Employee stock ownership and cost of capital: Evidence from the S&P 500

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Abstract
This article investigates whether the presence of employee stock ownership (ESO) is associated with a firm's cost of capital. Based on all of the S&P 500 firms, we find that ESO decreases the overall cost of capital in entities by reducing their cost of debt. In contrast, we find no strong relationship between ESO and the cost of equity. We also show that ESO provides a company with immunity to changes in the cost of capital observed during financial crises. We conclude that external providers of funds associate ESO with a lower financial risk, and that equity investors balance the positive effects of ESO, such as increased employee motivation and commitment, with the negative effects arising from management entrenchment and dilution in property rights. Overall, we show that ESO reduces a firm’s perceived financial risk. Our results also encourage managers to involve their employees in the life of the business by granting them company shares.

KEYWORDS
agency costs, agency theory, cost of capital, employee ownership, financial crises

JEL CLASSIFICATION
C33; G30; M12; M54

1 INTRODUCTION

Numerous internal and external parties are involved in a firm’s activities, including executives, managers, employees, suppliers, the state, and local communities. These actors fall under the term “stakeholders.” Their interconnecting presence indicates the existence of a highly complex environment within which companies operate, especially compared to their simplified legal description. This multifaceted business is becoming more problematic because stakeholders are increasingly appointing active representatives to speak on their behalf to relay their expectations concerning a firm’s goals and their perspective on strategies for achieving them.

This article focuses on one very important stakeholder group: Employees. The active engagement of employees is a necessary condition for business success (Anand, 2017). Kruse, Freeman, and Blasi (2010, p. 6) define shared capitalism as “employment relations where the pay or wealth of workers is directly tied to workplace or firm performance” and Blasi and Kruse (2006) have suggested that shared capitalism reduces the conflicts of interest between employees and employers. In the US, the most common and effective way to share a company’s achievements and profits with its employees is through employee stock ownership (hereafter ESO). ESO is a strategy which consists of offering shares in a company to its employees. This system is often used as a management strategy for corporate finance, but it is also a tool that increases employee welfare and benefits, in turn creating a more committed and motivated staff (Gamble, Culpepper, & Blubaugh, 2002; Kruse et al., 2010; Kruse, Blasi, & Freeman, 2012).
While agency theory focuses mainly on the conflicts of interest between shareholders and executive managers, all corporate agreements have similar agency problems, and the price of shares reflects the monitoring costs brought about by the divergence of interests between a firm’s stakeholders (Clark, 1907). Agency conflicts influence the cost structure of an organization and are reflected in the cost of capital. Barney (1990) has argued that ESO can decrease agency costs as it aligns the interests of investors and employees. Reduced agency costs within the company should lead to a lower cost of capital. ESO could, however, also increase agency costs, given that it accentuates management entrenchment and causes a dilution in property rights.

Using the US companies included in the S&P 500, this article investigates the impact of ESO on the cost of capital. We find that the presence of ESO reduces a firm’s global cost of capital. More precisely, we highlight a significant reduction in the cost of debt, while finding weak evidence indicating that ESO has a favorable impact on the cost of equity. Additional analyses show that the relationship between ESO and the cost of debt is linear, while ESO decreases the cost of equity only for low levels of employee ownership. We also investigate the impact of financial crises on our findings and conclude that ESO grants companies some immunity to changes in the cost of capital that take place during such economic scenarios. Finally, an industry-level analysis indicates that the sectors in which companies operate might have a certain impact on the reported evidence. In conclusion, we find that, overall, firms with higher levels of ESO enjoy easier and cheaper access to capital at any time, which demonstrates that the presence of ESO, in the US, decreases the perceived financial risk of an entity. Accordingly, we conclude that ESO is beneficial to both organizations and their stakeholders.

Our findings contribute to the debate about the potential conflicting effects of ESO on agency costs. Our evidence indicates that external providers of funds associate ESO with a lower financial risk. It also reveals that equity investors balance the positive effects of ESO, stemming from increased employee motivation and commitment to the firm, with the negative effects that arise from management entrenchment and the dilution in property rights. The overall effect is a weak relationship between ESO and the cost of equity, which only produces positive effects for low levels of ESO. Our results encourage managers to involve their employees in the life of the business by granting them company shares. Our findings also bring certain reflections to the attention of managers and shareholders. They clearly highlight that the presence of ESO impacts providers of debt differently than it does providers of equity. Indeed, while the former feel reassured when employees are also shareholders of a company, equity investors seem less comfortable with this scenario. This result should stimulate managers to mitigate possible management entrenchment and dilution in property rights related to ESO to reduce the concerns of equity investors.

The remainder of the paper is organized as follows. Section 2 frames the study in terms of the extant literature and develops the main hypotheses. Section 3 explains the sample selection procedure and describes the methodology. Section 4 discusses the empirical results. Section 5 concludes the paper by highlighting the study’s main implications and limitations.

2 LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The separation between ownership and control potentially creates a conflict of interests between a firm’s shareholders (principals) and its managers (agents; Jensen & Meckling, 1976). This conflict of interests creates agency costs because the principals must bear extra costs to ensure agents run the firm in their best interests. Several remedies to align the interests of managers with those of shareholders have been developed over time; examples include performance-related salaries (e.g., Jensen & Murphy, 1990), stock option plans (e.g., Yermack, 1995), the appointment of independent directors (e.g., Carpenter & Westphal, 2001), the prohibition of CEO duality (e.g., Finkelstein & D’Aveni, 1994), compulsory external audits (e.g., Chow, 1982), and the appointment of board committees (e.g., Collier & Gregory, 1999). The impact of all of these measures on the reduction of agency costs, measured either as superior performance (e.g., Agrawal & Knoeber, 1996), a lower cost of capital (e.g., Kochhar, 1996), or better accounting (i.e., earnings) quality (e.g., Ahmed, Hossain, & Adams, 2006), has been largely investigated and documented.

Another, less extensively investigated tool that firms use both to deal with agency costs and to involve one of their most important stakeholder groups (i.e., their employees) in the life of the business is the implementation of ESO. ESO is a strategy focused on giving out shares in the company to its employees (Kaarsemaker, 2006). Anand (2017) recognized that employee engagement is a necessary condition for business success. Nonetheless, academic research has reported conflicting results for the effect of ESO on agency costs. On the one hand, ESO makes employees an active part of the firm, thus stimulating their commitment, energy, productivity and positive work attitude (Buchko, 1992, 1993; Kruse et al., 2010, 2012; Gamble et al., 2002; Rosen, Klein, &
Young, 1986). It leads to better company performance (Blasi, Conte, & Kruse, 1996), boosts firm productivity and growth, decreases employee turnover and increases employee accountability (Saylor, 2017). ESO is thus seen as a stabilizing power system which fosters performance and ensures long-term sustainability (Boutilier, 2017). On the other hand, ESO may reduce monitoring by intensifying free-riding problems (Blasi & Kruse, 2006). ESO can also cause a decrease in shareholder value (Faley, Mehratra, & Morck, 2006) and an increase in agency costs due to higher management entrenchment (Beatty, 1995; Shivdasan, 1993) and a dilution in property rights (Furubotn & Pejovich, 1974, 1978; Jensen & Meckling, 1979).

Through an impact on agency costs, ESO can influence the cost of capital as well. The impact of different tools to mitigate agency costs on firms’ cost of capital is well documented, while the impact of ESO on the latter is somewhat rare (Aubert et al., 2017). The main reason for this is the peculiarity of this form of ownership, which is not widely observed in the world, and the rather limited availability of data regarding ESO (Aubert et al., 2017). This lack of research is indeed a gap in the extant literature, because employee involvement in day-to-day business practices through share participation is a model that is increasingly observed among firms (Kruse et al., 2010). It is therefore important to understand whether this strategy is effective, not only in motivating employees, but also in granting firms a more favorable cost of capital (Porter & Kramer, 2011).

To the best of our knowledge, few studies have explicitly investigated the impact of ESO on the cost of capital. Aubert et al. (2017) uncovered an inverted U-shaped relationship between ESO, the cost of debt and the weighted-average cost of capital (WACC). They found no evidence that ESO affects the cost of equity. Using a sample of Japanese firms, Barney (1990) argued that ESO reduces agency conflicts, which, consequently, in an efficient capital market, should be reflected by a lower cost of equity. It is worth noting that the French and Japanese contexts are very different from the US context. Indeed, in those institutional settings, agency costs may be naturally higher because of weaker investor protections compared to the US (Leuz, Nanda, & Wysocki, 2003). Accordingly, the findings from these studies cannot be generalized to other institutional settings. Ivanov and Zaima (2011) found that, in the US, the presence of ESO decreases a firm’s WACC through a reduction in the cost of equity. It is worth highlighting, however, that Ivanov and Zaima (2011) did not assess whether or not the level of ESO is consequential; they simply looked at the presence of ESO plans through a dichotomous variable. In addition, they only investigated firms that exhibit ESO through a qualified and defined contribution pension plan, which can create both sample selection bias and generalizability issues. Finally, Ivanov and Zaima (2011) focused on relatively small firms. Barney (1990) argued that, even if ESO is more commonly observed among small and medium entities, such plans are more advanced and developed among large US-listed corporations as a consequence of the privatization of large state-owned companies since the 1980s (Clark & Philippatos, 1998). Given the lack of US-based research centered on large corporations, and because of the double effect that ESO can have on agency costs and, in turn, on the cost of capital of firms, we state our first hypothesis in a null form as follows: 

**HP1:** The level of ESO does not affect a firm’s cost of capital.

Overall, the extant evidence indicates that ESO is effective in aligning the interests of firms with those of their employees (Rosen, Case, & Staubus, 2005), thus increasing the level of firm disclosure and thereby decreasing information asymmetry (Bova, Dou, & Hope, 2015). Accordingly, ESO can be considered a tool that mitigates agency costs (Aubert et al., 2017). However, the positive effect of ESO on agency costs is likely to be observed from certain levels of employee ownership. Indeed, for very low levels of shareholding, employees lack any sense of “shareholder activism” as well as the power, skills or interest to monitor management. Instead, they are merely focused on short-term gains (Mitra & Hossain, 2007) with a negative impact on agency costs. On the other hand, Ginglinger, Megginson, and Waxin (2011) found that ESO is efficient only for a low percentage of outstanding equity because, at high levels of employee shareholdings, some of the negative effects of ESO, such as management entrenchment and dilution in property rights, become more pronounced. Accordingly, we state our second hypothesis as follows: 

**HP2:** There is a nonlinear relationship between the level of ESO and a firm’s cost of capital.

### 3 | RESEARCH METHOD

#### 3.1 | Sample selection

Our sample consists of the nonfinancial companies included in the S&P 500 Index, which covers the 500 largest firms by market capitalization and trading volume, across an 11-year time period, starting from 2001. By choosing to examine US firms, we are able to investigate a context in which ESO is extensively used. Moreover, by using the firms included in the S&P 500, we can investigate large entities that have the most advanced and
developed ESO plans in the US (Clark & Philippatos, 1998). After excluding entities with missing data, our final sample includes 453 unique companies and 4,251 firm-year observations.1

3.2 | Employee stock ownership

ESO is our main independent variable and is defined as the percentage of company shares owned by non-executive employees in relation to the overall amount of company stocks (Blasi et al., 1996; Gamble, 2000; Ginglinger et al., 2011). We collected this information using a variety of sources which report the distribution of stock ownership within firms (e.g., from 5,500 pension plan reports and SEC filings), as well as company announcements and news reports.

3.3 | Estimation of the cost of capital

We investigated the cost of capital using the cost of debt, the cost of equity, and a combination of the two expressed by the WACC.

Using Bloomberg, we retrieved the cost of debt which is calculated using the effective rate that a company pays on its debt and is computed using the following formula2:

\[
\text{CoD} = \left( \frac{\text{Short-term debt}}{\text{Total debt}} \right) \times \text{Average rate of treasury notes} + \left( \frac{\text{Long-term debt}}{\text{Total debt}} \right) \times \text{Treasury bond rate} \times (1 - \text{Tax rate})
\]

Bloomberg provided us also with the cost of equity, computed using the capital asset pricing model (CAPM) formula:

\[
\text{Re} = r_t + \beta_e \times (r_m - r_t).
\]

In the formula above, \( r_t \) is the risk-free rate, which is equivalent to the 10-year US sovereign bond. The beta (\( \beta_e \)) corresponds to the adjusted beta, which is derived from historical data, but modified by the assumption that a security’s beta moves towards the market average over time. The benchmark used in the calculation of the beta is the S&P 500 index (i.e., the market in which the stock is primarily traded). The risk premium (\( r_m - r_t \)) is calculated as the expected market return minus the risk-free rate. The expected market return is the capital weighted average of the internal rate of return (IRR) for all major index members in the US based on historical and forecasted data. Finally, the WACC is calculated as an average of the cost of debt and the cost of equity, weighted for the financial structure of the entities.

3.4 | ESO and CoC: The model

To analyze the effect of ESO on the cost of capital, the following Model (1) is estimated:

\[
\text{CoC}_{it} = \alpha + \beta_1 \text{ESO}_{it} + \beta_2 \text{LEV}_{it} + \beta_3 \text{SIZE}_{it} + \beta_4 \text{BETA}_{it} + \beta_5 \text{PTB}_{it} + \beta_6 \text{ROA}_{it} + \epsilon_{it}
\]  

Variables are defined in Appendix.

The coefficient \( \beta_1 \) provides evidence with which to test our first hypothesis. In a scenario where the amount of employee shareholding decreases (increases) a firm’s cost of capital, we would expect a significantly negative (positive) coefficient. Indeed, it would indicate that higher levels of ESO are related to a lower (higher) cost of capital.

Our second hypothesis will be investigated by incrementing our Model (1) with the squared term of ESO in accordance with Equation (2):

\[
\text{CoC}_{it} = \alpha + \beta_1 \text{ESO}_{it} + \beta_2 \text{ESO}^2_{it} + \beta_3 \text{LEV}_{it} + \beta_4 \text{SIZE}_{it} + \beta_5 \text{BETA}_{it} + \beta_6 \text{PTB}_{it} + \beta_7 \text{ROA}_{it} + \epsilon_{it}
\]  

Variables are defined in Appendix.

The sign and significance of \( \beta_1 \) and \( \beta_2 \) provide evidence of the existence of a nonlinear relationship between the cost of capital and employee ownership. If both \( \beta_1 \) and \( \beta_2 \) are significant, this would indicate the presence of a non-linear relationship between the cost of capital and the level of ESO. More precisely, a negative (positive) \( \beta_1 \) and a positive (negative) \( \beta_2 \) would be evidence of a U-shaped (inverted U-shaped) relationship between ESO and firms’ cost of capital.

A set of control variables is also included in the regression to control for other firm-level factors which can influence a company’s cost of capital. In line with Mangena, Li, and Tauriringana (2016), we control for company leverage, price-to-book ratio, size, and beta. We expect firm size to be negatively related to the cost of capital (Botosan, 1997; Francis, LaFond, Olsson, & Schipper, 2005), as well as the price-to-book ratio (Botosan, Plumlee, & Xie, 2004; Gietzmann & Ireland, 2005). We also expect market risk and financial leverage (Botosan, 1997; Easton, 2004) to be positively associated with the cost of capital.3
The control variables are included in our models gradually. More precisely, the models will be estimated by both excluding and including PTB and ROA to take into account the risk that some of the effects of ESO, in terms of lower agency costs, might be captured by these two variables, thereby misleading the reported inference (Guedri & Hollandts, 2008).

Given the presence of panel data, we use an estimation model that controls for time-invariant omitted variables that might bias observed relationships. More precisely, in line with Aubert et al. (2017), we use the Blundell and Bond (1998) system—that is, generalized method of moments (GMM) regressions. This method simultaneously estimates the models with first differences. It also levels and instruments the endogenous variables with lagged variables in terms of levels and first differences. It uses lagged values of the dependent variable as an additional independent variable (Aubert et al., 2017).

4 | RESULTS AND DISCUSSION

4.1 | Descriptive statistics and univariate analyses

Exhibit 1 presents the descriptive statistics for the variables used in the study.

They indicate that employees own, on average, 1.4% of shares of the companies included in the S&P 500. The cost of equity is much larger than the cost of debt and, on average, firms prefer debt to equity, given the average leverage ratio of 58%. Firms have an average profitability, measured by ROA, of 6%.

The correlation matrix is given in Exhibit 2.

This indicates that the level of ESO is negatively correlated with the cost of equity and the WACC. ESO is positively correlated with leverage and size, but negatively correlated with companies’ beta and ROA. ESO is not significantly correlated with the price-to-book ratio. It is worth noting, however, that because of the multiple correlations between the variables used in our models, only a multivariate analysis can provide statistically reliable evidence to test the proposed hypotheses.

4.2 | Multivariate analyses

Exhibit 3 reports on the estimation of Model (1) to gather evidence for HP1.

Columns A and B of Exhibit 2 use the WACC as the dependent variable. The coefficient $\beta_1$ is negative and significant at the 1% level for both the restricted and full models. This is evidence that the overall cost of capital decreases when the level of ESO increases, thus suggesting that the presence of ESO lowers the financial risk of a firm.

Columns C and D focus on the cost of debt. In line with the evidence provided for the WACC, the coefficient $\beta_1$ is negative and significant at the 1% level for both the restricted and full models. This suggests that the presence of ESO reduces the costs charged to a firm by external providers of funds.

Finally, Columns E and F investigate the impact of ESO on the cost of equity. The coefficient $\beta_1$ is not significant, for both the restricted model and the full model. It appears that the level of ESO does not significantly impact the cost of equity; thus the overall reduction in the WACC is driven by the impact that ESO has on the cost of debt. The effect on the cost of equity can be explained by the fact that ESO might cause management entrenchment, which, combined with the dilution in property rights, could concern equity investors. On the

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**EXHIBIT 1** Descriptive statistics

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
<th>First quartile</th>
<th>Third quartile</th>
</tr>
</thead>
<tbody>
<tr>
<td>WACC</td>
<td>4,251</td>
<td>0.091</td>
<td>0.089</td>
<td>0.022</td>
<td>0.074</td>
<td>0.106</td>
</tr>
<tr>
<td>CoD</td>
<td>4,251</td>
<td>0.033</td>
<td>0.035</td>
<td>0.015</td>
<td>0.025</td>
<td>0.042</td>
</tr>
<tr>
<td>CoE</td>
<td>4,251</td>
<td>0.106</td>
<td>0.103</td>
<td>0.023</td>
<td>0.089</td>
<td>0.120</td>
</tr>
<tr>
<td>ESO</td>
<td>4,251</td>
<td>0.014</td>
<td>0.001</td>
<td>0.027</td>
<td>0.000</td>
<td>0.017</td>
</tr>
<tr>
<td>LEV</td>
<td>4,251</td>
<td>0.580</td>
<td>0.584</td>
<td>0.198</td>
<td>0.444</td>
<td>0.722</td>
</tr>
<tr>
<td>BETA</td>
<td>4,251</td>
<td>1.038</td>
<td>0.99</td>
<td>0.334</td>
<td>0.810</td>
<td>1.210</td>
</tr>
<tr>
<td>PTB</td>
<td>4,251</td>
<td>0.287</td>
<td>0.154</td>
<td>0.371</td>
<td>0.057</td>
<td>0.346</td>
</tr>
<tr>
<td>ROA</td>
<td>4,251</td>
<td>0.062</td>
<td>0.059</td>
<td>0.063</td>
<td>0.026</td>
<td>0.099</td>
</tr>
</tbody>
</table>

*Note: Variable definition is reported in the Appendix.*
contrary, however, providers of external funds perceive ESO as a factor that mitigates a company’s financial risk.

In relation to the control variables, the price-to-book ratio is associated with a higher cost of debt but a lower cost of equity. The cost of capital is, in general, negatively associated with firm profitability and positively associated with the perceived risk of entities proxied by the beta. Company size is positively associated with the cost of equity but negatively associated with the cost of debt.

Exhibit 4 below investigates HP2. It reports on the estimation of Model (2) to analyze whether or not there is any non-linear relationship between ESO and a firm’s cost of capital.

Following the same structure as Exhibit 3, Columns A and B focus on the WACC. In both columns, the coefficient $\beta_1$ is negative and significant at the 1% level, while the coefficient $\beta_2$ is not significant. This result suggests that the WACC of US entities is negatively related to ESO and that this relationship is linear.

Columns C and D use the cost of debt as the dependent variable. The evidence is consistent between the full and restricted models. The coefficient $\beta_1$ is not significant, while the coefficient $\beta_2$ is negative and

EXHIBIT 2  Pearson correlation matrix

<table>
<thead>
<tr>
<th></th>
<th>WACC</th>
<th>CoD</th>
<th>CoE</th>
<th>ESO</th>
<th>LEV</th>
<th>SIZE</th>
<th>BETA</th>
<th>PTB</th>
<th>ROA</th>
</tr>
</thead>
<tbody>
<tr>
<td>WACC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CoD</td>
<td>−0.088***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CoE</td>
<td>0.712***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESO</td>
<td>−0.204***</td>
<td>0.009</td>
<td>−0.075***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEV</td>
<td>−0.527***</td>
<td>0.216***</td>
<td>−0.096***</td>
<td>0.216***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIZE</td>
<td>−0.341***</td>
<td>−0.033**</td>
<td>−0.018</td>
<td>0.126***</td>
<td>0.403***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BETA</td>
<td>0.669***</td>
<td>0.024</td>
<td>0.869***</td>
<td>−0.081***</td>
<td>−0.124***</td>
<td>−0.085***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PTB</td>
<td>0.064***</td>
<td>0.011</td>
<td>−0.071***</td>
<td>−0.007</td>
<td>−0.096***</td>
<td>−0.456***</td>
<td>−0.047***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROA</td>
<td>0.243***</td>
<td>−0.298***</td>
<td>−0.085***</td>
<td>−0.087***</td>
<td>−0.378***</td>
<td>−0.207***</td>
<td>−0.106***</td>
<td>0.120***</td>
<td></td>
</tr>
</tbody>
</table>

Note: *, **, *** indicate significance at the 0.10, 0.05, and 0.01 level, respectively, two-tailed. Variable definition is reported in the Appendix.

EXHIBIT 3  Employee stock ownership and cost of capital

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>(A) WACC</th>
<th>(B) WACC</th>
<th>(C) CoD</th>
<th>(D) CoD</th>
<th>(E) CoE</th>
<th>(F) CoE</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTERCEPT</td>
<td>0.053***</td>
<td>(0.000)</td>
<td>−0.064***</td>
<td>(0.000)</td>
<td>0.091***</td>
<td>(0.000)</td>
</tr>
<tr>
<td>L.WACC</td>
<td>0.204***</td>
<td>(0.000)</td>
<td>0.198***</td>
<td>(0.000)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L.CoD</td>
<td></td>
<td></td>
<td>0.373***</td>
<td>(0.000)</td>
<td>0.371***</td>
<td>(0.000)</td>
</tr>
<tr>
<td>ESO</td>
<td>−0.123***</td>
<td>(0.000)</td>
<td>−0.118***</td>
<td>(0.000)</td>
<td>−0.057***</td>
<td>(0.001)</td>
</tr>
<tr>
<td>LEV</td>
<td>−0.037***</td>
<td>(0.000)</td>
<td>−0.032***</td>
<td>(0.000)</td>
<td>0.002</td>
<td>(0.661)</td>
</tr>
<tr>
<td>SIZE</td>
<td>0.001 (0.307)</td>
<td>0.001 (0.786)</td>
<td>−0.008***</td>
<td>(0.786)</td>
<td>−0.007***</td>
<td>(0.000)</td>
</tr>
<tr>
<td>BETA</td>
<td>0.035***</td>
<td>(0.000)</td>
<td>0.035***</td>
<td>(0.000)</td>
<td>0.003**</td>
<td>(0.026)</td>
</tr>
<tr>
<td>PTB</td>
<td>−0.001 (0.788)</td>
<td></td>
<td></td>
<td></td>
<td>0.009***</td>
<td>(0.000)</td>
</tr>
<tr>
<td>ROA</td>
<td>−0.021***</td>
<td>(0.000)</td>
<td>−0.033***</td>
<td>(0.000)</td>
<td>−0.020***</td>
<td>(0.002)</td>
</tr>
<tr>
<td>Observations</td>
<td>4,251</td>
<td></td>
<td>4,251</td>
<td></td>
<td>4,251</td>
<td></td>
</tr>
<tr>
<td>Number of instruments</td>
<td>70</td>
<td>72</td>
<td>70</td>
<td>72</td>
<td>70</td>
<td>72</td>
</tr>
<tr>
<td>Wald $\chi^2$</td>
<td>1,970.65***</td>
<td>2,002.12***</td>
<td>556.60***</td>
<td>615.87***</td>
<td>2,858.19***</td>
<td>2,622.14***</td>
</tr>
</tbody>
</table>

Note: *, **, *** indicate significance at the 0.10, 0.05, and 0.01 level, respectively, two-tailed. The models are estimated using Blundell and Bond (1998) system GMM regressions. Variable definition is reported in the Appendix. Bold indicates variables of interest.
significant at the 1% level. This indicates that there is no non-linear relationship between ESO and a firm’s cost of debt, and also that the negative relationship highlighted in Exhibit 3 is sharper than a linear one, because the cost of debt decreases exponentially when ESO increases.

Finally, Columns E and F report on the estimation of Model (2) using the cost of equity as the dependent variable. In both columns, the coefficient $\beta_1$ is negative and significant at the 1% level, while the coefficient $\beta_2$ is positive and significant at the 1% level. This result ought to explain the weak/absent relationship between ESO and the cost of equity in Exhibit 3. There is indeed a relationship between such variables, but it is not linear. In fact, the results in Exhibit 4 indicate the presence of a U-shaped relationship between ESO and a firm’s cost of equity. More precisely, the cost of equity decreases when ESO increases up to a certain point, where the path described above is reversed. This evidence should be consistent with the explanation given by Ginglinger et al. (2011), who state that ESO is efficient for a fairly low percentage of outstanding equity, which they set at around 5%, while it does not produce positive effects for high levels of ESO. They justify this result by explaining that equity investors, at high levels of ESO, may give more importance to its negative effects, such as management entrenchment and property rights dilution.5

If we read the results all together, the increase in the cost of equity related to significant levels of ESO is fully compensated by the decrease in the cost of debt, because the overall firm WACC decreases when ESO increases.

Accordingly, there is consistent evidence to show that ESO is beneficial in terms of the cost of capital, which means it is an effective tool mitigating agency problems and companies’ financial risk.

4.3 Additional analyses

4.3.1 Alternative measure for ESO

The measure of ESO used in the main analyses is a continuous variable which reflects the actual level of employee shareholding without any restriction, in accordance with previous studies (e.g., Aubert et al., 2017). It could be argued, however, that it is unlikely that very low levels of ESO may be sufficiently relevant to affect firms’ cost of capital. In accordance with Blasi et al. (1996), we therefore used an alternative estimation of ESO; as an additional test, we created a variable that only captures “significant employee ownership”, defined as employee shareholdings which exceed 5% of equities ($ESO_{5\%}$). This percentage was chosen because it represents what the SEC regards as a major stakeholder (Blasi et al., 1996). The estimation of the models using this alternative measure of ESO is presented in Exhibit 5.

Panel A of Exhibit 5 reports the estimation of Model (1) which investigates the linear relationship between ESO and firms’ cost of capital. The evidence exactly mirrors that of Exhibit 3. Indeed, it consistently indicates that the average cost of capital for firms, as well as their cost of debt, is negatively related to the percentage of

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>(A) WACC</th>
<th>(B) WACC</th>
<th>(C) CoD</th>
<th>(D) CoD</th>
<th>(E) CoE</th>
<th>(F) CoE</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTERCEPT</td>
<td>0.054*** (0.000)</td>
<td>0.054*** (0.000)</td>
<td>0.089*** (0.000)</td>
<td>0.081*** (0.000)</td>
<td>−0.077*** (0.000)</td>
<td>−0.064*** (0.000)</td>
</tr>
<tr>
<td>L.WACC</td>
<td>0.201*** (0.000)</td>
<td>0.195*** (0.000)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L.CoD</td>
<td>0.373*** (0.000)</td>
<td>0.372*** (0.000)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L.CoE</td>
<td></td>
<td></td>
<td>0.062*** (0.000)</td>
<td>0.055*** (0.000)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESO</td>
<td>−0.157*** (0.001)</td>
<td>−0.150*** (0.002)</td>
<td>−0.012 (0.672)</td>
<td>−0.007 (0.814)</td>
<td>−0.095*** (0.009)</td>
<td>−0.131*** (0.001)</td>
</tr>
<tr>
<td>ESO$^2$</td>
<td>0.148 (0.332)</td>
<td>0.146 (0.356)</td>
<td>−0.183** (0.012)</td>
<td>−0.191*** (0.008)</td>
<td>0.302*** (0.003)</td>
<td>0.366*** (0.001)</td>
</tr>
<tr>
<td>Observations</td>
<td>4,251</td>
<td>4,251</td>
<td>4,251</td>
<td>4,251</td>
<td>4,251</td>
<td>4,251</td>
</tr>
<tr>
<td>Number of instruments</td>
<td>71</td>
<td>73</td>
<td>71</td>
<td>73</td>
<td>71</td>
<td>73</td>
</tr>
<tr>
<td>Control variables</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Wald $\chi^2$</td>
<td>1,995.63***</td>
<td>2,027.77***</td>
<td>556.97***</td>
<td>614.12***</td>
<td>2,816.47***</td>
<td>2,568.44***</td>
</tr>
</tbody>
</table>

Note: *, **, *** indicate significance at the 0.10, 0.05, and 0.01 level, respectively, two-tailed. The models are estimated using Blundell and Bond (1998) system GMM regressions. Variable definition is reported in the Appendix. Bold indicates variables of interest.
In line with the main results, we do not find any significant impact of ESO on firms’ cost of equity, even using this alternative proxy for ESO.

Panel B of Exhibit 5 reports on the estimation of Model (2), which investigates potential nonlinear relationships between ESO and firms’ cost of capital. The results, once again, support those presented in the main analyses. Indeed, the sign and the significance of the coefficients associated with ESO5% and ESO5%², in relation to the WACC and to the cost of debt, are identical to those in Exhibit 4. As far as the cost of equity is concerned, we observe a nonsignificant coefficient β₁ and a positive and significant β₂, when we use both the restricted and the full model. This reinforces the evidence from our main analyses indicating that ESO reduces the cost of equity only for a fairly low percentage of outstanding equity. In fact, if we only consider employee shareholdings above 5%, we find that they are already too big to generate benefits in terms of a reduced cost of equity, while the positive and significant β₂ indicates that the cost of equity increases exponentially when ESO (above 5%) increases. This is also in line with Ginglinger et al. (2011), who stated that ESO is efficient for percentage of outstanding equity, which they set at around 5%.

### 4.3.2 The impact of financial crises

The sample period investigated includes financial crises, one at the beginning of the century and the other in 2008. This allows us to assess whether these crises had an impact on the above-documented relationships between ESO and firms’ cost of capital. To carry out this test, we extended Model (1) using a dummy variable, CRISIS, which distinguishes the years of financial crises (2001 and 2008–2011) and those without financial crises.

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>(A) WACC</th>
<th>(B) WACC</th>
<th>(C) CoD</th>
<th>(D) CoD</th>
<th>(E) CoE</th>
<th>(F) CoE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Panel A. Test of linear relationships</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INTERCEPT</td>
<td>0.052*** (0.000)</td>
<td>0.052*** (0.000)</td>
<td>0.090*** (0.000)</td>
<td>0.081*** (0.000)</td>
<td>−0.079*** (0.000)</td>
<td>−0.066*** (0.000)</td>
</tr>
<tr>
<td>L.WACC</td>
<td>0.209*** (0.000)</td>
<td>0.203*** (0.000)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L.CoD</td>
<td>0.373*** (0.000)</td>
<td>0.371*** (0.000)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L.CoE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESO5%</td>
<td>−0.083*** (0.000)</td>
<td>−0.079*** (0.000)</td>
<td>−0.042** (0.018)</td>
<td>−0.039** (0.032)</td>
<td>0.008 (0.591)</td>
<td>−0.006 (0.711)</td>
</tr>
<tr>
<td>Observations</td>
<td>4,251</td>
<td>4,251</td>
<td>4,251</td>
<td>4,251</td>
<td>4,251</td>
<td>4,251</td>
</tr>
<tr>
<td>Number of instruments</td>
<td>70</td>
<td>72</td>
<td>70</td>
<td>72</td>
<td>70</td>
<td>72</td>
</tr>
<tr>
<td>Control variables</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Wald χ²</td>
<td>1,995.13***</td>
<td>2,027.10***</td>
<td>558.91***</td>
<td>614.72***</td>
<td>2,845.78</td>
<td>2,637.63</td>
</tr>
</tbody>
</table>

**Panel B. Test of U-shaped relationships**

| INTERCEPT          | 0.052*** (0.000) | 0.052*** (0.000) | 0.089*** (0.000) | 0.080*** (0.000) | −0.079*** (0.000) | −0.066*** (0.000) |
| L.WACC             | 0.209*** (0.000) | 0.203*** (0.000) | | | | |
| L.CoD              | 0.373*** (0.000) | 0.371*** (0.000) | | | | |
| L.CoE              | | | | | | |
| ESO5%              | −0.074*** (0.006) | −0.070*** (0.009) | 0.001 (0.953) | 0.004 (0.878) | −0.009 (0.702) | −0.031 (0.183) |
| ESO5%²             | −0.040 (0.578) | −0.038 (0.628) | −0.208** (0.001) | −0.207** (0.001) | 0.913* (0.066) | 0.124** (0.011) |
| Observations       | 4,251 | 4,251 | 4,251 | 4,251 | 4,251 | 4,251 |
| Number of instruments | 71   | 73   | 71   | 73   | 71   | 73   |
| Control variables  | Yes | Yes | Yes | Yes | Yes | Yes |
| Wald χ²            | 2,033.68*** | 2,063.40*** | 557.49*** | 614.79*** | 2,942.97*** | 2,715.89*** |

Note: *, **, *** indicate significance at the 0.10, 0.05, and 0.01 level, respectively, two-tailed. The models are estimated using Blundell and Bond (1998) system GMM regressions. Variable definition is reported in the Appendix. Bold indicates variables of interest.

ESO. In line with the main results, we do not find any significant impact of ESO on firms’ cost of equity, even using this alternative proxy for ESO.
The model is expressed by the Equation (3):

\[
\text{CoC}_{it} = \alpha + \beta_1 \text{ESO}_{it} + \beta_2 \text{CRISIS}_{it} + \beta_3 \text{ESO} \times \text{CRISIS}_{it} + \beta_4 \text{LEV}_{it} + \beta_5 \text{SIZE}_{it} + \beta_6 \text{BETA}_{it} + \beta_7 \text{PTB}_{it} + \beta_8 \text{ROA}_{it} + \epsilon_{it} \tag{3}
\]

Variables are defined in Appendix.

The coefficient \( \beta_3 \) represents the marginal effect of ESO during financial crises. If the latter affected the relationship between ESO and the cost of capital, the coefficient would have a significant sign. The estimation of Model (3) is reported in Exhibit 6.

Columns A and B use the WACC as the dependent variable. The results are consistent between the restricted and full models. The coefficient \( \beta_1 \) is negative and significant at the 1% level, suggesting that, during periods without financial crises, the cost of capital is negatively related to the level of ESO. The coefficient \( \beta_2 \) is positive and significant at the 1% level. This shows that, in general, the cost of capital increases during financial crises. However, this increase in the cost of capital is significantly attenuated in the presence of ESO, as indicated by the coefficient \( \beta_3 \), which is negative and significant at the 5% level. More importantly, the sum of \( \beta_1 \) and \( \beta_3 \) is negative and significant at the 1% level, indicating that a firm’s cost of capital is negatively related to the levels of ESO, including during financial crises. This evidence shows that ESO makes the WACC of firms immune to the increases usually observed during financial crises.

Columns C and D focus on the cost of debt. In both columns, the coefficient \( \beta_1 \) is negative and significant at the 1% level, indicating that, in the absence of crises, the cost of debt decreases when the level of ESO increases. The coefficient \( \beta_2 \) is negative and significant at the 1% level. It suggests that, during a financial crisis, the cost of debt generally decreases. This result is usually related to the fact that, during financial crises, central banks decrease interest rates to incentivize investments with the hope of overcoming the negative economic effects of such crises. The coefficient \( \beta_3 \) is positive, but the p-value is above the conventional threshold of the 10% level. This suggests that the marginal effect of a financial crisis on the relationship between ESO and the cost of debt is not significant. However, the sum of \( \beta_1 \) and \( \beta_3 \) is negative but not significant, unless the p-value is considered to be one-tailed. This means that the level of ESO has no effect on the cost of debt during financial crises.

Finally, Columns E and F investigate the impact of financial crises on the cost of equity. The coefficient \( \beta_1 \) is not significant, suggesting that, in the absence of financial crises, the cost of equity is not associated with the ESO level. The coefficient \( \beta_3 \) is positive and significant at the 1% level, indicating a higher cost of equity in general during financial crises. This result is rather intuitive because it indicates that investors, during periods of crises, perceive a higher risk related to firm performance.

### EXHIBIT 6  Employee stock ownership and cost of capital: the impact of financial crises

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>(A) WACC</th>
<th>(B) WACC</th>
<th>(C) CoD</th>
<th>(D) CoD</th>
<th>(E) CoE</th>
<th>(F) CoE</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTERCEPT</td>
<td>0.062*** (0.000)</td>
<td>-0.023*** (0.001)</td>
<td>0.065*** (0.000)</td>
<td>0.050*** (0.000)</td>
<td>-0.033*** (0.000)</td>
<td>0.062*** (0.000)</td>
</tr>
<tr>
<td>L.WACC</td>
<td>0.207*** (0.000)</td>
<td>0.201*** (0.000)</td>
<td>0.322*** (0.000)</td>
<td>0.319*** (0.000)</td>
<td>0.074*** (0.000)</td>
<td>0.201*** (0.000)</td>
</tr>
<tr>
<td>L.CoD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESO</td>
<td>-0.112*** (0.000)</td>
<td>-0.105*** (0.000)</td>
<td>-0.055*** (0.000)</td>
<td>-0.054*** (0.000)</td>
<td>-0.004 (0.864)</td>
<td>-0.020 (0.424)</td>
</tr>
<tr>
<td>CRISIS</td>
<td>0.003*** (0.000)</td>
<td>0.003*** (0.000)</td>
<td>-0.005*** (0.000)</td>
<td>-0.005*** (0.000)</td>
<td>0.008*** (0.000)</td>
<td>0.000*** (0.000)</td>
</tr>
<tr>
<td>ESO × CRISIS</td>
<td>-0.037*** (0.034)</td>
<td>-0.038*** (0.009)</td>
<td>0.025 (0.130)</td>
<td>0.025 (0.123)</td>
<td>-0.022 (0.210)</td>
<td>-0.020 (0.274)</td>
</tr>
<tr>
<td>ESO + ESO × CRISIS</td>
<td>-0.149*** (0.000)</td>
<td>-0.142*** (0.000)</td>
<td>-0.030 (0.124)</td>
<td>-0.029 (0.134)</td>
<td>-0.026 (0.263)</td>
<td>-0.040* (0.087)</td>
</tr>
<tr>
<td>Observations</td>
<td>4,251</td>
<td>4,251</td>
<td>4,251</td>
<td>4,251</td>
<td>4,251</td>
<td>4,251</td>
</tr>
<tr>
<td>Number of instruments</td>
<td>72</td>
<td>74</td>
<td>72</td>
<td>74</td>
<td>72</td>
<td>74</td>
</tr>
<tr>
<td>Control variables</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Wald ( \chi^2 )</td>
<td>2,021.37***</td>
<td>2,040.75***</td>
<td>765.87***</td>
<td>833.56***</td>
<td>4,633.62***</td>
<td>4,171.82***</td>
</tr>
</tbody>
</table>

Note: *, **, *** indicate significance at the 0.10, 0.05, and 0.01 level, respectively, two-tailed. The models are estimated using Blundell and Bond (1998) system GMM regressions. Variable definition is reported in the Appendix. Bold indicates variables of interest.
during such periods, meaning they require a higher return, thus creating a higher cost of equity. The coefficient $\beta_3$ is not significant, suggesting that financial crises do not affect the cost of equity based on firms' level of ESO. However, the sum of $\beta_1$ and $\beta_3$ is negative and significant at the 10% level when we use the full model. This shows that, during financial crises, the cost of equity decreases for companies with higher levels of ESO. Overall, this test is highly important because it confirms that ESO reduces the financial risk of firms, especially during financial crises. Indeed, the level of ESO prevents companies from taking advantage of decreases in the cost of debt during financial crises, but ESO also protects firms from the increases in the cost of equity observed during these situations. The overall effect is that, in any period of time, the level of ESO is associated with a decrease in the overall cost of capital for firms.

4.3.3 Industry-level analysis

The industry in which companies operate affects the relevance of ESO (Kim & Patel, 2017). For example, Wagner III (1994) has suggested that employees may play an important role in information processing among firms operating under higher environmental complexity. Indeed, because ESO plays an important role in aligning the interests of employees and firms, employees have a stronger motivation to pay particular attention to information relevant to their firm in such environments, thus reducing information asymmetry (Shetzer, 1993).

To investigate how and whether the sector in which an entity operates affects the relationship between ESO and the cost of capital, we ran our analyses at the industry level based on the Standard Industrial Classification (SIC) divisions. The results of this analysis (not tabulated for reasons of space) mirror our main evidence in all of the industries investigated with the exception of the construction industry, where we find only the positive association between ESO and cost of equity for high levels of employee shareholding, and the wholesale and retail trade sector, where we do not find significant results.

4.3.4 Endogeneity test

Companies that give shares to their employees may have unique characteristics than those that do not have ESO. Thus, different levels of the cost of capital could be related to these firm-level differences rather than to the level of ESO. To deal with this potential endogeneity problem, all of our models were estimated using a two-stage least squares approach in accordance with the Heckman (1979) procedure. The first step in this procedure is the estimation of a probit model, where the dependent variable is a binary number and the independent variables are the main determinants of the former (Wu & Shen, 2013). In our case, the dependent variable of the first-stage model is an indicator variable which takes 1 for companies that have ESO and 0 otherwise. The independent variables are proxies of firm profitability, sales growth, cash flow, and leverage, because the previous literature found that these aspects of a firm are related to the presence of ESO plans (Guedri & Hollandts, 2008). The Heckman (1979) methodology requires the inclusion of the inverse Mills ratio from the probit equation described above as an additional explanatory variable in our main models. The evidence from the first-stage model (not tabulated for reasons of space) indicates that the presence of ESO is positively related to a firm's size, profitability, cash flow, and growth. The results from the second-stage regressions (not tabulated for reasons of space) confirm the evidence reported in Exhibits 3 and 4.

5 CONCLUSIONS AND IMPLICATIONS

This article investigated the effect of ESO on a firm's cost of capital. Using S&P 500 firms, we find that ESO significantly reduces the overall cost of capital through an impact on the cost of debt. Moreover, we found weak evidence for ESO having a positive effect on the cost of equity, which was observed only for low levels of employee shareholding. Further tests highlighted that ESO makes companies immune to the changes in the cost of capital normally observed during financial crises, and that, in any period of time, the level of ESO is associated with a reduced company WACC. An industry-level analysis revealed that the sectors in which companies operate may have a certain influence on the reported evidence. Taking all of our results together, we conclude that, overall, ESO reduces the perceived financial risk of firms.

Our results have several implications. They contribute to the contrasting debate about the relationship between ESO and agency costs, suggesting that debt holders associate ESO with a lower financial risk. Firm shareholders balance the positive effects that stem from increased employee motivation and commitment with the negative effects that arise from management entrenchment and property rights dilution, which explains the limited impact of ESO on the cost of equity. The findings signal to management and shareholders that the implementation of ESO can benefit the organization. They also
encourage managers to come up with strategies to reduce the concerns of equity investors at significant levels of ESO.

This research is not free from limitations. Given the limited availability of data on ESO, we only focused on S&P 500 firms, which are also the entities with the most advanced and developed ESO plans (Clark & Philippatos, 1998). Our findings may not be generalizable to small firms. Our investigation focuses on one institutional context: the US. This may limit the generalizability of the findings to different settings. Future research should, therefore, test the relationship between ESO and firms' cost of capital in different institutional settings through a matching sample procedure to highlight any differences due to different legal regimes. Other investigations could also take large and small firms into account to examine whether ESO is more or less effective in decreasing the cost of capital depending on firm size.

ACKNOWLEDGMENT
The authors acknowledge the support of the Associate Editor, Angela Pettinicchio, and the extremely helpful comments and insights of an anonymous Reviewer. The authors are also grateful to Joseph Blasi and Douglas Kruse for the access to data about employee stock ownership and to Gregory Moscato for his suggestions.

ENDNOTES
1 The number of total firm-year observations is lower than the number of unique firms multiplied by the number of years investigated, as few firms had data covering the entire time series investigated.
2 The cost of debt is calculated using government bond rates, a debt adjustment factor, the proportions of short- and long-term debt to total debt, and the stock's effective tax rate. The debt adjustment factor represents the average yield above government bonds for a given rating class: the lower the rating, the higher the adjustment factor. A discussion with a representative from the Bloomberg database indicates that the debt adjustment factor is based on the S&P's long-term currency issuer rating. Bloomberg uses their own calculation for the debt adjustment factor (not provided to the public because it is a Bloomberg proprietary calculation) only when this rating is not available for a company. Our cost of debt also considers the change in the credit rating of an entity, over time, because we did not use a static number for it but obtained a punctuated cost of debt for every year included in our time period.
3 Because leverage is also used to calculate the cost of capital, we re-estimated our models without having leverage as a control variable. The evidence reported in the following sections was not affected.
4 We further investigated the positive relationship between cost of equity and firm size and found that this is probably related to an indirect effect of the leverage on the beta of firms, which is used to compute the cost of equity. More specifically, Exhibit 3 shows a very strong correlation coefficient between size and leverage (+0.403), which indicates that larger companies finance their assets with larger portions of debt. Higher leverage translates into higher (leveraged) firm betas. Indeed, if we take the top 10% of firms in our sample in terms of size, their leverage (average = 0.734) is statistically higher, at the 1% level, than the leverage of the other companies (average = 0.566). Accordingly, the beta of such firms (average = 1.047) is statistically higher, at the 1% level, than the beta of smaller entities (average = 1.019). Because this beta used in the CAPM formula for the computation of the cost of equity, the higher beta of such large firms results in a higher cost of equity, ceteris paribus.
5 To double check whether the importance of the level of employee shareholding has a significant impact on the relationship between ESO and the cost of capital, as it is shown by Exhibit 4, we estimated Model (1) separately for firms with ESO below and above the mean of the sample. The results of this test indicate that the WACC and the cost of debt are negatively related to ESO regardless of whether the level of ESO is below or above the mean. Moreover, we find that ESO increases the cost of equity exclusively among entities with ESO above the mean of the sample. This evidence is exactly in line with that reported in Exhibit 4. We thank an anonymous Reviewer for suggesting this test.
6 The SIC divisions are defined as follows: Agriculture, Forestry, and Fishing (SIC Code 0100–0999); Mining (SIC Code 1000–1499); Construction (SIC Code 1500–1799); Manufacturing (SIC Code 2000–3999); Transportation (SIC Code 4000–4799); Communications (SIC Code 4800–4899); Electric, Gas, and Sanitary service (SIC Code 4900–4999); Wholesale and Retail Trade (SIC Code 5000–5999); Real Estate (SIC Code 6000–6799); Services (SIC Code 7000–8999); Public Administration (SIC Code 9100–9729). Given the low number of observations in the Agriculture, Forestry and Fishing sector (12 observations) and in the Public Administration industry (11 observations), they were not included in this analysis.
7 All untabulated tests are available from the authors upon request.
8 In line with the requirements of Heckman's (1979) methodology, not all the independent variables included in the first-stage probit model are control variables in our second-step regressions (Lennox, Francis & Wang, 2012).

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AUTHOR BIOGRAPHIES

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APPENDIX: VARIABLE DEFINITIONS

BETA is the beta of the firm.
CoC is the cost of capital, that is, CoD, CoE, and WACC in turn.
CoD is the effective rate that a company pays on its current debt.
CoE is the stockholders’ required rate of return on their investment in stocks, computed with the capital asset pricing model.
CRISIS is a dummy variable for the years of the financial crisis, more specifically for 2001 and for the years from 2008 to 2011.
ESO is the percentage of shares held by employees.
ESO5% is 0 for any employee shareholding below 5% and the actual percentage of shares held by employees when higher of equal to 5%.
L1.CoD is the lagged cost of debt.
L1.CoE is the lagged cost of equity.
L1.WACC is the lagged average cost of capital.
LEV is total liabilities divided by total assets.
PTB is the price-to-book ratio.
ROA is net income divided total asset.
SIZE is the natural logarithm of the total assets.
WACC is a weighted average of the cost of debt and the cost of equity.