Agency Conflicts Around the World*

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We incorporate agency conflicts in a dynamic model of corporate financing and use structural estimation to construct novel firm-specific governance indexes. Our agency cost estimates show that conflicts of interest between controlling and minority shareholders and between equityholders and creditors are large and exhibit sizable variation across and within countries. Legal origin, bankruptcy proceedings, and provisions for investor protection all affect agency costs, but their impact on the average firm is small compared to variation within country. Consistent with costly limited enforcement, investor protection provisions are more relevant for curtailing governance excesses than guarding the typical firm. Our governance indexes correlate with both financial indicators of performance and real variables, including GNI per capita, stock market capitalization, and private credit, confirming the effects of agency conflicts on real and financial outcomes.

JEL Classification: G32, G34

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Introduction

A central theme in financial economics is that key corporate decisions such as investment, financing, and default get distorted by corporate governance problems, with important implications for the pace of security issues, the efficiency of investment allocation, and stock market valuations. While governance problems are generally seen as being of first-order importance in many firms and countries (see e.g. La Porta, Lopez-de Silanes, Shleifer, and Vishny (1998, 2000)), an inherent difficulty in measuring their effects on policies, valuations, and other outcome variables is that conflicts of interest within firms are not directly observable and that good empirical proxies for these conflicts are difficult to construct.

To address this issue, empirical researchers have developed a number of indices measuring investor protection within firms or countries, arguing that the severity of corporate governance problems depends in large part on the extent of investor protection safeguarding outside investors. For example, Gompers, Ishii, and Metrick (2003) and Bebchuk, Cohen and Ferrell (2009) construct indices of shareholder protection using the provisions followed by the Investor Responsibility Research Center (IRRC) and show that these indices correlate with several measures of firm performance. Djankov, Hart, McLeish, and Shleifer (2008) and Favara, Schroth, and Valta (2012) construct indices capturing creditor protection and the enforcement of debt contact and show that these indices correlate with debt market development and equity risk and stock returns. According to this research, investor protection and corporate governance are central to understanding corporate finance patterns in different countries because, in many countries, expropriation of minority shareholders and creditors by controlling shareholders and managers is extensive.

This paper offers an alternative approach to estimating conflicts of interests within the firm by introducing a structural model of financing choices and by using observed capital structure decisions to infer the magnitude of agency conflicts and their effects on firm behavior. The backbone of our structural approach is the estimation of a dynamic capital structure model in the spirit of Fisher, Heinkel, and Zechner (1989), in which financing choices reflect the corporate tax advantage of debt, the cost of issuing securities, bankruptcy costs, as well as potential agency conflicts within the firm.[1] We introduce two types of agency conflicts in the model. First, we assume that controlling shareholders pursue private benefits at the expense of minority shareholders, within the limits imposed by shareholder protection. Second, we assume that shareholders can extract concessions from debtholders by renegotiating outstanding claims in default.

[1] While the approach developed in this paper is applicable to any theory of financial policy, only the trade-off argument has a fully worked out dynamic theory that produces quantitative predictions about leverage ratios.

In the model, each firm is run by a controlling shareholder who sets the firm's investment, financing, and default policies. This controlling shareholder owns a fraction of the firms' equity and can capture part of the firm's free cash flows as private benefits. Debt constrains the controlling shareholder by reducing the free cash flow available for cash diversion (as in e.g. Jensen (1986)), leading to a direct mapping between agency conflicts and the firm's financing choices. Controlling shareholders in firms that perform consistently well re-leverage to exploit the tax shield of debt embedded in their equity stake. Controlling shareholders in firms that perform poorly default, leading to debt renegotiation. In this environment, we determine the optimal leveraging decision of the controlling shareholder and characterize the effects of agency conflicts on target leverage and the pace and size of capital structure changes.

For each individual firm, the model implies a specific time-series behavior of financial leverage. The policy predictions include the target leverage, the refinancing frequency, and the default probability. Our identification strategy uses data on observable variables – corporate financing decisions – to infer properties of unobserved variables – private benefits of control and shareholders' bargaining power in default. Specifically, in a first step we obtain closed-form expressions for the model-implied stationary and conditional time-series distribution of leverage ratios, capturing the effects of agency conflicts on corporate policies. In a second step, we use simulated maximum likelihood (SML) and exploit the structural restrictions of the model to estimate from panel data the level of agency conflicts that best explains observed financing behavior in 14 countries. A novel aspect of the paper is that we are able to obtain firm-specific estimates of agency conflicts. In contrast, most related work estimates the parameters of a single representative firm.

Our empirical analysis delivers four main results. First, our agency cost estimates show that conflicts of interest destroy a significant share of market value. Conflicts of interest both between controlling and minority shareholders and between equityholders and creditors are widespread and economically sizable in most countries. Private control benefits represent 4.4% (3.2%) of firm value for the average (median) firm in our sample, ranging from 1.9% and 2% for Austria and, respectively, the Netherlands to 6.8% in Irland and 7.1% in France. The median tends to lower than the mean (yielding an asymmetric distribution with fat right tail) in each of the countries considered—suggesting private control benefits are of moderate importance for the typical firm but excessive for some firms in all countries.

Shareholders' renegotiation power is distributed more symmetrically, with a standard deviation of 24.2%, and varies relatively little across countries. On average, shareholders capture 42% (45% at median) of the surplus in default, close to the Nash solution. Hence, shareholders can extract substantial concessions from debtholders in default. The highest bargaining power can be attributed to shareholders in France and Switzerland, while Portugal tends to give almost all cash flow rights to debtholders.

Second, there exists large variation in conflicts of interest both between and within countries. As one would expect, our agency cost estimates correlate strongly with indicators for the governance quality in different countries. Legal origin, bankruptcy proceedings, and provisions for creditor and minority shareholder protection all alter the severity of agency conflicts. Consistent with costly limited enforcement, control benefits and shareholder advantage in default are significantly higher in civil than in common law countries and when creditor rights are weak. Anti-director and creditor rights provisions have differential impact depending on their exact nature.

Nonetheless, the impact of governance mechanisms on the average firm is small compared to variation within country. Consistent with Atanasov et al. (2011), decisions to tunnel funds reflect both legal and informal constraints. This suggests firm-specific arrangements and governance determinants may be more important at curbing rent extraction and tunneling of funds than country-wide legal factors. As a result, country of origin and industry determine only about 28% of all variation in control benefits across firms and, respectively, 20% of variation in shareholders' cash flow rights in default. The remainder is determined by factors that are unrelated to origin and industry. Firm specific factors including market-to-book, cash holdings, firm size, profitability, asset tangibility, and ownership structure explain variation in agency conflicts better than country factors. Individual ownership is a strong predictor of both higher private benefits of control (estimates range from 4% to 5% of firm value) and shareholder bargaining power in default (estimates range from 7% to 16% higher share of the surplus). The latter is consistent with the view that concentrated ownership dimishes free-rider problems and helps in coordinating ex-post contract renegotiations.

Third, enforcement costs are material. Investor protection provisions are more relevant for curtailing governance excesses than guarding the typical firm. Cross-sectional regressions in which we explore the determinants of agency costs at different quantiles of the firm distribution confirm this view.

Beyond these qualitative predictions, the structural estimation approach allows us to measure the quantitative impact of different governance provisions. We find majority shareholders in civil law countries face about 3% higher private control benefits on average than in common law countries. In addition to its effect on the ex-post allocation of cash flow rights, our findings highlight that the ex-ante disciplining role of bankruptcy laws is economically important. Private control benefits are 1-2% lower in countries with foreclosure and liquididation procedures than in countries with debt renegotiation. Stronger creditor rights are associated with about 76 basis points private benefits of control for each provision in the Djankov et al. (2008b) index.

Finally, our governance indexes correlate with both financial indicators of performance and real variables, including GNI per capita, stock market capitalization, and private credit. Overall, our analysis confirms agency conflicts are key determinants of real and financial outcomes.

The remainder of the paper is organized as follows. Section 1 describes the model. Section 2 discusses the data and our empirical methodology. Section 3 provides firm- and country-specific estimates of agency conflicts and of shareholder bargaining power in default and provides some initial analysis of variation. Section 4 relates the agency conflicts estimates to various corporate governance mechanisms. Section 5 examines the relation between agency conflicts and real and financial outcomes. Section 6 concludes. Technical developments are gathered in an Appendix.

1 An (S, s) Model of Financing Decisions

This section develops a dynamic model of investment, financing, and default decisions that incorporates conflicts of interests between controlling and minority shareholders as well as shareholder-debtholder conflicts in default. In the following sections, we use this model to obtain firm- and country-specific estimates of agency conflicts and we relate these estimates to real and financial variables.

1.1 Model assumptions

Throughout the analysis, agents are risk neutral and the risk-free rate $r > 0$ is constant. We consider an economy with a large number of firms, indexed by $i = 1, \ldots, N$. Firms are infinitely lived and rent capital at the rental rate R to produce output with the production function $F : \mathbb{R}_+ \to \mathbb{R}_+$, $F(k_t) = k_t^\gamma$, where $\gamma \in (0, 1)$. Capital depreciates at a constant rate $\delta > 0$. The goods produced by the firms are not storable so that output equals demand; output is sold at a unit price. As in Abel and Eberly (2011), there are no costs of adjusting the capital stock so that the optimal capital stock maximizes static operating profits.

Firms are *ex ante* identical in that their productivity shocks are drawn from the same distribution. They differ ex post in the realization of idiosyncratic shocks. Specifically, we consider that the firm-specific state variable is its technology shock process, denoted by X_i and governed by:

$$dX_{it} = \mu_{Xi} X_{it} \, dt + \sigma_{Xi} X_{it} \, dZ_{it} , \qquad X_{i0} = x_{i0} > 0, \tag{1}$$

where $\mu_{Xi} < r$ and $\sigma_{Xi} > 0$ are constant parameters and $(Z_{it})_{t\geq 0}$ is a Brownian motion. In the following, we omit the dependency of the technology shock on i and denote its realizations by x. Given a realization x of X_i and a size k, the firm's operating profit is given by $xF(k) - \delta k$.

Cash flows from operations are taxed at the rate τ^c. As a result, firms may have an incentive to issue debt to shield profits from taxation. To stay in a simple time-homogeneous setting, we consider debt contracts that are characterized by a perpetual flow of coupon payments c and a principal P. Debt is callable and issued at par. The proceeds from the debt issue are distributed on a pro rata basis to shareholders at the time of flotation. We consider that firms can adjust their capital structure upwards at any point in time by incurring a proportional cost λ, but that they can reduce their indebtedness only in default.[2] Under this assumption, the firm's initial debt structure remains fixed until either the firm goes into default or the firm calls its debt and restructures with newly issued debt. The personal tax rate on dividends τ^d and on coupon payments τ^i are identical for all investors. These features are shared with numerous other capital structure models, including Leland (1998), Goldstein, Ju, and Leland (2001), Hackbarth, Miao, and Morellec (2006), Strebulaev (2007), Bhamra, Kuehn, and Strebulaev (2010), and Morellec, Nikolov and Schürhoff (2012).

We are interested in building a model in which corporate policies reflect not only real frictions, such as taxes and contracting costs, but also agency conflicts. Agency conflicts are introduced by considering that each firm is run by a controlling shareholder (or manager) who extracts private benefits ςk from running a larger firm (as in Jensen (1986), Stulz (1990) or Zwiebel (1996)), with $\varsigma > 0$, and can capture a fraction $\phi \in [0,1)$ of free cash flow to equity (as in La Porta, Lopez-de Silanes, Shleifer, and Vishny (2002), Lambrecht and Myers (2008), or Albuquerque and Wang (2008)). We also consider throughout the paper that the controlling shareholder owns a fraction φ of the firm's equity and has discretion over the size of the firm k. These assumptions imply that when choosing firm size, the controlling shareholder solves[3]

$$\max_{k\geq 0}\left\{(1-\tau^d)\left[\phi+(1-\phi)\,\varphi\right]\left[(1-\tau^c)(xk^\gamma-\delta k-c)-rk\right]+\varsigma k\right\},$$

the solution to which is given by

$$k=\left\{\frac{\gamma(1-\tau)\left[\phi+(1-\phi)\,\varphi\right]}{\left[\phi+(1-\phi)\,\varphi\right]\left[(1-\tau)\delta+(1-\tau^d)r\right]-\varsigma}\right\}^{\xi}x^{\xi},\ \text{with } \xi\equiv\frac{1}{1-\gamma}>1.$$

[2]While in principle management can both increase and decrease future debt levels, Gilson (1997) finds that transaction costs discourage debt reductions outside of renegotiation.

[3]In most of the countries in our sample, the depreciation of capital is tax-deductible but the interest cost of capital is not. As will become clear below, this modeling assumption has no effect on our estimates of agency conflicts.

where the tax rate $\tau \equiv 1 - (1-\tau^c)\left(1-\tau^d\right)$ reflects corporate and personal taxes. In our analysis of corporate policies, it will be more convenient to work with the (capacity-adjusted) technology shock $Y_i \equiv X_i^{\xi}$ with realizations denoted by y and dynamics given by

$$dY_{it} = \mu Y_{it} dt + \sigma Y_{it} dZ_{it}, \qquad Y_{i0} = \mathcal{T} X_{i0}^{\xi} > 0$$

with $\mu = \xi \mu_{Xi} + \xi(\xi-1)\sigma_{Xi}^2/2$ and $\sigma = \xi \sigma_{Xi}$ and

$$\begin{aligned}\mathcal{T} \;\equiv\; & \frac{(1-\gamma)\left[\phi + (1-\phi)\varphi\right]\left[(1-\tau)\delta + (1-\tau^d)r\right] - \varsigma}{\gamma\left[\phi + (1-\phi)\varphi\right]} \\ & \times \left\{ \frac{\gamma(1-\tau)^{\gamma}\left[\phi + (1-\phi)\varphi\right]}{\left[\phi + (1-\phi)\varphi\right]\left[(1-\tau)\delta + (1-\tau^d)r\right] - \varsigma} \right\}^{\frac{1}{1-\gamma}}.\end{aligned}$$

Using this change of variable, we have that the total operating profit $\pi_T(y)$ and the cash flows to the minority and controlling shareholders in an unlevered firm, denoted by $\pi_m(y)$ and $\pi_c(y)$, are given by

$$\begin{aligned}\pi_T(y) &= (1-\tau^c)y, \\ \pi_m(y) &= (1-\varphi)(1-\phi)\,\pi_T(y), \\ \pi_c(y) &= \left[\phi + (1-\phi)\varphi\right]\left[1 + \frac{\gamma\varsigma}{(1-\gamma)\left[\phi + (1-\phi)\varphi\right]\left[(1-\tau)\delta + (1-\tau^d)r\right] - \varsigma}\right]\pi_T(y).\end{aligned}$$

In particular, $\pi_c(y) = \left[\phi + (1-\phi)\varphi\right]\pi_T(y)$ when $\varsigma = 0$. In the model, we take ς and ϕ as a fixed, exogenous parameters that reflects the severity of conflicts of interests between the controlling and minority shareholders. Our objective in the empirical section is to estimate the magnitude of (ς_i, ϕ_i), $i = 1, \ldots, N$, and to relate our estimates to firm- and country-specific characteristics.

Firms whose conditions deteriorate sufficiently may default on their debt obligations. In the model, default can lead either to liquidation or to renegotiation. We consider that if the instant of default is T, then $Y_T = (1-\alpha)Y_{T^-}$ in case of liquidation and $Y_T = (1-\kappa)Y_{T^-}$ in case of reorganization, where α and κ are frictional costs with $0 \leq \kappa < \alpha$. Because liquidation is more costly than reorganization, there exists a surplus associated with renegotiation. This surplus represents a fraction $(\alpha - \kappa)$ of cash flows after default. Following Fan and Sundaresan (2000), François and Morellec (2004), and Broadie, Chernov, and Sundaresan (2007), we consider a Nash bargaining game in default that leads to a debt-equity swap. We denote the bargaining power of shareholders by $\eta \in [0,1]$. The generalized Nash bargaining solution then implies that the shareholders get a fraction $\eta(\alpha - \kappa)$ of cash flows in default.[4] In addition to the estimates of (ς_i, ϕ_i), the paper

[4]Consistent with this modeling, Favara, Schroth, and Valta (2012) find using an international cross-section of

provides estimates of η_i, $i = 1, \ldots, N$, capturing shareholder-debtholder conflicts in default.

Agency costs typically depend on the allocation of control rights within the firm. In this paper, we consider that the controlling shareholder has decision rights over the firm's initial debt structure and the firm's restructuring and default policies. When making policy choices, the controlling shareholder maximizes the present value of the total expected cash flows (private benefits and equity stake) that it will take from the firm. As in Leland (1998), Strebulaev (2007), and Morellec, Nikolov and Schürhoff (2012), we focus on barrier policies whereby the firm's initial debt structure remains fixed until either cash flows reach a low level and the firm goes into default or cash flows rise to a sufficiently high level and the firm calls the debt and restructures with newly issued debt.[5] In the analysis below, we will denote by y_D $(< y_0)$ the default threshold and by y_U $(> y_0)$ the restructuring threshold. We can thus view the controlling shareholder's policy choices as determining the initial coupon payment c, the restructuring threshold y_U, and the default boundary y_D.

1.2 Leverage dynamics in the (S, s) model with agency conflicts

In the Appendix, we derive the policy choices that maximize the present value of the cash flows to the controlling shareholder. Given these policy choices, the firm's the interest coverage ratio $z_t \equiv Y_t/c_t$ follows a geometric Brownian Motion with drift μ and volatility σ, that is reset to the target level $z_T \in (z_D, z_U)$ whenever it reaches either the lower threshold z_D or the higher threshold z_U. The leverage ratio ℓ_t being a monotonic function of the interest coverage ratio, we can write $\ell_t = L(z_t)$ with $L : \mathbb{R}^+ \to \mathbb{R}^+$ and $L' < 0$ and a target leverage ratio given by $L(z_T)$. Let $f_z(z)$ be the density of the interest coverage ratio. The density of the leverage ratio can then be written in terms of f_z and the Jacobian of L^{-1} as follows:

$$f_\ell(\ell) = f_z\left(L^{-1}(\ell)\right)\left|\frac{\partial}{\partial \ell}L^{-1}(\ell)\right| = f_z\left(L^{-1}(\ell)\right)\left|\left(\frac{\partial \ell}{\partial L^{-1}(\ell)}\right)^{-1}\right|. \tag{2}$$

To compute the time-series distribution of leverage implied by agency conflicts, we need to know the density of the interest coverage ratio f_z. The following Proposition provides the stationary density of the interest coverage ratio z_t (the proof follows the same line as in Morellec, Nikolov, and Schürhoff (2012)):

stocks that cross-country differences in bankruptcy procedures lead to cross-country differences in default decisions.

[5] Hugonnier, Malamud, and Morellec (2012) show that barrier strategies are optimal in dynamic capital structure models in which firm value is homogeneous of degree 1 in Y and c, so that we need not consider alternative strategies.

Proposition 1 *The stationary density function of the interest coverage ratio z_t is given by*

$$f_z(z) = \frac{\frac{\partial}{\partial z}\mathcal{I}\left(z, z_0\right)}{\mathcal{I}\left(z_U, z_0\right)},$$

where the function $\mathcal{I}(z, z_0)$ is defined by

$$\mathcal{I}\left(z, z_0\right) = \begin{cases} \frac{e^{\vartheta \ln(z_0/z) } - e^{\vartheta \ln(z_0/z_D)}}{2b^2} - \frac{p_B}{b\sigma} \ln\left(\frac{z}{z_D}\right) - \frac{p_U}{2b^2}\left[e^{\vartheta \ln(z_U/z)} - e^{\vartheta \ln(z_U/z_D)}\right], \ z \leq z_0, \\ \frac{1 - e^{\vartheta \ln(z_0/z_D)}}{2b^2} + \frac{1}{b\sigma} \ln\left(\frac{z}{z_0}\right) - \frac{p_B}{b\sigma} \ln\left(\frac{z}{z_D}\right) - \frac{p_U}{2b^2}\left[e^{\vartheta \ln(z_U/z)} - e^{\vartheta \ln(z_U/z_D)}\right], \ z > z_0, \end{cases}$$

with $b = \frac{1}{\sigma}(\mu - \frac{\sigma^2}{2})$, $\vartheta = -\frac{2b}{\sigma}$, $p_B = \frac{z_0^\vartheta - z_U^\vartheta}{z_D^\vartheta - z_U^\vartheta}$, and $p_U = \frac{z_0^\vartheta - z_D^\vartheta}{z_U^\vartheta - z_D^\vartheta}$.

To implement our empirical procedure, we also need the conditional distribution of leverage at time t given its value at the initial date 0. To determine this conditional density, we first compute the conditional density of the interest coverage ratio $z_t = Y_t/c_t$ at time t given its value z_0 at time 0 and then apply the transformation (2). For ease of exposition, we introduce the regulated arithmetic Brownian motion $W_t = \frac{1}{\sigma}\ln(z_t)$ with initial value $w = \frac{1}{\sigma}\ln(z_0)$, drift $b = \frac{1}{\sigma}(\mu - \frac{\sigma^2}{2})$ and unit variance, and define the upper and lower boundaries as $H = \frac{1}{\sigma}\ln(z_U)$ and $L = \frac{1}{\sigma}\ln(z_D)$. Given that the interest coverage ratio is reset to the level z_T whenever it reaches the boundaries, W is regulated at L and H, with reset level at $T = \frac{1}{\sigma}\ln(z_T)$ and we can write its dynamics as

$$dW_t = bdt + dZ_t + 1_{\{W_{t-}=L\}}\left(T - L\right) + 1_{\{W_{t-}=H\}}\left(T - H\right).$$

The conditional distribution F_z of the interest coverage ratio z is then related to that of W by the following relation:

$$F_z(z|z_0) = \mathbb{P}(W_t \leq \frac{1}{\sigma}\ln(z)|W_0 = w).$$

We are interested in computing the conditional density function

$$g(w, x, t) = \frac{\partial}{\partial x}\mathbb{P}(W_t \leq x|w) = \frac{\partial}{\partial x}\mathbb{E}_w[1_{\{W_t \leq x\}}], \quad (w, x, t) \in [L, H]^2 \times (0, \infty)$$

of the process W at some horizon t. Rather than trying to compute this conditional density function directly, we will consider its Laplace transform in time:

$$\mathcal{J}(w, x, \lambda) = \int_0^\infty e^{-\lambda t} g(w, x, t)dt. \tag{3}$$

The last step will then involve the inversion of the Laplace transform (3) for $g(w, x, t)$.

Using basic properties of diffusion processes as found for example in Stokey (2009), it is possible to establish the following result:

Proposition 2 *The function $\mathcal{J}(w,x,\lambda)$ satisfies*

$$\mathcal{J}(w,x,\lambda) = \Theta(w,x,\lambda) + \frac{\Phi(w,\lambda)}{1-\Phi(T,\lambda)}\Theta(T,x,\lambda),$$

where

$$\Theta(w,x,\lambda) = \begin{cases} \left(\frac{A_H(x,\lambda)\Delta''_H(x,\lambda)-A_L(x,\lambda)\Delta''_L(x,\lambda)-\Lambda''(x,\lambda)}{\Delta_H(x,\lambda)\Delta'_L(x,\lambda)-\Delta_L(x,\lambda)\Delta'_H(x,\lambda)}\right)\Delta_H(x,\lambda)\Delta_L(w,\lambda), & \text{if } w\in[L,x], \\ \left(\frac{A_H(x,\lambda)\Delta''_H(x,\lambda)-A_L(x,\lambda)\Delta''_L(x,\lambda)-\Lambda''(x,\lambda)}{\Delta_H(x,\lambda)\Delta'_L(x,\lambda)-\Delta_L(x,\lambda)\Delta'_H(x,\lambda)}\right)\Delta_L(x,\lambda)\Delta_H(w,\lambda), & \text{if } w\in[x,H], \end{cases}$$

and

$$\Phi(w,\lambda) = \frac{e^{(b+\upsilon(\lambda))L}}{e^{2\upsilon(\lambda)L}-e^{2\upsilon(\lambda)H}}\Delta_H(w) - \frac{e^{(b+\upsilon(\lambda))H}}{e^{2\upsilon(\lambda)L}-e^{2\upsilon(\lambda)H}}\Delta_L(w),$$

with

$$\begin{aligned} A_L(x,\lambda) &= \frac{\Lambda(x,\lambda)\Delta'_H(x,\lambda)-\Lambda'(x,\lambda)\Delta_H(x,\lambda)}{\Delta_H(x,\lambda)\Delta'_L(x,\lambda)-\Delta_L(x,\lambda)\Delta'_H(x,\lambda)}, \\ A_H(x,\lambda) &= \frac{\Lambda(x,\lambda)\Delta'_L(x,\lambda)-\Lambda'(x,\lambda)\Delta_L(x,\lambda)}{\Delta_H(x,\lambda)\Delta'_L(x,\lambda)-\Delta_L(x,\lambda)\Delta'_H(x,\lambda)}, \\ \Lambda(x,\lambda) &= \frac{1}{\lambda}[1-e^{(b+\upsilon(\lambda))(L-x)}], \\ \Delta_{L,H}(w,\lambda) &= e^{(\upsilon(\lambda)-b)w}[1-e^{2((L,H)-w)\upsilon(\lambda)}], \end{aligned}$$

and $b=\frac{1}{\sigma}(\mu-\frac{\sigma^2}{2})$, $T=\frac{1}{\sigma}\ln(z_T)$, $H=\frac{1}{\sigma}\ln(z_U)$, $L=\frac{1}{\sigma}\ln(z_D)$ *and* $\upsilon(\lambda)=\sqrt{b^2+2\lambda}$.

In the following section, we exploit the structural restrictions of the model and estimate from panel data the level of agency conflicts that best explain observed financing behavior.

1.3 Using the (S,s) model to measure agency conflicts in the data

Our structural estimation uses simulated maximum likelihood (SML) and exploits the structural restrictions of the model to estimate from panel data the level of agency conflicts that best explains observed financing behavior in 14 countries. For each individual firm, the model implies a specific time-series behavior of financial leverage. The policy predictions include the target leverage, the refinancing frequency, and the default probability. In addition to the time-series predictions, the model yields comparative statics that describe how financial policies vary in the cross-section of firms. We exploit both types of predictions to identify the structural parameters in the data and to disentangle cross-sectional heterogeneity from the impact of transaction cost-driven inertia on financial leverage.

In the analysis, each firm $i = 1, \dots, N$ is characterized by a set of parameters $\widetilde{\theta}_i$ that determine the cash flow growth rate m_i and volatility σ_i, cash flow beta β_i, liquidation costs α_i, shareholders' bargaining power η_i, management's equity stake φ_i, issuance costs λ_i, private benefits ϕ_i, corporate and personal taxes τ^c, τ^e, and τ^d, the market risk premium ψ, and the risk-free rate r.[6] Estimating the parameter vector $\widetilde{\theta}_i$ for each firm using solely data on financial leverage is practically infeasible. We therefore split the parameter vector into two parts: parameters that we calibrate and parameters that we estimate. Given the dimensionality of the estimation, we first calibrate the parameters $\theta_i^\star = (m_i, \mu_i, \sigma_i, \beta_i, \alpha_i, \varphi_i, \tau^c, \tau^e, \tau^d, \psi, r)$ using the data sources described below. We then keep these parameters fixed when estimating the parameters (ϕ_i, or η_i) from data on financial leverage. In a last step, we investigate the effect of sampling error in $\theta_i^\star$ on our estimates.

Next, we treat (ϕ_i, η_i) as random coefficients to reduce the dimensionality of the estimation problem. Specifically, the structural parameters characterizing agency conflicts are defined as:

$$\phi_i = h(\alpha_\phi + \epsilon_i^\phi) \text{ and } \eta_i = h(\alpha_\eta + \epsilon_i^\eta),$$

where $h : \mathbb{R} \to [0, 1]$ is a transformation that guarantees that the parameters stay in their natural domain and the $\epsilon_i = (\epsilon_i^\phi, \epsilon_i^\eta)$ are bivariate random variables capturing firm-specific unobserved heterogeneity. As in linear dynamic random-effects models, the firm-specific random effects ϵ_i are assumed independent across firms and, for all firms $i = 1, \dots, N$, are normally distributed:

$$\begin{pmatrix} \epsilon_i^\phi \\ \epsilon_i^\eta \end{pmatrix} \sim \mathcal{N}\left(0, \begin{bmatrix} \sigma_\phi^2 & \sigma_{\phi\eta} \\ \sigma_{\phi\eta} & \sigma_\eta^2 \end{bmatrix}\right). \tag{4}$$

This setup is sufficiently flexible to capture cross-sectional variation in the parameter values while imposing the model-implied structural restrictions on the domains of the parameters. In summary, the set of parameters that we estimate structurally is $\theta = (\alpha_\phi, \alpha_\eta, \sigma_\phi, \sigma_\eta, \sigma_{\phi\eta})$.

The likelihood function $\mathcal{L}$ of the parameters θ given the data and $\theta^\star$ is based on the probability of observing the leverage ratio ℓ_{it} for firm i at date t. Assume there are N firms in the sample and

[6] We assume in our structural estimation that there is no empire-building motive for the controlling shareholder in that $\varsigma = 0$. One way to estimate this parameter would be to use the firm's return on assets defined by

$$\texttt{ROA} \equiv \frac{\pi_T(x)}{k} = \frac{1}{\gamma}\left[(1-\gamma)\left[(1-\tau)\delta + (1-\tau^d)r\right] - \frac{\varsigma}{\phi + (1-\phi)\,\varphi}\right].$$

let n_i be the number of observations for firm i. (The observations for the same firm are correlated due to autocorrelation in the cash-flow process.) The joint probability of observing the leverage ratios $\ell_i = (\ell_{i1}, \ldots, \ell_{in_i})'$ and the firm-specific unobserved effects $\epsilon_i = (\epsilon_i^\phi, \epsilon_i^\eta)$ for firm i is given by

$$f(\ell_i, \epsilon_i|\theta) = f(\ell_i|\epsilon_i;\theta)\, f(\epsilon_i|\theta) = \left(f(\ell_{i1}|\epsilon_i;\theta) \prod_{t=2}^{n_i} f(\ell_{it}|\ell_{it-1}, \epsilon_i;\theta) \right) f(\epsilon_i|\theta),$$

where $f(\epsilon_i|\theta)$ is the bivariate normal density corresponding to (4). Integrating out the random effects from the joint likelihood $f(\ell, k, \epsilon|\theta) = \prod_{i=1}^N f(\ell_i, \epsilon_i|\theta)$, we obtain the marginal log-likelihood function (since the ϵ_i are drawn independently across firms) as

$$\ln \mathcal{L}(\theta;\ell) = \sum_{i=1}^N \ln \int_{\epsilon_i} f(\ell_i, \epsilon_i|\theta)\, d\epsilon_i. \tag{5}$$

Explicit expressions for $f(\ell_{i1}|\epsilon_i;\theta)$ and $f(\ell_{it}|\ell_{it-1}, \epsilon_i;\theta)$ are derived in Section 1. We evaluate the integral in equation (5) using Monte-Carlo simulations. When implementing this procedure, we use the empirical analog to the log-likelihood function, which is given by:

$$\ln L(\theta;\ell) = \sum_{i=1}^N \ln \frac{1}{U} \sum_{u_i=1}^U \left(f(\ell_{i1}|\epsilon_i^{u_i};\theta) \prod_{t=2}^{n_i} f(\ell_{it}|\ell_{it-1}, \epsilon_i^{u_i};\theta) \right),$$

where U is the number of random draws per firm, and $\epsilon_i^{u_i}$ is the realization in draw u_i for firm i. In our empirical procedure, the number of random draws U affects the precision and accuracy of the Monte-Carlo simulations performed as part of the estimation as well as the finite simulation sample bias in estimated coefficients. We find that 1,000 random draws are sufficient to make the simulation error negligible. Correspondingly, we set $U = 1,000$ in the estimations.

The first step in our empirical procedure consists in estimating the parameters θ. This is done by recognizing that the simulated maximum likelihood estimator is defined as: $\widehat{\theta} = \arg\max_\theta \ln L(\theta;\ell)$. In a second step, we construct firm-specific measures of control benefits and of shareholders' bargaining power in default as the conditional expected value of ϕ_i and η_i given the data ℓ_i for firm i and the parameter estimates $\widehat{\theta}$, defined as $\mathbb{E}[g_i|\ell_i;\widehat{\theta}] \equiv \mathbb{E}[h(\alpha_g + \epsilon_i^g)|\ell_i;\widehat{\theta}]$ for $g \in \{\phi, \eta\}$.

1.4 Identification of the agency parameters

Before proceeding to the empirical analysis, it will be useful to better understand how we identify in the data the parameters describing unobserved agency conflicts. Our identification strategy uses data on observable variables—corporate financing decisions—to infer properties of unobserved variables—private benefits of control and shareholders' bargaining power in default.

In order to build intuition for the identification strategy, we start by illustrating the effects of agency conflicts on the distribution of leverage ratios. To do so, we plot in Figure 1 the effects of agency conflicts on the model-implied time-series distribution of leverage. Specifically, Panel A plots the distribution function of leverage for different parameter values. Panel B depicts the median (solid line), the 5% and 95% quantiles of leverage (dashed lines), and the low and high of leverage (dotted lines) as functions of the agency parameters.

Insert Figure 1 Here

The figure shows that an increase in private benefits of control, as measured by ϕ, lowers both the target leverage and the debt issuance trigger and raises the default trigger. As a result, the range of leverage ratios widens and the speed of mean reversion declines (autocorrelation rises). The intuition underlying this result is that cash distributions are made on a pro-rata basis to shareholders, so that controlling shareholders get a fraction of the distributions when new debt is issued. Controlling shareholders' stake in the firm, however, exceeds their direct ownership due to the private benefits of control. Since debt constrains controlling shareholders by limiting the free cash flow (as in Jensen, 1986, Zwiebel, 1996, or Morellec, 2004), they issue less debt (lower target leverage and higher default-triggering leverage) and restructure less frequently (lower refinancing-triggering leverage) than optimal for minority shareholders.

The figure also reveals that high bargaining power η leads to accelerated default, as shareholders capture a larger fraction of the surplus in default. Higher bargaining power results in costlier debt as bondholders anticipate shareholders' strategic action in default and require a higher risk premium on corporate debt. An increase in the bargaining power of shareholders in default therefore decreases target leverage and the low and high restructuring bounds. As a result, the leverage distribution shifts to the left and the speed of mean reversion increases (autocorrelation drops).

Turning now to the structural estimation, it is necessary for consistent inference that the parameters $\theta = (\alpha_\phi, \alpha_\eta, \sigma_\phi, \sigma_\eta, \sigma_{\phi\eta})$ can be identified in the data. In our setting, identification requires that the parameters (ϕ_i, η_i) have a distinct effect on financing choices which, in turn, determine the intertemporal evolution of financial leverage. A sufficient condition for identification is a one-to-one mapping between the structural parameters and a set of data moments of the same dimension. Heuristically, a moment m is informative about an unknown parameter θ if that moment is sensitive to changes in the parameter and the sensitivity differs across parameters. In formal terms, local identification requires the Jacobian determinant, $det(\partial m/\partial\theta)$, to be nonzero.

Insert Table 1 Here

The first column of Table 1 lists a broad choice of data moments that are a-priori informative about the agency-conflict parameters we seek to estimate—much like in method-of-moments estimation. In the simulated maximum likelihood estimation we perform, these moments are chosen optimally. The main moments to consider are the mean, standard deviation, range, and mean reversion of leverage and the quarterly changes in leverage. We also report the median, skew, kurtosis, min, max, interquartile range, and persistence in leverage measured by quarterly and annual autocorrelation. Table 1 reveals that the model moments exhibit significant sensitivity to the model parameters. More importantly for identification, the sensitivities differ across parameters, such that one can find moments with $det(\partial m/\partial\theta) \neq 0$.[7] While the qualitative effect on mean leverage is comparable across parameters, the measures of variation and of mean reversion depend very differently on the parameters. Bargaining power tends to decrease the variation in leverage and to decrease autocorrelation; private benefits of control have the opposite effect. Overall, the different sensitivities reveal that the structural parameters can be identified by combining time-series data on financial leverage (pinning down α_ϕ and α_η) with cross-sectional information on variation in leverage dynamics across firms (pinning down σ_ϕ, σ_η, and $\sigma_{\phi\eta}$).

2 Data and Agency Conflict Estimates

2.1 Data and estimation

Estimating our model of corporate financing behavior requires merging data from various sources. We obtain financial statements data from Compustat US and Global, stock price data from CRSP and Datastream, ownership data from Thomson Reuters, and tax rates data from the OECD. We collect proxies for the legal environment and other institutional determinants used in

[7] A concern with the standard approach is that local identification may not guarantee identification globally. We have therefore simulated the model moments and computed sensitivities in two ways, as marginal effect at different sets of baseline parameters and as average effect over a range of parameter values. The table reports the sensitivity $(\partial m/\partial\theta)/m$ in the baseline. Alternatively, we have computed the differential effect as the average sensitivity over the range of parameter values generating non-zero leverage and normalized by the average effect on the mean. We find that average sensitivities are more similar across parameters than marginal effects in the baseline. Importantly, however, the quantitative differences in their impact on the model moments remain, warranting identification.

the law and finance literature from Andrei Shleifer's website.[8] We remove all regulated firms (SIC 4900-4999) and financial firms (SIC 6000-6999). Observations with missing total assets, market value, long-term debt, debt in current liabilities, and SIC code are deleted. We obtain a panel dataset with 74,855 observations for 12,652 firms and 14 countries between 1997 and 2011.[9] The distribution of the firms in our sample across countries is AUT (61 firms, 0.5% of total), CHE (178, 1.4%), DEU (595, 4.7%), DNK (107, 0.8%), ESP (102, 0.8%), FRA (588, 4.6%), GBR (1,459, 11.5%), IRL (42, 0.3%), ITA (204, 1.6%), JPN (3,274, 25.9%), NLD (138, 1.1%), POL (236, 1.9%), PRT (37, 0.3%), USA (5,631, 44.5%).

Some of the model parameters are observable and can be calibrated or inferred from stock prices and other publicly available sources. They are therefore not the focus of our estimation. By contrast, the parameters capturing agency conflicts are unobservable and must be estimated in our SML procedure. The model parameters determined outside the SML procedure include the risk-free rate, r, corporate tax rate, τ_c, and personal tax rate on interest income and dividends, τ_i and τ_d, respectively, expected profitability, μ_P, volatility, σ, systematic exposure, β, controlling shareholder ownership, φ, liquidation costs, α, renegotiation costs, κ, and debt issuance costs, λ. The risk-free rate and tax rates are country specific, with the risk-free rate r calibrated to the three-year treasury rate. The rest of the parameters are firm specific.

We construct firm-by-firm values for the model parameters as follows. We estimate the growth rate of cash flows, μ_{it}^P, indexed by firm i and time t, as the industry average of the least-squares growth rate of EBIT where industries are defined at the SIC level 2. We estimate the risk-neutral growth rate of cash flows, μ_{it}, using the Capital Asset Pricing Model (CAPM). We have $\mu_{it} = \mu_{it}^P - \beta_{it}\psi$, where $\psi = 6\%$ is the market risk premium and β_{it} is the leverage-adjusted cash-flow beta. We estimate market betas based on equity returns and unlever these betas based on model-implied relations. Similarly, we estimate cash-flow volatility, σ_{it}, using the standard deviation of monthly equity returns and the following relation (implied by Itô's lemma): $\sigma_{it} = \sigma_{it}^E / (\frac{\partial \mathbf{E}(x,c)}{\partial x} \frac{x}{\mathbf{E}(x,c)})$, where σ_{it}^E is the volatility of stock returns and $\mathbf{E}(x,c) \equiv \mathbf{V}(x,c) - d\,(x,c)$ is the stock price derived from the model.

Thomson Reuters provides data on ownership structure at a glocal scale (Thomson Reuters Ownership, Profiles & Insider Data Feeds). We use these data to construct firm-specific measures of controlling shareholders' ownership, φ_{it}. We define φ_{it} as the ownership share of the largest shareholder. In robustness tests, we define φ_{it} as the ownership share of the five largest shareholders.

[8] `http://www.economics.harvard.edu/faculty/shleifer/dataset`.

[9] The Thomson-Reuters ownership data starts in 1997. All other data start earlier. We have obtained these data starting from 1991 so that we can run rolling regressions at least five years prior.

Gilson, John, and Lang (1990) provide evidence that renegotiation costs are negligible. We thus set the renegotiation costs parameter, κ, to zero. We estimate liquidation costs following Berger, Ofek, and Swary (1996): $\alpha_{it} = 1-(\text{Tangibility}_{it}+\text{Cash}_{it})/\text{Total Assets}_{it}$, where Tangibility_{it} equals $0.715 * \text{Receivables}_{it} + 0.547 * \text{Inventory}_{it} + 0.535 * \text{Capital}_{it}$.

The empirical literature provides estimates of debt issuance costs as a fraction of the debt being issued. In the model, however, the cost of debt issuance, λ, is defined as a fraction of total debt outstanding. The cost of debt issuance as a fraction of the issue size is given in the model by $\frac{\rho}{\rho-1}\lambda$, where ρ is the restructuring threshold multiplier. We observe a median value of 2 for ρ in our estimations, so we set $\lambda = 1\%$. The implied cost as a fraction of debt issued of 2% corresponds to the upper range of values reported by Altinkilic and Hansen (2000). Table 2, Panel A reports the country means for all these parameters.

Insert Table 2 Here

With these parameters as inputs, we estimate the structural parameters of interest using the SML procedure discussed in Section 1.3. For this, we split the data into country samples and perform the SML estimation separately for each country. For every country, we obtain statistical estimates for the five parameters $\theta = (\alpha_\phi, \alpha_\eta, \sigma_\phi, \sigma_\eta, \sigma_{\phi\eta})$. Table 2, Panel B reports the point estimates and standard errors in parenthesis. Standard errors are robust to heteroskedasticity and clustered at the industry level. The parameters representing the control benefits and the bargaining power of shareholders in default are well identified in the data. The variance estimates for the random effects are economically and statistically significant. This suggests there is sizable variation in ϕ and η across firms in each of the countries.

2.2 Agency conflict estimates

The next step in our procedure is to use the parameter estimates in Table 2 to construct firm-specific measures of private benefits of control (MADV) and shareholder advantage in default (SADV) in our sample of international firms from 14 countries. MADV is the predicted value of the parameter ϕ_i for firm i, governing the control benefits of controlling shareholders. SADV is the predicted value of the parameter η_i, capturing shareholders' renegotiation power in default and deviations from the bankruptcy code mandate of a strict schedule of priority claims. With these estimates at hand, we can explore the determinants of the conflicts of interest between controlling and minority shareholders and between shareholders and debtholders.

We define the controlling shareholder advantage in firm i as

$$\text{MADV}_i \equiv \mathbb{E}[\phi_i|\ell_i;\widehat{\theta}] = \mathbb{E}[h(\alpha_\phi + \epsilon_i^\phi)|\ell_i;\widehat{\theta}] = \int_{\epsilon_i^\eta}\int_{\epsilon_i^\phi} h(\alpha_\phi + \epsilon_i^\phi)\frac{f(\epsilon_i^\phi, \epsilon_i^\eta, \ell_i|\widehat{\theta})}{f(\ell_i|\widehat{\theta})} d\epsilon_i^\phi d\epsilon_i^\eta. \tag{6}$$

In expression (6), $f(\epsilon^\phi, \epsilon^\eta, \ell|\widehat{\theta}) = f(\ell|\epsilon^\phi, \epsilon^\eta; \widehat{\theta}) f(\epsilon^\phi, \epsilon^\eta|\widehat{\theta})$ is the joint density of the normally distributed random effects $(\epsilon^\phi, \epsilon^\eta)$ with leverage ℓ, and $f(\ell|\widehat{\theta}) = \int_{\epsilon^\eta}\int_{\epsilon^\phi} f(\ell|\epsilon^\phi, \epsilon^\eta; \widehat{\theta}) f(\epsilon^\phi, \epsilon^\eta|\widehat{\theta}) d\epsilon^\phi d\epsilon^\eta$ is the model-implied marginal leverage distribution given the parameter estimates $\widehat{\theta}$. Explicit expressions for the density $f(\ell|\epsilon^\phi, \epsilon^\eta; \widehat{\theta})$ are derived in Section 1.2.

Similarly, the shareholder advantage in firm i is

$$\text{SADV}_i \equiv \mathbb{E}[\eta_i|\ell_i;\widehat{\theta}] = \mathbb{E}[h(\alpha_\eta + \epsilon_i^\eta)|\ell_i;\widehat{\theta}] = \int_{\epsilon_i^\eta}\int_{\epsilon_i^\phi} h(\alpha_\eta + \epsilon_i^\eta)\frac{f(\epsilon_i^\phi, \epsilon_i^\eta, \ell_i|\widehat{\theta})}{f(\ell_i|\widehat{\theta})} d\epsilon_i^\phi d\epsilon_i^\eta. \tag{7}$$

Plugging in the estimates from Table 2, we obtain MADV and SADV for each firm as the predicted ϕ_i and η_i given the data on leverage $\ell_i = (\ell_{i1}, ..., \ell_{in_i})'$ and the parameter estimates $\widehat{\theta}$. Note that these conditional expectations are unbiased. Indeed, let v_i be omitted explanatory variables. We then have $\mathbb{E}[g_i|\ell_i, v_i;\widehat{\theta}] = \mathbb{E}[g_i|\ell_i;\widehat{\theta}] + e_i$, for $g \in \{\phi, \eta\}$, with the following moment condition on the error e_i:

$$\mathbb{E}(e_i|\ell_i;\widehat{\theta}) = \mathbb{E}(\mathbb{E}(g_i|\ell_i, v_i;\widehat{\theta}) - \mathbb{E}(g_i|\ell_i;\widehat{\theta})|\ell_i;\widehat{\theta}) = \mathbb{E}(\mathbb{E}(g_i|\ell_i, v_i;\widehat{\theta})|\ell_i;\widehat{\theta}) - \mathbb{E}(\mathbb{E}(g_i|\ell_i;\widehat{\theta})|\ell_i;\widehat{\theta}) = 0.$$

Figure 2 and Table 3 provide descriptive statistics for the predicted control benefits MADV and shareholders' renegotiation power SADV for the firms in our sample, split by the country of origin. The median (average) control benefit represents 3.2% (4.4%) of equity value. The median (average) renegotiation power of shareholders is 45.3% (42.0%). There is sizable variation in MADV and SADV across countries and across firms in each of the countries. The largest median control benefits can be found in Poland (5.5%), France (5.1%), USA (3.9%), and Portugal (3.5%). The lowest is in the Netherlands (0.9%) and Austria (1.1%). In each of the countries considered, the mean is larger than the median, indicating an asymmetric distribution with fat right tail. This is also illustrated in the top panel of Figure 2 which plots the histogram of MADV (left) and SADV (right) across all firms. Shareholders' renegotiation power is distributed more symmetrically, with standard deviation of 24.2%. In France, Switzerland, Japan, and Poland shareholders extract the most from debtholders in renegotiations, whilst Portugal and the United States are the most debtholder friendly. Renegotiation power SADV varies more strongly within country than across countries. Given the magnitude of bankruptcy and renegotiation costs (Table 2), 42% average bargaining power implies shareholders can capture about 20% of firm value on average by renegotiating outstanding claims in default.

Insert Figure 2 and Table 3 Here

The bottom panel of Figure 2 explores the relation between MADV and SADV across countries (left) and firms (right). The shaded area depicts the confidence interval obtained from the standard error of a linear prediction. While at the country level, there is more variation in MADV compared to SADV, the firm level analysis shows there is significant SADV variation within countries and this variation correlates positively with MADV. Thus, on average, debtholders in well-governed firms can extract more concessions from shareholders in default than in firms with powerful, controlling shareholders. The minority shareholder value loss from private benefits of control is thus partially offset by stronger cash flow rights in financial distress.

Table 3, Panel C performs an analysis of variation for MADV and SADV and, for comparison, leverage. We report the fraction of total variation (R^2) explained by country fixed effects (first column), industry fixed effects (second column), and country-industry fixed effects (last column). A maximum of 28.7% of the variation in control benefits across firms in our sample and of 20.1% in shareholders' renegotiation power can be attributed to the country of origin and the industry. The remainder is determined by factors that are unrelated to origin and industry. Later in our empirical analysis, we examine which factors affect the firm-specific variation in agency conflicts.

Insert Figure 3 Here

Figure 3 shows the distribution of predicted control benefits, MADV, and shareholders' renegotiation power, SADV, across different countries. Darker areas depict higher concentrations of firms.

3 The Determinants of Agency Conflicts

Many studies have identified factors that purport to explain variation in agency conflicts across and within countries. However, direct evidence for their effect and magnitude are sparse. The extent and cost of agency conflicts between various stakeholders are hard to measure and, hence, their determinants difficult to study. The MADV and SADV measures estimated in the previous section provide firm-by-firm proxies for agency conflicts that one can use to explore how various governance mechanisms impact agency costs. We first review the most prominent factors identified in the literature and then explore how they are linked to our agency cost estimates.

Table 4 provides a summary description of the determinants of agency conflicts that we use in the regressions. Most of the legal determinants and governance mechanisms are set at the country level. It will therefore be informative to not only measure their effect on the average firm in different countries but also explore how they affect different types of firms in each country.

Insert Table 4 Here

The law and finance literature, with the seminal study by La Porta et al. (1998), argues legal tradition and enforcement environment influence financial structure and economic and financial development. The origin of law and legal principals and mechanics of debt enforcement strongly influence the design of investor protection (Djankov et al., 2008). We assess the importance of legal origin by defining dummy variables that identify the heritage of the bankruptcy law for each country. The four origins are English common law and French, German, and Scandinavian civil law. Common law countries tend to score higher than civil law countries on the scale of shareholder protection and enforcement of minority rights. We therefore expect MADV to be significantly higher in civil law countries than in common law countries. Table 5 shows civil law countries have indeed up to 3–4% higher manager advantage (i.e., control benefits to management and majority shareholders) than common law countries, though this number is not statistically significant in all specifications. The number corresponds to 3 to 4 out of a 100 dollar profit diverted into the pockets of the controlling shareholders at the expense of minority interests, with a corresponding drop in market value.

Similarly, creditors' interests are poorly protected in civil law countries. Most civil law countries recognize some kind of security interest or, for that matter, priority among creditors. But this tends to be severely restricted to certain types of assets, and enforcement is burdensome. None recognizes unified or specialized security interests similar to the US or UK. As a result, the creditors' enforcement rights upon default are rather weak. Consistent with this enforcement hypothesis, we estimate shareholders' bargaining power in default is, across specifications in Table 6, between 4% and 12% higher in civil than in common law countries. In civil law countries, investors tend to be more unsecured and thus a priori hesitant to invest, with the result that secured debt is essentially priced as unsecured or simply unavailable, and firms are forced to take less leverage.

Insert Tables 5 and 6 Here

In addition to the corporate governance variables, we include in our regressions standard control variables for firm attributes. The market-to-book ratio (M/B) captures growth opportunities and other intangibles. Large cash holdings are a means to divert funds more easily from the firm and, hence, agency conflicts are likely stronger the larger the firm's cash holdings. We measure firm size, in order to control for scale effects, as the natural log of sales. To control for company profitability, we use the return on assets (ROA), defined as EBITDA divided by total assets at the start of the year. Two variables are included to measure the uniqueness of assets: M/B and tangibility (PP&E net divided by total assets). The coefficients on the firm characteristics are both economically and statistically significant and the signs are as expected. MADV, expressed in percent of cash flows, is larger the higher M/B, cash, ROA, and the smaller firm size and tangibility. SADV also rises strongly with M/B and cash holdings and drops marginally with size and tangibility.

Djankov et al. (2008) differentiate between three types of bankruptcy proceedings: reorganization (our benchmark in the regressions), foreclosure, and liquidation. Reorganization is a court supervised procedure aimed at rehabilitating a company in financial distress. Reorganization proceedings generally provide for a statutory freeze on individual creditor enforcements and specify powers to bind dissenting creditors to a reorganization plan. Foreclosure is a debt enforcement procedure aimed at recovering money owed to secured creditors, but not to unsecured creditors or other claimants. It is generally governed by laws separate from bankruptcy law. Liquidation, in turn, is the procedure of winding up a company under judicial supervision. Liquidation results in the dissolution of the legal entity. The underlying assets may be sold as a going concern or piecemeal (see Djankov et al., 2008, for a more detailed discussion).

The second set of regressions in Table 5 shows majority shareholders and management extract about 1–2% of firm value less from minority shareholders in countries with foreclosure and up to 1.7% less in countries with liquidation proceedings than in countries with reorganizations. This highlights the important ex-ante disciplining role of bankruptcy proceedings. Table 6, by contrast, shows the effect of bankruptcy laws on the ex-post allocation of cash flow rights is smaller. By design, reorganizations assign more rights to existing management and shareholders than other bankruptcy proceedings. Yet, bargaining power of shareholders in default is between 1% and 14% higher in countries with foreclosure and liquidation, controlling for other factors.

The literature has summarized the design of shareholder and debtholder protection by forming various indexes. They first compile a list of certain statutory legal and other governance provisions for different countries and then aggregate them by an equal-weighted sum. Compliance with each ex-ante determined criterion gives a point for the legal system. The more points, the better the protection. The most common indices are the creditor rights index, anti-director rights index, and anti-self-dealing index (see La Porta et al., 1998; Djankov et al., 2006; Djankov et al., 2008). In the following, we check how these indices correlate with our agency cost estimates.

The creditor rights index, following La Porta et al. (1998), aggregates the statutory rights of secured lenders as defined in laws and regulations. It ranges from 0 (weak creditor rights) to 4 (strong creditor rights). A score is assigned for each of the following provisions: First, there are restrictions, such as creditor consent or minimum dividends, for a debtor to file for reorganization. Second, secured creditors are able to seize their collateral after the reorganization petition is approved, i.e., there is no automatic stay or asset freeze. Third, secured creditors are paid first out of the proceeds of liquidating a bankrupt firm, as opposed to other creditors such as government or workers. Fourth, if management does not retain administration of its property pending the resolution of the reorganization. We expect strong creditor rights to curb rent seeking by controlling shareholders and allocate more bargaining power to debtholders in distress situations.

The anti-director rights index, following La Porta et al. (1998), aggregates shareholders' statutory rights. It ranges from 0 (weak shareholder rights) to 6 (strong shareholder rights). A score is assigned for each of the following provisions: First, shareholders can mail in their proxy vote. Second, shareholders are not required to deposit their shares prior to the shareholders' general meeting. Third, cumulative voting or proportional representation of minorities in the board of directors is allowed. Fourth, an oppressed minorities mechanism is in place. Fifth, the minimum percentage of share capital that entitles a shareholder to call for an extraordinary shareholders' meeting is less than or equal to ten percent. Sixth, shareholders have preemptive rights that can only be waived by a shareholders' vote.

Finally, the anti-self-dealing index of Djankov et al. (2008b), similar to the anti-director rights index, aggregates provisions designed to curb self-dealing by executives and controlling shareholders. The index is constructed by averaging the indices of ex-ante and ex-post control of self-dealing.

The investor protection indexes tend to impact MADV and SADV, but the magnitude of their effects on the average firm is small and not robust across all specifications (Tables 5 and 6, columns (5) through (9)). Creditor rights have a larger and more robust curtailing effect on both control benefits and shareholder advantage than anti-director and anti-self-dealing rights. The difference in control benefits between the countries with the weakest and the strongest creditor rights is 3% of cash flows (4 times -0.76). At the same time, shareholders capture 15% (4 times -3.88) less of the surplus.

Tables 7 and 8 summarize the estimates when we use each index contituent separately as regressor. Statutory governance provisions affect private benefits of control and shareholder advantages in default differently. None of the components of the anti-director rights index affects MADV significantly once we control for other determinants. The exception are shares-not-blocked and cumulative-voting provisions, which curtail shareholder advantage in default by 12.8% and, respectively, 6.1%. Secured creditors paid first tends to have the strongest and most robust impact on dampening agency conflicts among all creditor rights provisions. It curbs both control benefits (Table 7, Panel B) and shareholders' rights in default by up to 11% (Table 8, Panel B). When filing for Chapter 11 is restricted, MADV is 1.7% lower once we control for other factors.

Insert Tables 7 and 8 Here

The ownership structure of a firm is another important aspect of governance and gives an indication for how pronouced agency conflicts between different stakeholders are in a publicly traded company. Our source for ownership data is the Thomson-Reuters Global Institution Ownership Feed. It is a commercial database compiling public records on the ownership in companies around the world and is updated quarterly. It allows separating between ownership by individuals, institutions, and mutual funds. We measure controlling shareholder ownership by the stake of the largest shareholder (alternatively the five largest shareholders), expressed as a fraction of market capitalization.

Specifications (2) and (4)–(9) in Table 5 show ownership concentration by family and other individuals is, consistent with agency theory, one the single most important determinants of control benefits. A one percent increase in individual ownership predicts a 4–5 basis point rise in rent extraction and, hence, a decline of similar magnitude in the firm's market value. Ownership by institutions and mutual funds, on the other hand, does not systematically affect MADV.

Enforcement of statutory governance provisions is crucial to ensure efficacy of governance provisions. Enforcement costs preclude the efficient resolution of conflicts of interest when agency issues are small. One would thus expect the contracting environment has asymmetric impact on the distribution of agency costs. Small control advantages likely remain unresolved when enforcement is costly and, thus, governance provisions have little effect on MADV and SADV. By contrast, governance provisions should have larger impact on MADV and SADV when control advantages are sizable. Simply speaking, good governance should preclude massive control failures and agency excesses in the country.

Tables 9 and 10 check these predictions in the cross section. We use quantile regressions that allow us to determine the effect of legal provisions not just on the average firm in a country but on different types of firms—firms with low, medium and, respectively, big agency considerations. This allows us to test whether governance provisions and firm characteristics affect agency conflicts uniformly across all types of firms. The civil law dummies affect, statistically speaking, the right tail of MADV more than the median and left tail. This means, consistent with costly enforcement, that common law countries are better at curtailing excesses that are characterized by large amounts of resources diverted from the firm (as measured in the model by ϕ). This is likely due to better enforcement. Large intangibles, cash, and profitability facilitate resource diversion especially in the poorly governed firms (i.e., the coefficients are monotonically rising with the MADV quantile). Similarly, ownership concentration is responsible for the very large agency excesses. While a 1 percent increase in individual ownership leads to 1 basis point more of private benefits at the bottom of the distribution, in the top 5% of firms the same variation yields a 14 basis point rise in rent extraction. SADV exhibits much less variability in all civil law countries. Creditor rights provisions lower shareholders' advantage across the board. Anti-self-dealing provisions, on the other hand, mainly stop shareholders from exerting very high renegotiation power in default.

Insert Tables 9 and 10 Here

Overall, three facts emerge from this analysis. First, we find that our estimates of agency conflicts are related to a number of governance mechanisms. Variables associated with stronger investor protection have negative connections with our estimates of agency conflicts. Concentrated family ownership, bankruptcy proceedings, and creditor rights provisions have the largest impact on agency conflicts and, hence, on financing decisions. Second, bankruptcy proceedings have an important ex-ante disciplining effect on controlling shareholders. Third, enforcement costs are material. Investor protection provisions are more successful at curtailing massive governance excesses than guarding the average firm in a country.

4 The Effects of Agency Conflicts on Real and Financial Variables

The previous section has shown investor protection provisions significantly affect the extent and costs of agency conflicts. We now explore if our agency cost estimates are systematically related to financial valuations and real variables.

4.1 The real effects of agency conflicts

We start by analyzing the relation of MADV and SADV to real outcomes at the country level. In Figures 4 and 5, we correlate our governance indexes with a number of real variables, including GNI per capita, stock market capitalization to GDP, private credit to GDP, the block premium, the number of IPOs to GDP, and the number of listed firms per capita. The black line indicates the linear prediction and the shaded area depicts the confidence interval obtained from the standard error of the linear prediction. GNI per capital tends to be lower in countries with large average control benefits. The same holds true for stock market capitalization and privat credit provision. The block premium, IPOs, and listed firms are only weakly related to MADV. SADV is not systematically related to any of the macro variables we consider.

Insert Figures 4 and 5 Here

4.2 Agency conflicts and equity returns

To be written.

5 Conclusion

To be written.

Appendix

In our model, the controlling shareholder can capture a fraction ϕ of the firm free cash flow and have empire building motives. In order to derive the value of the controlling shareholder's claim, we will first characterize its value for the period over which neither the default threshold nor the restructuring threshold are hit and the firm does not change its debt policy. For any given coupon payment $c \geq 0$, this value solves

$$\begin{aligned} 0 &= \max_{k\geq 0}\left\{\frac{1}{2}\sigma_X^2 x^2\frac{\partial^2 \mathtt{cs}(x)}{\partial x^2}+\mu_X x\frac{\partial \mathtt{cs}(x)}{\partial x}-r\mathtt{cs}(x)\right.\\ &\qquad \left. +\left(1-\tau^d\right)\left[(\phi+(1-\phi)\varphi)\left[(1-\tau^c)(xk^\gamma-\delta k-c)-rk\right]+\frac{\varsigma k}{1-\tau^d}\right]\right\}. \end{aligned}$$

Since k there are no costs of adjusting capital, k only appears in the firm operating cash flow and we can solve this maximization problem for k to get

$$k=\left\{\frac{\gamma(1-\tau)\left[\phi+(1-\phi)\varphi\right]}{\left[\phi+(1-\phi)\varphi\right]\left[(1-\tau)\delta+(1-\tau^d)r\right]-\varsigma}\right\}^{\xi}x^{\xi},\ \text{with}\ \xi\equiv\frac{1}{1-\gamma}>1,$$

and where the tax rate $\tau\equiv 1-(1-\tau^c)\left(1-\tau^d\right)$ reflects corporate and personal taxes. In our analysis of corporate policies, it will be more convenient to work with the (capacity-adjusted) technology shock $Y_i\equiv X_i^{\xi}$ with realizations denoted by y and dynamics given by

$$dY_{it}=\mu Y_{it}dt+\sigma Y_{it}dZ_{it}, \qquad Y_{i0}=\mathcal{T}X_{i0}^{\xi}>0$$

with $\mu=\xi\mu_{Xi}+\xi(\xi-1)\sigma_{Xi}^2/2$ and $\sigma=\xi\sigma_{Xi}$. Using this change of variable, we get that the controlling shareholder's value function solves in the inaction region (y_D, y_U):

$$r\mathtt{cs}(y)=\frac{1}{2}\sigma^2y^2\frac{\partial^2\mathtt{cs}(y)}{\partial y^2}+\mu y\frac{\partial \mathtt{cs}(y)}{\partial y}+\left[\phi+(1-\phi)\varphi\right](1-\tau)\left[(1+\mathcal{A}(\varsigma))\,y-c\right],$$

where

$$\mathcal{A}(\varsigma)\equiv\frac{\gamma\varsigma}{(1-\gamma)\left[\phi+(1-\phi)\varphi\right]\left[(1-\tau)\delta+(1-\tau^d)r\right]-\varsigma}.$$

Under the assumption that $\varsigma=0$, both the controlling and minority shareholders are entitled to a cash flow stream that is proportional to the firm's net income $(1-\tau)(y-c)$. We thus start by deriving the value of a claim on net income, denoted by $\mathbf{N}(y,c)$. When determining the value of the controlling shareholder's rents, we will add the component related to empire building. Let $n(y,c)$ denote the present value of the firm's net income over one financing cycle, i.e., for the period over which neither the default threshold y_D nor the restructuring threshold y_U are hit and the firm does not change its debt policy. This value is given by

$$n(y,c)=\mathbb{E}^{\mathcal{Q}}\left[\int_t^T e^{-r(s-t)}\,(1-\tau)\,(Y_s-c)ds|Y_t=y\right], \tag{8}$$

where $T=\inf\{T_U,T_D\}$ with $T_s=\inf\{t\geq 0: Y_t=y_s\}$, $s=U,D$. This expression gives the value of a claim to the firm's net income until either the firm increases its debt level to shield more profits from taxation or the firm defaults on its debt obligations (i.e. until time T). This value does not incorporate any of the cash flows that accrue to claimholders after a restructuring. These cash flows belong to the next financing cycle and will be incorporated in the total value of the claim to net income, $\mathbf{N}(y,c)$.

Denote by $p_U(y)$ the present value of \$1 to be received at the time of refinancing, contingent on refinancing occurring before default, and by $p_D(y)$ the present value of \$1 to be received at the time of default, contingent on default occurring before refinancing. Using this notation, we can write the solution to equation (8) as:

$$n(y,c) = (1-\tau)\left[\frac{y}{r-\mu} - \frac{c}{r} - p_U(y)\left(\frac{y_U}{r-\mu} - \frac{c}{r}\right) - p_D(y)\left(\frac{y_D}{r-\mu} - \frac{c}{r}\right)\right], \tag{9}$$

where [see Revuz and Yor (1999, pp. 72)]

$$p_D(y) = \frac{y^\omega - y^\nu y_U^{\omega-\nu}}{y_D^\omega - y_D^\nu y_U^{\omega-\nu}} \quad \text{and} \quad p_U(y) = \frac{y^\omega - y^\nu y_D^{\omega-\nu}}{y_U^\omega - y_U^\nu y_D^{\omega-\nu}}$$

and ω and ν are the positive and negative roots of the equation $\frac{1}{2}\sigma^2\beta(\beta-1) + \mu\beta - r = 0$.

Consider next the total value $\mathbf{N}(y,c)$ of a claim to the firm's net income. In the static model in which the firm cannot restructure, the default threshold y_D is linear in the coupon payment c (see e.g. Morellec, Nikolov, and Schürhoff, 2012). In addition, the selected coupon rate c is linear in y. This implies that if two firms i and j are identical except that $y_0^i = \Lambda y_0^j$, then the selected coupon rate and default threshold satisfy $c^i = \Lambda c^j$ and $y_D^i = \Lambda y_D^j$ and every claim will be scaled by the same factor Λ. For the dynamic model, this scaling feature implies that at the first restructuring point, all claims are scaled up by the same proportion $\rho \equiv y_U/y_0$ that asset value has increased (i.e., it is optimal to choose $c^1 = \rho c^0$, $y_D^1 = \rho y_D^0$, $y_U^1 = \rho y_U^0$). Subsequent restructurings scale up these variables again by the same ratio. If default occurs prior to restructuring, firm value is reduced by a constant factor $\eta(\alpha-\kappa)\gamma$ with $\gamma \equiv y_D/y_0$, new debt is issued, and all claims are scaled down by the same proportion $\eta(\alpha-\kappa)\gamma$ that asset value has decreased. As a result, we have for $y_D \le y \le y_U$:

$$\underset{\substack{\text{Total value}\\ \text{of the claim}}}{\mathbf{N}(y,c) =} \underbrace{n(y,c)}_{\substack{\text{Value over}\\ \text{one cycle}}} + \underbrace{p_U(y)\,\rho\mathbf{N}(y_0,c)}_{\substack{\text{PV of claim on net}\\ \text{income at a restructuring}}} + \underbrace{p_D(y)\,\eta(\alpha-\kappa)\gamma\mathbf{N}(y_0,c)}_{\substack{\text{PV of claim on net}\\ \text{income in default}}}. \tag{10}$$

This equation shows that the value of a claim to the firm's net income over all financing cycles is equal to the cash flows claimholders receive over one financing cycle plus the value of the cash flows they get after the restructuring or in default. Using this expression, we can rewrite the total value of a claim to the firm's net income at the initial date as:

$$\mathbf{N}(y_0,c) = \frac{n(y_0,c)}{1 - p_U(y_0)\rho - p_D(y_0)\eta(\alpha-\kappa)\gamma} \equiv n(y_0,c)\ \mathbf{S}(y_0,\rho,\gamma), \tag{11}$$

where the function $\mathbf{S}(y_0,\rho,\gamma)$ scales the value of a claim to cash flows over one financing cycle at a restructuring point into the value of this claim over all financing cycles.

The same arguments apply to the valuation of corporate debt. Consider first the value $d(y,c)$ of the debt issued at time $t=0$. Since the issue is called at par if the firm's cash flows reach y_U before y_D, the current value of corporate debt satisfies at any time $t \ge 0$:

$$d(y,c) = \underbrace{b(y,c)}_{\text{Value of debt over one cycle}} + \underbrace{p_U(y)\ d(y_0,c)}_{\text{PV of cash flow at a restructuring}}. \tag{12}$$

where $b(y,c)$ represents the value of corporate debt over one refinancing cycle, i.e., ignoring the value of the debt issued after a restructuring or after default, and is given by

$$b(y,c) = \frac{(1-\tau^i)\,c}{r}\left[1 - p_U(y) - p_D(y)\right] + p_D(y)\left[1 - (\kappa + \eta(\alpha-\kappa))\right]\left(\frac{1-\tau}{r-\mu}\right) y_D. \tag{13}$$

The first term on the right-hand side of this equation represents the present value of the coupon payments until the firm defaults or restructures (i.e., until time T). The second term represents the present value of the cash flow to initial debtholders in default.

As in the case of the claim to net income, the total value of corporate debt includes not only the cash flows accruing to debtholders over one refinancing cycle, $b(y,c)$, but also the new debt that will be issued in default or at the time of a restructuring. As a result, the value of the total debt claim over all the financing cycles is given by $b(y_0,c)\,\mathbf{S}(y_0,\rho,\gamma)$, where $\mathbf{S}(y_0,\rho,\gamma)$ is defined in equation (11). Because flotation costs are incurred each time the firm adjusts its capital structure, the total value of adjustment costs at time $t=0$ is in turn given by $\lambda\, d\,(y_0,c)\;\mathbf{S}(y_0,\rho,\gamma)$. We can then write the value of the firm at the restructuring date as the sum of the present value of a claim on net income plus the value of all debt issues minus the present value of issuance costs and the present value of managerial rents, or

$$\mathbf{V}\,(y_0,c)\;=\;\mathbf{S}(y_0,\rho,\gamma)\;\{\,n\,(y_0,c)\;+\;b\,(y_0,c)\;-\;\lambda\,d\,(y_0,c)\;-\;\phi\,n\,(y_0,c)\,\}\,. \tag{14}$$

We are now in a position to determine the controlling shareholder's policy choices. Denote the present value of the controlling shareholder's cash flows by $\mathbf{CS}(y,c)$. This value is the sum of the controlling shareholder's equity stake and the value of private benefits. The value of equity at the time of debt issuance is equal to total firm value, $\mathbf{V}(y,c)$, because debt is fairly priced. We can then express the total value of the controlling shareholder's claims as:

$$\mathbf{CS}(y,c)\;=\;\underbrace{\varphi\,\mathbf{V}(y,c)}_{\text{Equity stake}}\;+\;\underbrace{\phi\,\mathbf{N}(y,c)}_{\text{Cash diversion}}\;+\;\underbrace{\mathbf{EB}(y,c)}_{\text{Empire Building}}\,, \tag{15}$$

where φ represents the fraction of the firm's equity owned by the manager, ϕ represents the fraction of the firm's net income that can be captured by the controlling shareholder, and $\mathbf{EB}(y,c)$ represents the present value of empire-building benefits given by

$$\mathbf{EB}(y,c)=\mathbf{S}(y_0,\rho,\gamma)\left\{\frac{1-\tau}{r-\mu}\left[y-p_U\,(y)\,y_U-p_D\,(y)\,y_D\right]\mathcal{A}(\varsigma)\right\} \tag{16}$$

The objective of the controlling shareholder is to maximize the ex-ante value of his claims by selecting the coupon payment c and the scaling factor $\rho=y_U/y_0$. Thus, the controlling shareholder solves

$$\sup_{c,\rho}\;\mathbf{CS}(y,c)\;=\;\sup_{c,\rho}\;\{\varphi\,\mathbf{V}(y,c)+\phi\,\mathbf{N}(y,c)+\mathbf{EB}(y,c)\}\,. \tag{17}$$

In a rational expectations model, the solution to the problem (17) reflects the fact that following the flotation of corporate debt, the controlling shareholder chooses a default trigger policy to maximize the value of his claim after debt has been issued. As in Leland (1998) or Strebulaev (2007), the default threshold results from a tradeoff between continuation value outside of default and the value of claims in default. Our model implies that all claims are scaled down by the same factor in default so that the controlling and minority shareholders agree on the firm's default policy. The value of equity at the time of default satisfies $\mathbf{V}(y,c)-d\,(y,c)=\eta\,(\alpha-\kappa)\,\gamma\mathbf{V}(y,c)$ (value-matching). The default threshold can then be determined by solving the smooth-pasting condition:[10]

$$\left.\frac{\partial\left[\mathbf{V}(y,c)-d\,(y,c)\right]}{\partial y}\right|_{y=y_D}\;=\;\left.\frac{\partial\eta\,(\alpha-\kappa)\,\gamma\mathbf{V}(y,c)}{\partial y}\right|_{y=y_D}. \tag{18}$$

The full problem of the controlling shareholder thus consists of solving (17) subject to (18). A closed-form solution to this problem does not exist and thus standard numerical procedures are used.

[10]Hugonnier, Malamud, and Morellec (2012) demonstrate that there exists a unique solution to this optimization problem, given the values of the parameters used to estimate our model.

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Table 1
Model identification

The table presents sensitivities of data moments with respect to the model parameters. We obtain the model-implied moments and sensitivities by Monte-Carlo simulation. The baseline parameter values are $(\lambda, \phi, \eta) = (.005, 0, 0)$. The column titled 'Baseline Moments' reports the model moment at the baseline parameter values, and the columns titled 'Sensitivity' report $(\partial m/\partial\theta)/m$ for each of the structural parameters.

	Baseline moments	Sensitivity		
		EFC λ	MADV ϕ	SADV η
Leverage:				
Mean	0.53	-4.59	-11.42	-0.39
Median	0.49	-3.20	-13.86	-0.41
S.D.	0.19	7.27	4.54	-0.34
Skew	0.71	-21.84	21.32	0.31
Kurtosis	2.58	-2.83	11.86	0.17
Range	0.74	3.69	8.47	-0.23
IQR	0.27	5.26	-2.44	-0.41
Min	0.26	-10.62	-24.36	-0.36
Max	1.00	0.00	0.00	-0.26
Autocorrelation 1qtr	0.93	0.78	1.88	-0.01
Autocorrelation 1yr	0.75	3.19	6.66	-0.02
Changes in leverage:				
Mean	0.00	-24.72	-23.95	-0.03
Median	0.00	624.58	149.46	-1.34
S.D.	0.06	6.34	-7.88	-0.34
Skew	0.17	252.65	54.03	-0.58
Kurtosis	3.30	16.46	6.59	-0.05
Range	0.66	-1.56	11.91	-0.31
IQR	0.08	-1.62	-11.75	-0.31
Min	-0.34	-2.85	16.74	-0.47
Max	0.33	-0.23	6.36	-0.14
Autocorrelation 1qtr	-0.05	-16.47	-52.94	0.02
Autocorrelation 1yr	-0.03	14.93	-3.32	0.26
Event frequencies:				
Pr(Default)	0.32	-10.10	-35.03	0.14
Pr(Issuance)	2.62	-142.06	-26.60	0.15
Issue size (%)	0.13	122.00	12.11	-0.59

Table 2
Parameter estimates

The table reports the parameter estimates by country. Panel A documents the model parameters that are estimated separately from the structural model estimation. Panel B documents the parameter estimates obtained from the structural model estimation. The model parameters include the risk free rate, r, corporate tax rate, τ_c, and personal tax rate on interest income and dividends, τ_i and τ_d, respectively, expected profitability, μ_P, volatility, σ, systematic exposure, β, ownership structure, φ, and liquidation costs, α. The risk free rate and tax rates are country specific. The rest of the parameters are firm specific. For these parameters, the table reports the country means. With these estimates as inputs, we apply the SML procedure discussed in Section 1.3. For this, we split the data into country samples and perform the SML estimation separately for each country. For each country, we obtain a set of estimates for the parameters $\theta = (\alpha_\phi, \alpha_\eta, \sigma_\phi, \sigma_\eta, \sigma_{\phi\eta})$. Panel B reports the point estimates and standard errors in parenthesis for each country. Standard errors are robust to heteroskedasticity and clustered at the industry level.

Panel A: Model parameters

Country	Firms	r	τ_c	τ_i	τ_d	μ_P	σ	β	φ	α
AUT	61	0.031	0.298	0.429	0.250	0.015	0.308	0.373	0.292	0.495
CHE	178	0.016	0.235	0.376	0.360	0.083	0.283	0.607	0.281	0.489
DEU	595	0.030	0.407	0.482	0.272	0.089	0.389	0.407	0.314	0.525
DNK	107	0.033	0.289	0.536	0.423	0.085	0.316	0.464	0.329	0.492
ESP	102	0.035	0.335	0.452	0.246	-0.099	0.271	0.403	0.343	0.540
FRA	588	0.031	0.364	0.378	0.369	-0.011	0.348	0.510	0.380	0.531
GBR	1,459	0.041	0.295	0.417	0.270	0.137	0.398	0.618	0.287	0.509
IRL	42	0.041	0.179	0.430	0.410	0.135	0.353	0.532	0.196	0.494
ITA	204	0.037	0.341	0.423	0.150	-0.145	0.281	0.387	0.384	0.550
JPN	3,274	0.005	0.411	0.468	0.212	0.035	0.330	0.447	0.362	0.468
NLD	138	0.030	0.311	0.521	0.341	0.039	0.323	0.490	0.305	0.500
POL	236	0.057	0.249	0.280	0.181	0.171	0.460	0.594	0.533	0.481
PRT	37	0.045	0.310	0.374	0.218	-0.132	0.256	0.272	0.545	0.596
USA	5,631	0.033	0.393	0.426	0.310	0.152	0.473	0.731	0.101	0.522

Panel B: Parameter estimates for agency conflicts

Country	α_ϕ	(SE)	α_η	(SE)	σ_ϕ	(SE)	σ_η	(SE)	$\sigma_{\phi\eta}$	(SE)	$\ln L$
AUT	-4.639	(0.011)	-0.361	(0.069)	1.138	(0.004)	1.050	(0.047)	-0.135	(0.085)	-2,745
CHE	-4.352	(0.022)	0.001	(0.006)	1.665	(0.031)	1.330	(0.050)	-0.018	(0.070)	-14,991
DEU	-4.700	(0.038)	-0.278	(0.031)	1.760	(0.017)	1.213	(0.059)	-0.053	(0.031)	-48,656
DNK	-3.978	(0.021)	-0.067	(0.233)	1.421	(0.020)	1.164	(0.239)	1.041	(0.080)	-5,323
ESP	-4.807	(0.010)	-0.164	(0.007)	1.845	(0.002)	1.111	(0.005)	-0.346	(0.003)	-6,780
FRA	-3.617	(0.046)	0.014	(0.010)	1.424	(0.012)	1.242	(0.054)	-0.077	(0.058)	-57,712
GBR	-4.078	(0.019)	-0.081	(0.033)	1.261	(0.003)	1.151	(0.095)	-0.151	(0.116)	-146,203
IRL	-4.270	(0.042)	-0.180	(0.106)	2.320	(0.047)	1.051	(0.148)	-0.166	(0.202)	-4,037
ITA	-3.592	(0.019)	-0.164	(0.004)	2.585	(0.013)	1.029	(0.003)	0.166	(0.027)	-16,507
JPN	-3.755	(0.104)	-0.007	(0.354)	1.422	(0.046)	1.150	(0.521)	0.404	(0.080)	-268,496
NLD	-4.303	(0.011)	-0.113	(0.046)	1.196	(0.017)	1.068	(0.031)	-0.022	(0.013)	-12,118
POL	-3.492	(0.116)	-0.118	(0.096)	1.368	(0.062)	1.088	(0.081)	-0.258	(0.115)	-8,975
PRT	-3.784	(0.074)	-2.316	(0.042)	1.276	(0.015)	1.043	(0.004)	-0.139	(0.006)	-1,211
USA	-3.496	(0.069)	-0.009	(0.013)	0.986	(0.007)	8.026	(1.883)	-0.395	(0.247)	-472,767

Table 3
Descriptive statistics for manager advantage and shareholder advantage

The table reports descriptive statistics for predicted manager advantage MADV, defined as $\mathbb{E}[\phi|\ell;\widehat{\theta}]$, and predicted shareholder advantage SADV, defined as $\mathbb{E}[\eta|\ell;\widehat{\theta}]$, for each firm in our sample and split by country. Panel A (B) documents the distrbution of MADV (SADV). All variables are measured in fractions. Panel C reports the variation in MADV and SADV and, for comparison, leverage that is explained by country and industry.

Panel A: Manager advantage MADV

Country	Mean	Std	5%	25%	Median	75%	95%
All	0.044	0.054	0.004	0.014	0.032	0.049	0.146
AUT	0.019	0.044	0.001	0.003	0.011	0.019	0.054
CHE	0.042	0.059	0.002	0.007	0.023	0.044	0.153
DEU	0.029	0.040	0.001	0.006	0.019	0.034	0.108
DNK	0.047	0.085	0.001	0.004	0.014	0.044	0.204
ESP	0.048	0.087	0.001	0.005	0.015	0.042	0.198
FRA	0.071	0.072	0.005	0.025	0.051	0.086	0.214
GBR	0.037	0.045	0.004	0.012	0.027	0.038	0.127
IRL	0.068	0.102	0.000	0.003	0.025	0.072	0.276
ITA	0.056	0.118	0.000	0.002	0.011	0.052	0.180
JPN	0.049	0.069	0.003	0.013	0.027	0.052	0.200
NLD	0.020	0.040	0.001	0.003	0.009	0.022	0.056
POL	0.063	0.057	0.007	0.026	0.055	0.070	0.190
PRT	0.067	0.114	0.004	0.016	0.035	0.073	0.183
USA	0.041	0.035	0.007	0.018	0.039	0.048	0.102

Panel B: Shareholder advantage SADV

Country	Mean	Std	5%	25%	Median	75%	95%
All	0.420	0.242	0.009	0.262	0.453	0.533	0.887
AUT	0.423	0.170	0.167	0.315	0.388	0.524	0.773
CHE	0.504	0.209	0.207	0.346	0.489	0.628	0.910
DEU	0.442	0.178	0.140	0.353	0.436	0.504	0.807
DNK	0.423	0.229	0.118	0.222	0.399	0.553	0.870
ESP	0.420	0.213	0.062	0.251	0.440	0.582	0.756
FRA	0.509	0.191	0.193	0.393	0.497	0.620	0.849
GBR	0.448	0.153	0.171	0.366	0.465	0.512	0.716
IRL	0.438	0.182	0.120	0.300	0.446	0.500	0.760
ITA	0.386	0.204	0.065	0.216	0.426	0.513	0.686
JPN	0.453	0.167	0.197	0.337	0.451	0.530	0.779
NLD	0.458	0.165	0.191	0.361	0.464	0.528	0.834
POL	0.493	0.165	0.244	0.413	0.469	0.535	0.849
PRT	0.133	0.125	0.010	0.053	0.104	0.153	0.359
USA	0.377	0.300	0.003	0.055	0.441	0.535	0.968

Panel C: Analysis of variation

Variable	Country R^2	Industry R^2	Country×Industry R^2
MADV	0.029	0.056	0.287
SADV	0.035	0.061	0.201
Leverage	0.052	0.271	0.413

Table 4
Determinants of agency conflicts

Variable	Description
Financial indicators (Source: Compustat Global)	
Book Debt	Long-term debt (DLTT) + Debt in current liabilities (DLC)
Book Debt (alternate)	Liabilities total (LT) + Preferred stock (PSTK) – Deferred taxes (TXDITC)
Book Equity	Assets total (AT) – Book debt
Book Equity (alternate)	Assets total – Book debt (alternate)
Leverage	Book debt/(Assets total – Book equity + Market value (CSHOC*abs(PRCCD)))
Leverage (alternate)	Book debt (alternate) / (Assets total – Book equity (alternate) + Market value))
EBIT growth rate	Five-year least squares annual growth rate of EBIT
Market-to-Book M/B	(Market value + Book debt) / Assets total
Cash	Cash and Short-Term Investments (CHE) / Assets total
Size	log(Sales net (SALE))
Return on assets ROA	(EBIT (EBIT) + Depreciation (DP)) / Assets total
Tangibility	Property, plant, and equipment total net (PPENT) / Assets total
Volatility and systematic risk (Source: Datastream and CRSP)	
Equity volatility	Standard deviation of monthly equity returns, rolling over past five years
Market model beta	CAPM beta based on monthly equity returns, rolling over past five years
Ownership structure (Source: Thomson-Reuters Global Institution Ownership Feed)	
Controlling shareholder ownership	Ownership share of the 1 (5) largest shareholders, measured as a fraction of market capitalization.
Ownership individual	Ownership share of the 1 (5) largest individual shareholders, measured as a fraction of market cap.
Ownership institutions	Ownership share of the 1 (5) largest institutional shareholders, measured as a fraction of market cap.
Ownership mutual funds	Ownership share of the 1 (5) largest mutual fund shareholders, measured as a fraction of market cap.
Origin of law and enforcement procedure (Source: Djankov et al., 2008a)	
Legal origin	Dummy variable that identifies the legal origin of the bankruptcy law of each country. The four origins are English common law and French, German, and Scandinavian civil law.
Procedure: Reorganization	Equals 1 if Mirage is most likely to undergo a reorganization proceeding. Reorganization is a court supervised procedure aimed at rehabilitating companies in financial distress. Reorganization proceedings generally provide for a statutory freeze on individual creditor enforcements and specify powers to bind dissenting creditors to a reorganization plan.
Procedure: Foreclosure	Equals 1 if Mirage is most likely to undergo a foreclosure or debt enforcement proceeding under the factual and procedural assumptions provided. Foreclosure is a security enforcement procedure aimed at recovering money owed to secured creditors. It is generally governed by laws separate from bankruptcy law. Foreclosure proceedings do not aim to recover money for unsecured creditors or other claimants, although in some cases any excess funds may be disbursed to other claimants.
Procedure: Liquidation	Equals 1 if Mirage is most likely to undergo a liquidation proceeding. Liquidation is the procedure of winding up a company under judicial supervision. Liquidation results in the dissolution of the legal entity. The underlying busines may be sold as a going concern or piecemeal, generally by auction.
Statutory governance provisions (Source: La Porta et al., 1998; Djankov et al., 2006; Djankov et al., 2008b)	
Creditor rights index	Index aggregating creditor rights, following La Porta et al. (1998). A score of one is assigned when each of the following rights of secured lenders is defined in laws and regulations: First, there are restrictions, such as creditor consent or minimum dividends, for a debtor to file for reorganization. Second, secured creditors are able to seize their collateral after the reorganization petition is approved, i.e. there is no "automatic stay" or "asset freeze." Third, secured creditors are paid first out of the proceeds of liquidating a bankrupt firm, as opposed to other creditors such as government or workers. Finally, if management does not retain administration of its property pending the resolution of the reorganization. The index ranges from 0 (weak creditor rights) to 4 (strong creditor rights). Source: Djankov, McLiesh and Shleifer (2006).

Continued

Table 4
Determinants of agency conflicts—*Continued*

Variable	Description
Anti-director rights index	Index aggregating the shareholder rights which we labeled as "anti-director rights." The index is formed by adding 1 when: (1) the country allows shareholders to mail their proxy vote to the firm; (2) shareholders are not required to deposit their shares prior to the General Shareholders' Meeting; (3) cumulative voting or proportional representation of minorities in the board of directors is allowed; (4) an oppressed minorities mechanism is in place; (5) the minimum percentage of share capital that entitles a shareholder to call for an Extraordinary Shareholders' Meeting is less than or equal to 10 percent (the sample median); or (6) shareholders have preemptive rights that can only be waived by a shareholders' vote. The index ranges from 0 to 6.
Anti-self-dealing index	Index aggregating provisions designed to curb self-dealing by executives and controlling shareholders. The index is constructed by averaging the indices of ex-ante and ex-post private control of self-dealing. Source: Djankov et al., 2008, "The Law and Economics of Self-Dealing"
Constituents of creditor rights index (Source: La Porta et al., 1998, "Law and Finance"; Djankov et al., 2007)	
(1) Ch. 11 petition restricted	Equals 1 if the reorganization procedure imposes restrictions, such as creditors' consent, to file for reorganization. It equals 0 if there are no such restrictions.
(2) No automatic stay on assets	Equals 1 if the reorganization procedure does not impose an automatic stay on the assets of the firm upon filing the reorganization petition. Automatic stay prevents secured creditors to gain possession of their security. It equals 0 if such restriction does exist in the law.
(3) Secured creditors 1st	Equals 1 if secured creditors are ranked first in the distribution of the proceeds that result from the disposition of the assets of a bankrupt firm. Equals 0 if non-secured creditors, such as the Government and workers, are given absolute priority.
(4) Management does not stay	Equals 1 if an official appointed by the court, or by the creditors, is responsible for the operation of the business during reorganization. Equivalently, this variable equals 1 if the debtor does not keep the administration of its property pending the resolution of the reorganization process, and 0 otherwise.
Constituents of anti-director rights index (Source: La Porta et al., 1998, "Law and Finance")	
(1) Proxy voting by mail	Equals 1 if the Company Law or Commercial Code allows shareholders to mail their proxy vote to the firm, and 0 otherwise.
(2) Shares not blocked	Equals 1 if the Company Law or Commercial Code does not allow firms to require that shareholders deposit their shares prior to a General Shareholders Meeting thus preventing them from selling those shares for a number of days, and 0 otherwise.
(3) Cumulative voting	Equals 1 if the Company Law or Commercial Code allows shareholders to cast all of their votes for one candidate standing for election to the board of directors (cumulative voting) or if the Company Law or Commercial Code allows a mechanism of proportional representation in the board by which minority interests may name a proportional number of directors to the board, and 0 otherwise.
(4) Oppressed minority	Equals 1 if the Company Law or Commercial Code grants minority shareholders either a judicial venue to challenge the decisions of management or of the assembly or the right to step out of the company by requiring the company to purchase their shares when they object to certain fundamental changes, such as mergers, assets dispositions and changes in the articles of incorporation. The variable equals zero otherwise. Minority shareholders are defined as those shareholders who own 10 percent of share capital or less.
(5) Votes for extraordinary meeting	The minimum percentage of ownership of share capital that entitles a shareholder to call for an Extraordinary Shareholders' Meeting. It ranges from one to 33 percent.
(6) Preemptive rights	Equals 1 when the Company Law or Commercial Code grants shareholders the first opportunity to buy new issues of stock and this right can only be waived by a shareholders' vote, and 0 otherwise.

Table 5
Legal environment and manager advantage

The table reports the determinants of managers' control benefits. Estimates are obtained from cross-sectional regressions. MADV is expressed in percent. All specifications include industry fixed effects. Standard errors are robust to heteroskedasticity and clustered at the country level. The number of observations is 12,652. Significance levels are indicated by * (10%), ** (5%), *** (1%).

Determinant	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
French civil law	2.10**	1.61							3.39**
	(0.82)	(0.96)							(1.15)
German civil law	0.93	-0.14							3.00**
	(0.53)	(0.75)							(1.18)
Scandinavian civil law	1.23***	0.77							4.03***
	(0.14)	(0.44)							(0.92)
Procedure: Foreclosure			-1.06**	-2.37***					-1.97***
			(0.45)	(0.43)					(0.41)
Procedure: Liquidation			-1.05	-1.76**					-0.37
			(0.88)	(0.63)					(0.41)
Creditor rights index					-0.80***			-1.05***	-0.76***
					(0.12)			(0.17)	(0.11)
Anti-director rights index						-0.51**		0.50	-0.01
						(0.23)		(0.47)	(0.13)
Anti-self-dealing index							-1.75	0.27	8.39***
							(1.79)	(1.02)	(2.37)
M/B		0.37**		0.33*	0.32*	0.36**	0.39**	0.32**	0.32**
		(0.16)		(0.16)	(0.15)	(0.17)	(0.17)	(0.14)	(0.14)
Cash		4.62***		3.55***	4.08***	4.24***	3.97***	3.89***	3.71***
		(1.25)		(0.79)	(1.01)	(1.09)	(0.97)	(1.06)	(0.97)
Size		0.00		-0.18***	-0.07***	-0.01	-0.08	-0.11**	-0.22***
		(0.09)		(0.04)	(0.02)	(0.05)	(0.06)	(0.05)	(0.04)
ROA		1.20		2.17*	1.72*	1.48	1.52	1.84*	2.13**
		(0.90)		(1.13)	(0.96)	(1.00)	(0.97)	(0.96)	(0.98)
Tangibility		-2.29**		-2.58**	-2.52**	-2.58**	-2.55**	-2.54**	-2.51**
		(0.88)		(0.92)	(0.83)	(0.94)	(0.95)	(0.86)	(0.94)
Ownership individuals		4.28**		5.57***	5.57***	5.14***	4.65***	5.27***	4.53**
		(1.76)		(1.11)	(1.24)	(1.34)	(1.42)	(1.49)	(1.78)
Ownership institutions		1.76		-0.74	-0.60	0.39	1.41	-0.47	0.18
		(1.20)		(1.15)	(0.91)	(1.05)	(0.98)	(1.02)	(0.60)
Ownership mutual funds		-4.02*		3.92	1.94	-1.10	-1.92	2.22	2.66
		(2.08)		(3.43)	(2.49)	(2.24)	(2.15)	(2.47)	(2.75)
r2	0.070	0.113	0.062	0.123	0.123	0.111	0.110	0.125	0.130

Table 6
Legal environment and shareholder advantage

The table reports the determinants of shareholders' renegotiation power. Estimates are obtained from cross-sectional regressions. SADV is expressed in percent. All specifications include industry fixed effects. Standard errors are robust to heteroskedasticity and clustered at the country level. The number of observations is 12,652. Significance levels are indicated by * (10%), ** (5%), *** (1%).

Determinant	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
French civil law	7.66**	6.88							8.16
	(3.36)	(4.00)							(7.02)
German civil law	7.92***	8.42**							12.92
	(2.01)	(3.66)							(7.40)
Scandinavian civil law	4.34**	4.23							11.05**
	(1.99)	(2.87)							(4.95)
Procedure: Foreclosure			3.08	0.93					14.25***
			(2.81)	(2.34)					(3.27)
Procedure: Liquidation			3.57	2.52					1.16
			(2.92)	(2.10)					(3.64)
Creditor rights index					0.13			-0.92	-3.88***
					(1.20)			(0.81)	(1.24)
Anti-director rights index						1.23		6.28***	2.79
						(1.26)		(1.94)	(1.75)
Anti-self-dealing index							-7.38	-20.67***	-5.01
							(4.72)	(6.35)	(20.23)
M/B		1.99***		1.88***	1.80***	1.89***	1.86***	2.02***	2.15***
		(0.40)		(0.36)	(0.40)	(0.36)	(0.35)	(0.38)	(0.33)
Cash		15.37***		16.73***	16.82***	15.62***	16.52***	14.03***	14.56***
		(3.11)		(3.57)	(3.51)	(3.17)	(3.50)	(3.05)	(2.75)
Size		-0.57*		0.18	0.13	0.00	-0.05	-0.73**	-0.75**
		(0.30)		(0.22)	(0.16)	(0.12)	(0.15)	(0.25)	(0.28)
ROA		2.46		1.36	1.89	2.07	1.80	2.56	1.99
		(4.06)		(5.14)	(4.94)	(4.65)	(4.34)	(4.07)	(3.69)
Tangibility		-5.32		-5.50	-5.83*	-5.41	-5.31*	-5.54	-4.88
		(3.06)		(3.13)	(3.07)	(3.22)	(2.90)	(3.18)	(3.20)
Ownership individuals		12.41***		16.00***	15.73***	15.35***	16.45***	10.07***	7.54***
		(2.03)		(3.00)	(3.16)	(3.06)	(3.48)	(1.95)	(1.61)
Ownership institutions		0.30		-5.56	-6.75	-5.28	-5.91	3.33	6.99**
		(6.41)		(6.98)	(7.93)	(6.61)	(5.76)	(5.34)	(2.99)
Ownership mutual funds		20.26**		19.64*	22.62*	21.85**	24.06***	16.65**	9.85*
		(8.07)		(10.46)	(11.27)	(7.77)	(5.51)	(7.44)	(5.15)
r2	0.083	0.112	0.064	0.104	0.104	0.105	0.106	0.116	0.120

Table 7
Governance provisions and manager advantage

The table reports the determinants of managers' control benefits. Estimates are obtained from cross-sectional regressions. MADV is expressed in percent. The control variables are M/B, cash, size, ROA, tangibility, and ownership share by individuals, institutions and, respectively, mutual funds. All specifications include industry fixed effects. Standard errors are robust to heteroskedasticity and clustered at the country level. The number of observations is 12,652. Significance levels are indicated by * (10%), ** (5%), *** (1%).

Panel A: Anti-director rights provisions and manager advantage

Determinant	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Anti-director rights index	0.16								-0.51**	
(1) Proxy voting by mail		-0.46						-0.22		-0.41
(2) Shares not blocked			-0.54					0.55		0.11
(3) Cumulative voting				1.11***				1.50		0.79
(4) Oppressed minority					-2.25***			-2.49*		-1.72
(5) Votes for extraord. meeting						-14.67*		-5.97		-13.99
(6) Preemptive rights							-0.02	1.62		0.78
Controls	No	No	No	No	No	No	No	No	Yes	Yes
r2	0.057	0.057	0.057	0.063	0.068	0.084	0.056	0.089	0.111	0.146

Panel B: Creditor rights provisions and manager advantage

Determinant	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Creditor rights index	-0.33						-0.80***		
(1) Ch. 11 petition restricted		-1.12**				-0.40		-1.00	-1.75***
(2) No automatic stay on assets			-1.14**			-0.89		-0.82	-0.45
(3) Secured creditors 1st				-2.75***		-2.87***		-1.67***	-0.66
(4) Management does not stay					0.54	1.03***		-0.07	-1.62
Judicial efficiency									0.32
Accounting standard									0.41
Repudiation risk									0.52
Expropriation risk									-5.77**
Controls	No	No	No	No	No	No	Yes	Yes	Yes
r2	0.061	0.063	0.063	0.068	0.059	0.079	0.123	0.125	0.129

Table 8
Governance provisions and shareholder advantage

The table reports the determinants of shareholders' renegotiation power. Estimates are obtained from cross-sectional regressions. The control variables are M/B, cash, size, ROA, tangibility, and ownership share by individuals, institutions and, respectively, mutual funds. All specifications include industry fixed effects. Standard errors are robust to heteroskedasticity and clustered at the country level. The number of observations is 12,652. Significance levels are indicated by * (10%), ** (5%), *** (1%).

Panel A: Anti-director rights provisions and shareholder advantage

Determinant	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Anti-director rights index	3.32**								1.23	
(1) Proxy voting by mail		-2.63						7.50		6.61
(2) Shares not blocked			-4.85					-12.79**		-12.81*
(3) Cumulative voting				6.06**				-5.66		-6.17**
(4) Oppressed minority					-11.85**			4.64		5.06
(5) Votes for extraord. meeting						-21.31		166.44		141.81
(6) Preemptive rights							4.71	-21.54**		-23.22**
Controls	No	No	No	No	No	No	No	No	Yes	Yes
r2	0.073	0.062	0.066	0.071	0.077	0.097	0.068	0.105	0.105	0.144

Panel B: Creditor rights provisions and shareholder advantage

Determinant	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Creditor rights index	1.63						0.13		
(1) Ch. 11 petition restricted		2.39				2.31		1.88	-1.19
(2) No automatic stay on assets			2.61			-0.86		-0.16	-1.07
(3) Secured creditors 1st				-9.20***		-12.48***		-11.29***	-10.47***
(4) Management does not stay					6.50**	7.33***		4.10	5.47
Judicial efficiency									-2.24
Accounting standard									-1.22
Repudiation risk									11.08***
Expropriation risk									10.98
Controls	No	No	No	No	No	No	Yes	Yes	Yes
r2	0.067	0.064	0.064	0.069	0.077	0.088	0.104	0.112	0.119

Table 9
Law enforcement and the cross section of manager advantage

The table reports the determinants of control benefits for different moments of the cross-sectional distribution of MADV. Estimates are obtained from cross-sectional quantile regressions. The control variables are M/B, cash, size, ROA, tangibility, and ownership share by individuals, institutions and, respectively, mutual funds. All specifications include industry fixed effects. Standard errors are robust to heteroskedasticity and clustered at the country level. The number of observations is 12,652. Significance levels are indicated by * (10%), ** (5%), *** (1%).

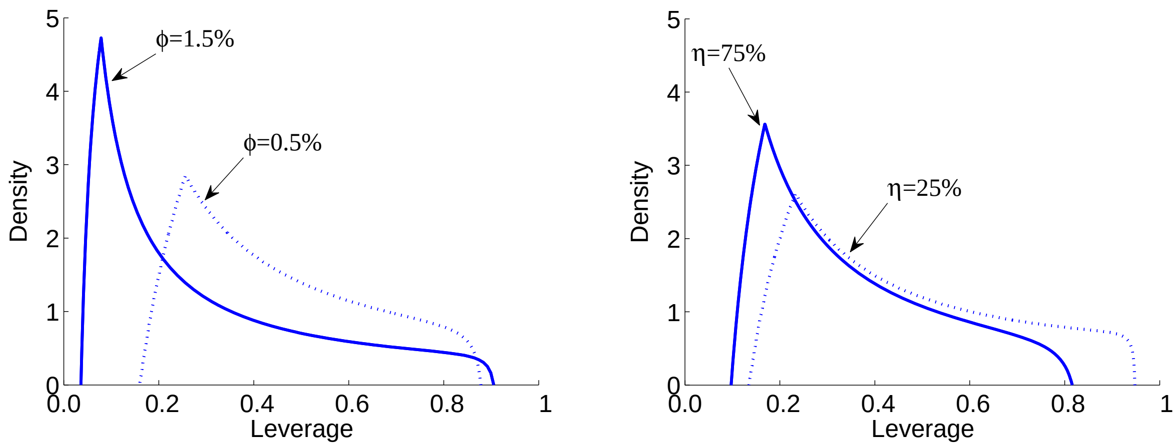
	Distribution of manager advantage at x% quantile				
Determinant	x =5%	x =25%	x =50%	x =75%	x =95%
French civil law	0.25**	0.94***	1.87***	4.18***	11.28**
	(0.11)	(0.26)	(0.37)	(1.00)	(4.56)
German civil law	0.78***	1.55***	2.54***	4.48***	7.02
	(0.11)	(0.28)	(0.47)	(1.10)	(6.41)
Scandinavian civil law	0.29*	0.67***	1.29***	3.38***	12.45**
	(0.15)	(0.25)	(0.34)	(0.80)	(6.28)
Procedure: Foreclosure	-0.34*	-0.17	-0.47	-0.23	-6.95*
	(0.18)	(0.24)	(0.40)	(0.83)	(3.74)
Procedure: Liquidation	0.23**	0.98***	1.61***	1.82*	-1.40
	(0.11)	(0.19)	(0.23)	(0.98)	(4.04)
Creditor rights index	-0.31***	-0.87***	-1.38***	-1.78***	-0.48
	(0.05)	(0.10)	(0.13)	(0.36)	(1.85)
Anti-director rights index	-0.01	0.11	0.26**	0.04	-0.19
	(0.05)	(0.07)	(0.12)	(0.24)	(1.49)
Anti-self-dealing index	2.72***	5.23***	8.38***	12.38***	18.06
	(0.41)	(0.74)	(1.18)	(3.34)	(16.25)
M/B	0.04	0.15***	0.17***	0.38***	0.70***
	(0.03)	(0.02)	(0.03)	(0.08)	(0.24)
Cash	1.66***	2.33***	1.85***	2.83***	9.74***
	(0.20)	(0.16)	(0.27)	(0.38)	(2.77)
Size	-0.08***	-0.14***	-0.21***	-0.27***	-0.45***
	(0.01)	(0.01)	(0.01)	(0.03)	(0.10)
ROA	-0.23	-0.15	0.61***	1.34***	5.10***
	(0.21)	(0.21)	(0.18)	(0.29)	(1.06)
Tangibility	-0.10	-0.74***	-1.48***	-1.68***	-2.81***
	(0.11)	(0.12)	(0.16)	(0.29)	(0.83)
Ownership individuals	1.04***	1.93***	1.97***	3.26***	14.55***
	(0.13)	(0.12)	(0.15)	(0.41)	(1.60)
Ownership institutions	0.77***	0.66***	0.08	0.27	0.59
	(0.14)	(0.21)	(0.21)	(0.27)	(1.00)
Ownership mutual funds	0.96**	0.91***	1.77***	1.06	2.89
	(0.42)	(0.35)	(0.58)	(0.90)	(2.45)

Table 10
Law enforcement and the cross section of shareholder advantage

The table reports the determinants of shareholders' renegotiation power for different moments of the cross-sectional distribution of SADV. Estimates are obtained from cross-sectional quantile regressions. The control variables are M/B, cash, size, ROA, tangibility, and ownership share by individuals, institutions and, respectively, mutual funds. All specifications include industry fixed effects. Standard errors are robust to heteroskedasticity and clustered at the country level. The number of observations is 12,652. Significance levels are indicated by * (10%), ** (5%), *** (1%).

	Distribution of shareholder advantage at x% quantile				
Determinant	x =5%	x =25%	x =50%	x =75%	x =95%
French civil law	13.96***	21.80***	9.35*	-9.66*	-23.68***
	(3.79)	(4.30)	(4.85)	(4.98)	(5.27)
German civil law	26.54***	26.50***	11.56**	-9.46*	-20.56***
	(4.72)	(5.50)	(4.64)	(5.36)	(4.45)
Scandinavian civil law	22.35***	16.05***	8.37***	-0.30	-11.65**
	(3.72)	(3.72)	(3.11)	(3.56)	(5.17)
Procedure: Foreclosure	31.04***	26.13***	5.61	10.89***	5.13
	(3.31)	(2.83)	(3.49)	(3.79)	(6.29)
Procedure: Liquidation	5.83*	5.22	-1.13	-9.93***	-1.28
	(3.32)	(3.51)	(3.20)	(3.81)	(4.55)
Creditor rights index	-6.34***	-4.25***	-2.42***	-1.41	-4.11**
	(1.09)	(1.17)	(0.80)	(1.38)	(1.81)
Anti-director rights index	2.82***	5.73***	1.60**	2.71**	0.15
	(1.01)	(1.25)	(0.80)	(1.10)	(1.39)
Anti-self-dealing index	5.86	-1.01	7.35	-50.21***	-43.96***
	(13.99)	(16.23)	(16.01)	(16.65)	(15.68)
M/B	-0.08	1.26**	1.38***	2.58***	2.38***
	(0.14)	(0.58)	(0.32)	(0.47)	(0.59)
Cash	2.54*	18.54***	9.55***	8.47***	15.11***
	(1.53)	(2.30)	(1.66)	(2.16)	(2.81)
Size	-0.24	-0.81***	-0.76***	-0.29*	0.16
	(0.16)	(0.15)	(0.13)	(0.15)	(0.30)
ROA	1.59	4.21*	0.92	1.56	4.25
	(1.37)	(2.41)	(1.02)	(1.64)	(2.89)
Tangibility	-0.93*	-6.13***	-6.22***	-4.29***	-1.83
	(0.51)	(1.51)	(1.00)	(1.50)	(3.31)
Ownership individuals	2.00*	4.66***	3.23***	8.01***	17.01***
	(1.21)	(1.29)	(0.78)	(1.49)	(2.87)
Ownership institutions	2.59**	7.41**	3.88	2.92	5.85*
	(1.03)	(2.92)	(2.95)	(2.30)	(3.49)
Ownership mutual funds	-2.60	4.11	7.64*	8.96*	9.91
	(3.83)	(6.30)	(4.40)	(5.24)	(6.40)

Panel A: Leverage density function under alternative parameter values



Panel B: Moments of leverage distribution as function of parameter values

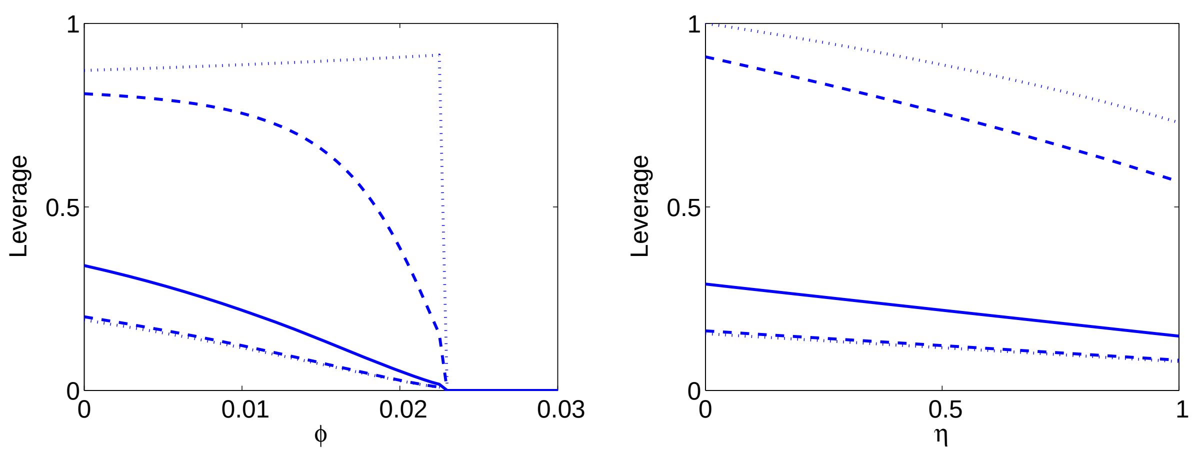
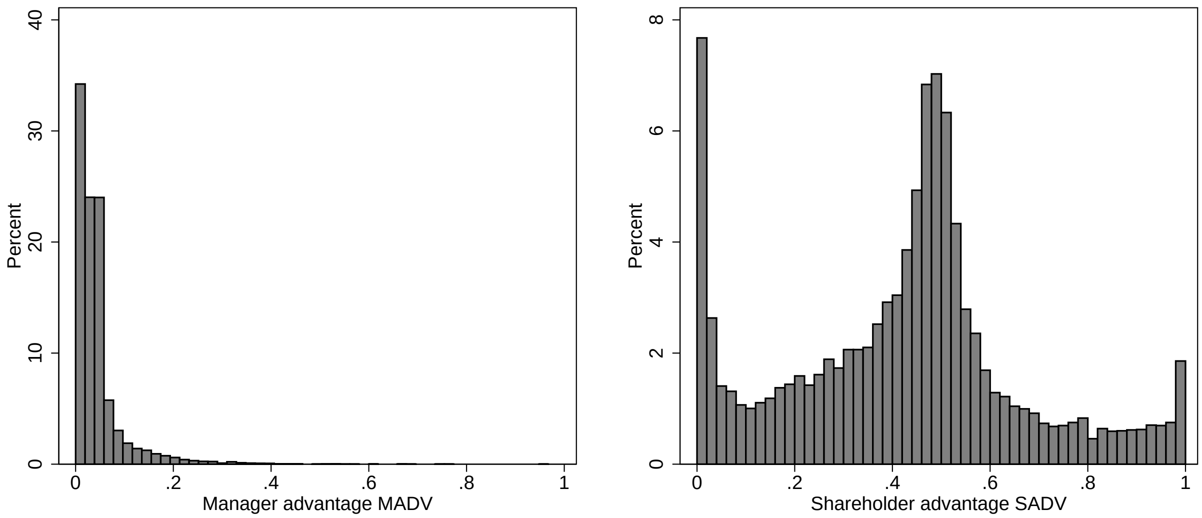


Figure 1

Leverage distribution over time and across firms

The figure shows comparative statics for the time-series distribution of financial leverage. We vary the degree of managerial entrenchment ϕ, and shareholders' bargaining power η around the baseline values $(\phi, \eta) = (.005, .25)$. Panel A plots the distribution function of leverage for different parameter values. Panel B depicts the median (solid line), the 5% and 95% quantiles of leverage (dashed lines), and the low and high of leverage (dotted lines) as functions of the parameters.

Panel A: Distribution of MADV (left) and SADV (right)



Panel B: Correlation between MADV and SADV at country level (left) and firm level (right)

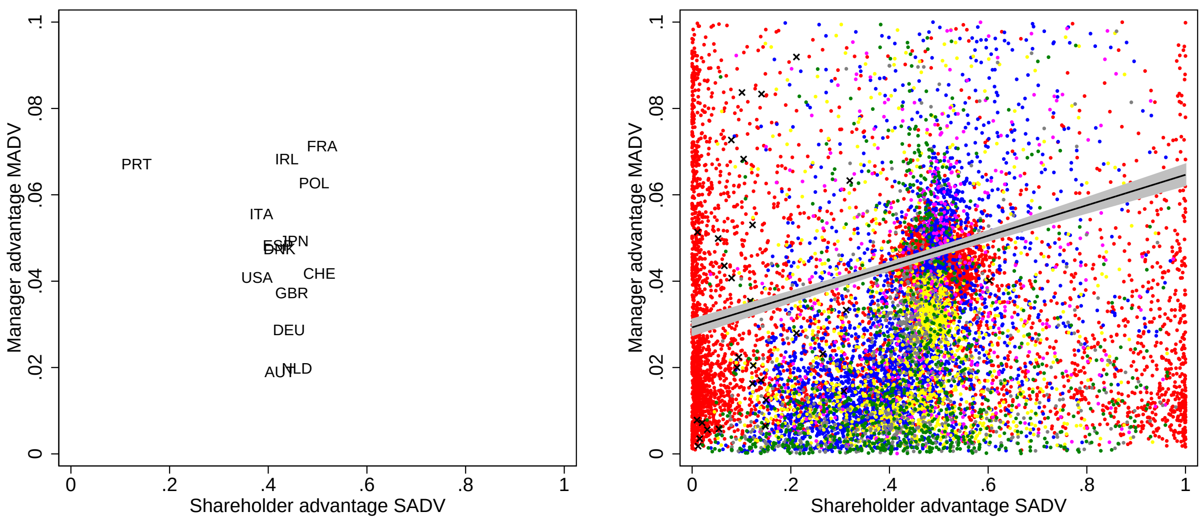


Figure 2

Control benefits and shareholder renegotiation power across firms

The figure shows the distribution of predicted control benefits MADV, defined as $\mathbb{E}[\phi|\ell;\widehat{\theta}]$, and the predicted shareholders' renegotiation power SADV, defined as $\mathbb{E}[\eta|\ell;\widehat{\theta}]$. In Panel A, the histograms plot the predicted values of ϕ (left) and η (right) across all firms in the sample. In Panel B, the scatter plots show the relation between the average MADV and SADV across countries (left) and the firm-by-firm relation (right). The shaded area depicts the confidence interval obtained from the standard error of the linear prediction. The color codes are USA (red), Japan (blue), UK (yellow), France (magenta), Germany (grey), Portugal (black), and the remainder (green).

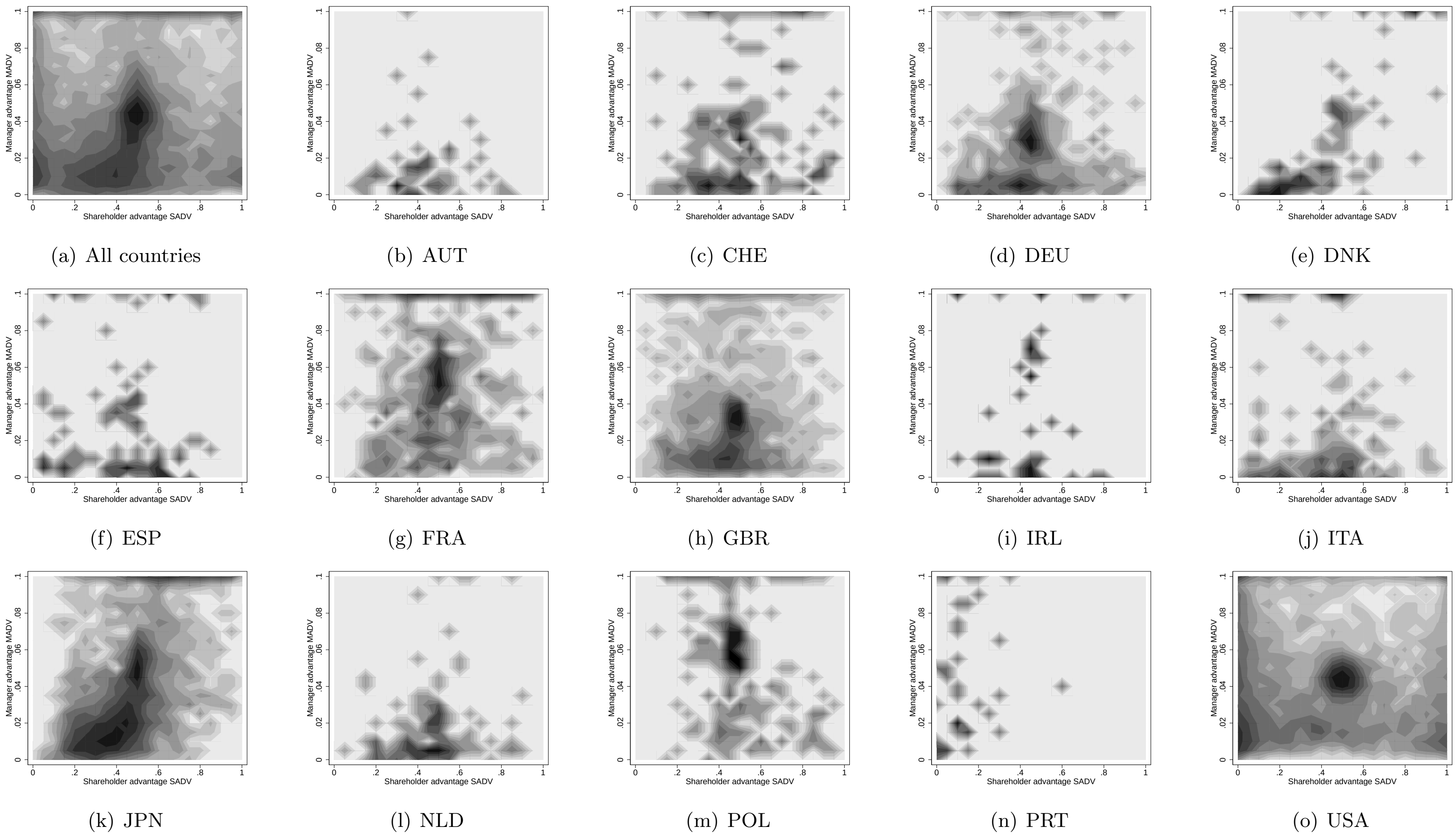


Figure 3
Distribution of control benefits and shareholder renegotiation power across countries

The figure shows the distribution of predicted control benefits MADV, defined as $\mathbb{E}[\phi|\ell;\widehat{\theta}]$, and the predicted shareholders' renegotiation power SADV, defined as $\mathbb{E}[\eta|\ell;\widehat{\theta}]$, across different countries. Darker areas depict higher concentrations of firms.

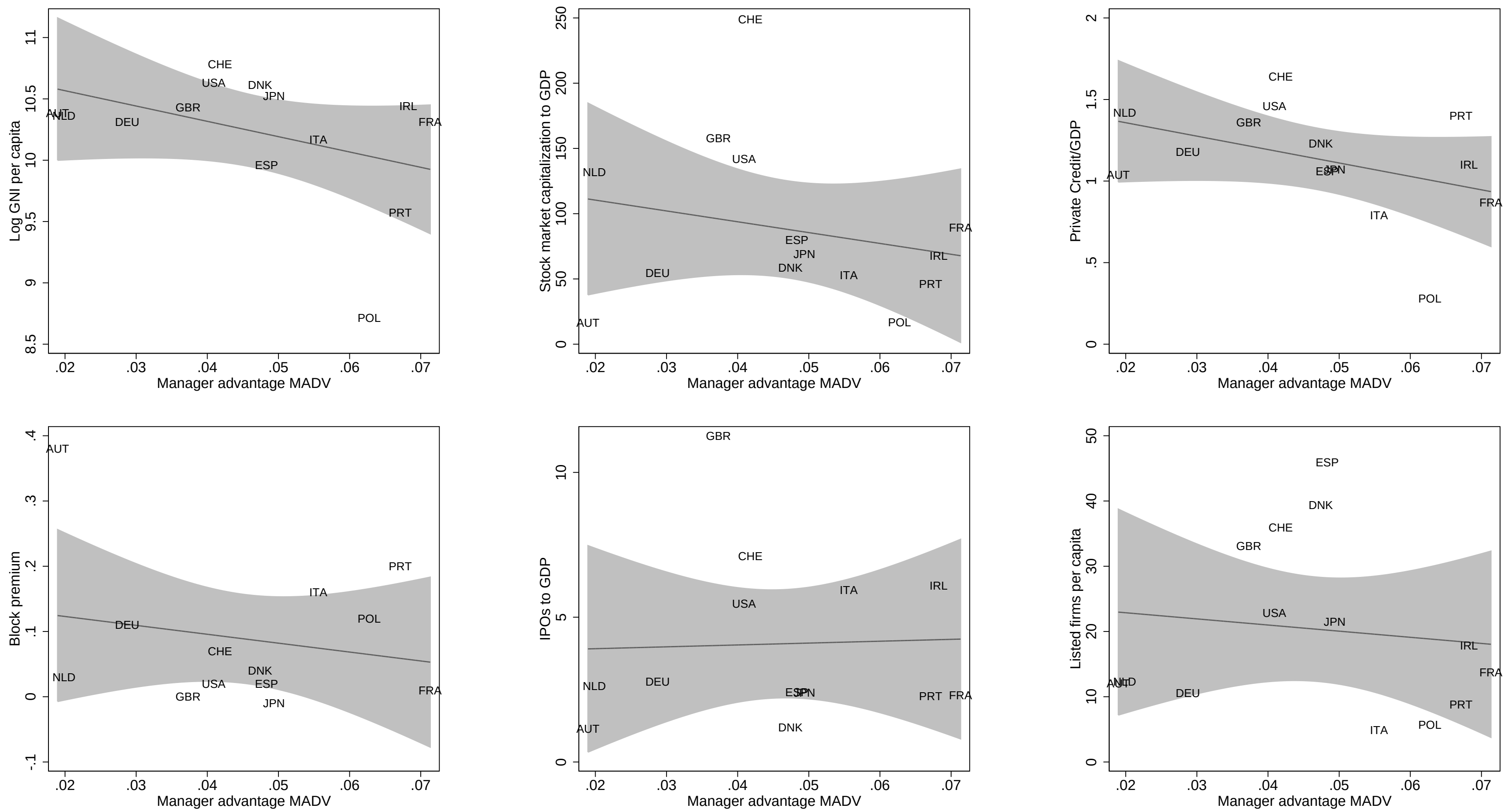


Figure 4

Macro conditions and manager advantage

The figure documents the relation between macro variables and manager advantage. The shaded area depicts the confidence interval obtained from the standard error of the linear prediction.

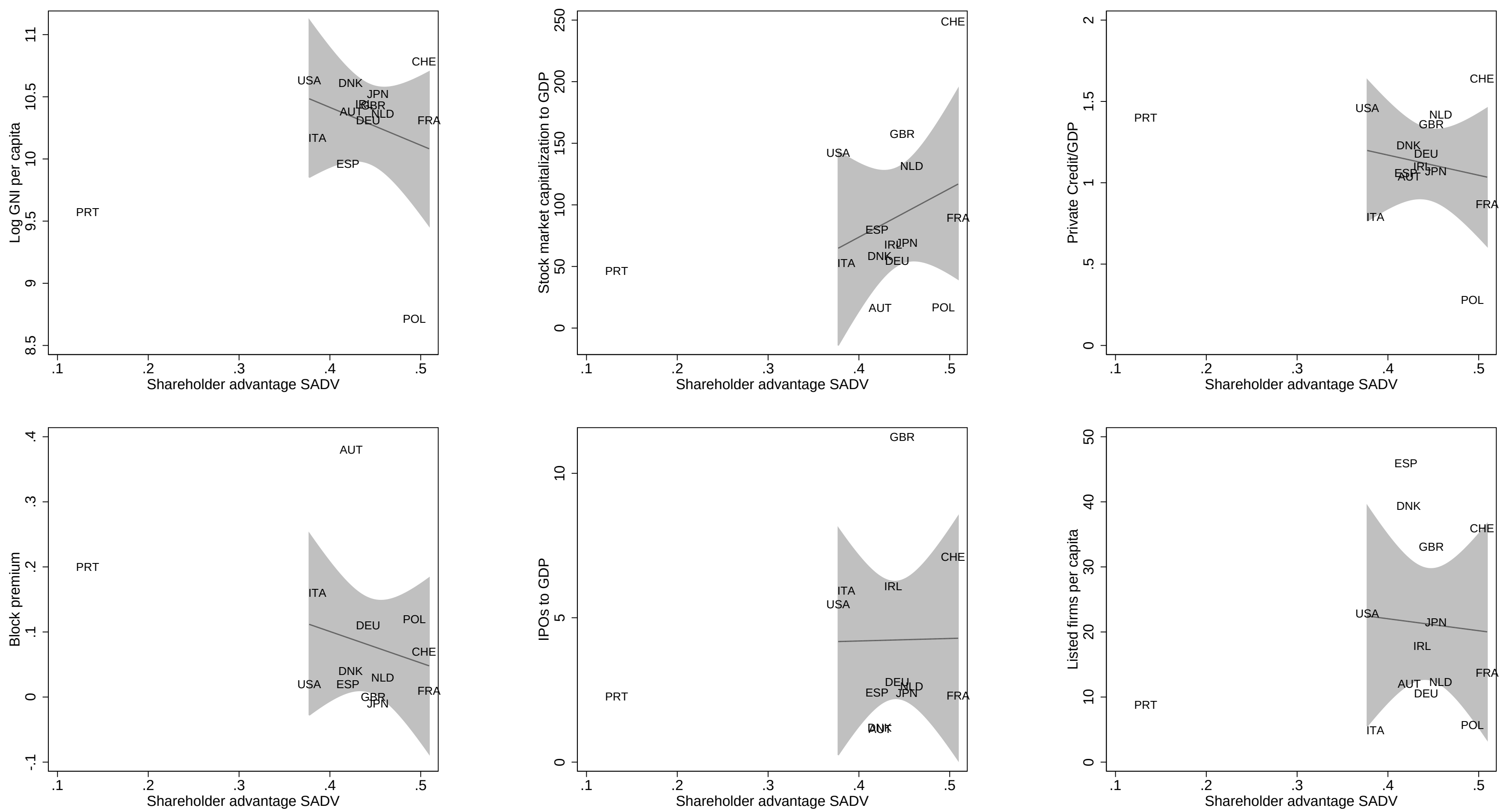


Figure 5
Macro conditions and shareholder advantage

The figure documents the relation between macro variables and shareholder advantage. The shaded area depicts the confidence interval obtained from the standard error of the linear prediction.