27)
Lev x LE				-0.0025 (-0.27)			
Did_1 x LE				0.1120*** (3.58)			
Lev x Did_1 x LE				-0.2659*** (-2.84)			
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
m_1	-1.77*	-1.76*	-1.76*	-1.76*	-1.77*	-1.77*	-1.76*
m_2	-1.18	-1.18	-1.18	-1.18	-1.18	-1.18	-1.18
Wald test (df)	2,601 (62)	2,604 (62)	2,627 (62)	2,626 (62)	2,594 (62)	2,611 (62)	2,621 (62)
# observations	40,860	40,860	40,860	40,860	40,860	40,860	40,860
# firms	10,370	10,370	10,370	10,370	10,370	10,370	10,370

The results presented in columns (2) and (3) in Table 5 analyze the effect of leverage on firm performance in industry downturns according to the protection of shareholder rights. This effect has been analyzed by multiplying the main variables in the estimation by the value of the protection of rights, in column (2) by ANTIDIRECTOR and in column (3) by RIGHTS. Three new variables have been included in these columns that are the result of multiplying LEV, DID_1 and LEV x DID_1 by the protection of shareholder rights, respectively. The results are qualitatively similar in both columns.

The coefficient of the variable DID_1 in column (2) shows a negative influence on operating performance of the economic downturn regardless of the level of leverage. This effect is the same as that noted in French civil law countries and is the opposite to that shown in Table 2. The variable LEV x DID_1 has a positive and significant coefficient. In fact, it implies evidence in favor of the greater weight of the role of debt as a mechanism that forces managers to take value-maximizing decisions compared to financial distress costs.

When the interaction with the variable ANTIDIRECTOR is considered, however, the variable LEV x DID_1 x ANTIDIRECTOR has a negative and statistically significant coefficient. Thus, when the protection of shareholder rights is high, there is a negative effect of leverage on the operating performance of firms compared to their more conservatively financed competitors. These results are maintained when the protection of rights is proxied by the protection of property rights in column (3). The only difference in the results is that related to the coefficients of the variables LEV and LEVxRIGHTS, which are statistically significant when the protection of shareholder rights is measured by the index of private property rights published by the Heritage Foundation.

In short, the results obtained when we consider the protection of shareholder rights show that debt plays a role as a mechanism that forces efficient decisions when the protection of shareholder rights is low. However, if the protection of shareholder rights is high, the influence of the costs of financial distress is seen to predominate. This effect is consistent with the idea that the disciplinary role of debt is higher in countries with low institutional quality.

4.3.3. Influence of legal enforcement

A strong system of legal enforcement could be a substitute for weak explicit legal protection of investors. Hence, in our analysis we have considered the influence of legal enforcement in the relationship between leverage and firm operating performance. We use one of the proxies for the quality of legal enforcement used by La

Porta *et al.* (1998); namely, the annual index of law and order of the International Country Risk Guide (ICRG), which ranges from 0 to 10, with a higher value indicating better quality and enforcement of the legal system. La Porta *et al.* (1998) and the data shown in Table 1 suggest that the quality of law enforcement also differs across legal origin. Scandinavian countries (mean value of 9.82) clearly have a high level of legal enforcement, with German civil law countries (mean value of 8.72) close behind. On the other hand, French civil law countries (mean value of 6.67) have the lowest level of legal enforcement.

Column (4) in Table 5 presents the results of the influence of leverage on corporate operating performance in industry downturns according to the legal enforcement of the country. This effect has been analyzed by multiplying the main variables in the estimation by the value of legal enforcement (LE). Three new variables have been included in this column which are the result of multiplying LEV, DID_1 and LEVxDID_1 by legal enforcement (LE). The results shown are qualitatively similar to those presented when we analyzed the effect of the protection of shareholder rights.

The variable LEVxDID_1 has a positive and significant coefficient, in line with the idea that debt works as a mechanism that forces managers to take value-maximizing decisions in countries with low levels of legal enforcement. However, when the interaction with the variable LE is considered, the variable LEV x DID_1 x LE has a negative and statistically significant coefficient. Thus, when there is a strong system of legal enforcement, a negative effect of leverage on the operating performance of firms exists compared to their more conservatively financed competitors. The results obtained show that debt plays a role as a mechanism that forces efficient decisions when the system of legal enforcement is weak. However, in the presence of a strong system of legal enforcement, the results suggest the predominance of the importance of the costs of financial distress.

As effective protection of rights requires both explicit legal protection and enforcement of the law, we interact the previously considered variables of protection of creditor and shareholder rights with the variable capturing law enforcement in the countries under study (LE). The results are presented in columns (5) to (7) in Table 5. In these columns, the variables of protection of creditor rights (CRED) and of shareholder rights (ANTIDIRECTOR / RIGHTS) are multiplied by the variable of legal enforcement (LE). The results are similar to those obtained previously when only considering the variables of protection of investor rights. On the one hand, the results in column (5) are similar to the results in column (1) and are consistent with the idea that differences in the protection of creditor rights cannot explain the differences shown in Table 3 between French civil law countries and the remaining countries.

On the other hand, the results in columns (6) and (7) considering the interaction between the protection of investor rights and the enforcement of law are similar to the results in columns (2) and (3). They suggest that, in countries with a low level of protection of shareholder rights and a weak system of legal enforcement, there is a positive effect of leverage on corporate operating performance when industries experience poor performance. In these cases, there is a predominance of the disciplinary role of debt that forces efficient decisions. However, when the protection of shareholder rights and the system of legal enforcement are strong, leverage has a negative effect on firm operating performance when industries suffer a downturn. This is in line with the predominance of the importance of financial distress costs over the disciplinary role of debt when institutional quality is high.

5. Conclusions

We analyze the effect of leverage on corporate operating performance using a panel database of 10,375 firms in 39 countries. Our results show that firms with higher leverage ratios prior to the onset of industry economic distress experience a decline in operating profits consistent with the idea that there are significant indirect costs of financial distress that are greater than the control benefits of debt. However, this conclusion is far from being the same in all countries.

The results show that the effect of leverage on firm operating performance varies with the legal origin and the financial structure and development of countries. As regards legal origin, the results for French civil law countries reveal a positive effect of leverage on operating performance when the industry has suffered a downturn. This finding is consistent with the argument that debt plays a different role in these countries, suggesting the predominance of the role of debt as a mechanism that forces efficient decisions by management.

Furthermore, our results show that financial structure and development have an influence on the relationship between leverage and firm operating performance. The disciplinary role of debt is greater than financial distress costs in countries with a higher degree of development of the banking system compared to stock market development, in financially underdeveloped economies and in more concentrated banking systems.

The protection of shareholder rights and the system of legal enforcement are key variables for distinguishing when leverage has a negative or a positive effect on corporate operating performance when industries suffer an economic downturn. In countries with a high level of protection of shareholder rights and a strong system of legal enforcement, there is a negative effect of leverage on corporate operating performance when industries experience poor performance. This effect reveals the predominance of financial distress costs. However, when the protection of shareholder rights is low and the system of legal enforcement is weak, leverage has a positive effect on firm operating performance when industries suffer a downturn. This is consistent with the predominance of debt as a mechanism that forces efficient decisions over the importance of the costs of financial distress. The role of debt as a mechanism that forces efficient decisions is probably not unrelated to the negligible importance that other control mechanisms have when the protection of property rights and legal enforcement are weak.

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Appendix A

Variables

The table shows the definition of variables used in the paper and their sources.

Name	Definition	Source
	OPERATING PERFORMANCE	
VOP	The variation in operating performance is the change in the ratio between earnings before interest and taxes plus depreciation expenses and provisions adjusted by removing the 3-digit SIC industry mean change in performance. The variation in operating performance is measured over a two-year period centered around the base year.	Worldscope
	LEVERAGE	
LEV	The ratio between the book value of financial debt (short- and long-term debt) and the book value of total assets. The leverage ratio is two years prior to the first date of operating performance.	Worldscope
DLEV	A dummy variable that takes the value of 1 if the firm belongs to the deciles 8 to 10 of leverage, and 0 otherwise.	Worldscope
	ECONOMICALLY DISTRESSED INDUSTRIES	
DID_1	A dummy variable that takes the value of 1 if the median sales growth of the industry at the 3-digit SIC level is negative and the median stock returns is below -30 percent.	Wordlscope
DID_2	A dummy variable that takes the value of 1 if the median sales growth of the industry at the 3-digit SIC level is negative and the median stock returns is below -20 percent.	Wordlscope
DID_3	A dummy variable that takes the value of 1 if the median sales growth of the industry at the 3-digit SIC level is negative and the median stock returns is below -10 percent.	Wordlscope
	COUNTRY VARIABLES	
LOF	A dummy variable that takes the value of 1 if the country is of French legal origin, and 0 otherwise.	La Porta *et al.*, (1998)
STRUCT	The first principal component of two variables that measure the comparative activity and size of markets and banks. Each of the underlying components is constructed so that higher values indicate more market-based financial systems. The first component is the natural logarithm of the ratio of value traded to bank credit. Value traded equals the value of stock transactions as a share of national output. Bank credit equals the claims of the banking sector on the private sector as a share of GDP. The second component equals the natural logarithm of the ratio of market capitalization to bank credit. Market capitalization is defined as the value-listed shares divided by GDP, and is a measure of the size of stock markets relative to the economy.	Financial Structure and Economic Database (Beck *et al.*, 2006)
MARKET	A dummy variable that takes the value of 1 if it is a market-based financial system, and 0 otherwise.	Demirgüç-Kunt and Levine (2001)
BANK WEIGHT	The ratio between the private credit by deposit money banks and the value of listed shares.	Financial Structure and Economic Database (Beck *et al.*, 2006)
BC	The fraction of bank assets held by the three largest commercial banks in the country.	World Bank Database
FINAN	The first principal component of two underlying measures of financial development. The first is a measure of the overall activity of financial intermediaries and markets. It equals the natural logarithm of the product of private credit (the value of credits by financial intermediaries to the private sector divided by GDP) and value traded (the value of total shares traded on the stock market exchange divided by GDP). Private credit includes credits by both bank and non-bank intermediaries. The second is a measure of the overall size of the financial sector and equals the natural logarithm of the sum of private credit and market capitalization.	Financial Structure and Economic Database (Beck *et al.*, 2006)

DEVELOP	A dummy variable that takes the value of 1 if the country is a financially developed economy, and 0 otherwise. A country has an underdeveloped financial system if: (1) claims of deposit money banks on the private sector/GDP are less than the sample mean; and (2) the total value traded as a share of GDP is less than the sample mean.	Demirgüç-Kunt and Levine (2001)
CREDITORS	This index measures four powers of secured lenders in bankruptcy: (1) whether there are restrictions, such as creditor consent, when a debtor files for reorganization; (2) whether secured creditors are able to seize their collateral after the petition for reorganization is approved, i.e., whether there is no automatic stay or asset freeze imposed by the court; (3) whether secured creditors are paid first out of the proceeds of liquidating a bankrupt firm; and (4) whether an administrator, and not management, is responsible for running the business during the reorganization. A value of one is added to the index when a country's laws and regulations provide each of these powers to secured lenders, consequently it varies between 0 (poor creditor rights) and 4 (strong creditor rights).	Djankov *et al.* (2007)
ANTIDIRECTOR	An index formed by adding 1 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 shareholder's 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.	La Porta *et al.*, (1998)
RIGHTS	An indicator of the degree to which private property rights are protected and the degree to which government enforces laws that protect private property. It also accounts for the possibility that private property may be expropriated, and analyzes the independence of the judiciary, corruption within the judiciary, and the ability of individuals and businesses to enforce contracts. It ranges between 1 and 5. We reverse the scale of the original index, so that a high score indicates greater legal protection of property.	Heritage Foundation
LE	The annual index of law and order of the International Country Risk Guide (ICRG). This ranges from 0 to 10, with a higher figure indicating better quality and enforcement of the legal system.	ICRG published by the Political Risk Service Group
	FIRM CONTROL VARIABLES	
SALES	The natural logarithm of total sales.	Worldscope
PROFIT	The prior profitability of the firm adjusted by the industry (3-digit SIC level). Profitability is measured as the ratio between earnings before interest and taxes plus depreciation expenses and provisions (non-cash deductions from earnings).	Worldscope
INVEST	The prior investment rate of the firm adjusted by the industry (3-digit SIC level). The investment rate is measured as the ratio between new investments and total assets.	Worldscope
ASSET SALE RATE	The asset sale rate of the firm adjusted by the industry (3-digit SIC level). The asset sale rate is measured as the ratio of divestitures on sales.	Worldscope

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