Capital Structure: New Evidence from the Ownership Structure*

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ABSTRACT

This paper provides theory and empirical evidence supporting a complementary perspective on capital structure based on corporate ownership structure. According to our ownership view, capital structure is partly determined by the incentives and the goals of those who are in control of the firm. Our results strongly support this view. As a consequence of managerial entrenchment and rent expropriation phenomena, self-interested agents (entrenched managers and controlling owners) chose the capital structure most appropriate for their own best interest. Additionally, we find evidence of an interaction effect between managerial ownership and ownership concentration, in particular, the larger debt increments promoted by outside owners when managers are entrenched.

Since Modigliani and Miller's (1958) paper, capital structure has become a puzzle where the pieces do not fit. In attempting to find answers to some of the unresolved questions, we provide a complementary perspective on capital structure, which we call the ownership view of capital structure. Our view is that a firm’s ownership structure can help explain the choice between debt and equity. The idea is that the capital structure choice depends on who is in control of the firm. As a result, the relationship between capital and ownership structure is not straightforward.

Following this view, the aim of this paper is to analyze the role of ownership in explaining a firm’s capital structure. To achieve this aim, we have chosen a sample of Spanish companies. The analysis of ownership and capital structures in Spain is an interesting case study because Spain is a civil-law country and, according to La Porta et al. (1998), Spanish investor protection is weaker than that of their U.S. counterparts. Furthermore, as La Porta et al. (1999) point out,

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the risk of expropriation of minority shareholders is greater in countries with weaker investor protection. Actually, Miguel et al. (2004) find a link between corporate ownership structure and performance consistent with the proposition that Spanish controlling owners manage to expropriate rents from minority ones.

Our findings reveal that managerial ownership does not affect debt when the interests of managers and owners are aligned. However, when managers are entrenched, they reduce the level of debt to avoid its disciplinary role and limit the risk they bear. In contrast, we find that ownership concentration encourages debt financing, although debt is less used when controlling owners manage to expropriate rents from minority shareholders. Additionally, we provide some interesting results concerning the interaction between managerial ownership and ownership concentration, which has not been examined in earlier studies. Our results reveal that the relationship between managerial ownership and debt is not affected by the level of ownership concentration. In fact, when entrenched managers are in control, the monitoring role of outside owners is totally ineffective. In contrast, the relationship between ownership concentration and debt is affected by managerial ownership phenomena; specifically, the debt increments promoted by outside owners are larger when managers are entrenched.

The remainder of this paper is organized as follows. Section I presents the ownership view of capital structure, which includes our hypotheses as well as empirical specifications of the model. The research methods are described in Section II, including data and econometric methods. Finally, Section III presents our results, and Section IV highlights our conclusions.

I. THE OWNERSHIP VIEW OF CAPITAL STRUCTURE

Capital structure is not only the result of the various financial characteristics of the firm; it is also determined by the decision-makers’ choice. Both managers and significant outside owners exert a major influence on decision-making in the firm and, consequently, on financing decisions.

To investigate whether or not the structure of a firm’s ownership has a significant impact on leverage, we first specify a basic model of capital structure that is then extended to test our hypotheses.

A. Empirical specification of the model

Our basic model of capital structure is

\[ D_{it} = \beta_0 + \sum_{k=1}^{5} \beta_k X_k + \eta_i + \theta_j + d_t + v_{it} \]  

(1)
where $X_k$ is a vector of the independent variables including lagged debt ($D_{i,t-1}$), nondebt tax shields ($NTDS_{it}$), probability of financial distress ($PFD_{it}$), profitability ($PROF_{it}$), and size ($S_{it}$). Note that $v_{it}$ is the random disturbance.

Besides these financial characteristics, we also control for strategic issues by modeling them as latent variables (see Rumelt 1991). We follow the proposal by Mauri and Michaels (1998) that both the industry and firm effects should be considered in determining the core strategy. Therefore, $\eta_i$ is a term that captures the individual latent variables for each firm ($i=1, \ldots, 135$), and $\theta_j$ is a term that captures the industry latent attributes shared by members of the same industry ($j=1, \ldots, 10$). Finally, we also enter the $d_t$ term, capturing the temporal latent effect into our model so that we control for the effect of macroeconomic variables on capital structure.

In our basic capital structure model $b_1 = (1/l)$, where $l$ is the speed of adjustment. Therefore, the coefficient of the lagged debt ratio should take values ranging from 0 to 1. Note that the highest value of $l$ is 1, which means that firms automatically adjust their debt level to the target debt level, and its lowest value is 0, which implies that firms do not adjust their debt level. Additionally, according to capital structure theories, the nondebt tax shield variable is expected to be negatively related to debt ($b_2 < 0$), because it is a substitute for the tax benefits of debt. The relationship between leverage and probability of financial distress is expected to be negative ($b_3 < 0$), in that the higher the probability of financial distress, the lower the debt level. We expect a negative relationship between debt and profitability ($b_4 < 0$), the latter capturing the asymmetric information and agency issues. This negative relation is due to the higher costs of debt as compared with internally generated funds because of the agency conflicts between shareholders and bondholders, which are facilitated by the existence of asymmetric information. Finally, size is a control variable in our study.

### B. Hypotheses

According to Jensen and Meckling (1976), the natural tendency of managers is to make decisions in their own best interests, which may conflict with those of outsiders. Given the risk of nondiversification of their personal wealth, self-interested managers are encouraged to reduce their firms’ debt to a level that is below the level of value maximization. However, as managerial equity ownership increases, the conflicts between managers and shareholders are likely to be resolved (Jensen and Meckling 1976) and consequently, the incentives of managers to lower debt diminish. On the basis of this convergence-of-interest effect, our first hypothesis states:

**Hypothesis 1:** Higher levels of managerial ownership lead to higher debt levels.

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1 An exact definition of all variables used in this study can be found in the Appendix A.
2 The companies in the sample are allocated to 10 subsectors according to their main product. The sample distribution by subsector classification is available from the authors upon request.
On the other hand, because dispersion creates free-riding problems and makes manager monitoring difficult, a concentrated ownership is considered to reduce the scope of managerial opportunism (Shleifer and Vishny 1986). Accordingly, when there is monitoring by large shareholders, managers will not be able to adjust leverage to their own interests, and the debt ratio will be higher than when ownership is dispersed. Consistent with this monitoring effect, we propose our second hypothesis:

**Hypothesis 2:** Higher levels of ownership concentration lead to higher debt levels.

Equation (1) can be easily extended to test Hypotheses 1 and 2. To consider the effect of managerial ownership and ownership concentration on debt, we introduce both variables, $MO_{it}$ and $OC_{it}$, into Equation (1). The resultant model is as follows:

$$D_{it} = \beta_0 + \sum_{k=1}^{5} \beta_k X_k + \beta_6 MO_{it} + \beta_7 OC_{it} + \eta_i + \theta_j + \delta_t + \nu_{it}. \tag{2}$$

Hypothesis 1 predicts that $\beta_6 > 0$, and according to Hypothesis 2, $\beta_7 > 0$.

The relation between ownership structure and corporate debt may be more complex than the one described above. The literature widely supports the view that both managerial ownership (as a consequence of convergence-of-interest and entrenchment effects) and ownership concentration (as a result of monitoring and expropriation effects) have a nonlinear influence on the scope of the firm’s agency costs and are thus nonlinearly related to firm value (see, e.g., Morck et al. 1988 and, more recently, Miguel et al. 2004). This nonlinearity of ownership with respect to firm value has implications on the previously described relationship between ownership and debt.

At some point, as the level of managerial ownership increases, managers get entrenched. By reducing leverage, entrenched managers avoid taking excessive risks on their large exposure to the firm (Fama 1980), and they also avoid the disciplinary role of debt over the firm’s free cash flow (Jensen 1986). Accordingly, our third hypothesis predicts a shift in the relationship between managerial ownership and debt postulated by Hypothesis 1:

**Hypothesis 3:** Under entrenchment, debt will be negatively affected by managerial ownership.

A further complexity in the relationship between ownership and debt concerns the expropriation phenomenon. A very concentrated ownership creates a conflict between controlling owners and minority shareholders, in that the former can expropriate the wealth of the latter. To avoid the disciplinary role of leverage and facilitate expropriation, large shareholders are expected to promote lower debt levels than would otherwise be the case.
Therefore, the positive relationship between ownership concentration and debt proposed by Hypothesis 2 is expected to weaken when the expropriation of minority owners is feasible. Accordingly,

**Hypothesis 4:** Under expropriation, the positive relationship between ownership concentration and debt will be weaker than if there were no controlling owners in the firm.

To test Hypotheses 3 and 4, we expand on the results in Miguel et al. (2004), and we account for the nonlinearities in the relationship between ownership structure and value in our model. Miguel et al. (2004) use the same sample of Spanish companies to estimate two value models and derive the breakpoints that allow them to distinguish between convergence of interests versus entrenchment and monitoring versus expropriation. Particularly, two breakpoints (0.35 and 0.70) are found in the managerial ownership-value model, pointing out that Spanish managers get entrenched when their ownership ranges from 35% to 70%. On the other hand, only one breakpoint (0.87) is obtained in the ownership concentration-value model, indicating that expropriation of Spanish minority shareholders exists when the level of ownership concentration increases beyond 87%.

To enter these nonlinearities into our model we construct two dummy variables. The first one is called managerial ownership dummy \((MOD_{it})\), which takes value 0 when the level of managerial ownership is below 35% or above 70% (i.e., when there is a convergence of interests between managers and shareholders), and value 1 otherwise (i.e., when managerial ownership ranges from 35% to 70% and, consequently, managers are entrenched). We call the second dummy variable ownership concentration dummy \((OCD_{it})\), which equals 0 when ownership concentration is below 87% (i.e., when there is monitoring by large shareholders), and 1 otherwise (i.e., when ownership concentration is equal to or above 87% and, consequently, controlling owners manage to expropriate the wealth of minority owners). As a result, the expanded model of capital structure is

\[
D_{it} = \beta_0 + \sum_{k=1}^{5} \beta_k X_k + (\beta_6 + \alpha_1 MOD_{it}) MO_{it} + (\beta_7 + \alpha_2 OCD_{it}) OC_{it} + \eta_i + \theta_j + d_t + u_{it}.
\]  

(3)

According to Hypothesis 3, managerial ownership negatively affects a firm’s leverage when managers are entrenched (i.e., when \(MOD_{it}\) takes value 1), that is, \((\beta_6 + \alpha_1) < 0\). The coefficient of managerial ownership when there is convergence of interests between managers and shareholders is \(\beta_6\) (because \(MOD_{it}\) takes value 0), which will remain positive according to Hypothesis 1. Similarly, the effect of ownership concentration on debt when controlling owners expropriate the wealth of minority owners is captured by \(\beta_7 + \alpha_2\) (because \(OCD_{it}\) takes value 1),
which according to Hypothesis 4 will be positive, although smaller than the coefficient when there is monitoring by large shareholders, $\beta_7$.

Finally, the relationship between a firm’s ownership and capital structure may be moderated by the interaction between managers and owners. It is worth noting that there is no prior evidence supporting this view, hence providing empirical support for this issue is one of the major contributions of this paper. The arguments above consider separately the effect of managerial ownership and ownership concentration on the capital structure choice. However, it could be the case that certain interactions between them may exist. For instance, when the monitoring effect dominates, higher levels of ownership reduce the scope of managerial opportunism and, consequently, result in higher debt. In this scenario, what is the role played by the firm’s managers? If they have a value-maximizing behavior, the monitoring incentives of outside owners will be complemented by the convergence-of-interest effect. In contrast, in the case of entrenched managers only worried about obtaining private benefits, the interests of outside owners will conflict with this nonvalue maximizing behavior of entrenched managers.

Accordingly, we pose a new hypothesis regarding the relationship between ownership and capital structures:

**Hypothesis 5:** The relationship between ownership and capital structure is moderated by the interaction between managerial ownership and ownership concentration.

The model proposed to test the effect of this interaction is as follows:

$$D_{it} = \beta_0 + \sum_{k=1}^{5} \beta_k X_k + (\beta_6 + \alpha_1 MOD_{it} + \alpha_2 OCD_{it}) MOD_{it}$$

$$+ (\beta_7 + \alpha_3 OCD_{it} + \alpha_4 MOD_{it}) OCD_{it} + \eta_i + \theta_j + d_t + \nu_{it} \quad (4)$$

in which managerial ownership and ownership concentration have been simultaneously interacted with both dummy variables $MOD_{it}$ and $OCD_{it}$. This way, the model allows us to investigate whether the effect of ownership on debt is moderated by the existence of interactions between the different phenomena captured by the different coefficients of the model, as we will explain in Section III.

**II. RESEARCH METHODS**

**A. Data**

As our paper is built on the methods and results reported by Miguel et al. (2004), we use the same database. Therefore, most of the information (balance sheet and ownership data) has been obtained from the CNMV (Spanish Security
Exchange Commission). Data on the market value of the company shares have been extracted from the Daily Bulletin of the MSE (Madrid Stock Exchange).

We have constructed a data panel of nonfinancial-quoted Spanish companies for the period ranging from 1990 to 1999. Therefore, we have obtained an unbalanced panel comprising 135 companies (1233 observations) for which the information is available for at least six consecutive years between 1990 and 1999. According to Arellano and Bond (1991), at least four consecutive years are needed to test for lack of second-order serial correlation when estimating by the generalized method of moments (GMM). In addition, 1 year is needed to eliminate individual heterogeneity by taking first differences of the variables, and one more for computing some variables (such as the replacement value of total assets, see Appendix A). Finally, panel A of Table 1 provides summary statistics (mean and standard deviation) and correlations of the dependent and independent variables in our models. Note that correlation coefficients are moderate and do not violate the assumption of independence between explanatory variables. Panels B and C report the values of the mean, median, and standard deviation of managerial ownership and ownership concentration, respectively, conditional on the values of the ownership dummy variables which interact with them.

Table 1  Descriptive statistics

<table>
<thead>
<tr>
<th>Panel A: Dependent and explanatory variables(^a)</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Dit</td>
<td>0.20056</td>
<td>0.21741</td>
</tr>
<tr>
<td>2. MOit</td>
<td>0.17664</td>
<td>0.23821</td>
</tr>
<tr>
<td>3. OCit</td>
<td>0.64311</td>
<td>0.24155</td>
</tr>
<tr>
<td>4. NDTSh</td>
<td>0.00443</td>
<td>0.061835</td>
</tr>
<tr>
<td>5. PFDit</td>
<td>0.48228</td>
<td>0.38256</td>
</tr>
<tr>
<td>6. PROFit</td>
<td>0.05455</td>
<td>2.63031</td>
</tr>
<tr>
<td>7. Sit</td>
<td>10.582</td>
<td>1.6005</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel B: Managerial ownership(^b)</th>
<th>Mean</th>
<th>Median</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>OCDit=0</td>
<td>0.16845</td>
<td>0.0604</td>
<td>0.20651</td>
</tr>
<tr>
<td>OCDit=1</td>
<td>0.20331</td>
<td>0.01779</td>
<td>0.31945</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel C: Ownership concentration(^c)</th>
<th>Mean</th>
<th>Median</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODit=0</td>
<td>0.63409</td>
<td>0.63892</td>
<td>0.25559</td>
</tr>
<tr>
<td>MODit=1</td>
<td>0.6875</td>
<td>0.66545</td>
<td>0.14725</td>
</tr>
</tbody>
</table>

\(^a\)D\(_{it}\) is the debt ratio, MO\(_{it}\) and OC\(_{it}\) denote managerial ownership and ownership concentration, respectively, NDTSh stands for nondebt tax shields, PFD\(_{it}\) is the probability of financial distress, PROF\(_{it}\) is the profitability, and Sit is the size. For each variable we report the values of the mean and standard deviation, as well as correlation coefficients.

\(^b\)OCD\(_{it}\) is a dummy variable that equals 0 when ownership concentration is below 87\%, and 1 otherwise. The table reports the values of the mean, median and standard deviation of MO\(_{it}\), conditional on OCD\(_{it}\).

\(^c\)MOD\(_{it}\) is a dummy variable which takes value 0 when the level of managerial ownership is below 35\% or above 70\%, and value 1 otherwise. The table reports the values of the mean, median and standard deviation of OC\(_{it}\), conditional on MOD\(_{it}\).
B. Econometric methods

As the individual heterogeneity is quite important in our study because each firm has its own debt policy, we should use the panel data methodology to avoid biased estimations. Additionally, Pindado and de la Torre (2006) document the effect of capital structure on some of the explanatory variables in our analysis (e.g., insider ownership and ownership concentration). As a result, an endogeneity problem arises that we solve by using an instrumental variable method. Specifically, all our models are estimated by using Arellano and Bond's (1991) GMM.

To check for potential misspecification of the models, we used the $m_2$ statistic, which tests for lack of second-order serial correlation in the first-difference residuals. As shown in Table 2, this hypothesis of second-order serial correlation is always rejected for all our models. Furthermore, Sargan's statistic of over-identifying restrictions rejects the existence of correlation between the instruments and the error term in all models. Finally, Table 2 provides three Wald tests, $z_1$, $z_2$, and $z_3$, of the joint significance of the reported coefficients and of the time and industry dummy variables, respectively.

III. RESULTS

The results of the GMM estimation of our basic model of capital structure in (1) are provided in the first column of Table 2. All the estimated parameters are statistically significant and of the expected sign. It is worth noting that the coefficient of the lagged debt variable indicates that firms follow an adjustment pattern toward target debt levels and that transaction costs create a delay in this adjustment. The speed of this adjustment is above 0.5 ($\lambda=0.44183=0.55817$).

As shown in the second column of Table 2, the results for the variables in the basic model remain practically identical once the ownership variables, $MO_{it}$ and $OC_{it}$, are included in (2). The lack of significance of the coefficient of managerial ownership does not corroborate the convergence-of-interest effect predicted in Hypothesis 1. This result adds new evidence on this topic in that it points out that this relation is neither positive (see, for instance, Agrawal and Mandelker 1987) nor negative (Friend and Lang 1988). In contrast, the positive and significant coefficient of ownership concentration supports Hypothesis 2, according to which, outside owners play an active monitoring role and seek to control managerial discretion through higher debt ratios. This evidence suggests that, as Noriyuki (2000) and Nobuyuki (2002) point out, increments in leverage reduce managers' opportunism.

The third column of Table 2 reports the estimation of the extended model in (3) that allows us to test Hypotheses 3 and 4. Table 3 summarizes the main results to calculate the coefficients of the ownership variables according to the phenomena captured by the dummy variables.

As can be seen in panel A of Table 3, the parameter of managerial ownership when managers are in convergence of interests remains nonsignificant, whereas
<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Constant</strong></td>
<td>-0.06245 (0.00802)</td>
<td>-0.05473 (0.00446)</td>
<td>-0.05548 (0.00547)</td>
<td>-0.05836 (0.00641)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Di,t/C0</strong></td>
<td>0.44183 (0.01429)</td>
<td>0.41381 (0.00672)</td>
<td>0.41207 (0.00984)</td>
<td>0.39630 (0.01289)</td>
</tr>
<tr>
<td><strong>NDTSit/C0</strong></td>
<td>-0.09266 (0.03053)</td>
<td>-0.09194 (0.01793)</td>
<td>-0.18269 (0.03265)</td>
<td>-0.19975 (0.03153)</td>
</tr>
<tr>
<td><strong>PFDit/C0</strong></td>
<td>-0.10213 (0.01405)</td>
<td>-0.13436 (0.00738)</td>
<td>-0.10534 (0.01653)</td>
<td>-0.12302 (0.01766)</td>
</tr>
<tr>
<td><strong>PROFit/C0</strong></td>
<td>0.00357 (0.00097)</td>
<td>0.16345 (0.00375)</td>
<td>0.16855 (0.00615)</td>
<td>0.16249 (0.00655)</td>
</tr>
<tr>
<td><strong>Sit/C0</strong></td>
<td>0.15893 (0.00462)</td>
<td>0.16345 (0.00375)</td>
<td>0.16855 (0.00615)</td>
<td>0.16249 (0.00655)</td>
</tr>
<tr>
<td><strong>MOit/C0</strong></td>
<td>0.01762 (0.01584)</td>
<td>-0.01339 (0.02466)</td>
<td>-0.00447 (0.00999)</td>
<td>0.00488 (0.00099)</td>
</tr>
<tr>
<td><strong>MODit/C0</strong></td>
<td>0.05316 (0.05267)</td>
<td>-0.05316** (0.05267)</td>
<td>-0.32904 (0.09145)</td>
<td>-0.32904 (0.09145)</td>
</tr>
<tr>
<td><strong>OCIt/C0</strong></td>
<td>0.12573 (0.01931)</td>
<td>0.22219 (0.03763)</td>
<td>0.26842 (0.04380)</td>
<td>0.26842 (0.04380)</td>
</tr>
<tr>
<td><strong>OCDit/C0</strong></td>
<td>-0.1019 (0.01714)</td>
<td>-0.10191 (0.01714)</td>
<td>-0.16166 (0.01639)</td>
<td>-0.16166 (0.01639)</td>
</tr>
<tr>
<td><strong>OCItMODit/C0</strong></td>
<td>0.2070 (0.0655)</td>
<td>0.20706 (0.0655)</td>
<td>0.20706 (0.0655)</td>
<td>0.20706 (0.0655)</td>
</tr>
</tbody>
</table>

The regressions are performed by using the panel described in Table 1. **MODit** takes the value 0 when the level of managerial ownership is below 35% or above 70% and the value 1 otherwise; **OCIt** equals 0 when ownership concentration is below 87%, and 1 otherwise. The remaining variables are defined in Table 1. The rest of the information needed to read this table is (i) Heteroskedasticity consistent asymptotic standard error in parentheses; (ii) *, ** and *** Significance at the 1%, 5% and 10% levels, respectively; (iii) **z1** is a Wald test of the joint significance of the reported coefficients, asymptotically distributed as $\chi^2$ under the null of no relationship, degrees of freedom in parentheses; **z2** is a Wald test of the joint significance of the time dummies, asymptotically distributed as $\chi^2$ under the null of no relationship, degrees of freedom in parentheses; **z3** is a Wald test of the joint significance of the industry dummies, asymptotically distributed as $\chi^2$ under the null of no relationship, degrees of freedom in parentheses; (iv) **mi** is a serial correlation test of order $i$ using residuals in first differences, asymptotically distributed as $N(0, 1)$ under the null of no serial correlation; (v) **Sargan** is a test of the over-identifying restrictions, asymptotically distributed as $\chi^2$ under the null of no correlation between the instruments and the error term, degrees of freedom in parentheses.
the negative coefficient of managerial ownership when managers are entrenched ($\beta_5 + z_1 = -0.05316$, $\beta_5$ not significantly different from zero) totally confirms Hypothesis 3. Consistent with Douglas (2002), this result points to the entrenched managers’ preference for low debt levels. As panel B shows, Hypothesis 4 is also supported in that the coefficient of ownership concentration when there is expropriation is positive ($\beta_7 + z_2 = 0.12028$, which is statistically significant, see $t_1$) and smaller than the one under monitoring ($\beta_7 = 0.22219$). This evidence confirms that although larger stakes in the firm create incentives to reduce risks, higher debt facilitates expropriation by allowing the controlling owner to dispose of more resources without diluting their stakes.

To study in depth the capital-ownership structure relation, we control for the interaction between managerial ownership and ownership concentration. The results of the estimation of the model in (4) are provided in the fourth column of Table 2, and Table 4 summarizes the coefficients of the ownership variables accounting for the interaction between managerial ownership and ownership concentration.

Panel A of Table 4 shows that the coefficient of managerial ownership when there is convergence of interests between owners and managers remains statistically nonsignificant, regardless of whether outside owners are encouraged to promote value-maximization actions or are only worried about expropriating rents ($z_2$ not significantly different from zero). Supporting Hypothesis 3, the effect of managerial ownership when managers are entrenched remains negative, and of the same magnitude under monitoring as under expropriation ($\beta_6 + z_1 = -0.32904$ and $\beta_6 + z_1 + z_2 = -0.32904$, respectively). Regarding the effect of ownership concentration on debt, our results show that managerial ownership plays a slight moderating role. On the one hand, the evidence from the extended model in (3) holds, confirming Hypotheses 2 and 4, because ownership concentration positively affects leverage, and its coefficient is larger under monitoring than under expropriation (see coefficients in panel B of Table 4). On the other hand, the debt

Table 3 Coefficients of ownership variables considering the nonlinearities of ownership with respect to firm value

<table>
<thead>
<tr>
<th>Value of dummy variable</th>
<th>Parameter</th>
<th>$t$-value of linear restriction test</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel A: Coefficients of managerial ownership</td>
<td>In case of convergence $MOD_{it}=0$</td>
<td>$\beta_6$</td>
<td>Test not needed</td>
</tr>
<tr>
<td>In case of entrenchment $MOD_{it}=1$</td>
<td>$\beta_6 + z_1$</td>
<td>Test not needed</td>
<td>0.0000–0.05316= −0.05316</td>
</tr>
<tr>
<td>Panel B: Coefficients of ownership concentration</td>
<td>In case of monitoring $OCD_{it}=0$</td>
<td>$\beta_7$</td>
<td>Test not needed</td>
</tr>
<tr>
<td>In case of expropriation $OCD_{it}=1$</td>
<td>$\beta_7 + z_2$</td>
<td>$t_1=4.152 $</td>
<td>0.22219–0.10191= 0.12028</td>
</tr>
</tbody>
</table>
increments promoted by outside owners are larger when managers are entrenched ($\beta_7 + \alpha_1 = 0.47548$ and $\beta_7 + \alpha_1 + \alpha_2 = 0.31382$, which are both statistically significant, see $t_2$ and $t_4$, respectively) as compared with those under convergence of interests ($\beta_7 = 0.26842$ and $\beta_7 + \alpha_3 = 0.10676$, which are both statistically significant, see $t_3$ for the last one). The coefficients of the remaining variables in the model remain significant and of the expected sign. Overall, these results corroborate those of the extended model in (3) and provide partial support to Hypothesis 5, which predicts that managerial ownership and ownership concentration interact.

### IV. CONCLUSIONS

In this study, we reach several interesting conclusions that help to explain the capital structure puzzle. In fact, the ownership view of capital structure plays a complementary role to the financial and strategy perspectives in explaining capital structure. First, the relationship between capital and ownership structure is not as simplistic as has often been considered in the literature, because capital
structure is partly determined by the decision-makers’ choice and, conse-
quently, by the incentives and goals of those who are in control of the firm. On
the one hand, a firm’s debt ratio decreases as managerial ownership rises when
managers are entrenched. Thus, when the decision-making process is under the
control of entrenched managers, debt decreases will be promoted to avoid
taking excessive risks and, at the same time, avoid the disciplinary role of debt
over the use of the firm’s free cash flow. On the other hand, ownership
concentration encourages debt financing even when controlling owners have
the ability to expropriate rents from minority shareholders, which confirms
that debt facilitates expropriation by allowing the controlling owners to dispose
of more resources without diluting their stakes.

Second, our study contributes to understanding the capital structure choice
by analyzing the interaction between managerial ownership and ownership
concentration. This connection has not been examined in previous studies, and
our findings partially support its relevance for the choice between debt and
equity. The level of ownership concentration does not moderate the relation-
ship between managerial ownership and debt and – what is more interesting –
when entrenched managers are in control of the decision-making process, the
monitoring role of outside owners is totally ineffective. Additionally, the debt
increments promoted by outside owners are larger when managers are
entrenched, which suggests that when ownership concentration increases and
consequently, outside owners’ influence over the decision-making process
strengthens, higher debt is used as a mechanism to restrain the opportunistic
behavior of entrenched managers.

Overall, this study provides new evidence on capital structure by emphasiz-
ing the decision-makers’ choice and the way in which this choice is affected by
their stakes in the firm. Our findings confirm that self-interested agents
(entrenched managers and controlling outside owners) play a major role in the
capital structure decision by adjusting the firm’s debt ratios to their own best
interests. Our findings from the ownership view thus open an additional path
to better fit together the pieces of the capital structure puzzle.

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**APPENDIX A**

*Debt ratio:* $D_t$ is the ratio between the market value of long-term debt and the market value of equity plus the market value of long-term debt, where the market value of long-term debt, $MVLTD_{it}$, is calculated following Miguel and Pindado (2001).

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Insider ownership: IO_it is the percentage of common shares held by managers.
Ownership concentration: OC_it is the percentage of common shares held by shareholders owning more than 5% of outstanding common shares.
Nondebt tax shields: NDTS_{it} is computed following Titman and Wessels (1988). To be exact, we calculate the taxes paid as \( T_{it} = t(EBIT_{it} - IP_{it} - NDTS_{it}) \), where \( EBIT_{it} \) stands for the earnings before interest and taxes, \( IP_{it} \) stands for the interest payable, and \( t \) is the tax rate. Solving the previous equation for \( NDTS_{it} \), we obtain the expression for nondebt tax shields: \( NDTS_{it} = EBIT_{it} - IP_{it} - (T_{it}/t) \).

Probability of financial distress: PFD_{it} is computed following Vicente-Lorente (2001). We improve this measure by using interest payable instead of total equity, because we are interested in measuring the probability of a firm suffering from financial distress, not the probability of the firm filing for bankruptcy. We apply the Chebychev inequality to the earnings before interest and taxes (EBIT),

\[
P[ |EBIT - E(EBIT)| \geq C ] \leq \frac{\sigma^2(EBIT)}{C^2}
\]

where \( E(EBIT) \) is the mean of the earnings before interest and taxes and \( \sigma^2(EBIT) \) is the variance. This expression is analogous to

\[
P[EBIT > E(EBIT) + C] + P[EBIT < E(EBIT) - C] \leq \frac{\sigma^2(EBIT)}{C^2}.
\]

Unlike Vicente-Lorente (2001), we take into account that a financial distress problem only happens in the left tail of the distribution. Therefore, following Hannan and Hanweck (1988), we assume that the distribution is symmetric and obtain the following result:

\[
P[EBIT < E(EBIT) - C] \leq \frac{1}{2} \frac{\sigma^2(EBIT)}{C^2}.
\]

Finally, a financial distress problem arises when EBIT is lower than interest payable (IP). Therefore, if \( C = E(EBIT) - IP \), the probability of financial distress is

\[
P[EBIT < IP] \leq \frac{1}{2} \frac{\sigma^2(EBIT)}{(E(EBIT) - IP)^2}.
\]

Profitability: PROF_{it} is measured as the return on equity.
Size: \( S_{it} \) is computed as the natural log of the replacement value of assets.
Replacement value of assets: \( K_{it} \) is obtained as

\[
K_{it} = RF_{it} + RI_{it} + (TA_{it} - BF_{it} - BI_{it})
\]

where \( RF_{it} \) is the replacement value of tangible fixed assets, \( RI_{it} \) is the replacement value of inventories, \( TA_{it} \) is the book value of total assets, \( BF_{it} \) is the book value of tangible fixed assets, and \( BI_{it} \) is the book value of inventories. The last three data were obtained from the firm’s balance sheet, while the first two were calculated following the formulas described in Miguel and Pindado (2001).