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## Corporate Governance and Risk Taking

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### Abstract

This paper examines the relationship between investor protection and corporate insiders' incentive to take value-enhancing risks. In a poor investor protection environment corporations are often run by entrenched insiders who appropriate considerable corporate resources as personal benefits. When these private benefits are large, insiders may undertake sub-optimally conservative investment decisions to preserve them. Better investor protection reduces these private benefits and may therefore induce riskier but value enhancing investment policy. Such a relationship can also result from risk-averse behavior on the part of dominant shareholders with undiversified exposure in their own firms, which is again more prevalent in countries with poorer investor protection. If prominent non-equity stakeholders such as banks, labor unions or the government can influence corporate investment, and their influence is decreasing in investor protection, that can also give rise to a positive relationship between investor protection and investment risk. We test these predictions using a large cross-country panel. We find empirical confirmation that corporate risk-taking and firm growth rates are positively related to the quality of investor protection. On the other hand, the data do not lead to consistent evidence for the alternative channels.

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## **I. Introduction**

A central theme of corporate governance studies is how constraints on corporate decision makers' pursuit of self interest leads to firm value maximizing behavior. In this paper we focus on how these mechanisms affect managerial risk choices in corporate investment decisions and the consequent implication for growth.

Recent finance research, building on the seminal work of La Porta *et al.* (1997, 1998), examines various fundamentally important roles of investor protection. One strand of the literature is focused on the effect of investor protection on the cost of capital (e.g., Shleifer and Wolfenzon (2002), Lombardo and Pagano (2002), and Castro, Clementi, and MacDonald (2004)). Poor investor protection creates the need for dominant owners (Burkart, Panunzi, and Shleifer (2003)); but they can not be trusted to protect minority shareholders' rights. The equilibrium outcome is high cost of capital. This leads to under-utilization of external capital and generally sub-optimal investment. For example, Wurgler (2000) shows that in locations with poorer investor protection investment is less responsive to change in value added.<sup>1</sup> In another strand of related literature, Morck, Yeung, and Yu (2000) show that poor investor protection is associated with low level of informed risk arbitrage. Durnev, Li, Morck, and Yeung (2004) suggest further that a low level of informed risk arbitrage could lead to poor corporate governance, poor resource allocation, and ultimately low productivity growth.

This literature, in our view, focuses on the implications of investor protection on financing. Few examine the relationship between investor protection and corporate investment behavior. Durnev, Morck, and Yeung (2004) show that more informed risk arbitrage, which is associated with better investor protection, would be associated with more firm value enhancing

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<sup>1</sup> See also Fisman and Love (2003) and Minton and Schrand (1999).

capital budgeting decision. However, their work does not readily reveal investment projects that managers have sub-optimally chosen to forego.<sup>2</sup>

We examine the relationship between investor protection and the risk choices in corporate investment. Our perspective is that the risk choices are affected not just by the insiders' or the managers' explicit ownership and compensation structures, but also by the private benefits that they would capture, including the corporate cash flows that they plan to divert to themselves. To protect their private benefits, insiders may opt to be conservative in directing corporate investment, even to the extent of passing up value enhancing risky projects. The more important the private benefits are, the more risk averse the insiders would be in directing corporate investments. The effectiveness of the investor protection in the economy has a negative effect on the magnitude and the importance of private benefits to the insiders. In countries with poorer investor protection the private benefits are more important, resulting in more positive net present value risky projects to be foregone.

There are at least two other arguments in the literature that could justify a positive association between investor protection and corporate risk-taking. First, in poor investor-protection countries, corporations may have dominant insiders with non-trivial cash flow rights and large private benefits in the firms that they control. Their high exposure therefore may lead them to be conservative in directing corporate investment. Second, non-equity stakeholders like banks, governments, and organized labor, which often prefer conservative corporate investment, may influence investment policy for their own benefits. In low investor-protection countries, the influences of these groups would often be high leading to low corporate risk-taking.

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<sup>2</sup> There is a related literature which examines the role of institutions on risk-taking in investments. The work by Allen and Gale (1997) and Acemoglu and Zilibotti (1997) argue that economies that provide better risk-sharing tend to promote more risk taking in investment and consequently lead to growth.

The literature offers justification for a negative association between investor protection and risk-taking too. First, when investor protection improves there is less fear of expropriation by managers and consequently lesser need for concentrated ownership by dominant shareholders (Burkart *et al.*, 2003). Dominant shareholders might have authority and incentives to reduce the discretion enjoyed by managers (Shleifer and Vishny, 1986). The reduction in ownership of dominant shareholders may therefore allow greater managerial discretion to implement conservative investment policies. This can give rise to a negative relation between investor protection and risk-taking. In essence, the argument here and in the above highlight that dominant shareholders could make opposite contributions to corporate governance, see, e.g., Stulz (1988). Second, in poorer investor protection locations firms have dominant owners, who may control a pyramid of firms (Morck *et al.*, 2005, Stulz, 2005). The dominant owner may instruct lower layer units to take excess risks and tunnel gains to upper layer units leaving lower level units to absorb any potential losses.

The contradictory theoretical possibilities motivate our empirical investigation, which is based on firm level and country level data from 1992 to 2002 for thirty-nine countries. We examine the relationship between shareholders' rights and a company's risk taking in investment. The shareholder rights are measured using proxies from La Porta *et al.* (1997, 1998). To proxy for the "riskiness" of chosen investment projects we use the variation in firm level cash flow over total assets. We find a positive relationship – stronger protection of shareholder interest is associated with higher firm-level riskiness which is in turn positively associated with firm-level growth. On the other hand, our proxies for the influence of non-equity stakeholders do not show support for the view that these stakeholders are successful in mitigating corporate risk-taking. We also find that the riskiness measure is positively associated with economic growth,

including total factor productivity growth. These results are robust to including various controls suggested in the literature.

Since corporate insiders might be able to manage earnings (Ball, Kothari, Robin (2000) and Leuz, Nanda, Wysocki (2003)), and such earnings management is more prevalent in low shareholder rights countries, there is a built-in negative relationship between firm-level riskiness measures and shareholder rights. Likewise, if corporate insiders appropriate a greater portion of corporate cash flow in poor shareholder rights location, there is a built-in negative relationship between the volatility of corporate cash flow and shareholder rights protection. In addition to including controls for the degree of earnings management, we also consider an imputed measure of risk-taking. We first select the country with the least earnings smoothing, which, as suggested by Leuz *et al.* (2003) and Bhattacharya, Daouk, Welker (2002) is the United States. We then use that country's corporate cash flow, based only on undiversified firms, to compute a benchmark volatility index for each 3-digit SIC industry. For each country, the weighted average of these industry-level volatility indices, weighted by the country's industry composition, captures the "risks" which the country's firms collectively undertake. Using this imputed risk-taking measure we perform the same analysis as before and find the results continue to hold and to withstand a series of robustness tests.

To complement our firm-level investigation in the cross-country analysis, we also undertake an analysis of firms in the United States for which we are able to find detailed firm-level data on corporate governance, including measures of investor protection. A single-country analysis of individual firms enables us to understand better the effect of firm-level variation in investor protection and transparency on measures of firm-level risk-taking. We again find a positive relationship between firm level shareholder protection, corporate risk taking, and growth.

The organization of the paper is as follows. Section II presents a discussion of the different arguments that link shareholder rights to corporate risk-taking in investment. Data, methodology, and the empirical design are presented in Section III. The empirical results are presented Section IV. Section V concludes.

## **II. Do shareholder rights affect corporate risk-taking?**

In this section we start with a brief description of our framework that suggests a positive relationship between the degree of investor protection and the riskiness of the investment policy implemented by corporate insiders or management. We also argue that the riskier investment policy implemented leads to higher firm value and overall growth rate. We then examine other arguments in the literature and work through their implications for the relationship between risk-taking in corporate investment and investor protection. We differentiate the arguments according to whether they suggest better investor protection is positively or negatively related to corporate risk-taking.

### ***Positive relationship***

Our perspective follows from examining how corporate insider's private benefits affect their choices on investment risks. Corporate insiders would use corporate resources to pursue their self-interest, including diverting corporate resources for personal benefits, at the expense of shareholders. The corporate resources that insiders are able to divert, prior to settling the cash flow claims of the firm, make insiders behave like senior debt holders. This happens because insiders expect that they have to lessen their cash flow diversion when a company's cash flow is low. In these low cash flow states siphoning of the low level of corporate resources for private benefits is not only constrained by lower cash flow availability but is also more readily detectable. This leads to insiders playing it safe avoiding even some firm value enhancing risky

projects to preserve their private benefits. They will undertake a risky project only if its outcomes in high-cash flow states are high enough to compensate for the lower level of diversion in less profitable states.

The amount of corporate resources diverted for private benefits depend on the degree of investor protection – the expected diversion is smaller, the better the investor protection (Shleifer and Wolfenzon (2002).) Thus, with better investor protection the insider's investment choices are less conservative and closer to the optimal one.

The link between investor protection and corporate risk taking can also be obtained from some agency-theoretic models by augmenting them with differential degrees of investor protection. For example, Amihud and Lev (1981), Hirshleifer and Thakor (1992), and Holmstrom and Ricart i Costa (1986) argue that managers avoid taking risks for career concerns, including those that enhance firm value. They may even spend corporate resources to diversify their companies' operations' risks to protect their career. It can be argued that better investor protection and thus more effective monitoring mitigate such conservative behavior resulting in higher corporate risk-taking in value enhancing projects.

There are alternative channels in the literature that generate a linkage between investor protection and corporate risk-taking. A recent literature shows that around the world corporations have dominant owners. This was first pointed out in studies of corporate governance in Germany and Japan, such as Prowse (1992), Berglof and Perotti (1994) and Edwards and Fischer (1994). La Porta *et al.* (1999) offer the first in-depth systematic cross country study, followed by a few studies that expanded the sample of firms and sometimes also countries, e.g., in Claessens *et al.* (2000) on Asian countries, and Faccio and Lang (2002) and Barca and Becht (2001) on European countries. The above-mentioned papers and the follow up studies show that these dominant owners are able to use pyramidal ownership structure, dual class shares, cross holdings, and

appointment of trusted allies in key executive positions to secure control of a large number of corporations (e.g., Morck, Stangeland, Yeung (2000), Rajan and Zingales (2003), Stulz (2005)) with only limited actual equity investment. Given the divergence in control and cash flow rights, the dominant owners derive private benefits from the corporations they control; indeed, the resources in the corporations they control become an integral part of the economic resources they command. This phenomenon is particularly prevalent in locations with poorly developed capital markets.<sup>3</sup>

The resources available to dominant insiders, including both their equity ownership and the private benefits of control, are inevitably concentrated within the firms they control. Because of their large exposure to these firms, these dominant insiders would be directing corporations they control to invest more conservatively than they would have if they held a diversified portfolio of firms. Given the evidence in the literature,<sup>4</sup> a direct implication would be that the investment policy implemented in firms with lower investor protection, and hence larger ownership positions by insiders, would lead to more conservative investment policies.<sup>5</sup> In addition, economies with lower investor protection also often have poorer stock markets, making it even more difficult for the dominant insiders to diversify their concentrated exposure in their firms. This accentuates the conservative nature of the investment undertaken by the insiders. Essentially, this hypothesis is an implication of the “insider dominance” problem articulated in Stulz (2005).<sup>6</sup>

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<sup>3</sup> Burkart et al. (2003) argue that it is because the protection for investor rights is low that dominant owners emerge to control managerial agency behavior. When the protection is so low that even a dominant owner cannot adequately control outside managers the dominant owner will run the firm herself. For empirical work on the prevalence of dominant owners and the impact on corporate governance, see, e.g., La Porta et al. (1999), Dyck and Zingales (2003), Nenova (2003), Claessens, Djankov, Fan, and Lang (2002), and Lins (2003).

<sup>4</sup> See, e.g., La Porta et al. (1999) and the survey in Morck et al. (2005) and Stulz (2005).

<sup>5</sup> We thank Rene Stulz for suggesting the argument.

<sup>6</sup> Morck et al. (2000) show that insiders controlling a vast amount of corporations would be conservative in investing in innovations and that is a reason why countries in which they are incorporated would experience slower growth.

A third set of explanations for a positive relationship between investor protection and corporate risk taking builds on the higher influence of non-equity stakeholders such as banks, labor unions, and the government on the investment policy of corporations in countries with poorer investor protection.<sup>7</sup>

For example, in a society with poor investor protection, firms often rely on banks exclusively for external financing. Banks may enjoy considerable market power as the sole source of financing. Given the concave payoff structure of the debt claims held by the banks, they may have the incentives and ability to influence a company to pursue a conservative investment policy.<sup>8</sup> This effect on investment policy will be higher in countries in which the investor protection is poorer and banks enjoy higher degree of market power as financiers.

Another argument links investor protection and investment risk through the role of powerful labor unions. Starting with the increased presence of dominant business groups in countries with poorer investor protection, Roe (2003) has suggested that these are also environments with strong labor groups that arise as a balancing response to the bargaining power of the dominant business groups. Faleye, Mehrotra, Morck (2005) show further that strong labor representation presses companies to undertake less risky investment and other steps to advance hired labor's interest (e.g., job security and pay). Therefore conservative investment behavior would be more prevalent in countries with poorer investor protection.

Likewise, societies with poorer investor protection are probably those with more intervention-prone governments. A powerful government may influence conservative investment policy on the part of the firms for several reasons. First, government values social stability and continued employment (see Fogel, Morck and Yeung, 2005). Second, a rent-seeking

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<sup>7</sup> We thank Randall Morck for these arguments.

<sup>8</sup> See Morck and Nakamura (1999) who show evidence from Japan that powerful banks, as a monitor, serve to advance creditors' interest even at the expenses of firm value.

government would discourage corporate risk-taking to preserve extractible rents. Furthermore, if the rent extraction acts like a progressive tax on high earnings, it will also discourage both insiders and shareholders from supporting corporate risk taking. This argument also leads to more conservative investment behavior in countries with poorer investor protection.

### *Negative relationship*

There are arguments that would suggest a negative relationship between the degree of investor protection and the riskiness of corporate investment.

One argument is that as investor protection improves, there is less fear of expropriation by managers. Hence, the benefits of having dominant shareholders serving as monitors of managerial behavior decrease (Burkart *et al.*, 2003.) As a result, dominant shareholders become less prevalent across firms and their cash flow rights in firms also decline. This reduction in dominant shareholding allows managers greater discretion to reduce risk taking, giving rise to a possible negative relationship between investor protection and corporate risk-taking.<sup>9</sup>

A second argument is one which we label “tunneling distortion.” In locations with poor investor protection a dominant insider often controls a multitude of corporations in complex ownership structures with varying degrees of cash flow and control rights. An example would be

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<sup>9</sup> We thank our referee for suggesting the argument. We note here that our leading “positive” argument in the previous sub-section focuses on that managers have more control in a poorer investor protection environment and appropriate more personal benefits; the result is that they may avoid risky investment to protect their appropriation, sometimes even if the risky investment is value-enhancing. Improving investor protection at the public level may mitigate such behavior. In the current argument, we recognize that dominant shareholders and public protection may be substitutes in protecting investor interest. Improvement of public protection may reduce the presence of dominant shareholders with the consequence that managers may in the net have more discretionary power, which results in that more public protection for investors is associated with less corporate risk taking. We also note here that we have argued in the previous sub-section that in locations with poorer investor protection, a firm is more likely to have controlling owners who make firm investment excessively risk averse to protect their personal exposures in the firm. The key in all these arguments is that dominant shareholders in poor investor protection will direct managers to behave according to their preference. Their presence may make managers more or less risk averse: both cases are theoretically plausible. The contradictions in these predictions point to the importance of empirical investigation.

the pyramid ownership structure in which the dominant insider would have limited cash flow rights in many component firms with high degree of control rights. The dominant insider would benefit by tunneling cash flow from low-cash-flow-rights units to high-cash-flow-rights units (Johnson, LaPorta, Lopez-de-Silanes, and Shleifer (2000)). Tunneling might then encourage risk taking – a dominant insider may take risks in units where her cash flow rights are low and then siphon out proceeds to units where her cash flow rights are high.

Here are the details in the above argument. Consider a scenario in which the dominant shareholder is able to maintain strong control rights with a very low level of cash flow rights (say, only an ownership of  $\alpha$  of the cash flows). Now assume that tunneling imposes a cost of  $\tau$  per dollar tunneled. Then, to the dominant insider the value of a dollar in any unit is the maximum of  $(1-\tau)$  and her cash flow rights,  $\alpha$ , that is:  $\max((1-\tau), \alpha)$ . Also, further assume that in many relevant corporate units the dominant insider's cash flow rights are less than  $(1-\tau)$ , i.e.,  $(1-\tau) > \alpha$ . This assumption is likely to be satisfied in countries with poor investor protection, and more so the poorer the investor protection is. Suppose further that the tunneling cost varies with the amount of cash flow a unit has, i.e.,  $\tau$  is lower when the unit has higher cash flow. That is, we assume that the tunneling cost is decreasing and concave in the cash flows. Since the tunneling cost behaves like a regressive corporate income tax, the net-of-tax amount to insiders is convex in the cash flows. If the convexity is sharp enough, it could encourage risk-taking. This could be the case when  $\tau$  drops fast enough with a unit's cash flow.<sup>10</sup> Our conjecture is that this

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<sup>10</sup> Assume an investment  $I$  leads to payoff  $H$  with a probability  $q$  and  $L$  with probability  $1-q$ ,  $H > L$ . Let the tunneling cost be  $\tau_m$  at the point of investment, and  $\tau_h$  and  $\tau_L$ , respectively, for the high and low pay-off state. Assume that  $\alpha < (1-\tau_L)$ . The expected value of the investment to the insider is  $qH(1-\tau_h) + (1-q)L(1-\tau_L) - I(1-\tau_m)$ . Note that if the three  $\tau$ 's are identical, the sign of the insider's expected value for the project is the same as  $[qH + (1-q)L - I]$ . Now, assume that tunneling cost is decreasing and concave in cash flow so that  $\tau_h < \tau_m < \tau_L$ . If  $\tau$  decreases sufficiently fast with a unit's cash flow, that is if  $\tau_h$  is sufficiently smaller and  $\tau_L$  is not too much larger than  $\tau_m$ , an investment project's expected returns could be positive even if  $[qH + (1-q)L - I]$  is non-positive. The project may even become attractive to a risk-averse dominant insider. In this sense, the tunneling cost behaves like a regressive

is more likely to happen when investor protection is poorer – in such countries, the cash flow rights are generally low and the tunneling costs are more regressive. Note, however, that it is unclear whether the higher risk-taking investment leads to higher or lower growth at the economy level.

In summary, in this section we have provided three complementary channels that imply a positive relationship between the degree of investor protection and corporate risk-taking. First, we describe a channel based on the interaction between the larger diversion of corporate resources in countries with poorer investor protection and the more conservative investment policies pursued by such corporate insiders. The lower investor protection allows insiders with relative low level of cash flow rights to siphon out more corporate resources for private benefits. The greater the corporate resources they expect to divert, the more the insiders will avoid taking risky investments to protect their private benefits. An alternative channel arises from the undiversified ownership in their own firm held by entrenched owners in poor investor protection countries. They direct companies they control to undertake less risky investments to reduce their exposure. A third channel arises from the conservative investment considerations of important non-equity stakeholder groups such as banks, labor unions, and the government. Such stakeholders are more influential in poor investor protection countries and induce low risk investments.

We have also presented arguments in favor of a possible negative relationship between investor protection and corporate risk-taking. For example, in weak investor protection locations

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corporate income tax that encourages risk-taking. More generally, if the cost of consuming private benefits is a concave function of the available cash flow such that the private benefits captured by corporate insiders optimally is a convex function of the available cash flows (and in addition the cash flow claims held by the insiders are small) it can be argued that the insiders overall objective function has a convex structure that gives them incentives to pursue risky investment strategies. In addition, if the cash flow rights held by the corporate insiders are smaller in countries with poorer investor protection, it is possible that there could be negative relationship between the degree of investor protection and the riskiness of corporate investment.

companies often have controlling owners whose incentives to monitor may serve to mitigate managers' excessive risk avoidance. Second, in poor investor locations dominant owners often control not just a stand alone firm but a pyramid of firms. Given the pyramidal ownership structures, dominant insiders might be tempted to shift risks to low cash flow rights units and siphon high earnings to high cash flow rights units. The above arguments lead to the following empirical questions:

1. Does better investor protection result in higher risk-taking in corporate investment? Likewise, does the presence of powerful interest groups, such as dominant banks, labor unions, and the government constrain risk-taking in corporate investment?
2. Is higher risk-taking value enhancing and thus associated with greater country-wide productivity and GDP growth?

### **III. Empirical Examinations**

We examine these questions using Compustat Global Vantage data for thirty-nine countries in the period 1992-2002. A cross-country study is appropriate because variation in investor protection across countries is more likely to be exogenous than variations within countries. A downside of this approach is that our panel of company data is unbalanced across countries. To address this concern, we further conduct a single country study, based on companies in the United States. Doing so allows us to utilize firm level variations in critical independent variables, which are not available in many other countries, and also allow us to more adequately control for relevant but unobservable country-level factors.

We first present the set up for the cross-country firm-level study. The empirical work entails regressing firm level and country-level observations of “risk-taking” in corporate operations on variables that capture investor protection, stakeholder influence, and controlling

for other relevant factors. We also relate firm- and country-level growth measure (including country-level total factor productivity growth) on “risk-taking” in corporate operations, controlling for corporate accountability and market factors to examine whether corporate risk taking is associated with growth. The regression specifications are as follows:

$$RISK_c = \alpha_1 + \alpha_2 \text{ investor protection}_c + \alpha_3 \text{ stakeholder influence}_c + \alpha_4 X_c + \omega_c \quad (1)$$

$$RGDP_c = \beta_1 + \beta_2 RISK_c + \beta_3 Y_c + \mathcal{G}_c, \quad (2)$$

$$TFP_c = \gamma_1 + \gamma_2 RISK_c + \gamma_3 Z_c + \zeta_c, \quad (3)$$

where the subscripts  $c$  indicates country.  $RISK_c$  is a proxy for risk-taking in corporate operations. *Investor protection* is a collection of variables that capture corporate accountability, outsider shareholder rights, and the rule of law. *Stakeholder influence* is a collection of proxies that capture the power of non-equity stakeholders such as banks, the government, and labor unions to influence corporate investment decisions; these non-equity stakeholders may constrain corporate risk taking, as described in the previous section.<sup>11</sup>  $RGDP$  is the per-capita real GDP growth,  $TFP$  is the total factor productivity growth, and  $X_c$ ,  $Y_c$ , and  $Z_c$  are vectors of control variables. As operating risk and growth could jointly be impacted by investor protection, we perform models (2) and (3) taking into account this endogeneity. In particular we instrument  $RISK_c$  in these models.

Our first empirical hypothesis is that  $\alpha_2$  is positive,  $\alpha_3$  is negative, and  $\beta_2$  and  $\gamma_2$  are positive. Our alternative hypothesis is that  $\alpha_2$  could be negative, as we have elaborated in our discussion above, e.g., if tunneling distortion raises risk-taking and tunneling distortion is more prevalent in weak investor protection environments. If poor investor protection and the presence

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<sup>11</sup> Several authors (Tirole (2001), Roe (2003)) have stressed the scenario in which non-equity stakeholders such as creditors, labor, and the government constitute powerful interest groups that can influence the corporate investment decisions in their favor even in the presence of dominant insiders. Our hypothesis is that these powerful interest groups can induce a conservative corporate investment policy.

of influential interest groups distort corporate risk taking in investments, we would expect that a country-level regression like (2) generates a coefficient  $\beta_2$  statistically different from zero. In regressions (2) and (3), we will include as controls the interest group influence proxies.

### ***A. Description of Variables***

Below is an extended description of how we construct our key variables. See Table 1 for a concise reference.

#### ***A.1. Measuring risk taking***

Since riskier corporate operations have more volatile returns to capital, we develop three proxies for the degree of risk-taking in firm's operations based on the volatility of corporate profitability: (i) the market-adjusted volatility of firm-level profitability over the sample period from 1992 to 2002; (ii) a country average of the volatility of firm profitability; and (iii) an imputed country risk score, based on industry risk characteristics. We describe them in turn.

#### **RISK1**

Our first measure of risk-taking (RISK1) is  $\sigma_{i,c} = \sqrt{\frac{1}{T-1} \sum_{t=1}^T \left( E_{i,c,t} - \frac{1}{T} \sum_{t=1}^T E_{i,c,t} \right)^2} \mid T \geq 5$ , where

$$E_{i,c,t} = \frac{EBITDA_{i,c,t}}{A_{i,c,t}} - \frac{1}{N_{c,t}} \sum_{k=1}^{N_{c,t}} \frac{EBITDA_{k,c,t}}{A_{k,c,t}}, \text{ and } N_{c,t} \text{ is the total number of firms within country } c \text{ for}$$

year  $t$ . EBITDA is the sum of operating income after depreciation (data item #14) and depreciation and amortization expenses (data item #11) and  $A_{i,c,t}$  is the contemporaneous total assets (data item #89). For each firm with available earnings and total assets for at least five years across 1992-2002, we compute the deviation of the firm's EBITDA/Assets from the country average for the corresponding year. We then calculate the standard deviation of this

measure, for each firm (subtracting  $\frac{1}{T} \sum_{t=1}^T E_{i,c,t}$  from  $E_{i,c,t}$  has the effect of taking away the time invariant firm-specific factor in profitability). Hence, each firm receives a single observation. Prior to computing the risk-taking proxy, the demeaned profitability measure  $E_{i,c,t}$  is Winsorized at 0.5% in both tails of the distribution to account for possible data errors.

### RISK2

We use  $\sigma_{i,c}$  as the dependent variable in regression (1). This sampling gives more weight to countries with more firms. To address this bias, we also use a second measure, the average of  $\sigma_{i,c}$  within a given country so that each country has only one observation. We denote this  $\sigma_c$  (RISK2).

Regression (1) aims to identify association between return volatility and corporate accountability. The  $\sigma_{i,c}$  and  $\sigma_c$  measures, however, may be influenced by firm level income smoothing (Ball *et al.* (2000) and Leuz *et al.* (2003).) If income smoothing is more aggressive and more prevalent in countries with low corporate accountability, it may render  $\sigma_{i,c}$  and  $\sigma_c$  lower; in that case, observing lower risk-taking in countries with low corporate accountability may not imply that firms in the latter undertake less risky operations.

Another reason for not fully relying on the above risk measure is that it might be mechanically linked to investor protection. If poor investor protection allows insider managers to divert corporate resources at a rate proportional to the available cash flow, the observed cash flow would mechanically be less volatile than the real one – the poorer the investor protection the greater the reduction (e.g., Shleifer and Wolfenzon (2002)). Thus, the observed relationship between investor protection and the volatility of profitability does not necessarily reflect

managerial investment risk choices. To address this issue we impute a riskiness measure that does not depend on observed corporate cash flow.

### RISK3

To deal with the above problems, we develop an imputed measure of risk-taking. First, we use US earnings data to compute an industry-by-industry risk score,  $\sigma^{USA}_{1994-1997,j}$ , based on the observation that US cash flow data, while certainly not perfect, is subject to less earnings smoothing than data from other countries (Leuz *et al.* (2003) and Bhattacharya *et al.* (2003)).

$\sigma^{USA}_{1994-1997,j}$  is the variation of  $E^{USA}_{i,j,t} = (EBITDA^{USA}_{i,j,t} / A^{USA}_{i,j,t}) - \frac{1}{N_t^{USA}} \sum_j \sum_{i=1}^{N_j} (EBITDA^{USA}_{i,j,t} / A^{USA}_{i,j,t})$  in

the period 1994-1997 defined as  $\left[ \frac{1}{\sum_{t=1994}^{1997} N_{j,t}^{USA}} - 1 \sum_{t=1994}^{1997} \sum_{i=1}^{N_j} \left( E^{USA}_{i,j,t} - \frac{1}{\sum_{t=1994}^{1997} N_{j,t}^{USA}} \sum_{t=1994}^{1997} \sum_{i=1}^{N_j} E^{USA}_{i,j,t} \right) \right]^{2^{-0.5}}$  where  $j$  indexes

the 3-digit SIC codes for manufacturing industries,  $i$  indexes the undiversified companies within a given industry,  $t$  indexes the years 1994-1997 and  $N_{j,t}^{USA}$  represents the number of firms in the

US in industry  $j$  in year  $t$ . By construction,  $\left[ E^{USA}_{i,j,t} - \frac{1}{\sum_{t=1994}^{1997} N_{j,t}^{USA}} \sum_{t=1994}^{1997} \sum_{i=1}^{N_{j,t}^{USA}} E^{USA}_{i,j,t} \right]$  captures the deviation

of a firm's EBITDA/Assets from industry  $j$ 's average in year  $t$ , and also the deviation of industry  $j$ 's average EBITDA/Assets in year  $t$  from its sample average, but the deviation of economy-wide average in year  $t$  from its sample average is netted out. The construct is also equivalent to computing within the 1994 to 1997 window for industry  $j$  the standard variation based on its firms' EBITDA/Asset in year  $t$ , net of the US average in the same year, and also free of industry specific time invariant deviation from the US average.  $\sigma^{USA}_{1994-1997,j}$  captures the corresponding variance measure.

Prior to computing  $\sigma_{1994-1997,j}^{USA}$  we Winsorize  $E_{i,j,t}^{USA}$  at 0.5% in both tails of its distribution to account for data errors. We use only single business segment firms, identified through the Compustat segments file.  $EBITDA_{i,j,t}^{USA}$  is data item #13 (Operating Income Before Depreciation and Amortization) and  $A_{i,j,t}^{USA}$  refers to data item #6 (Total Assets), both from Compustat North America for 1994-1997. We start in 1994 in order to exclude the recession years within our sample of 1992-2002 preceding 1994. The sample ends in 1997 because business unit reporting changed in that year (in 1997, FAS 131 changed the way companies reported their segments, rendering comparisons of US segments pre- and post-1998 difficult). We include only firms with sales of at least \$10 million.

We use  $\sigma_{1994-1997,j}^{USA}$  to impute the score of country “*risk-taking*.” The score is calculated for each country over 1998-2002 (in Table 6 panels A and B) or 1998-2000<sup>12</sup> (in Table 6 panel C.) The imputed risk scores are obtained as follows:

$\Omega_c = \frac{1}{5} \sum_{t=1998}^{2002} \left( \frac{\sum_{j \in \{200, \dots, 399\}} MV_{t,j,c} \times \sigma_{1994-1997,j}^{USA}}{\sum_{j \in \{200, \dots, 399\}} MV_{t,j,c}} \right)$ , where  $j$  is an industry subscript based on 3-digit SIC codes,  $c$  is a country subscript,  $t$  is a year subscript,  $MV_{t,j,c}$  is the total market capitalization of companies in industry  $j$  in year  $t$  in country  $c$ . We name that *RISK3*. The concept of constructing this index is that countries that have allocated more investments into “riskier” industries will have a higher  $\Omega_c$  score.

In computing  $\Omega_c$  we include only firms with sales above \$10 million. Market capitalizations (MV) are computed as of the end of the fiscal year. Prices and shares outstanding for the sample firms are compiled from Compustat Global Issue database. Thus,  $\Omega_c$  is the simple

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<sup>12</sup> Total factor productivity is available only till 2000, since Penn World Tables Version 6.1 data needed to compute it is available only till 2000.

average over 1998 - 2002 of country  $c$ 's annual value-weighted average of risk scores,

$$\sigma_{1994-1997,j}^{USA}.$$

## A.2. Measuring investor protection

To characterize investor protection in each country, we use three measures: the quality of accounting disclosure standards (ASR), the rule of law (RL), and an index of anti-director rights (ADR). High accounting disclosure standards lead to better investor protection – they make the diversion of corporate resources more difficult. Higher accounting disclosure requirements could also lessen the propensity to tunnel, which as we argued above could encourage risk-shifting by dominant insiders in firms where their cash flow rights are low. The variable is retrieved from La Porta *et al.* (1998) who tabulate the original data from the Center for International Financial Analysis and Research.<sup>13</sup>

We supplement accounting disclosure standards (ASR) with the rule of law (RL) as an indicator of the effectiveness of enforcement of the regulations. The source of the data is also La Porta *et al.* (1998). RL is calculated as “average of the months of April and October of the monthly index between 1982 and 1995.” The scale of this variable is from zero to 10, with lower scores for less tradition for law and order. Third, we include the anti-director rights index (from La Porta *et al.* (1998)) to gauge the level of protection of shareholders from insider stealing (Table 1 spells out the index details.)

The institutional measures are dated in 1990 or mid nineties and our data sample is from 1992 to 2002. In spite of these time differences, the data are likely to represent the institutional

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<sup>13</sup> The variable represents a count of the inclusion or omission of 90 accounting items in a sample of 1990 annual reports. These items fall into seven categories (general information, income statements, balance sheets, fund flow statement, accounting standards, stock data, and special items).

environment in our sample period fairly well to the extent that institutional regimes tend not to change rapidly.

### *A.3. Measuring non-equity stakeholder influence*

Low investor protection countries often have underdeveloped equity markets and rely on bank financing. To the extent that banks may prefer conservative investments, their dominance in financing would impact firm risk-taking. Countries also may have interventionist governments and strong labor unions which may press corporations to avoid risky investments because the possibility of bankruptcy and unemployment would be socially disruptive.

#### *Bank dominance*

We use private domestic credit as share of the GDP, to capture bank dominance. The variable is from Demirguç-Kunt and Levine (2001). As a robustness check, we also use bank credit/stock market capitalization.<sup>14</sup>

#### *Interventionist Government*

To capture interventionist government, we use government spending as share of GDP; the variable is the average from 1980 to 1995. The data source is IFS Statistics. As a robustness check, we also use the percent of top 10 largest firms controlled by the state as a proxy for interventionist government.<sup>15</sup> Our results are not qualitatively different.

#### *Labor unions influence*

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<sup>14</sup> Note that the bank credit/GDP and stock market capitalization variables are the average of 1980 to 1995 (Demirguç-Kunt and Levine (2001)). The time window overlaps slightly with our dependent variables' time windows which begin in 1992. The advantage of using the Demirguç-Kunt and Levine (2001) variables is that they are in the public domain and thus facilitate replications by others. We also used 1980 to 1991 data, collected from the World Bank and IFS. The results are all very similar.

<sup>15</sup> Such observation is available in La Porta et al. (1999).

To capture the power of organized labor, we use the percentage of labor that participates in trade unions from the World Labor Report, 1997-1998. As a robustness check, we also use the indicator “flexibility of firing index” from the 2003 Doing Business Report of the World Bank since it is also plausible that corporations avoid risky value-enhancing investments when investment exit costs are high, e.g., due to inflexible labor laws designed against layoffs. Such laws may also raise united labor power.

#### *A.4. Measuring growth*

Firm level growth is measured as the average of the growth in total assets (item #89) and in sales (item #1) over the sample period, 1992-2002. Prior to computing the growth measures we convert all accounting data items into US\$ at the average monthly exchange rate as of the fiscal year end month. We Winsorize the average assets and sales growth variables at the 0.5% level on both sides of the distribution.

For country growth we use two measures: real per-capita GDP growth and Total Factor Productivity (TFP) growth. Real GDP is measured in 1995 constant US\$. The nominal GDP, the GDP deflator and population data are obtained from the International Financial Statistics of the IMF. To measure TFP we follow the algorithm in King and Levine (1993a, 1993b). We use the recursive formulation,  $K_{c,t+1} = K_{c,t} + I_{c,t} - \delta \times K_{c,t}$ , where  $c$  and  $t$  are country and time subscripts.  $K$  and  $I$  are, respectively, the real capital stock and real investment in country  $c$  in year  $t$ , and  $\delta$  is the rate of depreciation, which we set to 7% as in the above mentioned studies. We start the recursion by assuming that the capital stock is zero in 1950 (the beginning of the data provided by Penn World Tables (PWT) version 6.1). Iterating forward we obtain the capital stock for each year in 1992-2000 (the last date with available data in PWT 6.1.) We then define

capital stock per capita,  $k$ , as the ratio of the real capital stock to the population. The productivity growth is finally defined as  $\Delta \ln(y) - 0.3\Delta \ln(k)$ , where the capital stock intensity is assumed to be 30% across all countries.

#### *A.5. Control Variables*

The set of control variables in regression (1) includes factors known to explain the cross-section of earnings volatility, such as competition, earnings smoothing, debt and equity market development, and firm level characteristics such as firm size, recent corporate growth, profitability, firm leverage and ownership.

##### *A.5.1. Country level control variables*

We start with the country-level controls.

##### *Competition*

Philippon (2002) suggests that product market competition contributes to volatile firm markups and thus to higher volatility in firm profits. To distinguish the effect of competition from the impact of governance mechanisms, we attempt to control for competition. We use a Herfindahl index, defined as the sum of the squared shares of firm sales to total sales within a given country, averaged for the period 1992-2002,  $H_c = \frac{1}{T} \sum_t \sum_i \left( \frac{s_{i,c,t}}{\sum_i s_{i,c,t}} \right)^2$ , where  $s_{i,c,t}$  is the sales

of company  $i$  from country  $c$  in fiscal year  $t$ .

##### *Financial Development*

We also control for equity and debt market development in the growth regressions (2) and (3). Acemoglu and Zilibotti (1997) argue that at early stages of development the degree of

risk-sharing the economy can achieve is limited; hence undertaking risky investments is less desirable for risk-averse managers whose human capital is under-diversified. We note here that the lack of means to diversify may prompt controlling insiders, whose wealth is concentrated in the corporations they control, to be even more risk averse in directing these corporations' investment. As financial markets develop, risk avoidance diminishes since risk sharing is more readily achievable. To control for equity market development we use the 1991 stock market capitalization. Another control for financial development is the banking market development. However, as we have discussed earlier, we have already included private domestic credit as share of the GDP as an independent variable aiming to capture the influence of bank dominance in corporate risk-taking decisions. Here, we note that the performance of the variable may be weak because it may be capturing two opposite forces.

#### *Other country-level controls*

In the growth regressions (2) and (3) we further incorporate standard controls, including real per-capita GDP, financial market development and human capital accumulation proxy (the average number of years of schooling as of 1990 from Barro and Lee (1993)). Since our growth regressions time window is from 1992 to 2002, these variables are measured at pre-1992 values.

Finally, our various risk-taking measures are aimed to capture inherent risks in firm-level operations. However, the volatility measures are undoubtedly affected by macro-volatility. To address this, our volatility measures are based on the deviation of accounting returns *from* market averages.<sup>16</sup>

#### *A.5.2. Firm level control variables*

##### *Earnings smoothing*

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<sup>16</sup> Our empirical results remain intact if we use a measure of total firm risk. We shall return to this point subsequently.

An important concern is that our risk-taking measures may be influenced not only by the fundamental volatility of the investment projects but also by earnings smoothing incentives. Leuz *et al.* (2003) suggest that earnings management is used to conceal firm performance from outsiders, and argue that strong protection for investors limits private benefits of control and thus reduces managerial incentives to mask firm performance. To control for earnings smoothing we use a measure in Leuz *et al.* (2003), the ratio of the standard deviation of operating income (OI) and the standard deviation of operating cash flow (where both variables are scaled with lagged

$$\text{total assets}), \quad ES_1 = \left[ \frac{\sum_{t=1992}^{2002} \left( \frac{OI_{i,c,t}}{A_{i,c,t}} - \sum_{t=1992}^{2002} \frac{OI_{i,c,t}}{A_{i,c,t}} \right)^2}{\sum_{t=1992}^{2002} \left( \frac{OI_{i,c,t} - Accrual_{i,c,t}}{A_{i,c,t}} - \sum_{t=1992}^{2002} \frac{OI_{i,c,t} - Accrual_{i,c,t}}{A_{i,c,t}} \right)^2} \right]^{0.5}. \quad \text{Leuz } et \text{ al. (2003)}$$

interprets lower values of this measure as evidence of higher level of earnings smoothing. In other words, earnings smoothing is high when the standard deviation of reported earnings relative to the standard deviation of earnings free of accruals is low. To facilitate interpretation we transform the variable to  $ES_2 = 1 - ES_1$  so that higher values indicate higher propensity for earnings smoothing. In the above, operating cash-flow is defined as operating income (Compustat Global item #14) minus accruals, where accruals are calculated as  $ACCRUALS_{i,t,c} = (\Delta CA_{i,t} - \Delta CASH_{i,t}) - (\Delta CL_{i,t} - \Delta STD_{i,t} - \Delta TP_{i,t}) - DEP_{i,t}$ , where  $CA_{i,t}$  is total current assets (#75),  $CASH_{i,t}$  is cash or cash equivalents (#60),  $CL_{i,t}$  is total current liabilities (#104),  $STD_{i,t}$  is short-term debt (#94),  $TP_{i,t}$  is taxes payable (#100), and  $DEP_{i,t}$  is depreciation expense (#11); all variables are from Compustat Global Vantage. The  $i$  and  $t$  index companies and years, respectively. In regression (1) with dependent variable RISK1,  $ES_2$  is a firm level variable. When we conduct the regression using country-level dependent variables (RISK2 and RISK3),  $ES_2$  is the median of the firm level observations in each country.

### Firm book leverage

We define firm leverage as the ratio of total liabilities plus preferred stock minus balance sheet deferred taxes to total assets. We Winsorize it at 0.5% in each tail of the sample distribution. We use the firm book leverage as of the first year of appearance of the company in our dataset.

#### Corporate ownership

Our corporate ownership is derived from Bureau Van Dijk's Osiris shareholder ownership database. We rank the shareholders in each company by their total (direct and indirect) ownership. We then retrieve the ownership of the largest cash flow rights holder on the shareholder list. If the largest shareholder has less than 20% we code the ownership value as 0, following Faccio and Lang (2002) and Cleassens, Djankov and Lang (2000). As a robustness check we further consider a different threshold of 10% and find that our results are robust to this assumption. The advantage of using that data is that it represents a comprehensive set of total cash flow rights by shareholders in a large cross-country panel. The caveat of using that data is that it is as of the end of our sample period.

#### Other firm-level controls

We further control for initial sales growth and initial profitability (EBITDA/Assets). These firm traits are retrieved as of the year of entry of the company in our sample.

### ***B. Data summary and univariate results***

Table 2 reports descriptive statistics for the main variables at the country level. The sample is chosen based on the requirement that data are available to compute the risk scores above. That leaves us with a sample of thirty-nine countries. The sample of firms included per countries

varies from 13 firms (Colombia) to 1,818 (United States).<sup>17</sup> The firms' sales together represent a significant portion of the economy they reside in. Their average total sales over GDP in 1999 is 25.2% (the median is 21.84%, the lowest is 2.5%, and the highest is 70.4%). Table 3 reports the pair-wise correlations among the main country level variables. The correlation between the two country risk-taking variables, RISK2 and RISK3 is 15%, and is not statistically significant. As discussed above, we deliberately create the  $\Omega_c$  measure to be different from  $\sigma_c$  because we are concerned about the representativeness of  $\sigma_c$  as fundamental "risk-taking." We further notice that the index of earnings smoothing is negatively associated with RISK2 (significant correlation of -42%), while it has an insignificant correlation with RISK3 (-7%). Thus, the skepticism that high volatility of firm level accounting returns may partly be due to low earnings smoothing is substantiated.<sup>18</sup>

Both country-level measures of risk-taking are positively correlated with the three corporate accountability variables: the quality of accounting disclosure standards (ASR), the rule of law (RL), and anti-director rights (ADR). Of these, the correlations of RISK2 with ASR (50%) and with ADR (27%) are statistically significant while the correlation of RISK2 with RL is not. At the same time, the correlations of RISK3 with ASR (49%) and RL (40%) are significant but its correlation with ADR is not. These univariate results provide some weak support for our first hypothesis. Figures 1 through 3 show these correlations, which are visibly positive.

We further find that the proxy for bank influence (PRIVO) is not significantly correlated with RISK2 but is with RISK3, 52%. However, the sign is positive rather than negative.

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<sup>17</sup> Rajan and Zingales (1995) discuss at length the reporting bias in the Compustat Global Vantage. See robustness checks section for further discussion.

<sup>18</sup> One may argue that RISK2 is equally weighted average while RISK3 is a value-weighted average so that their behavior is different. When we used a value-weighted RISK2 index, we obtained similar results. We do not report these results to conserve space.

Government spending is positively but not significantly correlated with both RISK2 and RISK3 while the unionized labor proxy is positively correlated with RISK3 but not with RISK2. Hence, simple correlations do not support the idea that non-equity stakeholder influences mitigate corporate risk taking.

Economies with less competitive intensity, as judged by a higher Herfindahl index, tend to score lower on our risk-taking measures (the correlation are -9% for RISK2 and -49% for RISK3, the latter of which is statistically significant). This appears consistent with the conjecture that intense competition increases the volatility of earnings (Philippon (2002)).

Finally, both country-level risk-taking measures are positively correlated with growth in real per-capita GDP and in total factor productivity. The scatter plots are shown in Figures 4 and 5. However, the correlations are not statistically significant. Either the hypothesized relationship does not exist, or perhaps the correlation omits variables important for growth.

## **IV. Multivariate results**

### ***A. Firm level tests***

#### ***A.1. Cross-country study***

We present our multivariate results in Tables 4, 5 and 6. We start by examining the firm level results (Tables 4 and 5). All t-statistics are based on country-cluster-adjusted standard error estimates. To account for the varying number of firm observations across country, we weigh the individual observations with the inverse of the number of firms from the corresponding country.

#### **Risk-taking**

In Table 4 Panel A equations 1 to 5 we present the determinants of the firm-level risk-taking proxy (RISK1) in an ordinary least squares estimation framework. We include as country-level explanatory variables anti-director rights, the rule of law, accounting disclosure standards,

country level competition intensity (“country Herfindahl index”), private credit as share of GDP, stock market capitalization as a share of GDP, government spending as share of GDP, and the percent of unionized labor. We also include firm level determinants such as the ownership of the largest shareholder on record, earnings smoothing, firm size, profitability, sales growth, and book leverage. While earnings smoothing is computed utilizing the data over 1992-2002, the firm size, profitability, sales growth and book leverage are retrieved as of the first year of company entry into our panel. The shareholder ownership is as of 2002. We also include one-digit SIC code industry fixed effects.

The regression results are consistent with our first hypothesis – the corporate accountability measure has a positive and statistically significant relation with firm-level risk-taking. This measure is significant whether entered individually or jointly with rule of law and anti-director rights. The economic impact of disclosure on risk taking is noteworthy. Using model 5 in Table 4 Panel A, one standard deviation increase of disclosure increases the risk-taking proxy by 7.9% of its mean. The anti-director rights index is positive but not always significant. Based again on model 5, a one standard deviation increase in anti-director rights increases the risk-taking proxy by 4.4% of its mean. One possible reason for this loss of statistical significance for anti-director rights index when entered jointly with the rule of law and the corporate accountability measure is the high correlation of the country-level variables in the firm level analysis, for example the correlation between disclosure and anti-director rights index is 47%. The rule of law proxy has a positive sign but is not statistically significant in any of the specifications. We note however that the investor protection variables are jointly significant in models 4 and 5 as indicated by an F-test of the joint significance of the investor protection variables (3.54 for model 4 and 4.13 for model 5, both significant at the 1% level).

The coefficient on the proxy for the bargaining power of the labor unions has a positive sign which is mostly statistically insignificant. That does not support our conjecture that these non-equity stakeholders constrain risk-taking. Country private credit variable attracts a negative coefficient as expected, however it is not significant in all specifications. The coefficient on government spending is insignificant and changes signs across specifications. This does not support the hypothesis that an active government as a stakeholder constrains corporate risk-taking.

The Herfindahl index, a proxy for competitive intensity, does not have a stable relationship with volatility in earnings. The coefficient on market capitalization is negative in most specifications. It is insignificant in all. One possibility is that we have high collinearity among the country-level controls. The capital market development measure is highly correlated with accounting disclosure standards, the rule of law, and anti-director rights. We observe negative signs on equity market capitalization in firm growth regressions in Panel B as well. While these results are problematic, the previous literature has reported similar conclusions.<sup>19</sup>

Certain other variables behave generally as expected. The earnings smoothing proxy attracts a negative coefficient, indicating that higher earnings-smoothing is associated with lower volatility of accounting returns. Firm size is also negative and significant, indicating that large size is associated with lower operating risks.

The potential joint determination of company operating risk and ownership structure raises concerns. It could be that high risk companies develop over time concentrated ownership structures if diffuse owners are less able to monitor operating risk choices. To address the

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<sup>19</sup> For example, Beck and Levine (2002) find results similar to ours: when both judicial efficiency (which is highly correlated with investor protection) and financial development are included as explanatory variables for industry growth across countries, only the former is significant and positive while the latter is negative and insignificant. Similarly, Demirguç-Kunt and Maksimovic (1998) show that in regressions of excess firm growth, the coefficient on the equity market size as a fraction of GDP is negative and insignificant.

ensuing endogeneity, we treat the ownership proxy as endogenous variable in a two-stage least squares (2SLS) estimation framework in model 6. We instrument our ownership structure proxy with the value of the average large shareholder ownership of other companies from the same country in the same two-digit SIC code industry and with the logarithm of firm age. These proxies have been used in Laeven and Levine (2006a, 2006b).

The 2SLS results are consistent with the OLS ones in models 1 to 5 except that the role of the rule of law indicator is further weakened. The accounting disclosure variable has stronger association with the risk-taking proxy. Our set of instruments appears valid as indicated by the over-identification test. We cannot reject the hypothesis of no correlation of the excluded instruments with the error term as the over-identification test p-value is 0.86. The instrument set is further jointly significant. Our concern of endogeneity is not substantiated as the Hausman test reveals that we cannot reject the null hypothesis of no difference between the 2SLS and OLS estimates. We conclude that while our instrumentation results may be subject to low explanatory power (partial R-squared of 2.83%), they yield support for the hypothesis of a positive association between risk-taking and accounting disclosure.

### Corporate Growth

In Table 4 panel B we relate two measures of firm-level growth, growth in total book value of assets and growth in sales, to the company level risk-taking proxy,  $\sigma_{i,c}$ . Both asset and sales growth are Winsorized at the 0.5% level in each tail of the distribution. The regression controls for the three measures of investor protection, the influence of other non-equity holders such as banks, the government, and labor unions, and stock market development. We also control for past corporate profitability as the latter is persistent (Schmalensee, 1985) and as such likely to

impact overall corporate growth. The regressions are performed with one-digit industry fixed effects.

For both growth variables, the regression coefficient for the risk-taking proxy is positive. It is statistically significant in all models except for 4. The specifications in columns 2 and 4 could be problematic as the risk measure and the growth measure could have correlated errors for three reasons: endogeneity, multicollinearity among explanatory variables, and measurement error. In the first place, greater risk-taking may be likely in firms operating in industries with higher growth rates, i.e. risk-taking and growth could be driven by a latent variable. Second, we include the investor protection variables because the law and finance literature advocates that better investor protection facilitates financing and thus firm growth (La Porta *et al.* (1997, 2002), Shleifer and Wolfenzon (2002)). Note, however, that they are related to corporate risk-taking as Table 4 Panel A reveals. There is then a multicollinearity problem. Third, the risk-taking measures are proxies for the real risks in operations; and as such they are bound to have noise. This errors-in-variables problem could lead to attenuation bias in the coefficient estimates. The effect of risk-taking on corporate growth would then be underestimated.

The endogeneity problem is most serious and can lead to biased regression estimates. We therefore adopt a two-stage least squares estimation approach. The method relies on instrumental variables for risk-taking in equations (2) and (3) above. In the search for valid instruments we aim to find exogenous variables that are economically related to risk-taking in investment choices but are uncorrelated with the error term of the second-stage regression explaining corporate growth. Table 4, panel C incorporates four different sets of instrumental variables in an attempt to isolate the independent impact of risk-taking on growth. We judge the validity of these instruments by over-identification tests. First, we instrument our risk-taking proxy with firm size. Larger firms are more likely to have stable operations whose returns are less volatile. We

recognize that this variable may directly influence growth, the degree of which we can judge by over-identification tests. Second, we instrument risk-taking by country level investor protection variables. Third, we instrument risk-taking with the average risk-taking of other companies in the same two-digit SIC code industry in the same country, RISK1\*.<sup>20</sup> The investment risk choices of the industry peer group are likely to influence the risk choice of an individual firm through competitive pressure in the underlying product market. Thus, we would expect that this instrumental variable would have a positive relationship with the risk-taking proxy in our first stage regressions. Note that for regressions using the average corporate risk-taking of other firms in the same industry as instrument we exclude all firms from industries with only one company. This selection is necessary in order to be able to compute the instrument.

We report the estimates from the first and second stage regressions in Table 4 Panel C. Consistent with the hypothesized relationship between our instruments and risk-taking, the first-stage results show that RISK1 is negatively affected by firm size and positively affected by the risk-taking of competitors' in the same country-industry pair, RISK1\*. Both coefficients are statistically significant at the 1% level. All of the investor protection instrumental variables in models 2, 4, 6 and 8 have positive sign as expected, however, only disclosure is statistically significant. Our instruments have strong predictive power: the partial R-squared of the first-stage regression indicates that the instruments explain between 11.1% and 17.3% of the variation in RISK1, net of any effect they may have through the other explanatory variables. In addition, the F-test rejects the null hypothesis that the coefficients on both instruments are jointly zero. Finally, the test of over-identifying restrictions fails to reject the joint null hypothesis that our

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<sup>20</sup> Our results are robust to using the average risk taking of other companies in the same three-digit SIC code level as opposed to two-digit SIC code level.

instruments are uncorrelated with the error term and are therefore correctly excluded from the second-stage regression for all models except 4.

The second-stage results provide further evidence of a statistically significant and positive relation between the instrumented RISK1 and both company asset and sales growth. These results hold when we use different instrumental variable sets and control for firm profitability and the influence of other non-equity stakeholders.<sup>21</sup> The magnitudes of the estimated 2SLS coefficients are significantly higher than those obtained from the OLS regressions reported in Table 4 Panel B, indicating the presence of an attenuation bias. Indeed, our endogeneity concern is substantiated. The Hausman test rejects the null hypothesis that the 2SLS and OLS coefficients on RISK1 are the same, for most specifications except 3 and 4.

Based upon the two-stage least squares coefficients the economic significance of the estimates is substantial. For example, using model 2 a one standard deviation increase in the instrumented risk-taking proxy is associated with an increase in the asset growth of 32% of its mean. Similarly, based on model 7 a one standard deviation in the instrumented RISK1 above its mean would increase the sales growth with 38.8% of its mean.

Our firm level cross-country analysis is limited in two aspects. First, country heterogeneity may cause differences in industries across countries that are not easy to control for. Second, our investor protection and non-equity stakeholder proxies do not vary at the firm level and thus by construction do not fully capture variations in the dependent variables, which are at the firm level. To address these concerns we examine the within-country validity of our hypothesis, to which our theoretical analysis also applies. A single country sample offers greater

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<sup>21</sup> The controls reveal that firms from countries with more developed equity markets have significantly slower sales growth. As discussed previously, even though we can not explain the latter result, we note that they mimic those in Beck and Levine (2002) and Demirguç-Kunt and Maksimovic (1998). Note further that assets growth does not depend on equity market development. Our results hold if we include as control variables in our growth regressions other firm traits such as initial book leverage, initial sales growth, and the ownership of the largest shareholder.

similarity in investment opportunities and other country-level latent factors for the companies within. In addition, the measurement noise in our risk-taking proxy due to income smoothing is limited within the same country as opposed to cross-country. Consequently, a single-country panel would highlight firm level variation in risk-taking. Finally, we can obtain more precise measures of investor protection, managerial ownership, and non-equity stakeholder influence in a data-rich country such as the United States.

## *A.2. Single country study*

### *Variables*

We focus our within-country examination on the United States as this is the country with most detailed corporate data available and the highest number of firms present in our panel. We discuss our proxies for the equity and non-equity stakeholder influence in turn. We use two alternative measures of investor protection. These are the corporate governance (G) index of Gompers, Ishii, and Metrick (2003) and the entrenchment (E) index of Bebchuk, Cohen, and Farrell (2005).<sup>22</sup> We retrieve the value of these indices as of the first year of appearance of the company in our sample. We use the union membership at the three-digit SIC code level as proxy for the labor union influence on corporate risk taking. The source of that data is the union membership and coverage database maintained by Barry Hirsh and David Macpherson and available at [www.unionstats.com](http://www.unionstats.com). The data are compiled from the Current Population Survey based on the methodology used by the Bureau of Labor Statistics. Hirsch and Macpherson (2003) provide details on the construction of the dataset. In order to capture bank dominance we

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<sup>22</sup> Both indices are based on a count of charter provisions that reduce minority shareholder rights. The G-index include 24 firm-level charter provisions geared at reducing the propensity of takeover. The E-index reduces the set of such provisions to the following six: staggered boards, limits to shareholder bylaw amendments, supermajority requirements for mergers, supermajority requirements for charter amendments, poison pills and golden parachutes. In this paper we interpret higher values of these indices as weaker investor protection.

use the ratio of total bank debt to total assets.<sup>23</sup> The source of that data is Bureau van Dijk's Osiris dataset. We use the level of bank-debt financing as of the first year the company appears in our sample. Our results are unchanged when instead of that we consider the value of this proxy as of 1992, the first year of our sample (which results in a smaller sample.) Consistent with our cross-country firm level study we control for the ownership of the largest shareholder on record with the company derived from the Bureau Van Dijk's Osiris shareholder dataset.

### Risk-taking

We present our firm-level analysis for companies in our panel domiciled in the United States in Table 5. In Panel A we examine the influence of equity and non-equity stakeholders on risk-taking. Models 1 and 2 provide support for our hypothesis. Both the entrenchment index of Bebchuk *et al.* (2005) and the governance index of Gompers *et al.* (2003) are significantly negatively associated with risk-taking, implying that stronger investor protection is associated with higher risk-taking for companies in the United States. Our bank power proxy has a negative sign as expected. However it is only marginally significant in model 2. The proxy for labor union power is negative and highly statistically significant, in support of our hypothesis that powerful labor unions may use their bargaining power to constrain risk-taking. Finally, higher concentration of ownership is not significantly associated with risk-taking, which is consistent with our cross country analysis.

The potential joint determination of ownership and company risk raises concerns of endogeneity. To address it, we instrument the ownership of the largest shareholder. The 2SLS results are reported in columns 3 and 4. We use the sets of instruments that we have applied in the cross-country analysis, namely the average dominant shareholder ownership of other firms in

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<sup>23</sup> Our results are qualitatively unchanged when we use book leverage as an alternative proxy for bank dominance. The correlation between book leverage and bank debt to total assets is 18.1%. To conserve space we present the results based on the latter.

the same industry and country, and the logarithm of the firm age. Our results are robust to these controls in terms of both economic and statistical significance. For example, based upon model 4 a one standard deviation increase in the governance index (which corresponds to the addition of about three new charter provisions that limit minority shareholder rights) is associated with 9.7% drop in RISK1 below its mean net of any effect it may have through the other explanatory variables. The over-identification test reveals that our instruments are uncorrelated with the error term and are correctly excluded from the second-stage. The Hausman test indicates that our OLS coefficients are not statistically different from the 2SLS estimates, and thus our OLS estimates in models 1 and 2 are not biased.

### Growth

In line with our cross-country examination, in Panel B we relate firm-level sales- and asset- growth to the risk-taking proxy for companies in the United States. We use a two-stage least squares regression to address the endogeneity of investment risk choices with respect to corporate growth. We use the same instrumental variables as in our cross-country analysis, namely firm size, the average risk-taking of other companies in the same two-digit SIC code industry (RISK1\*), and the investor protection variables.

The results provide further support that risk-taking is associated with higher corporate growth. We report the estimates from the first and second stage regressions in Table 5 Panel B. Consistent with the hypothesized relationship between our instruments and risk-taking, the first-stage results show that RISK1 is negatively affected by firm size and positively affected by RISK1\*. Both governance and entrenchment indices have negative sign as expected, and are statistically significant. Our instruments have predictive power with a partial R-squared of the first-stage regression between 4% and 14.1% of the variation in RISK1, net of any effect they may have through other explanatory variables. In addition, the F-test rejects the null hypothesis

that the coefficients on both instruments are jointly zero. Finally, the test of over-identifying restrictions fails to reject the joint null hypothesis that our instruments are uncorrelated with the error term and are correctly excluded from the second-stage regression, except for models 1 and 5. We still present these to be consistent with our cross-country analysis.

The second-stage results provide further evidence of a statistically and economically significant and positive relation between the instrumented RISK1 and both company asset and sales growth. These results hold when we use different instrumental variable sets and control for the influence of other non-equity stakeholders. The Hausman test rejects the null hypothesis that the 2SLS and OLS coefficients on RISK1 are the same for all specifications, thus indicating the presence of the attenuation bias in the OLS estimates.

### ***B. Country-level tests using RISK2 measure***

A concern in the cross-country firm-level results is that more weight is given to countries with more firm-level observations. These usually are more advanced economies with better corporate governance foundations and developed financial markets. To address this we have clustered the standard errors at the country level and simultaneously weigh the observations by the inverse of the number of firms from that country. We now take a very conservative approach: we give each country an equal weight by using only country level average of the firm level observations; that is, use RISK2 instead of RISK1. Such an approach sacrifices information (and thus efficiency in the econometric estimates) but avoids over-weighting large economies. Results for the latter approach are presented in Table 6.<sup>24</sup>

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<sup>24</sup> To address multicollinearity concerns and to preserve degrees of freedom we do not include in our country-level regression analysis the country averages of firm traits such as leverage, sales growth and profitability.

Panel A reports in models 1 to 4 regressions of our country level risk-taking proxy (RISK2) on accounting disclosure, the rule of law, and anti-director rights and proxies for the influence of banks, labor unions and the government on corporate investment. Model 1 reveals that accounting disclosure standard is significantly positive. The rule of law coefficient is positive but only weakly significant, as shown in model 2. The anti-director rights variable is not significant in model 3. When all three institutional variables are included, only the accounting disclosure standard variable attracts a significant regression coefficient in model 4, although the three variables are jointly significant. Overall, the more conservative approach of examining RISK2 generates results that broadly support the prediction that better investor protection increases risk-taking propensity. Note however that the proxies for labor union power and bank dominance are both insignificant in determining RISK2. The proxy for interventionist government behavior is insignificant but again has a positive rather than a negative sign

In terms of economic significance a one standard deviation increase in disclosure increases the risk-taking proxy RISK2 by 16.1% of its mean, based on model 4. A one standard deviation increase in the rule of law increases the risk-taking proxy RISK2 by 19.4% of its mean. A one standard deviation increase in anti-director rights increases the risk-taking proxy RISK2 by 4.2% of its mean.

Panels B and C report regressions of country level growth on our country level risk-taking proxies. Model 2 in Panel B includes the risk-taking proxy and the investor protection variables in the same regression, in which case the explanatory power of the risk-taking proxy diminishes. This could indicate either that our hypothesis is not supported, or that our risk-taking proxy is (i) closely correlated with the institutional variables, (ii) too noisy to compete with them, and (iii) risk-taking choices and growth could be driven by a latent variable leading to endogeneity. Due to the latter, we report model 3 in which we address the ensuing endogeneity

problem with two-stage least squares estimation. We instrument risk-taking with similar sets of instrumental variables as the ones in the cross-country firm-level study. We use anti-director rights, the quality of accounting disclosure, and the average logarithm of corporate total assets as instruments. Our results are also robust to the inclusion of the rule of law as part of the set of instruments for RISK2.

The instrumented risk-taking attracts a positive and significant coefficient in model 3. The set of selected instruments accounts for significant part of the variation of RISK2, 30.7%. The F-test indicates that the excluded instruments are jointly significant. The over-identification test indicates that the set of selected instruments are not correlated with the error terms and thus are valid instruments. The Hausman test indicates the presence of attenuation bias in the coefficient estimates. The test rejects the equality of the OLS and 2SLS estimates for RISK2 at 1% level.

The economic significance of RISK2 is non-trivial: for example one standard deviation increase in RISK2 is associated with 33.2% increase of real GDP per capita growth of its mean. We conclude that these results provide support to the proposition that high risk-taking as an outcome of better investor protection contributes to per-capita real GDP growth net of the impact of non-equity stakeholders on country economic growth.

Panel C of Table 6 reports regressions using total factor productivity as the dependent variable. The regression specifications are otherwise identical to those in Table 6 panel B. We again note that our choice of instruments is valid and significant as evidenced by the over-identification test and the excluded instruments F-test results. The Hausman test rejects the null hypothesis that the 2SLS and OLS coefficients on RISK2 are the same, thus indicating the presence of the attenuation bias. The second-stage results provide further evidence of a statistically significant and economically meaningful positive relation between the instrumented

RISK2 and average TFP growth. Based on model 3, one standard deviation increase in the instrumented RISK2 will increase TFP growth by 39.4% of its mean. We again interpret these as support for the hypothesis that our risk-taking measures are associated with higher productivity growth.

### ***C. Multivariate results using RISK3 measure***

The results in sub-section B, some of which are statistically weak, may reflect the fact that our country-level risk-taking proxy, RISK2, is noisy. RISK2 is certainly affected by earnings management given its inverse relationship to income-smoothing. Moreover, it could be mechanically linked to insider appropriation of corporate earnings. As discussed in the introduction, the greater the insider appropriation the lower the RISK2 even if the underlying operation result is held constant. These concerns motivate the third risk-taking measure, RISK3, which is an industry value-weighted average of risk-taking measures based on US data; the debatable assumption is that RISK3 might be a more reliable measure of industry level operation risk than RISK2 as it may be subject to less earnings management.

The right side of Table 6, Panel A reports regressions using RISK3 as a dependent variable. Among all the investor protection variables, the statistically significant determinant of imputed risk-taking is the anti-director rights variable, which is positive and marginally significant in both model 7 and model 8. Based on model 7 in Table 6 Panel A, a one standard deviation increase in anti-director rights increases the risk-taking proxy RISK2 by 6.5% of its mean. However, both the accounting disclosure and the rule of law indicators are statistically insignificant, where the latter even has the opposite sign. Still, these results generally fit our hypothesis because anti-director rights represent the institutional environment variable that directly captures the likelihood of discovering managerial stealing.

Using RISK3 as the dependent variable, we again do not find non-equity stakeholders' negative influence on risk-taking. The government spending has the expected sign (negative) but is at best marginally significant. The bank dominance and unionization variables attract positive and significant coefficients, contrary to our non-equity stakeholder influence hypothesis.

In Table 6, panel B, model 4 is the regression of real per-capita GDP growth on RISK3, and on the institutional environment variables, controlling for various initial conditions. The coefficient on RISK3 is positive and marginally statistically significant. As risk-taking choices and growth can be driven by some latent forces leading to endogeneity, we also show in model 5 the results for the two-stage least squares estimation where we treat RISK3 as endogenous variable. Model 5 demonstrates that RISK3 attracts a positive, statistically and economically significant coefficient. Based on model 5 a one standard deviation increase of RISK3 is associated with a 77% increase in real GDP-per-capita growth above its mean. We interpret this result with caution as the validity of our instruments is marginal (the over-identification test has a p-value of 0.10). The low explanatory power of our instrumental set for RISK3 is further corroborated by the low F-statistic for the excluded instruments.

We also consider the impact of risk-taking on productivity. In model 4 in Table 6 Panel C we regress country productivity growth on RISK3 and on the investor protection variables. RISK3 attracts a positive coefficient, that is however insignificant. Hence, in model 5 we treat RISK3 as endogenous, and regress productivity growth on the instrumented RISK3. This results in a positive and statistically and economically significant coefficient in model 5. A one standard deviation increase of the instrumented RISK3 is associated with a 70.9% increase of the TFP growth above its mean (compare this with the economic significance of one standard deviation in RISK3 in model 3, which is 39.4% increase in the TFP growth above its mean). We note though that similar to our analysis of the linkage between real GDP-per-capita and RISK3,

our choice of instruments is not sufficiently significant (the p-value of the F-test for the joint significance of the excluded instruments is 0.12), albeit still valid as evidenced by the over-identification test.

Overall, we have shown some evidence in favor of our hypothesis that there exists a positive association between risk-taking and investor protection and that there exists a positive association between risk-taking and growth, in particular, productivity growth. While our country-level results based on RISK2 and RISK3 may suggest significant relationship between our risk-taking proxy and economic growth and total factor productivity in our two-stage least squares estimation, such results need necessarily be interpreted with caution for two reasons: first, they are based on a small sample and are therefore subject to the small sample bias concern. Second, our proxy for risk-taking in the country level analysis is based upon a sub-set of the economy, namely the manufacturing industries represented by public firms present in Compustat Global Vintage dataset. At the same time our proxies for economic growth and factor productivity are derived from all industries in each country. Consequently, we would expect by design limited explanatory power of our risk-taking proxies on country-wide economic growth and productivity. We conclude that while our country-level analysis is subject to limitations, the results therein are largely supportive of our firm-level analysis results. We now offer more robustness checks on these results.

#### ***D. Robustness***

In this sub-section we examine the robustness of our empirical work.

##### *Statistical robustness and sample selection*

We checked the statistical robustness of the regressions, in particular, the risk-taking and growth regressions reported in Table 6. We first delete countries in our sample with only a very

limited number of listed firms captured in Compustat Global Vantage (e.g., Colombia and Argentina). Excluding these countries from our tests does not change our results. Second, we conduct residual diagnostics analyses and exclude outliers. In the risk-taking regressions where we use RISK3, Taiwan is an outlier. In the total growth regressions, Korea is an outlier. In the productivity growth regressions, Singapore is an outlier. Excluding the outliers, improves the significance of our key results.

A drawback of the Compustat Global Vantage is its limited firm coverage (Rajan and Zingales (1995)). Included firms are likely the ones that are attractive to global investors and are able to overcome their home countries' poor investor protection problems. This selection bias reduces the dependence of firm-level governance on country-level institutions and would tend to work against our hypotheses. Yet, home-country institutions seem to remain the dominant factor in corporate governance (Dojige, Karolyi, Stulz (2006)) and we do find affirmative evidence for our hypotheses. Still, including firms that have cross-listed their stock may weaken our results since their governance is likely less affected by the host country institutional environment. To investigate these issues, we repeat our regressions from Table 4 and Table 6 but restrict our sample to non-cross-listed firms. We obtained statistically stronger results.

#### *Dependent variables measuring risk-taking*

We measure risks by the deviations of operating results from economy-wide average. For robustness, we also consider a measure of total firm risk, that is, we do not subtract from firm level profitability a country-specific component prior to computing our risk-taking measures.<sup>25</sup> While it is debatable whether such a measure would reflect managerial risk choices, managers could nevertheless seek to avoid both economy wide and firm-specific investment

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<sup>25</sup> More precisely we also have a modified risk-taking proxy, defined as the volatility of  $E_{i,c,t} = EBITDA_{i,c,t} / A_{i,c,t}$ .

risks. Acemoglu, Johnson, Robinson, Thaicharoen (2003) document that poor institutional environment is associated with high macroeconomic risks. Thus, considering a measure of total risks, which include economy wide risks, would bias our results against finding that strong investor protection is associated with more risk-taking. Still, we examine the total volatility of firm profitability in addition to the volatility of the firm-specific profitability alone. Our empirical results still hold indicating that firm-specific as opposed to macroeconomic volatility drives them.

Another way to measure corporate risk taking is corporate survival. The simple premise is that when corporations take less risky investments they are more likely to survive.<sup>26</sup> We note that the firms we have are from Global Vantage. For many economies, especially for smaller economies with less developed capital markets, they are more likely to be dominant firms that attract international investors' attention. Fogel *et al.* (2005) show that dominant firms are more likely to survive in the long term when the banking sector is more dominant, shareholder rights are less well protected, the government is more pro-active, and the economy is more open. The observation fits our expectations – poorer investor rights and more influence from non-equity stakeholders like banks which press for risk avoidance would lead firms to invest conservatively and firm survival in the economy is greater.

### *Independent variables*

Consistent with our firm-level analysis we examine the impact of insider dominance on corporate risk-taking in the cross country studies. Insider dominance is the extent to which listed firms are controlled by dominant insiders (Stulz (2005).) Morck *et al.* (2005) and Stulz (2005) provide various measures of insider dominance that we can use alongside our measure of large

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<sup>26</sup> The premise may be too simplistic. For example, corporations that are excessively avoiding investment risks may become less competitive and not survive due to, for example, foreign competition.

shareholder ownership. We follow Stulz (2005) in measuring insider dominance by “close\_ew,” which is the average fraction of firms’ stock market capitalization held by insiders according to Worldscope in 2002.<sup>27</sup> We input insider dominance as an explanatory variable for our risk taking measures. The variable is not significant, albeit negative in sign. As in our firm-level analysis we recognize that this variable is endogenous with respect to risk-taking. Since insider ownership is affected by the riskiness of the underlying assets we have instrumented it with the assessment of the risk of outright confiscation and with the total value traded on the country stock market as share of GDP, both from Demirguç-Kunt and Levine (2001). We have chosen these instruments since Stulz (2005) found them to be significant in explaining insider ownership (Stulz (2005), Table 2, Panel C.)<sup>28</sup> Controlling for the instrumented insider ownership, the investor protection proxies remain significant and positive in explaining risk taking. However, the instrumented insider ownership variable is not significant. Still, we recognize that the excluded instruments do not enter significantly the 2SLS specification as indicated by the F-test of excluded instruments. Therefore, this reported endeavor is only an attempt to check the robustness of our results.

We also examine the robustness of our results to different proxies for key variables. First, to proxy for bank dominance, we also use the ratio of deposit money bank assets divided by stock market capitalization instead of claims on private sector by deposit money banks and other financial institutions as share of GDP. Regressing our risk taking measures RISK2 and

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<sup>27</sup> Our results are similar when we use the country average large shareholder ownership instead of the insider dominance measure. The correlation between the former and the latter is 71% and is statistically significant. To conserve space, we discuss the results based upon Stulz’s measure of insider dominance because the data is more readily available to the public (listed in Stulz (2005)).

<sup>28</sup> Stulz (2005) documents that anti-director rights are a significant determinant of insider ownership. Since we include anti-director rights directly as a determinant of risk-taking, we do not include it in the set of instruments for insider ownership. We have further considered as instrument *polcov*, an index of political constraints on state rulers (Henisz (2000)) instead of the assessment of the risk of outright confiscation. Stulz (2005) shows that this variable is also a significant determinant of insider ownership. Our results are robust to the inclusion of that measure.

RISK3 on the proxy like in Table 6 Panel A, we find that the coefficients for the proxy to be negative but insignificant except when the dependent variable is RISK3.

Second, to proxy for labor groups' dominance, we use the "flexibility of firing" index from the 2003 Doing Business Report of the World Bank instead of the percent of labor force unionized. Lower flexibility of firing raises labor power and exit costs and that may prompt firms to be more risk averse in their investments. In the regression analysis in Table 6, Panel A, this index has negative coefficient that is insignificant. These additional variables do not qualitatively change our results.

Third, to proxy for interventionist government, we use the percent of top 10 largest firms controlled by the state instead of government spending/GDP. The variable is obtained from La Porta *et al.* (1999). Our results are not qualitatively different.

## **V. Conclusions**

In this paper we consider the relationship between investor protection and corporate risk-taking. Poor investor protection can affect corporate risk taking in several ways. Managers in countries with poor investor protection are often dominant insiders having much of their wealth invested in the firms they control. They may invest more conservatively as compared to what outside shareholders desire and thus forego positive net present value investments. Managers / insiders may also skip risky but value-enhancing projects to protect their expected private benefits. Better investor protection lowers the expected level of private benefits, causing insiders/managers to be less risk-averse and better aligned with shareholders in their investment risk choices. Another view is that non-equity stakeholders, such as banks, labor unions and the government may constrain value-enhancing corporate risk-taking to protect their claims.

We show empirical support for these hypotheses using a large panel of manufacturing companies from thirty-nine countries from the Compustat Global Vantage dataset covering 1992-2002. We also find strong support using more detailed US data. Consistent with our theoretical predictions we document significant positive relationships between various firm- and country- level risk-taking measures and measures of investor protection, and between risk-taking and growth. However, the cross country data do not show consistent support for that high bargaining power of labor unions, interventionist government, and bank dominance are associated with less corporate risk taking. On the other hand, our firm-level examination of companies in the United States reveals that reliance on bank financing and unionization is associated with less risk taking in corporate investments. Our results are generally robust to controls for firm earnings management, competition in the local economy, stock market development, and general economic development.

We believe that this study contributes to the broader literatures on corporate governance and growth in several important ways. First, we provide a novel explanation for why better investor protection leads to faster growth. Second, we provide evidence that powerful stakeholders whose interests conflict with shareholders can also compromise growth. Third, our study is the first to empirically document an impact of risk-taking on growth. We hope that future research on investor protection, stakeholder governance, and growth will shed further light on this.

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**Table 1. Variable Definitions.**

Main Variables	Definition	Source
<b>Risk-taking variables</b>		
Company risk-taking proxy (RISK1, $\sigma_{i,c}$ )	We compute company earnings volatility, $\sigma_{i,c} = \sqrt{\frac{1}{T-1} \sum_{t=1}^T \left( E_{i,c,t} - \frac{1}{T} \sum_{t=1}^T E_{i,c,t} \right)^2}   T \geq 5$ , where $E_{i,c,t} = \frac{EBITDA_{i,c,t}}{A_{i,c,t}} - \frac{1}{N_{c,t}} \sum_{k=1}^{N_{c,t}} \frac{EBITDA_{k,c,t}}{A_{k,c,t}}$ , $N_{c,t}$ indexes the firms within country $c$ and year $t$ , and EBITDA is defined as depreciation (item #11) plus operating income (item #14). That is, for each firm with available earnings and total assets for at least five years in 1992-2002 we compute the deviation of the firm's EBITDA/Assets from the country average (for the corresponding year) and then calculate the standard deviation of this measure for each firm. $E_{i,c,t}$ is Winsorized at 0.5% on both sides of the sample distribution to account for data entry omissions.	Compustat Global Industrial Database.
Country risk-taking proxy (RISK2, $\sigma_c$ )	The average of the company risk-taking proxy (RISK1), $\sigma_c = \frac{1}{N_c} \sum_{i=1}^{N_c} \sigma_{i,c}   N_c \geq 2$ .	Compustat Global Industrial Database.
Imputed risk score (RISK3, $\Omega_c$ )	Calculated for each country over the period 1992-2002 (for Table 5, Panels A and B) or 1992-2000 (for Table 5, Panel C). The imputed risk scores are obtained using the following formula, $\Omega_c = \frac{1}{11} \sum_{t=1992}^{t=2002} \left( \frac{\sum_{j \in \{200, \dots, 399\}} MV_{t,j,c} \times \sigma_{1994-1997,j}^{USA}}{\sum_{j \in \{200, \dots, 399\}} MV_{t,j,c}} \right)$ , where $j$ is an industry subscript based on 3-digit SIC codes, $c$ is a country subscript, $t$ is a year subscript, $MV_{t,j,c}$ is the market capitalization in industry $j$ in year $t$ for country $c$ , and $\sigma_{1994-1997,j}^{USA}$ is the industry $j$ risk score computed using only US single business segment firms for the period 1994-1997. In the computation of $\sigma_{1994-1997,j}^{USA}$ we include firm-years where sales are above 10 million US\$. Market values (MV) are computed as of the end of the fiscal year. Prices and shares outstanding data is compiled from Global Vantage Issue database. The $\sigma_{1994-1997,j}^{USA}$ is computed as the within-industry variation of $E_{i,j,t}^{USA} = \left( \frac{EBITDA_{i,j,t}^{USA}}{A_{i,j,t}^{USA}} \right) - \frac{1}{N_{j,t}^{USA}} \sum_{i=1}^{N_{j,t}^{USA}} \left( \frac{EBITDA_{i,j,t}^{USA}}{A_{i,j,t}^{USA}} \right)$ , i.e. $\sigma_{1994-1997,j}^{USA} = \left[ \frac{1}{\sum_{t=1998}^{t=1997} N_{j,t}^{USA} - 1} \sum_{t=1994}^{1997} \sum_{i=1}^{N_{j,t}^{USA}} \left( E_{i,j,t}^{USA} - \frac{1}{\sum_{t=1994}^{1997} \sum_{i=1}^{N_{j,t}^{USA}} E_{i,j,t}^{USA}} \right)^2 \right]^{0.5}$ where $j$ indexes the manufacturing industries defined as 3-digit SIC codes and $i$ indexes the companies within a given industry. Prior to computing $\sigma_{1994-1997,j}^{USA}$ we Winsorize $E_{i,j,t}^{USA}$ at 0.5% on both sides of its distribution to account for data entry omissions. The single business segment firms are identified from the Compustat Segment file. EBITDA corresponds to data item #13 (Operating Income Before Depreciation) and A refers to data item #6 (Total Assets), both from Compustat North America, for the period 1994-1997. We start in 1994 to avoid the recession years preceding it. The sample ends in 1997 to account for the changed US practices of reporting business units as of 1997 (FAS 131 changed the rules of reporting segments, rendering comparisons of US segments pre- and post-1997 imprecise).	Compustat Global Industrial Database and Compustat North American Industrial Database.
<b>Growth Variables</b>		
Real-GDP-per capita growth (RGDP)	Growth rate of real per capita GDP. The latter is measured in 1995 constant US\$. The nominal GDP, GDP deflator and population data, used to compute it are obtained from the International Financial Statistics of the IMF. We use the line data item 99bvp and 99bvr that are presented on a reference year 1995 (GDP volume index assumed 100 in 1995) in the IFC yearbook.	International Financial Statistics of the International Monetary Fund.
Total Factor Productivity growth (TFP)	To measure TFP we follow algorithm similar to King and Levine (1993a, 1993b). We use the recursion $K_{c,t+1} = K_{c,t} + I_{c,t} - \delta K_{c,t}$ , where $c$ indexes countries, $t$ is the time period, $K$ is the real capital stock in year $t$ and country $c$ , $I$ is the real capital investment in year $t$ and country $c$ , and $\delta$ is the rate of depreciation, which in accord with previous studies we assume to be the same across all countries, 7%. We start the recursion by assuming that in 1950 (the beginning of the data by Penn World Tables version 6.1) the capital stock is 0. Iterating forward we obtain the capital stock for each year in 1992-2000 (the last date with available data in PWT). We then define capital stock per capita, $k$ , as the ratio of the real capital stock to the population. The productivity growth is finally defined as: $\Delta \ln(y) - 0.3 \Delta \ln(k)$ , where the capital stock intensity is assumed 30% across all countries.	Penn World Tables, version 6.1.
Average assets growth (ASSETGROWTH)	Average assets (line item #89) growth over the sample period, 1992-2002. Prior to computing the growth we convert all accounting data in US\$. We have further Winsorized the assets at the 0.5% level on both sides of the sample distribution.	Compustat Global Industrial Database.
Average sales growth (SALESGROWTH)	Average sales (line item #1) growth over the sample period, 1992-2002. Prior to computing the growth we convert all accounting data in US\$. We have further Winsorized the sales at the 0.5% level on both sides of the sample distribution.	Compustat Global Industrial Database.

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**Investor Protection Variables**

Rule of Law (RL)	Rule of law is 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; Quotation is from La Porta <i>et al.</i> (1998).
Rating of Accounting disclosure Standards (ASR)	Index that is created by “examining and rating companies’ 1990 annual report on their inclusion or omission of 90 items. These items fall into seven categories (general information, income statements, balance sheets, fund flow statement, accounting disclosure standards, stock data, and special items). A minimum of three companies in each country were studied.” Approximately 70% of the companies screened are industrials, while the remaining 30% represent financials.	Center for International Financial Analysis and Research. Quotation is from La Porta <i>et al.</i> (1998)
Anti-director rights (ADR)	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) minorities shareholders have legal mechanisms against perceived oppression by directors, (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 <i>et al.</i> (1998)

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**Firm-Level Control Variables**

Firm size	We define it as the logarithm of total assets (data item #89) measured in million of US\$. We retrieve that variable as of the first year of entry of the company in our sample.	Compustat Global Industrial Database.
Book Leverage	Defined as the ratio of the book debt to total assets. We define book debt as the sum of total liabilities (item #118) plus preferred stock (item #118) net of deferred taxes (item #105). All line items are in million of US\$. We retrieve that variable as of the first year of entry of the company in our sample.	Compustat Global Industrial Database.
Profitability	Defined as the ratio of EBITDA to total assets. Both line items are in million US\$. We retrieve that variable as of the first year of entry of the company in our sample.	Compustat Global Industrial Database.
Large Shareholder Ownership	The total cash flow rights of the largest shareholder on record with the company. The data span is 2002-2005. If the largest owner has less than 20%, we code the value as 0.	Bureau van Dijk Osiris dataset; shareholders file.
Earnings Smoothing (ES <sub>2</sub> )	A measure of earnings smoothing due to managerial incentives in Ball, Kothari, Robin (2000) and used also in Bhattacharya, Daouk, Welker (2003), and in Leuz, Nanda, Wysocki (2003). We compute it as the ratio (ES <sub>1</sub> ) of firm-level standard deviations of operating income (OI) and operating cash flow where both variables are scaled with lagged total assets. The higher the value of this measure, the lower earnings smoothing is. To facilitate interpretation, we thus consider the modified measure ES <sub>2</sub> =1-ES <sub>1</sub> , for which higher values indicate higher level of earnings smoothing. Operating cash flow is equal to operating income (Compustat Global item #14) minus accruals, where accruals are calculated as $ACCRUALS_{i,t,c} = (\Delta CA_{i,t} - \Delta CASH_{i,t}) - (\Delta CLS_{i,t} - \Delta STD_{i,t} - \Delta TP_{i,t}) - DEP_{i,t}$ , where CA <sub>i,t</sub> is total current assets (item #75), CASH <sub>i,t</sub> is cash or cash equivalents (#60), CLS <sub>i,t</sub> is total current liabilities (#104), STD <sub>i,t</sub> is short-term debt (item #94), TP <sub>i,t</sub> is taxes payable (#100), and DEP <sub>i,t</sub> is depreciation expense (#11); i indexes the company in point. We compute the country analogous measure to the above one as the median firm ratio for each country.	Compustat Global Industrial Database.

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**Country-Level Control Variables**

Country Insider Ownership	Equally- (CLOSE_EW) or value- weighted (CLOSE_VW) average fraction of firms’ stock market capitalization held by insiders based on data from Worldscope database in 2002.	Stulz (2005), Quotation is from Stulz (2005)
Expropriation Risk (EXPRISK)	Assessment of risk of “outright confiscation”. The index ranges from 0 to 10, with lower scores indicating higher risk. Country average is over 1982-1995.	Knack and Keefer (1995) based on data from ICRG
Market Turnover (TVT)	Total value that is traded on the stock market as share of GDP. The ratio is an annual average over 1980-1995.	Beck, Demirgüç-Kunt and Levine (2003)
Index of political constraints (POLCONV)	An index of political constraints of the state government for 1960. The value ranges from 0 to 1, with 0 being dictatorship and 1 democracy.	Henisz (2000)
Herfindahl Index (HERF)	To control for competition we use a Herfindahl index, defined as the sum of the squared shares of firm sales to total sales within a given country for the period 1992-2002, $H_c = \frac{1}{T} \sum_t \sum_i \left( \frac{s_{i,c,t}}{\sum_j s_{j,c,t}} \right)^2$ , where $s_{j,c,t}$ is the sales of company $j$ from country $c$ in fiscal year $t$ .	Compustat Global Industrial Database.
Private Credit (PRIVO)	Claims on private sector by deposit money banks and other financial institutions as share of GDP.	Beck, Demirgüç-Kunt and Levine (2003)
Market Capitalization (MCAP)	Stock market capitalization as share of GDP.	Beck, Demirgüç-Kunt and Levine (2003)
Union membership (UNION)	Union membership as a percentage of the non-agricultural labor force in the International Labor Organization’s World Labor Report, 1997-1998.	World Labor Report, 1997-1998, Statistical Annex, Table 1.2
Government spending (GOV)	Country average of the government expenditures as share of GDP over 1980-1995.	Demirgüç-Kunt and Levine (2001)
Average Schooling (SCHOOL)	Average schooling years in the total population over 25 in 1990.	Barro and Lee (1993)
1991 \$ GDP-per-capita (\$ GDP)	1991 GDP-per-capita in 1996 constant US dollar terms (adjusted back to 1995 constant US dollar).	Penn World Tables Version 6.1

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**Table 2.** Descriptive Statistics.

Descriptive statistics for country variables in our sample. The columns contents is: (1) average number of manufacturing companies per country in the sample (N), (2) country average of the standard deviation of firm EBITDA-to-asset ratio (RISK2), (3) imputed country riskiness score (RISK3), (4) earnings smoothing parameter, computed as  $1-ES_1$  where  $ES_1$  is the earnings smoothing measure in Ball, Kothari, Robin (2000) (ESM), (5) average annual real GDP-per-capita growth for 1992-2002 (GDP), (6) country average total factor productivity growth for 1992-2000 (TFP), (7) claims on private sector by deposit money banks and other financial institutions as share of GDP (PRIVO), (8) stock market capitalization as share of GDP (MCAP), (9) rule of law (RL), (10), disclosure – quality of the accounting disclosure standards rating (ASR), (11) anti-director rights index (ADR), (12) country Herfindahl index (HERF), (13) 1991 GDP-per-capita in 1995 constant US dollar terms (\$ GDP), (14) Union membership as a percentage of the non-agricultural labor in 1997-1998 (UNION), and (15) Average annual government expenditure as share from GDP, 1980-1995 (GOV). Items seven, eight, 14, and 15 are from Demirgüç-Kunt and Levine (2001). Items nine through 11 are from La Porta *et al.* (1998). The source of the data for computing N, RISK2 and RISK3 is Compustat Global Vantage database for the period 1992-2002. When computing RISK2 and RISK2 we have included manufacturing firms (SIC codes 2000-3999) only.

Country	Variables														
	(1) N	(2) RISK2	(3) RISK3	(4) ESM	(5) GDP	(6) TFP	(7) PRIVO	(8) MCAP	(9) RL	(10) ASR	(11) ADR	(12) HERF	(13) \$ GDP	(14) UNION	(15) GOV
Argentina	15	0.062	0.084	0.35	0.00%	3.10%	0.15	0.05	5.35	45	4	0.25	\$5,771	25.4	11.7
Australia	101	0.077	0.088	0.21	2.60%	2.10%	0.81	0.43	10	75	4	0.07	\$18,302	28.6	17.7
Austria	53	0.04	0.084	0.58	1.60%	1.00%	0.87	0.07	10	54	2	0.14	\$21,652	36.6	18.3
Belgium	54	0.041	0.105	0.5	2.30%	1.10%	0.37	0.26	10	61	0	0.14	\$20,320	38.1	15.4
Brazil	84	0.052	0.081	0.42	1.50%	1.60%	0.25	0.12	6.32	54	3	0.18	\$2,712	32.1	11.0
Canada	224	0.09	0.127	0.21	3.20%	1.60%	0.77	0.46	10	74	5	0.03	\$21,057	31	20.3
Chile	41	0.03	0.107	0.45	3.90%	2.60%	0.5	0.43	7.02	52	5	0.23	\$2,601	15.9	11.1
Colombia	13	0.022	0.09	0.39	0.70%	-0.10%	0.27	0.06	2.08	50	3	0.34	\$1,347	7	10.6
Denmark	73	0.05	0.162	0.33	2.00%	1.60%	0.42	0.22	10	62	2	0.07	\$26,035	68.2	25.3
Finland	64	0.047	0.151	0.3	2.40%	2.70%	0.67	0.18	10	77	3	0.09	\$24,627	59.7	20.6
France	264	0.044	0.121	0.4	1.40%	0.90%	0.91	0.2	8.98	69	3	0.05	\$20,923	6.1	18.7
Germany	313	0.06	0.121	0.5	1.10%	0.30%	0.92	0.19	9.23	62	1	0.05	\$22,135	29.6	19.1
Greece	25	0.033	0.062	0.41	2.40%	2.50%	0.4	0.08	6.18	55	2	0.24	\$8,813	15.4	13.7
Hong Kong	45	0.067	0.183	0.41	2.10%	0.70%	1.36	1.28	8.22	69	5	0.09	\$14,947	18.5	7.2
India	184	0.048	0.109	0.38	4.00%	2.70%	0.27	0.13	4.17	57	5	0.1	\$339	5.4	11.0
Indonesia	62	0.06	0.094	0.32	2.00%	0.20%	0.26	0.05	3.98	-	2	0.16	\$708	2.6	9.5
Ireland	22	0.047	0.13	0.21	6.40%	5.30%	0.63	0.27	7.8	-	4	0.14	\$13,546	36	16.2
Israel	25	0.062	0.101	0.32	1.10%	0.90%	0.51	0.29	4.82	64	3	0.18	\$11,956	23.1	29.8
Italy	98	0.034	0.107	0.49	1.40%	1.00%	0.51	0.12	8.33	62	1	0.14	\$20,462	30.6	16.5
Japan	768	0.021	0.16	0.41	0.80%	0.00%	1.69	0.73	8.98	65	4	0.01	\$28,110	18.6	9.2
Korea	58	0.053	0.155	0.45	4.60%	2.30%	0.81	0.25	5.35	62	2	0.14	\$6,819	9	10.9
Malaysia	222	0.069	0.108	0.46	2.90%	1.70%	0.8	1.07	6.78	76	4	0.03	\$2,521	11.7	15.5
Mexico	32	0.038	0.085	0.07	1.10%	1.10%	0.18	0.15	5.35	60	1	0.08	\$3,714	31	8.1
Netherlands	89	0.055	0.094	0.36	2.30%	1.70%	1.28	0.41	10	64	2	0.2	\$20,058	21.8	15.3
New Zealand	18	0.073	0.105	0.4	2.20%	1.90%	0.54	0.4	10	70	4	0.26	\$12,098	23.2	16.7
Norway	46	0.079	0.143	0.28	2.70%	2.30%	0.89	0.15	10	74	4	0.13	\$27,630	51.7	20.7
Pakistan	25	0.052	0.126	0.65	0.90%	0.90%	0.23	0.09	3.03	-	5	0.23	\$396	5.5	12.2
Philippines	22	0.082	0.096	0.4	1.10%	1.30%	0.29	0.21	2.73	65	3	0.47	\$708	22.8	8.7
Portugal	21	0.033	0.089	0.51	2.50%	1.00%	0.63	0.08	8.68	36	3	0.15	\$8,207	18.8	14.3
Singapore	107	0.058	0.154	0.35	3.30%	4.70%	0.95	1.23	8.57	78	4	0.07	\$13,665	13.5	10.9
South Africa	30	0.039	0.081	0.24	0.60%	0.80%	0.79	1.31	4.42	70	5	0.1	\$3,343	21.8	18.0
Spain	59	0.038	0.078	0.33	2.20%	1.50%	0.72	0.18	7.8	64	4	0.23	\$14,178	11.4	15.1
Sweden	103	0.08	0.157	0.14	2.10%	1.50%	1.09	0.38	10	83	3	0.08	\$28,724	77.2	27.4
Switzerland	96	0.043	0.119	0.35	0.60%	0.20%	1.78	0.71	10	68	2	0.15	\$34,217	20	13.0
Taiwan	101	0.036	0.196	0.32	-	2.90%	0.91	0.49	8.52	65	3	0.1	\$8,781	27.9	15.5
Thailand	140	0.066	0.104	0.35	2.70%	1.00%	0.68	0.26	6.25	64	2	0.06	\$1,735	3.1	10.7
Turkey	24	0.073	0.076	0.08	1.40%	0.60%	0.14	0.06	5.18	51	2	0.28	\$2,636	22	7.4
United Kingdom	485	0.069	0.116	0.21	2.20%	1.60%	0.74	0.76	8.57	78	5	0.05	\$17,883	26.2	21.4
United States	1,818	0.09	0.161	0.1	2.10%	1.60%	1.31	0.58	10	71	5	0.01	\$23,471	12.7	17.5

**Table 3.** Pairwise Correlations of main variables.

In this table we present correlations for the following variables that appear in our empirical work: (1) a country average of the company EBITDA-to-assets ratio, RISK2, (2) country imputed riskiness score, RISK3, (3) average annual country real GDP-per-capita growth for 1992-2002, (4) average annual total factor productivity growth for 1992-2000 (smaller sample is due to data availability in PWT Version 6.1), (5) claims on private sector by deposit money banks and other financial institutions as share of GDP, (6) stock market capitalization as share of GDP, (7) measure of earnings smoothing computed as  $ES_2=1-ES_1$  where  $ES_1$  is the measure computed in Ball, Kothari, Robin (2000) and Leuz *et al.* (2003), (8) anti-director rights index, (9) rule of law, (10) rating on quality of accounting disclosure standards (disclosure), (11) average country Herfindahl index, (12) percentage of non-agricultural labor participating in labor unions, (13) annual average government spending as share of GDP. Items five, six, as well as government spending are from Demirgüç-Kunt and Levine (2001). Items eight through ten are from La Porta *et al.* (1998). Higher values of the earnings smoothing measure are associated higher levels of smoothing. Pairwise correlations are presented in percentage values. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, correspondingly.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	RISK2 ( $\sigma_c$ )	RISK3 ( $\Omega_c$ )	GDP Growth (GDP)	TFP Growth (TFP)	Private Credit (PRIVO)	Market Cap (MCAP)	ESM (ESM)	Anti- director (ADR)	Rule of Law (RL)	Disclo- sure (ASR)	HERF	UNION
RISK3	15.0%											
GDP Growth	10.0%	26.0%										
TFP Growth	9.0%	22.0%	70.0%***									
Private Credit	6.0%	52%***	1.0%	-11.0%								
Market Cap	14.0%	0.38**	5.0%	9.0%	58.0%***							
Earnings Smoothing	-42%**	-7.0%	-8.0%	-16.0%	-6.0%	-14.0%						
Anti-director	27.0%	22.0%	20.0%	29%*	16.0%	46%***	-15.0%					
Rule of Law	16.0%	40%**	17.0%	15.0%	61%***	20.0%	-10.0%	-7.0%				
Disclosure	50%***	49%***	18.0%	18.0%	48%***	55%***	-39%**	29%*	42%**			
Herfindahl Index	-9.0%	-49%***	-20.0%	-6.0%	-50%***	-41%**	0.22	-10.0%	-55%***	-47%***		
Unionized Labor	17.0%	28%*	1.0%	16.0%	4.0%	-11.0%	-28%*	-20.0%	51%***	29%*	-18%	
Government spending	24.0%	19.0%	1.0%	6.0%	15.0%	-2.0%	-18.0%	3.0%	47%***	43%**	-34%**	61%***

**Table 4 Panel A. Firm Level Risk-taking Regressions**

In this table we present firm-level OLS regressions of corporate risk-taking proxy RISK1, investor protection indicators, and controls for firm characteristics (large shareholder ownership, earnings smoothing, size, profitability, sales growth, and book leverage) and country characteristics such as Herfindahl index, government spending, labor union bargaining power, country bank- and stock-market development. All firm-level controls except for earnings smoothing are as of the first year of firm appearance in our database. The risk-taking proxy is the time series standard deviation of the EBITDA/Assets company ratio, computed for 1992-2002. We include only firms for which there are at least five annual observations on EBITDA/Assets. Earnings smoothing is one minus the firm's ratio of firm-level standard deviations of operating income and operating cash flow, both scaled by lagged total assets. The higher the measure, the higher the propensity to smooth earnings. For the definition of the control variables refer to Table 1. We consider only firms in the manufacturing industry (SIC 2000-3999). Reported results are obtained from regressions with one-digit SIC industry code fixed effects (not reported); regressions includes as control the number of observations used to estimate the risk taking proxy (not reported). Regression (5) includes as control variable the ownership of the largest shareholder on record. Regression (6) is a two-stage least squares (2SLS) estimation where we instrument shareholder ownership with the logarithm of firm age and with the average large shareholder ownership value of other companies from the same country in the same two-digit SIC code industry. The partial R-squared is the fraction of the variation of RISK1 explained by the instruments, net of their effect through the exogenous variables. The test of over-identifying restrictions tests the joint null hypothesis that the excluded instruments are uncorrelated with the error term and are correctly excluded from the second-stage equation. The Hausman test examines whether the OLS and 2SLS coefficients on RISK1 are statistically different. The absolute value of the t-statistics (in parentheses below the coefficient estimates) is based on robust standard errors clustered at the country level. We weight each firm observation with the inverse of the number of firms from its domicile country. Results are obtained from regressions with one-digit SIC code dummies (not reported). \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, correspondingly.

	Dependent Variable: Company Risk-taking, RISK1 ( $\sigma_{i,c}$ )					
	(1)	(2)	(3)	(4)	(5)	(6)
Anti-Director Index (ADR)	0.0034** (2.23)			0.0025 (1.64)	0.002 (1.16)	0.003 (1.30)
Rule of Law (RL)		0.002 (0.55)		0.002 (0.63)	0.001 (0.42)	-0.003 (1.07)
Disclosure (ASR)			0.0007*** (2.94)	0.0007** (2.56)	0.0008*** (3.28)	0.0018*** (4.31)
Large Shareholder Ownership					-0.009 (1.13)	0.048 (1.58)
Corporate Earnings Smoothing	-0.004 (1.45)	-0.004 (1.23)	-0.004 (1.38)	-0.004 (1.44)	-0.01** (2.24)	-0.0109*** (2.79)
Log (Initial Corporate Assets)	-0.0084*** (6.28)	-0.0084*** (6.40)	-0.0082*** (6.27)	-0.008*** (6.30)	-0.0079*** (5.60)	-0.0096*** (5.04)
Initial Profitability	-0.051 (1.30)	-0.054 (1.38)	-0.052 (1.35)	-0.050 (1.30)	-0.080 (1.42)	-0.091 (1.57)
Initial Sales Growth	0.002 (0.43)	0.003 (0.52)	0.001 (0.17)	0.001 (0.18)	0.0166** (2.21)	0.012 (1.16)
Initial Book Leverage	0.006 (0.89)	0.005 (0.65)	0.004 (0.57)	0.005 (0.67)	0.001 (0.06)	0.003 (0.15)
Country Herfindahl Index	0.0002 (0.20)	-0.0004 (0.26)	-0.0013 (0.96)	-0.0012 (0.91)	-0.001 (0.83)	-0.002 (1.32)
Country Private Credit	-0.002 (0.29)	-0.007 (0.71)	-0.007 (1.02)	-0.010 (1.03)	-0.0189** (2.23)	-0.003 (0.40)
Country Market Capitalization	-0.001 (0.14)	0.008 (1.34)	-0.005 (0.80)	-0.008 (1.13)	-0.006 (0.63)	-0.0287** (2.54)
Government Spending	0.0002 (0.39)	0.0003 (0.74)	-0.0001 (0.11)	-0.0002 (0.38)	-0.001 (1.13)	-0.001 (1.40)
Unionized Labor	0.0003* (1.85)	0.0002 (1.04)	0.0002 (1.21)	0.0002 (1.20)	0.0003** (2.04)	0.0003* (1.78)
<i>Number of observations</i>	5,007	5,007	5,007	5,007	2,173	1,537
<i>R-squared (%)</i>	14.3%	13.7%	15.3%	15.7%	26.1%	23.8%
<i>F-statistic (p-value)</i>	5.61 (0.00)	6.16 (0.00)	4.97 (0.00)	5.40 (0.00)	15.11 (0.00)	18.65 (0.00)
<i>Number of countries</i>	38	38	38	38	37	28
<i>Excluded instruments robust F-statistic (p-value)</i>	-	-	-	-	-	2.53 (0.098)
<i>Partial R-squared</i>	-	-	-	-	-	2.83%
<i>Hansen J-test (p-value)</i>	-	-	-	-	-	0.03 (0.86)
<i>Hausman test (p-value)</i>	-	-	-	-	-	1.25 (0.27)

**Table 4 Panel B. Firm Level Growth Regressions**

In this table we present the regressions of corporate assets and sales growth versus risk-taking proxy RISK1, investor protection indicators, and controls for profitability, bank- and stock-market development, percentage of labor participating in unions from the World Labor Report 1997-1998, and the average government spending in 1980-1995. Assets and sales growth are Winsorized at the 0.5% level on both sides of the distribution. Firm profitability are as of the first year of firm appearance in our database. Assets (sales) growth is computed as the growth of US-dollar-measured assets (sales) of the firm. Reported results are obtained from regressions with one-digit SIC industry code fixed effects (not reported). We include only firms for which there are at least five annual observations on EBITDA/Assets; have required that the rule of law indicator is available for the country of residence of the companies in our sample; consider only manufacturing industry constituents (SIC 2000-3999). The absolute value of the t-statistics (in parentheses below the coefficient estimates) is based on robust standard errors clustered at the country level. We weight each firm observation with the inverse of the number of firms from its domicile country. Results are obtained from regressions with one-digit SIC code dummies (not reported). \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, correspondingly.

	Dependent Variable			
	<i>Company Asset Growth</i>		<i>Company Sales Growth</i>	
	(1)	(2)	(3)	(4)
RISK1, $\sigma_{i,c}$	0.3056*** (3.03)	0.2909*** (2.95)	0.204* (1.92)	0.156 (1.45)
Anti-Director Index (ADR)		-0.001 (-0.21)		-0.001 (0.11)
Rule of Law (RL)		-0.003 (-0.38)		-0.001 (0.14)
Disclosure (ASR)		0.001 (1.02)		0.0016** (2.39)
Initial Corporate Profitability	0.1102*** (3.42)	0.1099*** (3.51)	-0.045 (1.39)	-0.044 (1.38)
Country Private Credit	0.012 (0.72)	0.013 (0.56)	0.019 (0.95)	0.009 (0.36)
Country Market Capitalization	-0.011 (0.79)	-0.022 (1.21)	-0.0271* (1.81)	-0.0529*** (3.06)
Government Spending	0.0032** (2.57)	0.0029** (2.39)	0.001 (0.54)	-0.0003 (0.26)
Unionized Labor	-0.001 (1.38)	-0.001 (1.19)	0.0002 (0.56)	0.00002 (0.06)
<i>Number of observations</i>	5,007	5,007	5,007	5,007
<i>R-squared (%)</i>	5.6%	5.9%	2.2%	3.7%
<i>F-statistic</i>	4.7 (0.00)	3.9 (0.00)	4.1 (0.00)	4.9 (0.00)
<i>Number of countries</i>	38	38	38	38

**Table 4 Panel C. Firm Level Growth 2SLS Regressions**

**Part I** of Panel C presents the first-stage regressions of firm-level risk-taking on the instrumental variables (logarithm of initial total assets, RISK1\* (average risk-taking of peer firms in the same industry and country), ADR, ASR, and RL) and the exogenous control variables included in the second stage firm-level regressions of assets and sales growth versus the risk-taking proxy, RISK1. Controls include initial firm profitability, Herfindahl index, bank- and stock-market development, percentage of labor participating in unions from the World Labor Report 1997-1998, and the average government spending in 1980-1995. Assets and sales growth are Winsorized at the 0.5% level on both sides of the distribution. Assets (sales) growth is computed as the growth in dollar-denominated assets (sales) of the firm. We include only firms for which there are at least five annual observations on EBITDA/Assets. We consider only manufacturing industry constituents (SIC 2000-3999). The partial R-squared is the fraction of the variation of RISK1 explained by the instruments, net of their effect through the exogenous variables. The test of over-identifying restrictions tests the joint null hypothesis that the excluded instruments are uncorrelated with the error term and are correctly excluded from the second-stage equation. **Part II** reports the results from the second-stage regressions of firm growth measures on instrumented RISK1 and control variables. The Hausman test examines whether the OLS and 2SLS coefficients on RISK1 are statistically different. The absolute value of the t-statistics (in parentheses below the coefficient estimates) is based on robust standard errors clustered at the country level. We weight each firm observation with the inverse of the number of firms from its domicile country. Results are obtained from regressions with one-digit SIC code dummies (not reported). \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, correspondingly.

	<i>Part I: First-Stage Regressions and Validity of Instruments</i>							
	<i>Company Asset Growth</i>				<i>Company Sales Growth</i>			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Instruments</i>								
Log(Initial firm asset size)	-0.0082*** (6.07)	-0.0078*** (6.15)			-0.0082*** (6.06)	-0.0078*** (6.14)		
RISK1*			0.3833*** (5.30)	0.3444*** (4.96)			0.3833*** (5.30)	0.3444*** (4.96)
Disclosure (ASR)		0.0007*** (2.73)		0.0004*** (3.10)		0.0007*** (2.73)		0.0004*** (3.10)
Rule of Law (RL)		0.002 (0.86)		0.002 (1.42)		0.002 (0.86)		0.002 (1.42)
Anti-Director Index (ADR)		0.002 (1.48)		0.002* (1.67)		0.002 (1.48)		0.002* (1.67)
<i>Predetermined Variables</i>								
Profitability	-0.055 (1.41)	-0.051 (1.32)	-0.051 (1.22)	-0.046 (1.10)	-0.055 (1.41)	-0.051 (1.32)	-0.051 (1.22)	-0.046 (1.10)
Country Herfindahl Index	-0.000004 (0.00)	-0.001 (1.06)	0.001 (0.69)	-0.0004 (0.44)	-0.000004 (0.00)	-0.001 (1.06)	0.001 (0.69)	-0.0004 (0.44)
Country Private Credit	-0.002 (0.27)	-0.010 (1.07)	-0.005 (0.92)	-0.0101* (1.77)	-0.002 (0.27)	-0.010 (1.07)	-0.005 (0.92)	-0.0101* (1.77)
Country Market Capitalization	0.006 (1.13)	-0.009 (1.12)	0.005 (1.61)	-0.004 (0.88)	0.006 (1.13)	-0.009 (1.12)	0.005 (1.61)	-0.004 (0.88)
Unionized Labor	0.0002 (1.56)	0.0002 (1.16)	0.000 (1.04)	0.000 (0.67)	0.0002 (1.56)	0.0002 (1.16)	0.0001 (1.04)	0.0001 (0.67)
Government Spending	0.0004 (0.96)	-0.0002 (0.35)	0.0003 (0.94)	-0.0001 (0.19)	0.0004 (0.96)	-0.0002 (0.35)	0.0003 (0.94)	-0.0001 (0.19)
<i>Number of observations</i>	5,007	5,007	4,372	4,372	5,005	5,005	4,932	4,932
<i>Number of countries</i>	38	38	38	38	38	38	38	38
<i>R-squared (%)</i>	12.7%	15.0%	15.9%	17.3%	12.7%	15.0%	11.1%	12.1%
<i>F-statistic</i>	6.7	6.8	9.2	10.2	6.7	6.8	6.9	12.1
<i>F-statistic p-value</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Predictive Power of Excluded Instruments</i>								
<i>Partial R-squared</i>	9.4%	11.8%	7.4%	8.5%	9.4%	11.8%	7.4%	8.5%
<i>Robust F-statistic(instruments)</i>	36.79	12.22	28.11	16.18	36.76	12.21	28.11	16.17
<i>F-statistic p-value</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Test of Over-identifying Restrictions</i>								
<i>Hansen J-Statistic</i>	0.00	4.69	0.00	2.20	0.00	1.31	0.00	4.28
<i>p-value</i>	-	0.20	-	0.03	-	0.73	-	0.23

<i>Part II: Second-Stage Regressions of company growth measures on RISK1</i>								
	<i>Company Asset Growth</i>				<i>Company Sales Growth</i>			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Instrumented RISK1	1.387*** (5.26)	1.136*** (5.60)	0.6241*** (2.84)	0.6841** (2.36)	1.1208*** (3.54)	1.1642*** (3.69)	0.9278*** (4.16)	1.2688*** (3.84)
<i>Predetermined Variables</i>								
Initial Profitability	0.100 (1.62)	0.088 (1.67)	0.059 (1.41)	0.062 (1.54)	-0.007 (-0.14)	-0.005 (0.10)	-0.024 (0.59)	-0.007 (0.14)
Country Herfindahl Index	-0.002 (1.16)	-0.002 (1.25)	-0.0003 (0.10)	-0.0003 (0.11)	0.0044* (1.95)	0.0044* (1.94)	0.0074** (2.15)	0.0072** (2.28)
Country Private Credit	-0.008 (0.59)	-0.009 (0.77)	-0.013 (1.25)	-0.013 (1.19)	0.020 (1.42)	0.020 (1.45)	0.015 (1.05)	0.017 (1.21)
Country Market Capitalization	0.001 (0.04)	0.003 (0.26)	0.008 (0.78)	0.008 (0.71)	-0.0379*** (-3.17)	-0.0384*** (3.29)	-0.036*** (2.69)	-0.0395*** (3.11)
Unionized Labor	-0.0002 (0.69)	-0.0002 (0.65)	-0.0003 (1.06)	-0.0003 (1.04)	-0.0001 (-0.30)	-0.0001 (0.32)	-0.0003 (0.66)	-0.0003 (0.73)
Government Spending	-0.001 (1.25)	-0.001 (1.18)	-0.0002 (0.16)	-0.0002 (0.19)	0.000 (-0.14)	0.000 (0.17)	0.0002 (0.18)	-0.0001 (0.06)
<i>Number of observations</i>	5,007	5,007	4,933	4,933	5,005	5,005	4,932	4,932
<i>F-statistic (p-value)</i>	4.66 (0.00)	5.06 (0.00)	2.12 (0.06)	2.05 (0.07)	5.46 (0.00)	6.48 (0.00)	5.96 (0.00)	5.29 (0.00)
<i>Hausman test for the Effect of RISK1</i>								
<i>Cluster-Robust F-statistic</i>	10.87	7.08	1.82	2.46	6.02	7.71	6.59	8.12
<i>p-value</i>	0.00	0.01	0.19	0.13	0.02	0.01	0.01	0.00

**Table 5 Panel A.** Firm Level Risk-taking for Firms in the United States

In this table we present firm-level regressions of corporate risk-taking proxy RISK1 on corporate governance indicators (entrenchment- and governance- indices), and controls for firm characteristics (earning smoothing, size, profitability, sales growth, book leverage, large shareholder ownership and earnings smoothing) for US-companies with available data in our sample. All firm-level controls except for earnings smoothing are as of the first year of firm appearance in our database. We control for the ownership of the largest shareholder. The risk-taking proxy is the time series standard deviation of the EBITDA/Assets company ratio, computed for 1992-2002. We include only firms for which there are at least five annual observations on EBITDA/Assets. Earnings smoothing is one minus the firm's ratio of firm-level standard deviations of operating income and operating cash flow, both scaled by lagged total assets. The higher the measure, the higher the propensity to smooth earnings. All variables are defined in Table 1. We consider only firms in the manufacturing industry (SIC 2000-3999). In models (5) and (6) we instrument the ownership with the average large shareholder ownership for other companies in the same two-digit industry and the logarithm of firm age. The partial R-squared is the fraction of the variation of RISK1 explained by the instruments, net of their effect through the exogenous variables. The test of over-identifying restrictions tests the joint null hypothesis that the excluded instruments are uncorrelated with the error term and are correctly excluded from the second-stage equation. The Hausman test examines whether the OLS and 2SLS coefficients on RISK1 are statistically different. Reported results are obtained from regressions with one-digit SIC industry code fixed effects (not shown); in addition the regression includes as control the number of observations used to estimate the risk taking proxy (not shown). The absolute value of the t-statistics (in parentheses below the coefficient estimates) is based on robust standard errors. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, correspondingly. The table also presents the number of observations and the R-squared statistics for the regressions.

	Dependent Variable: Company Risk-taking RISK1, $\sigma_{i,c}$			
	(1)	(2)	(3)	(4)
Entrenchment index (E-index)	-0.0025** (2.48)		-0.002 (1.11)	
Governance index (G-index)		-0.0019*** (3.67)		-0.0018** (2.28)
Earnings Smoothing	-0.0166*** (4.79)	-0.0161*** (4.74)	-0.0177*** (4.34)	-0.0163*** (4.14)
Log (Initial Firm Size)	-0.0062*** (4.95)	-0.0056*** (4.72)	-0.0064*** (4.96)	-0.0057*** (4.68)
Initial Profitability	-0.1481*** (4.11)	-0.1501*** (4.20)	-0.1449*** (4.09)	-0.1489*** (4.23)
Initial Sales Growth	0.008 (0.63)	0.006 (0.51)	0.011 (0.85)	0.008 (0.57)
Initial Book Leverage	0.013 (1.61)	0.013 (1.66)	0.0157* (1.80)	0.014 (1.59)
Large Shareholder Ownership	-0.006 (0.59)	-0.009 (0.80)	0.034 (0.52)	-0.001 (0.02)
Initial Bank Power Proxy	-0.019 (1.56)	-0.0206* (1.73)	-0.0228* (1.76)	-0.0227* (1.8)
Initial Industry Unionized Level	-0.0005*** (4.97)	-0.0005*** (5.04)	-0.0005*** (4.89)	-0.0005*** (5.07)
<i>Number of observations</i>	443	443	436	436
<i>R-squared (%)</i>	35.2%	36.2%	33.8%	36.6%
	<i>2SLS regressions statistics</i>			
<i>F-statistic (excluded instruments)</i>	-	-	3.32 (0.04)	2.8 (0.06)
<i>Partial R-squared</i>	-	-	2.3%	2.2%
<i>Hansen J-test (p-value)</i>	-	-	2.52 (0.11)	1.19 (0.28)
<i>Hausman test (p-value)</i>	-	-	0.09 (0.77)	0.05 (0.83)

**Table 5 Panel B.** Firm Level Growth Regressions for Firms in the United States

Part I of Panel B presents the first-stage regressions of firm-level risk-taking on the instrumental variables (logarithm of initial firm size, average risk-taking by other firms in the same two-digit SIC code industry, RISK1\*, entrenchment- and corporate governance-indices) and the pre-determined control variables included in the second stage firm-level regressions of assets and sales growth versus the risk-taking proxy, RISK1, for companies from the United States in our sample. These controls include initial corporate profitability, bank power, and union power proxy. Assets and sales growth are Winsorized at the 0.5% level on both sides of the distribution. Assets (sales) growth is computed as the growth in \$ assets (sales) of the firm. We include only firms for which there are at least five annual observations on EBITDA/Assets. We consider only manufacturing industry constituents (SIC 2000-3999). The partial R-squared is the fraction of the variation of RISK1 explained by the instruments, net of their effect through the exogenous variables. The test of over-identifying restrictions tests the joint null hypothesis that the excluded instruments are uncorrelated with the error term and are correctly excluded from the second-stage equation. **Part II** reports the results from the second-stage regressions of firm growth measures on RISK1 and control variables, in which risk-taking is treated as endogenous variable. The Hausman test examines whether the OLS and 2SLS coefficients on RISK1 are statistically different. The absolute value of the t-statistics (in parentheses below the coefficient estimates) is based on robust standard errors clustered at the country level. We weight each firm observation with the inverse of the number of firms from its domicile country. Results are obtained from regressions with one-digit SIC code dummies (not reported). \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, correspondingly.

<i>Part I: First-Stage Regressions and Validity of Instruments</i>								
	<i>Company Asset Growth</i>				<i>Company Sales Growth</i>			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Instruments</i>								
Log(Initial firm total assets)	-0.006*** (5.40)		-0.007*** (5.90)		-0.006*** (5.40)		-0.007*** (5.90)	
RISK1*		0.121** (2.21)		0.123** (2.20)		0.121** (2.21)		0.123** (2.20)
Entrenchment index (E)			-0.003*** (3.22)	-0.005*** (4.68)			-0.0033*** (3.22)	-0.005*** (4.68)
Governance index (G)	-0.002*** (4.52)	-0.003*** (6.23)			-0.002*** (4.52)	-0.003*** (6.23)		
<i>Predetermined Variables</i>								
Initial Corporate Profitability	-0.142*** (3.94)	-0.15*** (3.81)	-0.141*** (3.85)	-0.15*** (3.66)	-0.142*** (3.94)	-0.15*** (3.81)	-0.141*** (3.85)	-0.15*** (3.66)
Bank Power	-0.013 (1.39)	-0.015 (1.45)	-0.012 (1.22)	-0.013 (1.24)	-0.013 (1.39)	-0.015 (1.45)	-0.012 (1.22)	-0.013 (1.24)
Unionized Labor	-0.0005*** (5.00)	-0.0004*** (3.53)	-0.0005*** (4.92)	-0.0005*** (3.59)	-0.0005*** (5.00)	-0.0004*** (3.53)	-0.0005*** (4.92)	-0.0005*** (3.59)
<i>Number of observations</i>	463	463	463	463	463	463	463	463
<i>R-squared (%)</i>	31.4%	26.4%	30.2%	23.4%	31.4%	26.4%	30.2%	23.4%
<i>Regression F-statistic (p-value)</i>	13.8 (0.00)	12.1 (0.00)	13.9 (0.00)	11.4 (0.00)	13.8 (0.00)	12.1 (0.00)	13.9 (0.00)	11.4 (0.00)
<i>Predictive Power of Excluded Instruments</i>								
<i>Partial R-squared</i>	14.0%	7.83%	12.5%	4.0%	14.1%	7.83%	12.5%	4.0%
<i>Robust F-statistic for Excluded instruments (p-value)</i>	27.47 (0.00)	20.44 (0.00)	25.05 (0.00)	12.72 (0.00)	27.47 (0.00)	20.44 (0.00)	25.05 (0.00)	12.72 (0.00)
<i>Test of Overidentifying Restrictions</i>								
<i>Hansen J-Statistic</i>	3.13	0.75	0.11	0.12	4.18	0.13	0.55	0.00
<i>p-value</i>	0.08	0.39	0.74	0.73	0.04	0.72	0.46	0.99

<i>Part II: Second-Stage Regressions of company growth measures on RISK1</i>								
	<i>Company Asset Growth</i>				<i>Company Sales Growth</i>			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Instrumented RISK1	2.695 <sup>***</sup> (5.42)	2.129 <sup>***</sup> (4.18)	3.007 <sup>***</sup> (5.34)	2.894 <sup>***</sup> (3.8)	2.511 <sup>***</sup> (5.2)	1.777 <sup>***</sup> (3.61)	2.808 <sup>***</sup> (5.14)	2.291 <sup>***</sup> (3.28)
<i>Predetermined Variables</i>								
Profitability	0.486 <sup>***</sup> (4.05)	0.40 <sup>***</sup> (3.70)	0.533 <sup>***</sup> (3.94)	0.516 <sup>***</sup> (3.23)	0.336 <sup>***</sup> (2.88)	0.225 <sup>**</sup> (2.23)	0.381 <sup>***</sup> (2.87)	0.303 <sup>**</sup> (2.07)
Bank Power	0.014 (0.38)	0.006 (0.17)	0.018 (0.47)	0.017 (0.42)	0.002 (0.05)	-0.009 (0.27)	0.006 (0.16)	-0.001 (0.03)
Unionized Labor	0.001 <sup>*</sup> (1.69)	0.0004 (0.86)	0.001 <sup>**</sup> (1.97)	0.001 (1.44)	0.001 <sup>**</sup> (2.21)	0.0004 (1.06)	0.001 <sup>**</sup> (2.43)	0.001 (1.41)
<i>Number of observations</i>	463	463	463	463	463	463	463	463
<i>Second-stage Regression F-statistic (p-value)</i>	7.8 (0.00)	6.1 (0.00)	7.4 (0.00)	4.8 (0.00)	6.0 (0.00)	3.8 (0.00)	5.8 (0.00)	3.3 (0.00)
<i>Hausman test for the Effect of RISK1</i>								
<i>Robust F-statistic</i>	68.2	23.38	74.87	21.1	67.33	17.26	75.25	13.95
<i>p-value</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

**Table 6 Panel A.** Risk-taking and Corporate Governance

We analyze the relationship between investor protection, accounting disclosure standards, and rule of law proxies and the risk-taking proxies, RISK2 ( $\sigma_c$ ) and RISK3 ( $\Omega_c$ ). A detailed description of both risk-taking measures and the real GDP-per-capita growth is presented in Table 1. As explanatory variables we include anti-director rights, the quality of the accounting disclosure standard, and the rule of law (from La Porta *et al.* (1998)). As controls we include the percentage labor participating in labor unions from the 1997-1998 World Labor Report, the average annual government spending as a share of GDP over 1980-1995, earnings smoothing proxy (refer to Table 1 for definition), a Herfindahl index, claims on private sector by deposit money banks and other financial institutions as share of GDP, stock market capitalization as share of GDP (the latter two measures from Demirgüç-Kunt and Levine (2001)), and the logarithm of 1991 GDP-per-capita (in US\$). We consider companies in the manufacturing industry only, SIC codes 2000 through 3999. We have required that the rule of law indicator is available for the country of residence of the companies in our sample. The absolute value of the t-statistics (in parentheses below the coefficient estimates) is based on robust standard errors. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, correspondingly.

	Dependent Variable:							
	RISK2 ( $\sigma_c$ )				RISK3 ( $\Omega_c$ )			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Disclosure (ASR)	0.0010*** (2.16)			0.0009*** (2.00)	0.0007 (1.19)			0.0009 (1.39)
Rule of Law (RL)		0.0059*** (2.12)		0.0043 (1.60)		-0.0019 (0.45)		-0.0042 (0.98)
Anti-Director Index (ADR)			0.0022 (0.84)	0.0017 (0.56)			0.0051* (1.88)	0.0055* (1.84)
Unionized labor	0.0000 (0.22)	-0.0001 (0.65)	0.0001 (0.30)	-0.0001 (0.54)	0.0008*** (2.28)	0.0009*** (2.85)	0.0009*** (3.10)	0.0009*** (2.77)
Government Spending	0.0004 (0.52)	0.0013*** (2.16)	0.0009 (1.24)	0.0005 (0.61)	-0.0012 (1.00)	-0.0006 (0.64)	-0.0010 (0.99)	-0.0019 (1.49)
Earnings Smoothing	-0.0451 (1.54)	-0.0680*** (3.48)	-0.0529*** (2.47)	-0.0519* (1.79)	0.0253 (0.65)	0.0267 (0.72)	0.0317 (0.97)	0.0508 (1.16)
Herfindahl Index	0.0306 (0.81)	0.0536 (1.25)	0.0182 (0.38)	0.0523 (1.38)	-0.0923*** (2.19)	-0.1112*** (2.34)	-0.1068*** (2.78)	-0.1198*** (2.89)
Private Credit	-0.0006 (0.06)	0.0020 (0.21)	0.0056 (0.54)	-0.0041 (0.46)	0.0326 (2.00)	0.0407*** (2.59)	0.0366*** (2.54)	0.0325*** (2.17)
Market Capitalization	-0.0051 (0.38)	0.0088 (0.78)	0.0018 (0.12)	-0.0041 (0.31)	0.0018 (0.08)	0.0071 (0.33)	-0.0010 (0.05)	-0.0122 (0.50)
Log (1991 GDP-per-capita)	-0.0015 (0.43)	-0.0114*** (2.30)	-0.0029 (0.74)	-0.0065 (1.08)	-0.0034 (0.71)	-0.0043 (0.63)	-0.0044 (0.93)	0.0041 (0.51)
<i>Number of observations</i>	36	39	39	36	36	39	39	36
<i>R-squared (%)</i>	38.4%	35.7%	26.6%	46.2%	48.2%	44.6%	47.2%	51.7%
<i>Regression F-statistic(p-value)</i>	2.8 (0.02)	2.3 (0.05)	2.1 (0.12)	2.9 (0.01)	7.9 (0.00)	6.0 (0.00)	7.2 (0.00)	12.0 (0.00)

**Table 6 Panel B.** Economic Growth and Risk-taking

We analyze the relationship between annual real GDP-per-capita growth and risk-taking measures: RISK2 ( $\sigma_c$ ) and RISK3 ( $\Omega_c$ ). A detailed description of both risk-taking measures and the real GDP-per-capita is presented in Table 1. As control variables we include anti-director rights, the quality of the accounting disclosure standard, and the rule of law (from La Porta *et al.* (1998)). Further controls include claims on private sector by deposit money banks and other financial institutions as share of GDP, stock market capitalization as share of GDP (both measures from Demirgüç-Kunt and Levine (2001)), percentage of labor participating in unions from the World Labor Report 1997-1998, average country government spending in 1980-1995, average schooling years in the total population over 25 in 1990 (from Barro and Lee (1993)), and the logarithm of 1991 GDP-per-capita in US dollars. We consider companies in the manufacturing industry only (SIC codes 2000 through 3999). Models (1), (2), and (4) present OLS regressions for RISK2 and RISK3. Models (3) and (5) present the second-stage regressions results from two-stage least squares (2SLS) estimation of country growth measures on RISK2, RISK3, and control variables, in which risk-taking is treated as endogenous variable. We instrument the risk-taking proxies in models (3) and (5) with anti-director rights, accounting disclosure quality and the average of the logarithm of total corporate assets. The partial R-squared is the fraction of the variation of the risk-taking proxy explained by the instruments, net of their effect through the exogenous variables. The test of overidentifying restrictions tests the joint null hypothesis that the excluded instruments are uncorrelated with the error term and are correctly excluded from the second-stage equation. The Hausman test examines whether the OLS and 2SLS coefficients on the risk-taking proxy are statistically different. The absolute value of the t-statistics (in parentheses below the coefficient estimates) is based on robust standard errors. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, correspondingly.

	Dependent Variable: Average Real GDP-per-capita growth, 1992-2002				
	(1)	(2)	(3)	(4)	(5)
	<i>OLS</i>	<i>OLS</i>	<i>2SLS</i>	<i>OLS</i>	<i>2SLS</i>
RISK2, $\sigma_c$		-0.0592 (0.65)	0.5216** (2.49)		
RISK3, $\Omega_c$				0.178* (1.79)	0.6998*** (2.61)
Anti-Director Index (ADR)	0.0007 (0.51)	0.0009 (0.62)		0.0002 (0.14)	
Disclosure (ASR)	0.0003 (1.14)	0.0003 (1.31)		0.0002 (0.91)	
Rule of Law (RL)	0.0042** (2.31)	0.0043** (2.29)		0.0044*** (2.94)	
Private Credit	-0.0054 (0.84)	-0.0058 (0.87)	-0.00004 (0.01)	-0.0107** (2.20)	-0.0220 (1.56)
Market Capitalization	-0.0002 (1.51)	-0.0002 (1.44)	-0.0001 (1.15)	-0.0003* (1.80)	-0.0005* (1.93)
Unionized Labor	0.0001 (0.17)	0.0001 (0.16)	-0.0002 (0.35)	0.0003 (1.03)	0.0007 (1.26)
Government Spending	-0.0024 (0.40)	-0.0029 (0.45)	-0.0034 (0.70)	-0.0035 (0.65)	-0.0109 (1.30)
Schooling, 1990	0.0003 (0.23)	0.0005 (0.35)	-0.0015 (0.78)	-0.0004 (0.33)	-0.0026 (1.63)
Log(1991 GDP-per-capita (\$))	-0.0072** (2.44)	-0.0077** (2.48)	0.0020 (0.51)	-0.007** (2.49)	0.0014 (0.42)
<i>Number of observations</i>	35	35	35	35	35
<i>R-squared (%)</i>	34.1%	34.8%	-	47.1%	-
<i>Regression F-statistic (p-value)</i>	2.1 (0.08)	2.0 (0.08)	1.6 (0.19)	4.2 (0.00)	1.2 (0.33)
<i>Partial R-squared</i>	-	-	30.7 %	-	10.5%
<i>Excluded Instruments F-stat (p-value)</i>	-	-	8.09 (0.00)	-	0.93 (0.44)
<i>Hansen J-Statistic (p-value)</i>	-	-	0.59 (0.74)	-	0.95 (0.10)
<i>Hausman Test (p-value)</i>	-	-	6.73 (0.02)	-	2.74 (0.11)

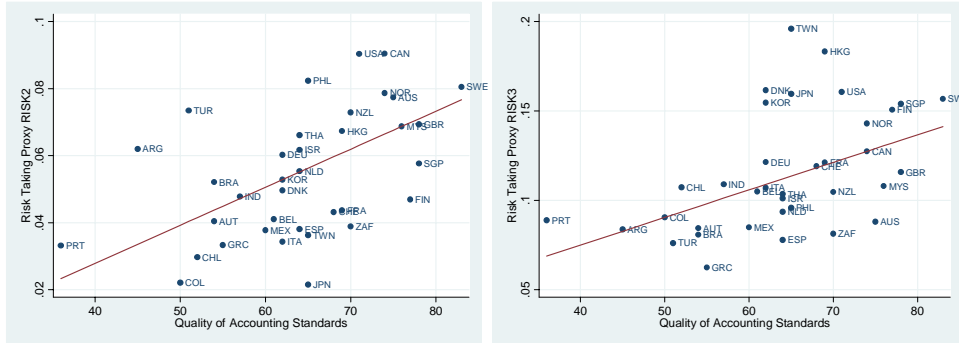
**Table 6 Panel C.** Total Factor Productivity Growth and Risk-taking

We analyze the relationship between annual total factor productivity growth and risk-taking measures: RISK2 ( $\sigma_c$ ) and RISK3 ( $\Omega_c$ ). A detailed description of both risk-taking measures and the total factor productivity growth is presented in Table 1. As control variables we include anti-director rights, the quality of the accounting disclosure standard, and the rule of law (from La Porta *et al.* (1998)). Further controls include claims on private sector by deposit money banks and other financial institutions as share of GDP, stock market capitalization as share of GDP (both measures from Demirgüç-Kunt and Levine (2001)), percentage of labor participating in unions from the World Labor Report 1997-1998, average country government spending in 1980-1995, average schooling years in the total population over 25 in 1990 (from Barro and Lee (1993)), and the 1991 TFP growth. We consider companies in the manufacturing industry only (SIC codes 2000 through 3999). Models (1), (2), and (4) present OLS regressions for RISK2 and RISK3. Models (3) and (5) present the second-stage regressions results from two-stage least squares (2SLS) estimation of country growth measures on RISK2, RISK3, and control variables, in which risk-taking is treated as endogenous variable. We instrument the risk-taking proxies in models (3) and (5) with anti-director rights, quality of accounting disclosure and the average of the logarithm of total corporate assets for each country. The partial R-squared is the fraction of the variation of the risk-taking proxy explained by the instruments, net of their effect through the exogenous variables. The test of overidentifying restrictions tests the joint null hypothesis that the excluded instruments are uncorrelated with the error term and are correctly excluded from the second-stage equation. The Hausman test examines whether the OLS and 2SLS coefficients on the risk-taking proxy are statistically different. The absolute value of the t-statistics (in parentheses below the coefficient estimates) is based on robust standard errors. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, correspondingly.

Dependent Variable: Average TFP growth, 1992-2000					
	(1)	(2)	(3)	(4)	(5)
	OLS	OLS	2SLS	OLS	2SLS
RISK2, $\sigma_c$		0.0373 (0.41)	0.7361*** (2.92)		
RISK3, $\Omega_c$				0.0192 (0.22)	0.485*** (2.81)
Anti-Director Index (ADR)	0.0029*** (2.73)	0.0028** (2.39)		0.0028** (2.53)	
Disclosure (ASR)	0.0006*** (2.65)	0.0005** (2.47)		0.0005*** (2.87)	
Rule of Law (RL)	0.0021** (2.02)	0.002** (2.03)		0.0021* (1.88)	
Private Credit	-0.017*** (2.97)	-0.0165*** (2.94)	-0.0027 (0.56)	-0.0176** (2.45)	-0.023*** (2.62)
Market Capitalization	-0.0034 (0.47)	-0.0030 (0.40)	0.0040 (0.59)	-0.0035 (0.50)	-0.0011 (0.16)
Unionized Labor	0.0000 (0.07)	0.0000 (0.01)	0.0002 (1.30)	0.0000 (0.18)	-0.0002 (1.50)
Government Spending	-0.0005** (1.98)	-0.0005** (1.97)	-0.0004 (0.88)	-0.0005** (2.11)	0.0004 (0.83)
Schooling, 1990	-0.0001 (0.06)	-0.0001 (0.14)	-0.0010 (0.82)	-0.0001 (0.13)	-0.0010 (0.90)
1991 TFP Growth	0.1136*** (2.60)	0.1109** (2.54)	0.0543 (0.76)	0.1107** (2.53)	0.0311 (0.55)
<i>Number of observations</i>	35	35	35	35	35
<i>R-squared (%)</i>	46.5%	46.8%	-	46.7%	-
<i>Regression F-statistic (p-value)</i>	6.4 (0.00)	5.7 (0.00)	3.1 (0.02)	5.7 (0.00)	1.1 (0.37)
<i>Partial R-squared</i>	-	-	17.1%	-	13.9%
<i>Excluded Instruments F-stat (p-value)</i>	-	-	5.00 (0.01)	-	2.18 (0.12)
<i>Hansen J-Statistic (p-value)</i>	-	-	0.25 (0.88)	-	1.17 (0.56)
<i>Hausman Test (p-value)</i>	-	-	9.34 (0.00)	-	8.82 (0.01)

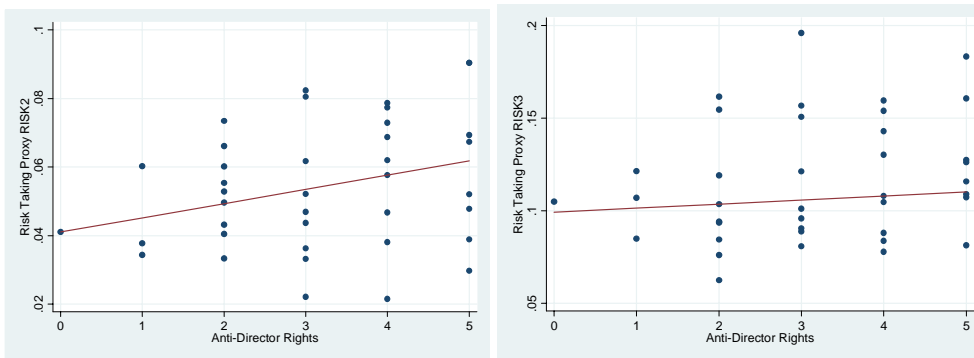
**Figure 1.** Risk-taking and accounting disclosure standards.

Risk-taking proxies, RISK2 and RISK3, and the quality of accounting disclosure standards rating (from La Porta *et al.* (1998)). The fitted line represents the slope from a quintile regression of the risk-taking proxy on constant and accounting disclosure standard ranking.



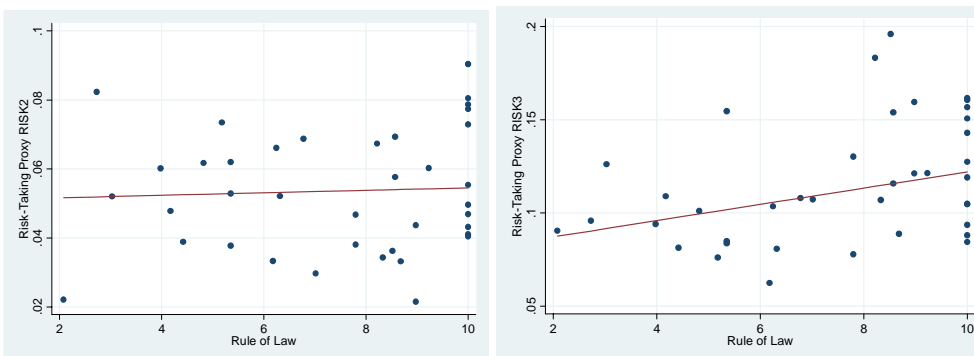
**Figure 2.** Risk-taking and anti-director rights.

Risk-taking proxies, RISK2 and RISK3, and anti-director rights index (from La Porta *et al.* (1998)). The fitted line represents the slope from a quintile regression of the risk-taking proxy on anti-director rights index.



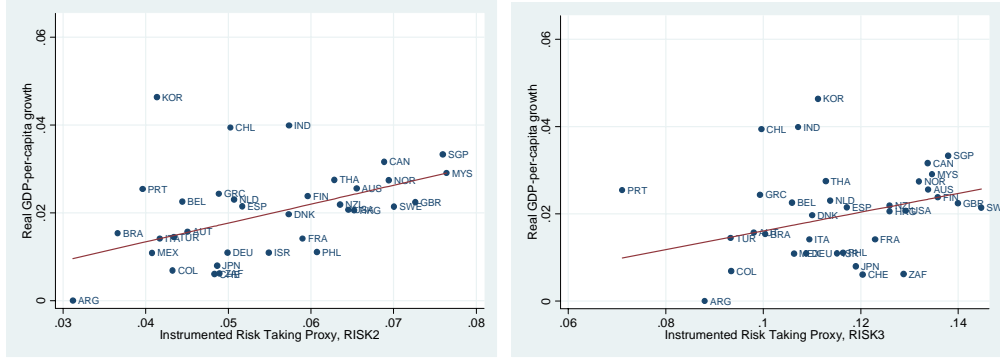
**Figure 3.** Risk-taking and rule of law.

Risk-taking proxies, RISK2 and RISK3, and the rule of law indicator (from La Porta *et al.* (1998)). The fitted line represents the slope from a quintile regression of the risk-taking proxy on constant and the rule of law indicator.



**Figure 4.** GDP growth and risk-taking.

Instrumented risk-taking proxies, RISK2 and RISK3 and average real GDP-per-capita growth. We use as instruments anti-director rights, quality of accounting disclosure and the country average of the logarithm of total firm assets. The measures have been computed for the sample 1992-2002, using Compustat Global Industrial database. The fitted line represents the slope from a quintile regression of real GDP-per-capita growth on constant and the instrumented risk-taking proxy.



**Figure 5.** Total factor productivity growth and risk-taking.

Instrumented risk-taking proxies, RISK2 and RISK3, and country average total factor productivity growth. We use as instruments anti-director rights, quality of accounting disclosure and the country average of the logarithm of total firm assets. The measures have been computed for the sample 1992-2000, using the Compustat Global Industrial database. The fitted line represents the slope from a quintile regression of TFP growth on constant and the instrumented risk-taking proxy.

