REPORTED LEVELS OF EMPLOYEE SHARE OWNERSHIP AND THE PERFORMANCE OF LISTED COMPANIES IN EUROPE

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Giving employees an ownership stake in their companies is widely believed to be beneficial not only for the employees themselves, but also for the firms concerned (Gates, 1998; Rosen, Case & Staubus, 2005). According to economic theory, these beneficial effects are rooted in the interest alignment between employees and other shareholders, and the resulting reduction in principal-agent problems (e.g., French, 1987; Holmstrom & Milgrom, 1991). However, economists also caution that ESO may have undesirable consequences on the firm level such as the costs associated with adopting and administering an employee share ownership plan (ESOP) (Jones & Kato, 1995).

Empirical research has largely, but not unequivocally, attested to the idea that ESO is good for firm performance (Freeman, 2007; Freeman, Kruse & Blasi, 2010). Freeman et al. (2010) point to considerable variation in the evidence, "with many workplaces having little or no improvement in output or labor productivity" (Freeman et al., 2010, p. 8) upon introducing ESO. In an analysis of French firms, Guedri & Hollandts (2008) find an inverted U-shaped effect of employee ownership on accounting performance, but no significant effect on capital market performance. Their study raises three issues that we seek to address in our paper. First, we investigate whether the potential effects of ESO hold for different dimensions of firm performance, namely accounting performance, capital market performance, and productivity. Second, we seek to provide a more finely-grained analysis of the ESO–performance relationship, by using a spline regression approach that makes far less restrictive assumptions regarding the nature of the relationship than does the quadratic regression methodology employed by Guedri & Hollandts (2008). Third, in our paper we use a large-scale sample of 1115 companies from the five largest European economies, thus allowing us to assess whether the presumed performance effects of ESO are contingent on institutional and socio-economic

conditions in the countries concerned. Overall, our paper is in the spirit of an exploratory analysis that seeks to shed light on potential non-linearities in the effects of ESO on different dimensions of firm performance under different country-level conditions.

The structure of the paper is as follows. In the next section we discuss the theoretical arguments underlying the ESO–firm performance relationship and review the extant empirical evidence. Thereafter, we describe the data used in this study and discuss the measures and methods employed. Finally, we present the results of our analysis and discuss them in light of our theoretical approach. We discuss their implications and sketch the limitations of our study.

REVIEW

Broad-based employee share ownership

Employee share ownership (ESO) refers to situations in which a broad cross-section of employees holds a portion of the ownership rights in the firm employing them. This characteristic distinguishes employee share ownership from other ownership forms, which involve only a limited fraction of the work force, such as partnerships or founder management. Employee participation in ownership is often viewed as normatively preferable to exclusive control of companies by outside shareholders for such reasons as equality or autonomy (Dow, 2003), yet the popular support stands in contrast to the fact that absolute ESO levels in many market-based economies are still fairly low (Boatright, 2004). However, the importance of ESO has increased in recent decades for a variety of reasons; e.g., the increased importance of (investments in) human capital in knowledge-intensive firms (e.g., Robinson & Zhang, 2005).

Employee share ownership and firm performance

The economics literature has analyzed the effects of employee share ownership primarily in terms of a device for alleviating principal-agent problems between workers and

shareholders (Holmstrom & Milgrom, 1991). Principal-agent theory suggests that the interests of shareholders (principals) and employees (agents) may differ (e.g., Conte & Svejnar, 1988; Tirole, 1988; Sappington, 1991). Under conditions of information asymmetry and imperfect monitoring, agents may maximize their own utility at the expense of principals (Hansmann, 1996; Jensen & Meckling, 1976).

Economic theory suggests that employee share ownership may benefit firm performance by internalizing the conflict of interest between workers and owners (e.g., French, 1987; Holmstrom & Milgrom, 1991). Employees who hold a stake in the ownership rights are entitled to sharing in the returns of the firm for which they work. This right should increase employee motivation to exert effort, to cooperate with management, and to stay with the firm. These arguments resonate with behavioral perspectives, suggesting that employee participation in ownership elicits feelings of attachment to and responsibility for the firm concerned (Pierce, Kostova & Dirks, 2001; Rousseau & Shperling, 2003). Employee stability can facilitate investment in human capital and skill accumulation, thus improving firm performance (Hansmann, 1996). A cooperative culture can foster trust and reduce bargaining costs associated with collective choice (Ben-Ner, 1988). A more participatory firm is expected to experience superior conflict resolution and fewer strikes and work stoppages (Estrin, Jones & Svejnar, 1987). Front-line workers are experts regarding the processes at their own workplace and, if committed to the success of their firm, are more likely to make suggestions for improvements to increase productivity (Nalbantian, 1987). Ownership participation increases their interest in the business and fosters engagement in productivity-enhancing activities such as quality control circles (Jones & Kato, 1995).

At the same time, the economics literature cautions that ESO may induce inefficiencies that limit its positive effects on firm performance or even reduce it, for four reasons. First, in the presence of a large number of shareholders, an increase in the share of an employee's total compensation that is accounted for by his/her participation in ownership may soften his/her

incentives to increase individual performance, as s/he bears the full cost of effort as well as the cost of the risk associated with the variability in returns, while receiving only a small portion of the gains accruing from it. As this effect holds true for every employee shareholder, it may limit overall value creation on the aggregate level (Boatright, 2004). Informal and formal monitoring may reduce this problem (Fama & Jensen, 1983) and employee identification with the firm will increase information sharing and peer monitoring (Putterman, 1993), yet these mechanisms are imperfect especially in large and anonymous organizations.

Second, higher levels of employee share ownership may also weaken the incentives for outside monitoring and control as economic surplus for non-employee shareholders decreases (Jensen & Meckling, 1979). Furthermore, employee share ownership, in particular at higher levels, can facilitate managerial entrenchment (Pugh, Jahera & Oswald, 1999); although empirical research does not universally support this argument (Lu, Reising & Stohs, 2007). Managers may use employee share ownership to protect their position and defend against threats of hostile takeovers (Aubert, Lapied & Rousseau, 2011; Gamble, 2000; Rauh, 2006). The entrenchment argument may have lost importance since the 1980s, a period characterized by high levels of hostile takeover activities by 'corporate raiders', yet some argue that in recent years ESOPs may serve similar purposes in helping management defend against unwelcome advances by private equity investors (Keeling, 2007).

Third, employees are in a suboptimal position to bear the costs associated with greater ownership of the firm for which they work (Hansmann, 1996). Employees have comparatively tight wealth constraints and face borrowing restrictions (Pagano, Panetta & Zingales, 1998). Even if they do not have to provide the financial means for the initial investment, they nevertheless bear the costs of sub-optimal portfolio diversification (Schlicht & von Weizsäcker, 1977; Brown, Liang & Weisbenner, 2006). However, recent work by Blasi, Kruse and Markowitz (2010) has shown that for most employees, prudent asset

allocation strategies may include ownership stakes in their firm of approximately 10 to 15 per cent of an individual's portfolio at only modest loss in utility due to risk.

Fourth, higher levels of employee ownership can carry costs of collective decision-making (if these ownership rights are associated with employee participation in decision-making). Especially in large enterprises with many employees, there is often heterogeneity of interests among employees, which leads to frictions in decision-making processes (Dow & Putterman, 2000; Kennan & Wilson, 1993). If decisions are reached through bargaining, there may be costs associated with incomplete information (Kennan & Wilson, 1993) or with the time consumed in multilateral negotiations (Boatright, 2004). Furthermore, the objectives of employee-shareholders may differ from those of other shareholders (as well as from those of employees without ownership participation). Specifically, employee shareholders may prefer maintaining wage and employment levels over profit maximization (Bradley et al., 1990) and short-term cash generation over long-term investments (the so-called horizon problem; see Hansmann, 1996; Jensen & Meckling, 1979). Kardas, Keogh & Scharf (1998) and Kim & Ouimet (2010) show that employee compensation tends to be higher in ESOP than in non-ESOP firms, which benefits current employees but may be detrimental to firms' long-term prospects, unless there are corresponding productivity increases. These arguments carry little weight at low levels of employee share ownership, as employee participation in governance is likely to be relatively limited in such situations, but they become more relevant as ESO levels increase.

The above considerations suggest that the effects of employee share ownership on firm performance may not be uniform across ESO levels. At the same time, economic theory does not allow developing specific predictions regarding the exact shape of the ESO–performance relationship. This shape may also depend on which performance dimension is used. For example, outside investors might welcome low levels of ESO due to its signaling effects, yet be more critical of higher ESO levels, which would translate into an inverted U-shaped

relationship between ESO and capital market performance. In contrast, the motivational effects of ESO (which would be better captured by productivity or accounting-based measure of performance) might only kick in at a particular (unknown) threshold level.

The extant empirical research suggests that investigations of the ESO–firm performance relationship are sensitive to model specification and the use of alternative performance measures. There appears to be a positive albeit weak association between employee share ownership and *firm productivity* (Bradley et al., 1990; Jones & Kato, 1995; Kalmi, Pendleton & Poutsma, 2005; Sengupta, Whitfield & McNabb, 2007). Conte & Svejnar (1988) find a positive effect for low ESO levels when using regressions with instrumental variables, but no ESO effect on productivity when using an OLS regression. The effects of employee share ownership on other measures of firm performance are also not entirely conclusive. Many studies find positive ESO effects on *profits* (Kalmi et al., 2005; Long, 1980; Rosen & Quarrey, 1987), *growth* (Blasi, Conte & Kruse,1996; Rosen & Quarrey, 1987), *market returns* (Richardson & Nejad, 1986), *cost of equity* (Barney, 1990) and *survival* (Park, Kruse & Sesil, 2004). Conte & Tannenbaum's (1978) exploratory study points to positive ESO effects on *profitability*, but its statistical power is too weak to draw definitive conclusions. However, others find no effect on *accounting performance* (Chaplinsky, Niehaus & Van de Gucht, 1998; Davidson & Worrell, 1994). Blasi et al. (1996) find no strong association between a continuous measure of employee share ownership and various measures of *profitability*, but the companies with more than 5% employee share ownership had significantly higher growth in return on assets, return on equity and profit margin than did other companies in their sample. Richardson & Nejad (1986) analyze longitudinal *changes in stock prices* of companies with and without employee ownership in the multiples stores sector in Britain. They conclude that the average return for the portfolio of companies with employee share ownership was significantly higher than for the portfolio of companies without. In contrast, Faleye et al. (2005) find that ESOP firms have significantly lower *Tobin's Q*, *sales growth*,

and *total factor productivity* than firms without ESOPs. In an early study using data from the 1960s (i.e, before the creation of ESOPs), Livingston & Henry (1980) found that companies with employee stock purchase plans had lower mean *profitability ratios* than those without such plans.

In their study on 230 French firms, Guedri & Hollandts (2008) have modeled the possibility of an inverted U-shaped relationship between employee share ownership and firm performance. They find support for this hypothesis when using an *accounting measure of performance* (return on invested capital), but neither linear nor curvilinear effects when using a *market-based performance measure* (market-to-book ratio). Furthermore, they rely on the inclusion of a quadratic ESO term in order to model the proposed curvilinear relationship, a method that attaches disproportionately high weight to firms with high ESO. Quadratic regression is also restrictive in that it assumes the existence of an unambiguous inflection point as well as a symmetric shape of the ESO-performance function that is imposed on the data.

We thus seek to advance the empirical research produced thus far by providing a more differentiated analysis of the effects of ESO on three dimensions of firm performance, namely accounting performance, capital market performance, and productivity, using spline regression. This technique allows estimating the relationship between the independent variable of interest (ESO) and the dependent variable (firm performance) as a piecewise linear function (Greene, 2008). It takes into consideration the possible variation in the relationship between the predictor variable and the response variable, both within and between levels of the predictor variable (Hurley, Hussey, McKeown & Addy, 2006). As a result, spline regression traces the shape of the underlying relationship between ESO levels and firm performance more closely than alternative techniques that make more restrictive assumptions about the shape of that relationship. By using the same approach to model the effects of ESO on three different performance variables, we are able to assess whether there is a consistent

profile to the ESO–performance relationship, or whether any effects of ESO are specific to the performance measure used.

The role of the country environment

According to the institutional economics literature, there are reasons to believe that both the *level* of employee ownership and the *effects* of ESO on performance may differ across countries (Estrin et al., 1987). According to this perspective, country-specific formal and informal institutions define the rights and responsibilities of different groups of economic actors, and provide positive or negative incentives for ownership. Among others, countries differ in terms of

- the degree of protection given to different groups of owners, specifically minority shareholders;
- the tax, fiscal and other incentives for different forms of employee financial participation;
- the level of political support for employee ownership, and the perceived importance of ESO as expressed in the public debate.

As the PEPPER reports (Uvalić, 1991; Commission of the European Communities, 1997; Lowitzsch, 2006; Lowitzsch, Hashi & Woodward, 2009) have shown, there is significant variation in the use of ESO and other forms of financial participation among the EU member countries. According to Lowitzsch & Hashi (2012, p. 26), the proportion of firms in the EU member states that offered broad-based ESO in 2010 varied from 40% (Ireland) to less than 4% (Spain and other Mediterranean countries). Furthermore, they suggest that employee share ownership plans are most widely used "in countries where concrete legislative measures have been introduced to support them (e.g., France, the UK and Ireland). Conversely, the lack of specific legal provisions on employee financial participation, providing a different fiscal treatment or other type of incentive, seems to have been a major obstacle to introduction"

(Lowitzsch & Hashi, 2012, p. 36). Furthermore, they argue that countries with high ESO usage rates (such as the UK) are characterized by higher levels of political support than is the case in countries such as Germany, whose codetermination system emphasizes forms of employee participation other than employee share ownership (Kabst, Matiaske & Schmelter, 2006).

However, greater usage of ESO in particular countries may not necessarily point to greater effectiveness of ESO in these countries as compared to others. In fact, in countries where employee share ownership is more unusual, its motivational effects may be stronger than in countries where ESO is widely used. Empirical investigations of the relationship between employee share ownership and firm performance have so far focused primarily on single-country settings (e.g., Guedri & Hollandts, 2008). In our paper, we thus provide a differentiated analysis of the ESO–firm performance relationship across the five largest European economies (France, Germany, Italy, Spain, UK).

DATA AND METHODS

Data

We use information on publicly traded companies in five European countries, Germany, Spain, France, Italy and the UK from the European Federation of Employee Share Ownership (EFES). The EFES data set includes all listed companies whose market capitalization was 200 million Euro or more in any one year between 2006 and 2008, regardless of whether these companies had any employee ownership or not. It thus covers 24% of all European listed companies, but 97% of the entire stock market capitalization in Europe.

The EFES database draws solely on information produced by the companies in their audited financial reports. Since the beginning of 2005, IFRS2 (which was issued by the International Accounting Standards Board [IASB] in 2004) requires all companies listed in

Europe "to recognise share-based payment transactions (such as granted shares, share options, or share appreciation rights) in [their] financial statements, including transactions with employees or other parties to be settled in cash, other assets, or equity instruments of the entity. Specific requirements are included for equity-settled and cash-settled share-based payment transactions, as well as those where the entity or supplier has a choice of cash or equity instruments" (http://www.iasplus.com/en/standards/ifrs/ifrs2; for further information on IFRS2 see Deloitte, 2007). Although the detailed rules set out in IFRS2 have attracted criticism (see Osborne 2007; Smith & Luesby, 2009; Stibbe, 2005), the principles underlying it have been broadly welcomed, in that they provide for a much greater degree of comparability between companies from different countries regarding their reporting of information on employee share ownership.

EFES provides data on the amount of share capital held by all employees and on the split between share capital held by executives (provided by about 80% of all listed firms according to EFES) and non-executive employees. This information includes capital held directly by employees and indirectly on their behalf by collective bodies such as foundations, funds and trusts. With respect to the latter, EFES seeks to focus on trusts that are truly vehicles of collective ownership, whereas those trusts that are merely vehicles for treasury shares are excluded. Stock options, performance shares and deferred shares are not included in the data, yet shares kept following the exercise of such options, the vesting of deferred shares and the like are included. However, it needs to be pointed out that shares acquired by companies on behalf of their employees, for example those held by foundations and funds, are highly indirect in that they provide virtually no participation in control rights to the employees concerned. Therefore, not all of the employee share ownership reported in this paper may confer participation in the full sets of rights generally associated with ownership.

The EFES data set was used recently as a data source for the latest version of the PEPPER IV report (*Promotion of Participation by Employed Persons in Profits and*

Enterprise Results), a study on employee financial participation authorized by the European Commission (Lowitzsch, Hashi & Woodward, 2009). The fact that the data has been used before in a reputable, widely distributed study provides indications for its quality. We also investigated possible alternative data sources, specifically the CRANET database, the European Working Conditions Survey (EWCS), and the European Company Survey (ECS). None of these survey-based data sources provided information on the level of employee share ownership across firms.

The original sample of listed companies for the five countries included 1,228 companies. Information on sales, total assets, return on assets, debt and industry affiliation was obtained from the Thomson One Banker database. The data we used were for the years 2006 through 2008. 105 observations were dropped from the original sample as no complete data could be obtained for them. We also omitted eight firms with a one-digit SIC code of 0 (agriculture, forestry & fishing), as we considered eight observations too small a number to represent an industry. Therefore, the final sample includes 1,115 companies. ANOVA tests for the variables market capitalization and non-executive employee share ownership as a percentage of total market capitalization suggest that there are no significant differences between the original and the final sample.

Variables

Firm performance. In line with prior research on the firm performance effects of employee ownership (e.g., Blasi et al., 1996; Gamble, 1998; Guedri & Hollandts, 2009; Park & Song, 1995), we used three alternative performance measures as dependent variables: *Tobin's Q*, *return on assets* (*RoA*), and *sales per employee*. *Tobin's Q* is calculated by dividing the market value of the firm by the replacement value of its assets (approximated by the total assets of a firm). Therefore, it captures both past-oriented operating performance as well as risk influences, and minimizes distortions due to accounting conventions

(Montgomery & Wernerfelt, 1988). Furthermore, as Sirmon & Hitt (2009:1381) point out, "this measure is a dynamic indicator of the market's reaction to firm actions and expectation of those actions on future performance". *RoA* is an accounting-based measure of the firm's profit generation relative to its asset base. It is widely employed by managers, analysts and researchers as it reflects a return more directly under the control of management and the workforce (Bettis, 1981).

There is a long-standing debate about the relative merits of using *Tobin's Q* and *RoA* (for a summary of this debate see Stevens, 1990). Accounting-based measures have proved to be strongly related to economic returns (e.g., Danielson & Press, 2003), however these measures are backward rather than forward-looking, they relate to a single period only, and they can be distorted by accounting policies or earnings manipulation (Richard, Devinney, Yip & Johnson, 2009). *Tobin's Q* reflects *ex ante* financial market valuation of the rents expected to accrue to the firm (Fisher & McGowan, 1983), *including* its accounting profits. It is also subject to smaller average errors than accounting-based measures (McFarland, 1988). However, it is subject to psychological and behavioral influences (Richard et al., 2009). The finance literature, due to its concern with market valuation, tends to give preference to *Tobin's Q*, while economists are primarily interested in matters of profitability and price-cost ratios, thus preferring *RoA*. Both measures are commonly used to analyze performance effects of employee ownership (e.g., Bell & Kruse, 1995; Faleye et al., 2006; Kim & Ouimet, 2008).

Given that the distributions of the two variables depart from normality, logarithmic transformations were used. In order to avoid observations from dropping out of the analysis as a result of zero values (for which the logarithm is undefined), we applied a box-cox transformation. A few cases where the *RoA* values were negative were omitted from the analysis as the logarithm of negative values is undefined, however, we checked whether these omissions affected our findings, and did not find any evidence of that.

As a measure of productivity we used *sales per employee*. This variable is well established in labor economics as a measure of productivity effects (e.g., Kramer, 2010; Quarrey & Rosen, 1993). In order to be able to estimate a Cobb-Douglas type production function, logarithmic transformations were used.

Employee share ownership (ESO). Our main independent variable is measured in two ways. First, we created a dummy variable taking the value of 1 if a company had any ESO in a given year, and 0 otherwise. Second, ESO is included as a continuous variable, defined as the percentage of company stock owned by non-executive employees relative to the total number of shares in this company. This ESO operationalization is commonly used in the literature (Blasi et al., 1996; Guedri & Hollandts, 2008; Park et al., 2004). There are alternative dimensions of employee ownership, in particular the distribution of ownership rights among employees (Kruse & Blasi, 1997); however, that measure is particularly relevant in the context of largely or fully employee-owned firms. In contrast, since we investigate stock-market listed firms, average ESO in our sample is just 1.2%, there is only one firm (in 2006 and 2007) that is majority employee-owned, and fewer than 2% of firms have an employee ownership stake of more than 10% (see Table 5).

Firm size. Firm size may have a significant effect on firm performance, for example, for economies of scale and market power reasons. We included the logarithm of the number of employees as a measure of firm size as a control factor (Blasi et al., 1996; Kimberly, 1976).

Capital per employee. To control for differences in capital stocks in the regressions on productivity effects we included a variable for capital intensity (Conte & Svejnar, 1988; Blasi et al., 1996). We included the logarithm of the ratio of total assets to number of employees.

Leverage. High levels of debt can reduce financial ratios based on net income (Gamble, 1998). Leverage is measured by calculating the logarithm of the ratio of total debt to total assets per firm.

Industry. Industries differ in terms of market characteristics such as size, growth, or R&D intensity (Guedri & Hollandts, 2008) and can thus influence firm performance (Mauri & Michaels, 1998). We included eight industry dummies based on one-digit SIC codes in our regressions.

Country. Firm performance can be affected by the institutional differences between countries such as legislation or the existence or absence of supporting organizations (Estrin et al., 1987; Kalmi et al., 2005). Therefore, we included dummy variables for each country.

Analytical approach

We used a battery of estimation approaches to model the ESO–firm performance relationship. As our main tool for testing the proposed effects, we chose a random effects model implemented as a feasible generalized least squares (FGLS) regression (Baltagi, 2008); for conceptual as well as for analytical reasons. First, we are primarily interested in the performance differences between firms that can be attributed to organizational features such as employee share ownership. This between-firm variance can be best analyzed using a random-effects model (Hsiao, 2003). Second, inspection of our data revealed that for all variables there is more variation across individual firms (between-variation) than over time (within-variation). For example, 87% of the companies in our sample which did not have employee share ownership in any one year did not change this situation over the whole time period. Conversely, 95% of the companies which did have employee share ownership at one point in time had employee share ownership over the whole period of analysis. Third, the model includes two time-invariant variables, country and industry. Fixed-effects models cannot estimate the effects of these variables because variables that do not change over time drop out of the model. A Breusch-Pagan/Cook-Weisberg test for heteroskedasticity yielded positive results; therefore a FGLS regression which controls for heteroskedasticity was necessary for consistency and robustness reasons (Cameron & Trivedi, 2009). A test for

multicollinearity showed that the variance inflation factors for all main effects were well below the acceptable level of 10 (Bowerman and O'Connell, 1990; Myers, 1990).

For the regressions on productivity effects we used a Cobb Douglas–type production function, controlling for differences in labor and capital stocks in addition to the other control variables. We estimated the following Cobb-Douglas based production specification

$$\ln Q = \beta_a \ln K + \beta_b \ln L + \beta_c E + \beta_d Z + \varepsilon$$

where Q measures productivity (*sales per employee*), K measures capital intensity (*capital per employee*), L measures labor input (*number of employees*), E represents the ESO variable, Z is a vector of control measures, β_x denote the slope coefficients, and ε is the disturbance term.

We supplemented our analysis with estimated fixed-effects models that investigate the effects of the (limited) variation in ESO levels within firms over time, omitting the time-invariant *country* and *industry* dummies. We ran these regressions with alternative independent variables, namely with ESO levels (and the squared term thereof), and with dummy variables denoting the introduction of ESOPs in firms that did not have such plans in 2006. However, these fixed-effects regressions provided only minimal explanatory power (with R^2 values between 0.03 and 0.06), probably as a result of the small changes in ESO over time. Therefore, we refrain from presenting the results here.

RESULTS

Descriptive Statistics

Tables 1 and 2 present the distribution of firms in our sample by industry, country, and size. Almost 40% of the firms in our sample are based in the UK, followed by France, Germany and Italy. Spain is the country with the smallest number of large listed firms in the sample. The firms are distributed among all major industries. The industry represented by the largest number of firms is manufacturing (35% of all firms) followed by Other Services

(17%) and Finance & Insurance (16%). The median firm in our sample has around 3,500 employees, with the average firm size being much larger with almost 19,000 employees. Sample firms in France and Germany are typically larger than those in the other countries: The median firm in Italy has about 1,900 fewer employees than the one in Germany.

Table 3 shows the distribution or reported ESO levels in the sample firms by country. Employee share ownership is most common in the UK, where more than 90% of sample firms have some form of ESO. In contrast, in Spain only one in four large, listed firms offers ESO. We used pairwise ANOVAs to further analyze the differences between countries. The results confirm that the differences in ESO usage among countries are statistically significant, with one exception: With about 55%, Germany and Italy have similar ESO usage rates. On the average, reported ESO levels within firms are fairly small. At an average of 2.3%, French firms reported the highest ESO rate, followed by firms from the UK (1.3%), German (0.6%), Italian (0.5%) and Spanish firms (0.2%).

At the industry level, the differences in ESO usage are less pronounced (Table 4). Across all industries between 70% and 80% of all firms reported having ESO. Differences in the level of diffusion among industries are only statistically significant for a few industries, particularly Other Services with the highest ESO diffusion, and Manufacturing with the lowest. The average ESO share in firms is the highest in the Finance and Other Services industries. These two sectors are the only ones where reported ESO levels exceeded 3% of the total market capitalization of their firms.

In a next step we take a closer look at ESO size categories across the firms in our sample (Table 5). As is the case in prior studies (e.g., Guedri & Hollandts, 2008), this distribution is right-skewed. The average ESO level in the overall sample did not change much over time: On average, ESO accounted for 1.1% to 1.2% of total market capitalization in the years 2006 to 2008, with a median of 0.33% in 2006 and 0.43% in 2008. The maximum ESO share in 2008 was 49%. However, 261 firms (23.4%) did not have employee ownership at all, 757

firms (67.8%) reported ESO levels under 3%, and 97 firms (8.7%) reported ESO levels of more than 3%. Of these 97, only 18 firms reported ESO of more than 10%.

Despite the overall small employee ownership levels, Table 5 reveals two interesting trends: First, the number of firms offering some kind of employee ownership increased over the time period from 791 firms in 2006 to 854 firms in 2008, an increase of about 8%. Second, of those 791 firms that already had some ESO in 2006, more firms increased than decreased their ESO levels during the period analyzed. As a result, the median ESO level in those firms with ESO increased slightly, from 0.33% to 0.43%.

Table 6 reports the descriptive statistics for the variables in this study, distinguishing between firms with and without ESO. Firms with ESO tended to be larger than firms without; they also had a higher market capitalization, but were less capital-intensive. *t*-tests showed that these differences are statistically significant. The performance measures log *Tobin's Q* and log *RoA* were, on average, higher for firms with ESO, and these differences were statistically significant. *Sales per employee* were on average statistically significant lower in firms with ESO than in those without.

Table 7 presents the correlations between the central variables in this study. ESO is positively correlated with *Tobin's Q* and negatively correlated with *sales per employee*. Furthermore, it is positively correlated with firm size, but negatively with capital intensity (measured as *capital per employee*). The results show that firms with higher reported ESO levels are characterized by a higher number of employees and by lower capital intensity than firms with lower levels of or no ESO. These results are consistent with the preponderance of ESO in service industries, which tend to be less capital-intensive than firms in manufacturing (see Table 4).

Results of the Regression Analyses

Results of the random effects regressions are presented in Tables 8 and 9. For each dependent variable (*Tobin's Q*, *RoA* and *sales per employee*) we estimated five models. All models have good model fit, as demonstrated by high Wald chi^2 values. The first model is the baseline model and includes all control variables, namely firm size, leverage, industry and country affiliation. The baseline model for *sales per employee* also includes a control for capital intensity. In the baseline models 1.1 (*Tobin's Q*), 2.1 (*RoA*) and 3.1 (*sales per employee*) the coefficients for firm size and leverage are significant; both variables are negatively related to performance. In model 3.1 the coefficient for capital intensity is positive and significant. For the UK, the country coefficient is positive and significant in the regressions using *Tobin's Q* and *RoA*, but negative and significant when using *sales per employee*, as compared to the default case, Germany. For France, the country coefficients are negative and significant throughout.

In models 1.2, 2.2 and 3.2 we added ESO as a dummy variable. In all models the coefficients for this variable are positive and statistically significant. Furthermore, the increase in the Wald chi^2 values indicates that the inclusion of the ESO variable increases the quality of the models. This finding suggests that employee share ownership has a positive effect on *Tobin's Q*, *RoA* and *sales per employee*, after controlling for a range of other factors.

In models 1.3, 2.3 and 3.3 we included ESO as a continuous variable. The coefficients are positive and significant throughout. However, entering ESO as a continuous variable into the models does not add much explanatory power as compared to including it as a dummy variable.

In order to ascertain the shape of the ESO-performance relationship, we performed spline regressions (models 1.4, 2.4 and 3.4). Univariate polynomial splines are piecewise polynomials in one variable of some degree *d* with function values and first *d*-1 derivatives that agree at the points where they join (Poirier, 1976; Eubank, 1999). The coefficients estimate the slopes for the respective intervals. One linear segment represents the function for

values between the two knots. In the present case, we divided the sample firms into quintiles by ESO level and calculated the performance function for each linear segment representing one firm quintile. We experimented with different segmentations for the splines e.g., we calculated splines for specific ESO percentage ranges. However, our results did not vary much between the different models. We chose to display the segmentation by quintiles, because it represented an unforced segmentation. Graphs of the results are presented in Figures 1a–1c.

The results for *Tobin's Q* and for *RoA* are fairly similar. The coefficients for each of the first four splines representing ESO between 0 and 1.84% are positive and significant for both *Tobin's Q* and *RoA*. The coefficients for the last spline representing ESO of more than 1.84% are negative. However, the decline in *Tobin's Q* respectively in *RoA* is fairly minor in magnitude relative to the increase in these performance measures for the first four quintiles of ESO levels. We tested pairs for differences in spline coefficients. The coefficients are all statistically different from each other.

The results for the productivity measure convey a more mixed picture. The positive productivity effects of employee ownership begin to materialize only from the second quintile onwards, representing ESO levels of more than 0.2%. Firms with ESO levels above roughly 0.3% show better productivity than firms without employee ownership.

In order to provide an analysis that is more directly comparable to the one by Guedri & Hollandts (2008), we present models 1.5, 2.5 and 3.5 in Tables 8 and 9. These models provide the conventional curvilinearity test by including the squared values of the (logarithmic value of the) *ESO share* variable. For the purpose of this analysis, we applied a box-cox transformation i.e., before transforming the data, we added "one" to each data point. This method is widely used to avoid the problem that firms with zero values of the variable concerned are excluded when the logarithmic transformation is applied. These choices were

made in order to replicate the approach taken by Guedri & Hollandts (2008) as closely as possible, and thereby ensure comparability.

The coefficients for the ESO variable and its squared term have opposite signs and are significant for all three performance measures. A graphical display of our results is presented in Figure 2. According to these results, *Tobin's Q* increases in the level of employee share ownership up to a value of 1.44%, and decreases thereafter. For *RoA* the maximum performance value is at an ESO level of 1.53%. However, a comparison between these results and those of the more differentiated spline regressions above shows that the former approach tends to *underestimate* performance-optimal ESO levels and, more importantly, to *overestimate* the decrease in firm performance for ESO levels above that optimal point (compare specifically Figures 2a and 1a, respectively Figures 2b and 1b). If quadratic ESO terms are used, a few firms with relatively high levels of ESO carry disproportionately higher weight in the regressions, and thus the performance decreases above the 'optimal' ESO level appears to more than outweigh the performance increases at ESO levels below that point. The results of spline regressions show that this impression is misleading: Any performance decreases above a particular level of employee share ownership do not "eat up" the performance gains achieved at lower levels.

Country Effects in the ESO–Performance Relationship

We were interested in whether the relationships between reported ESO levels and the three measures of firm performance uncovered in our analyses above varied between the five countries included in our data set. To this end, we ran our spline regressions (models 1.4, 2.4 and 3.4 in Tables 8 and 9) for five different subsamples, each including all firms from a particular country. The results are presented in Tables 10 (for *Tobin's Q*), 11 (for *RoA*) and 12 (for *sales per employee*) respectively.

Overall, we find that the general profile of the relationship between reported levels of ESO and firm performance in four of the five countries (all except Spain) follows the one described above and sketched in Figures 1a, 1b and 1c. Specifically, we observe that in none of the countries, the relationship between reported levels of ESO and performance is of a monotonic shape, regardless of the performance measure used.

However, in terms of the exact shape of the ESO–performance relationship, there are noteworthy variations between countries. First, in several countries, low levels of ESO are associated with adverse performance effects, as indicated by negative and statistically significant coefficients on the first ESO spline. This is the case for Germany when *Tobin's Q* and *sales per employee* are used as dependent variables (see Tables 10 and 12), and for Spain when *RoA* is used (see Table 11). For the UK, the coefficients on the first spline are also negative however, they are not statistically significant. For other countries, in particular for Italy, the positive effects of ESO appear to kick in strongly at low ESO levels already. At the same time, in Italy the decline and eventual "flattening out" of the effects of ESO on performance appears to set in at a somewhat lower ESO level (as indicated by the negative coefficient on the fourth spline) than is the case in the other countries (where this effect mostly sets in over the ESO range described by the fifth spline).

Second, the country with the ESO–performance profile that is least in line with the one found for the other countries is Spain. There, the "slump" in the ESO–performance relationship occurs at medium ESO levels (the coefficient on the third spline is negative in the regressions using *Tobin's Q* and *RoA*), whereas for higher levels of ESO, the effects are positive again. Also, the total effect of ESO on performance is small.

DISCUSSION

The objective of this study was to provide an in-depth analysis of the effects of reported employee share ownership on firm performance using a sample of the largest listed

companies in the five largest Western European economies. Our analysis has produced three major insights. First, employee share ownership enhances firm performance in that, holding other factors constant, firms that report ESO enjoy a performance advantage over firms reporting no ESO. This finding holds true not only for capital market measures of firms' value generation potential (as reflected in Tobin's *Q*), but also for measures of firms' underlying value generation capacity relative to its asset base (as reflected in *RoA*), as well as to the efficiency with which they deploy capital and labor (as reflected in productivity measures such as *sales per employee*).

Second, the marginal effects of ESO on firm performance are declining with increasing ESO levels. There are some indications that the marginal effects may even become negative at some point however, the performance decreases at ESO levels above that point are neither large nor are they consistent across alternative performance measures. A more reliable interpretation of the results is that the performance effects of ESO simply peter out at levels anywhere between 1.5% and 2.0%, depending on the performance measure used. Firms with ESO above these levels do not enjoy an additional performance advantage over others with lower ESO levels.

Third, the performance effects of ESO hold true across the five European economies we investigated, although both the strengths of these effects, and the shape of the ESO-performance relationship, differ from country to country. Overall, Spain is the country in which we find the weakest performance effects of ESO. However, Spain is also the country with the lowest number of observations in our sample, reflecting the smaller size of its economy (with fewer publicly listed firms with a market capitalization of 200 million Euro or more).

With respect to the other four countries (France, Germany, Italy, UK) the shape of the ESO–performance relationship exhibits a greater degree of similarity, although the performance effects of ESO appear to kick in at different levels. In Germany, the initial

introduction of ESO appears to be associated with negative performance effects; and in the UK, there are no statistically significant effects for low levels of ESO (see Table 10-12). These tentative findings seem consistent with the argument made by authors such as Conte et al. (1996), Jones & Kato (1995) and Kumbhakar & Dunbar (1993) that the introduction of employee ownership may be associated with set-up and administrative costs, and that any positive effects of employee ownership might take time to develop any impact.

Our results are in line with the economics perspective developed in the theoretical section of this paper. According to this perspective, employee participation in ownership rights helps align the interests of employees and other shareholders, thus enhancing motivation and commitment (Holmstrom & Milgrom, 1991; Tirole, 1998). It also supports investments in firm-specific human capital as it helps create bonds between employees and their firm (Hansmann, 1996). At the same time, the marginal returns to ESO appear to be declining with increasing levels of ESO. However, our analysis casts doubt on the finding by Guedri & Hollandts (2008) of a "fully-fledged" inverted U-shaped relationship between ESO and performance. We believe their finding to be an over-interpretation, driven by the inclusion of a quadratic ESO term in their regressions. Our findings are more consistent with an "Enough-of-a-Good Thing" argument than with the "Too-Much-of-a-Good Thing" effect in management recently described by Pierce and Aguinis (2013). Following their recommendations, our application of a range restriction technique (namely, spline regression) helps to provide a far more nuanced image of the relationship under investigation.

Our cautiously positive findings on the firm performance effects of ESO shed new light on why extant empirical research, while largely positive about ESO, has produced somewhat inconsistent results. For example, we notice that several papers reporting statistically insignificant ESO effects use productivity measures of performance (e.g., Bloom, 1985; Dunbar & Kumbhakar, 1992), which we, too, find to be less strongly related to ESO than the other two measures of firm performance we use. The study by Faleye et al. (2005) which

finds ESO to be fairly detrimental to firm performance focuses specifically on firms with more than 5% ownership rights (mostly between 5 and 20%), in which labor has a significant say in governance, whereas we focus on firms with much smaller ESO stakes, finding in this context that the positive performance effects of having employee share ownership weaken at relatively low levels.

The differences in terms of the profiles of the ESO–performance relationship between countries warrants further discussion. These differences are particularly marked for Spain, as compared to the other countries. The dual findings regarding Spanish listed firms of low employee share ownership levels and weak performance effects of ESO in the few companies that have ESO should be interpreted against the background of Spain's institutional framework. Spain has traditionally favored two forms of workers' financial participation namely "Workers' Companies" (sociedades laborales) in which employees hold the majority of the shares, and profit sharing (Lowitzsch et al., 2009). Tax incentives for broad-based employee share ownership plans were introduced only in 2003, and have not yet led to a significant increase in the adoption of such plans beyond large multinationals. The latest Pepper Report (Lowitzsch et al., 2009, pp. 94-95) also suggests that "employer associations […] do not actively support broad-based plans". The European Federation of Employee Share Ownership describes the dynamics of ESO adoption in Spain as "bad" (EFES, 2009).

In contrast, we find the highest levels of ESO in France and the UK. Both of these countries have strong traditions in fostering employee share ownership. Lowitzsch and Hashi (2012, p. 58) rate the UK as the most supportive of employee ownership among all EU member states. Specifically, the UK began introducing tax incentives for ESO plans in 1978, and these plans are regularly reviewed by the government. As a result, the UK has seen a steady increase in such plans, in particular so-called Revenue-Approved Plans (Würz, 2003, p. 130). With respect to France, Lowitzsch and Hashi (2012) argue that the French institutional tradition favors profit sharing (with respect to which they rate France as the most favorable

country in Europe). However, as most profit sharing in France is share-based, this support for profit sharing also indirectly favors ESO. Both France and the UK raise reduced respectively no social security contributions on the returns from ESO plans; furthermore, they impose alternative taxes (such as capital gains tax in the UK) at favorable rates in lieu of personal income taxes. These fiscal measures provide material incentives for employees to acquire shares in their companies.

According to our findings, Italy and Germany have medium levels of employee share ownership, as compared to the UK and France on the one hand, and Spain on the other. In particular with respect to Germany, Lowitzsch and Hashi (2012) argue that although tax incentives for ESO are in place, they are too restrictive, thus preventing a more widespread use of ESO. In particular, German codetermination law (§87 Section 1 No. 10 *Betriebsverfassungsgesetz*) stipulates that the use of employee share ownership plans for all but executive employees requires prior agreement by the Works Council. KPMG describes the use of ESO plans in Germany as "complex though doable", thus requiring significant time commitments and efforts (Steininger, 2011). The hurdles to the initial introduction of ESO plans may also help explain why the initial performance effects of ESO in Germany turn out to be negative (see the negative coefficients on the first spline in each of the regressions for Germany reported in Tables 10-12). In Italy, there are fiscal advantages (e.g., in terms of reduced corporate and income taxes and social security contributions) to employee share acquisitions however, there is a whole range of restrictive rules that effectively limit their benefits (see the report by Clifford Chance, 2010, pp. 113-124).

Overall, our results suggest that country-specific institutional conditions (e.g., regulatory and fiscal regimes, cultural attitudes and so on) appear to matter for both the adoption and the effects of employee ownership (Pendleton, Poutsma, Van Ommeren & Brewster, 2001; Poutsma, 2001; Poutsma & de Nijs, 2003; Vaughan-Whitehead, 1995). We thus caution

against transferring the results found in a particular country to geographies characterized by different institutional settings.

Our study has several limitations that should be addressed in future research. First, our sample only includes large and medium-sized listed companies, whose share of employee ownership is typically small. We believe the dynamics of employee share ownership are quite different in stock-market listed companies with large employee ownership stakes (although only a few such firms exist), and in smaller firms. Future research should explore the performance effects of ESO in these firms. Second, for the firms in our study we can only observe the absolute level of employee share ownership reported by those firms in their financial statements. As discussed above, we see substantial strength in using data from audited financial reports that were compiled on the basis of common accounting standards (IFRS2). At the same time, shares held by companies on their employees' behalf constitute only a very indirect source of employee share ownership; for example, they are likely to carry few rights to participation in decision-making, if at all. Also, as is the case in other studies (e.g., Guedri & Hollandts, 2008), we only have information on overall ESO levels per firm, but not on the distribution of ownership rights among employees. Whether only a small group of employees holds large stakes in the firm or all employees hold relatively small stakes may influence the effect of share ownership on employee attitudes and behaviors, corporate governance, and ultimately, firm performance. Future research should focus on the governance implications of employee share ownership.

Third, and related to the point above, we do not have much information on the way employee share ownership was implemented, nor do we know if it was introduced along with other human resource management (HRM) policies. Given the importance of complementarities among HRM practices (Ichniowski, Shaw & Prennushi, 1997; Laursen & Foss, 2003), research should take into account the consequences of employee share ownership

and other HRM policies used in conjunction. For the purpose of these kinds of investigation, a different data set than the one provided by EFES would likely be needed.

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Table 1: Distribution of Sample Firms by Country and Industry

Industry	Germany	Spain	France	Italy	UK	Total
Mining & Construction	3	12	12	5	54	**86**
Manufacturing	92	31	87	59	128	**397**
Transportation & Utilities	20	17	33	27	38	**135**
Wholesale Trade	23	6	31	9	58	**127**
Finance, Insurance & Real Estate	28	18	30	35	66	**177**
Services	22	14	48	11	98	**193**
Total	**188**	**98**	**241**	**146**	**442**	**1,115**

Table 2: Distribution of Sample Firms by Country and Firm Size (# Employees)

Country	*N*	Mean	Median	Min	Max	SD
Germany	188	23,883	4,232	2	520,112	64,019
Spain	98	15,500	3,566	40	257,035	36,336
France	241	26,432	4,072	11	495,287	58,116
Italy	146	10,339	2,352	13	198,348	25,867
UK	442	16,216	3,409	0	561,876	45,224
Total	**1,115**	**18,884**	**3,498**	**0**	**561,876**	**49,625**

Note: Calculated across all three years (2006-2008)

Table 3: Distribution of Reported Employee Share Ownership by Country

Country	*N*	% of Firms Reporting ESO[a]	Average % of Reported ESO per Firm
Germany	188	54.8%	0.58%
Spain	98	24.8%	0.20%
France	241	85.6%	2.33%
Italy	146	56.6%	0.48%
UK	442	92.3%	1.26%
Total	**1,115**	**73.92%**	**1.18%**

Note: Calculated across all three years (2006-2008); *N*=1,115

[a] Pairwise ANOVAs by country and share of firms reporting ESO confirmed that all values in this column are significantly different from one another at 99.9% significance level, except for the comparison between Italy and Germany.

Table 4: Distribution of Reported Employee Share Ownership by Industry

Industry	*N*	% of Firms Reporting ESO[a]	Average % of Reported ESO per Firm
Mining & Construction	86	77.5%	1.37%
Manufacturing	397	71.0%	0.94%
Transportation & Utilities	135	73.3%	1.05%
Wholesale Trade	127	74.8%	1.12%
Finance, Insurance & Real Estate	177	71.9%	3.36%
Services	193	79.0%	3.94%
Total	**1,115**	**73.92%**	**1.18%**

Note: Calculated across all three years (2006-2008); *N*=1,115

[a] Significance levels of pairwise ANOVAs by industry and share of firms with ESO; *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$

Table 5: Reported Employee Share Ownership Levels across Firms

		2006		2007		2008	
		# of firms	**% of firms**	**# of firms**	**% of firms**	**# of firms**	**% of firms**
Firms reporting no ESO		**324**	**29.1%**	**298**	**26.7%**	**261**	**23.4%**
Firms reporting ESO		**791**	**70.9%**	**817**	**73.3%**	**854**	**76.6%**
	ESO share 0-1%	487	43.8%	503	45.1%	540	48.4%
	ESO share 1-2%	163	14.6%	163	14.6%	153	13.7%
	ESO share 2-3%	58	5.2%	69	6.2%	64	5.7%
	ESO share 3-5%	39	3.5%	44	3.9%	59	5.2%
	ESO share 5-10%	23	2.1%	18	1.6%	20	1.8%
	ESO share 10-20%	13	1.1%	14	1.3%	10	0.9%
	ESO share 20-30%	5	0.4%	4	0.3%	6	0.5%
	ESO share 30-40%	1	0.1%	1	0.1%	0	0.0%
	ESO share 40-50%	1	0.1%	0	0.0%	2	0.2%
	ESO share >50%	1[a]	0.1%	1[b]	0.1%	0	0.0%
Total		**1,115**	**100%**	**1,115**	**100%**	**1,115**	**100%**
Average ESO			**1.19%**		**1.14%**		**1.21%**
Median			0.33%		0.43%		0.43%

a) One firm in 2006 with ESO share of 76%

b) One firm in 2007 with ESO share of 54.5%

Table 6: Descriptive Statistics

	Group 1: Firms Reporting ESO			Group 2: Firms Reporting No ESO			Δ G1 / G2
Variables	**Median**	**Min**	**Max**	**Median**	**Min**	**Max**	
Tobin's Q	.620	0	31.6	.510	.01	55.18	.110***
RoA	6.160	-148.84	104.66	5.395	-63.62	104.48	.765**
Sales/employee	.204	0	12.838	.254	0	8.258	-.050***
Employees	4,278	7	561,876	1,974	0	136,931	2,304***
Capital/employee	.257	.006	97.987	.355	.012	138.612	-.098***
Leverage	.229	0	3.100	.261	0	.949	-.072**
Marketcap	738	2	125,762	342	7	37,619	396***

Δ Group 1 / Group 2: Difference between the medians of variables in firms reporting ESO and firms reporting no ESO.
Mann-Whitney U-test: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$. N=3,345 for all variables except for *RoA* (N=3,327)

Table 7: Correlations

	1	**2**	**3**	**4**	**5**	**6**	**7**
1. Log(Tobin's *Q*)	1.0000						
2. Log(*RoA*)	.5551***	1.0000					
3. Log(*sales per employee*)	-.1644***	-.1097***	1.0000				
4. Log(*firm size*)	-.2329***	-.1209***	-.3189***	1.0000			
5. Log(*leverage*)	-.3507***	-.1326***	.0622***	.1235***	1.0000		
6. Log(*ESO share*)	.0401*	.0182	-.0969***	.1970***	-.0710***	1.0000	
7. Log(*capital per employee*)	-.2638***	-.3109***	.7148***	-.3604***	.1815***	-.1015***	1.0000

Significance levels: *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$. N= 3,345 for all variables except *RoA* (N=3,327)

Table 8: Results of Random Effects Regressions Using *Tobin's Q* and *RoA*

	Model 1 Dependent variable: *Tobin's Q*										Model 2 Dependent variable: *RoA*									
	1.1		**1.2**		**1.3**		**1.4**		**1.5**		**2.1**		**2.2**		**2.3**		**2.4**		**2.5**	
Constant	1.2240	***	1.2074	***	1.2289	***	1.2425	***	1.2503	***	2.9070	***	2.9025	***	2.9117	***	2.9274	***	2.9363	***
	(.0113)		(.0118)		(.0135)		(.0123)		(.0130)		(.0302)		(.0309)		(.0303)		(.0306)		(.0310)	
Log (Firm size)	-.0568	***	-.0587	***	-.0600	***	-.0638	***	-.0638	***	-.0840	***	-.0868	***	-.0864	***	-.0915	***	-.0909	***
	(.0005)		(.0007)		(.0008)		(.0007)		(.0008)		(.0025)		(.0026)		(.0024)		(.0026)		(.0026)	
Log (Leverage)	-.8012	***	-.8017	***	-.7869	***	-.7974	***	-.7864	***	-.3850	***	-.3970	***	-.3794	***	-.3911	***	-.3779	***
	(.0120)		(.0117)		(.0131)		(.0126)		(.0127)		(.0316)		(.0322)		(.0313)		(.0301)		(.0305)	
Spain[a]	-.0056		.0182	***	.0066		.0272	***	.0268	***	.0053		.0269		.0158		.0466	**	.0299	*
	(.0066)		(.0052)		(.0060)		(.0052)		(.0051)		(.0156)		(.0164)		(.0157)		(.0159)		(.0152)	
France[a]	-.0396	***	-.0610	***	-.0715	***	-.0844	***	-.0876	***	-.0987	***	-.1230	***	-.1238	***	-.1323	***	-.1454	***
	(.0044)		(.0045)		(.0052)		(.0051)		(.0051)		(.0118)		(.0124)		(.0127)		(.0133)		(.0129)	
Italy[a]	-.1615	***	-.1606	***	-.1564	***	-.1531	***	-.1505	***	-.2834	***	-.2890	***	-.2778	***	-.2723	***	-.1292	***
	(.0047)		(.0045)		(.0045)		(.0043)		(.0042)		(.0179)		(.0168)		(.0178)		(.0165)		(.0104)	
UK[a]	.0875	***	.0639	***	.0734	***	.0477	***	.0537	***	.1732	***	.1470	***	.1597	***	.1324	***	.1297	***
	(.0055)		(.0054)		(.0056)		(.0060)		(.0054)		(.0117)		(.0121)		(.0116)		(.0116)		(.0104)	
SIC 2[b]	.0418	***	.0373	***	.0525	***	.0346	***	.0328	***	-.0324		-.0358		-.0324		-.0552	**	-.0578	**
	(.0084)		(.0090)		(.0104)		(.0093)		(.0097)		(.0200)		(.0197)		(.0174)		(.0190)		(.0192)	
SIC 3[b]	.0160		.0229	**	.0136		.0137		.0019		.0021		-.0045		-.0001		-.0126		-.0145	
	(.0084)		(.0083)		(.0104)		(.0088)		(.0094)		(.0193)		(.0197)		(.0173)		(.0192)		(.0194)	
SIC 4[b]	-.0080		-.0051		-.0017		-.0092		-.0122		-.1285	***	-.1333	***	-.1231	***	-.1284	***	-.1292	***
	(.0080)		(.0082)		(.0103)		(.0094)		(.0099)		(.0192)		(.0196)		(.0172)		(.0190)		(.0195)	
SIC 5[b]	-.0086		.0024		.0035		-.0065		-.0088		-.0562	**	-.0626	***	-.0487	**	-.0852	***	-.0749	***
	(.0087)		(.0087)		(.0106)		(.0096)		(.0097)		(.0194)		(.0192)		(.0167)		(.0187)		(.0189)	
SIC 6[b]	-.3194	***	-.3206	***	-.3224	***	-.3277	***	-.3398	***	-.8931	***	-.8949	***	-.9010	***	-.9087	***	-.9103	***
	(.0080)		(.0082)	***	(.0102)		(.0086)		(.0094)		(.0211)		(.0208)		(.0197)		(.0200)		(.0209)	
SIC 7[b]	.0678	***	.0727	***	.0687	***	.0400	***	.0352	**	-.0686	***	-.0719	***	-.0649	***	-.0908	***	-.0897	***
	(.0102)		(.0092)		(.0120)		(.0115)		(.0117)		(.0192)		(.0195)		(.0168)		(.0204)		(.0203)	
SIC 8[b]	.0781	***	.0799	***	.0731	***	.0634	***	.0625	***	-.0062		-.0143		-.0075		-.0365		-.0260	
	(.0083)		(.0088)		(.0149)		(.0124)		(.0130)		(.0200)		(.0204)		(.0171)		(.0188)		(.0192)	
ESO (yes/no)[c]			.0570	***									.0654	***						
			(.0037)										(.0123)							
1st spline							.1692	***									.2204	*		
							(.0333)										(.0978)			
2nd spline							.2436	***									.3146	***		
							(.0378)										(.0838)			
3rd spline							.1917	***									.0663			
							(.0467)										(.0720)			
4th spline							.0826	**									.0954	*		
							(.0273)										(.0435)			
5th spline							-.0763	***									-.0834	***		
							(.0059)										(.0114)			
Log (ESO share)					.0515	***			.2121	***					.0393	***			.2043	***
					(.0037)				(.0070)						(.0057)				(.0160)	
(Log (ESO share))^2									-.0733	***									-.0665	***
									(.0028)										(.0056)	
Wald chi^2	25,444	***	31,170	***	26,749	***	32,512	***	30,999	***	8,322	***	8,481	***	11,287	***	8,709	***	8,749	***

N=3,345 for models 1.1 – 1.5; *N*=2,673 for models 2.1-2.5. Standard errors in parentheses. Significance levels: *p<.05, **p<.01, ***p<.001. [a]Naturally coded, reference category Germany. [b]Naturally coded, reference category SIC 1. [c]Dummy variable

Table 9: Results of Random Effects Regressions Using *sales per employee*

Model 3 Dependent variable: *sales per employee*

	3.1		**3.2**		**3.3**		**3.4**		**3.5**	
Constant	.2404	***	.2370	***	.2407	***	.2444	***	.2419	***
	(.0040)		(.0036)		(.0039)		(.0041)		(.0039)	
Log (Firm size)	-.0080	***	-.0091	***	-.0090	***	-.0095	***	-.0092	***
	(.0003)		(.0003)		(.0003)		(.0003)		(.0003)	
Log (Capital per employee)	.3306	***	.3322	***	.3323	***	.3303	***	.3322	***
	(.0025)		(.0028)		(.0028)		(.0029)		(.0028)	
Log (Leverage)	-.1506	***	-.1557	***	-.1514	***	-.1458	***	-.1503	***
	(.0040)		(.0035)		(.0039)		(.0043)		(.0040)	
Spain[a]	-.0419	***	-.0342	***	-.0392	***	-.0398	***	-.0390	***
	(.0024)		(.0022)		(.0025)		(.0024)		(.0025)	
France[a]	-.0210	***	-.0270	***	-.0294	***	-.0296	***	-.0304	***
	(.0016)		(.0016)		(.0017)		(.0015)		(.0018)	
Italy[a]	-.0022		-.0018		-.0025		-.0012		-.0028	
	(.0023)		(.0018)		(.0023)		(.0020)		(.0023)	
UK[a]	-.0794	***	-.0879	***	-.0845	***	-.0880	***	-.0857	***
	(.0014)		(.0015)		(.0015)		(.0013)		(.0016)	
SIC 2[b]	.0293	***	.0315	***	.0350	***	.0361	***	.1341	***
	(.0019)		(.0018)		(.0021)		(.0023)		(.0020)	
SIC 3[b]	.0110	***	.0113	***	.0134	***	.0122	***	.0121	***
	(.0017)		(.0017)		(.0018)		(.0020)		(.0018)	
SIC 4[b]	.0288	***	.0297	***	.0331	***	.0305	***	.0324	***
	(.0022)		(.0022)		(.0025)		(.0027)		(.0025)	
SIC 5[b]	.0646	***	.0652	***	.0673	***	.0682	***	.0661	***
	(.0021)		(.0022)		(.0024)		(.0024)		(.0024)	
SIC 6[b]	-.1747	***	-.0773	***	-.1762	***	-.1746	***	-.1770	***
	(.0039)		(.0060)		(.0059)		(.0059)		(.0059)	
SIC 7[b]	.0012		.0036		.0041		.0017	***	.0030	
	(.0022)		(.0021)		(.0022)		(.0025)		(.0022)	
SIC 8[b]	-.0267	***	-.0274	***	-.0228	***	-.0235	***	-.0243	***
	(.0020)		(.0022)		(.0020)		(.0022)		(.0021)	
ESO (yes/no)[c]			.0224	***						
			(.0014)							
1st spline							-.0712	***		
							(.0113)			
2nd spline							.1897	***		
							(.0096)			
3rd spline							-.0529	***		
							(.0075)			
4th spline							-.0229	***		
							(.0048)			
5th spline							.0239	***		
							(.0019)			
Log (ESO share)					.0171	***			.0235	***
					(.0009)				(.0020)	
(Log (ESO share))^2									-.0033	***
									(.0009)	
Wald chi^2	38,000	***	41,112	***	36,063	***	39,255	***	39,929	***

N=3,345 for models 3.1 – 5.5. Standard errors in parentheses. Significance levels: *p<.05, **p<.01, ***p<.001. [a]Naturally coded, reference category Germany. [b]Naturally coded, reference category SIC 1. [c]Dummy variable

Table 10: Results of Random Effects Regressions Using *Tobin's Q* by Country

	All		Germany		Spain		France		Italy		UK	
1st spline	.1692	***	-.2382	*	.5145	***	.5353	***	.4210	***	-.1829	
	(.0333)		(.1033)		(.1384)		(.0980)		(.0861)		(.1125)	
2nd spline	0.2436	***	.3568	**	-.0599		.1256		.1623	†	.3517	***
	(.0378)		(.1200)		(.1649)		(.0889)		(.0967)		(.0879)	
3rd spline	.1917	***	.5390	***	-.8274	*	-.0996		.5339	***	.2487	**
	(.0467)		(.1459)		(.3375)		(.0915)		(.0899)		(.0795)	
4th spline	.0826	**	.1938	*	.3904	†	.0240		-.7426	***	.2437	***
	(.0273)		(.0916)		(.2014)		(.0453)		(.0547)		(.0450)	
5th spline	-.0763	***	-.1987	***	.4443	***	-.0628	***	.1708	***	-.0541	***
	(.0059)		(.0370)		(.0882)		(.0060)		(.0326)		(.0135)	
Wald chi^2	32,512	***	6,179	***	2,773	***	4,604	***	3,842	***	3,509	***
N	3,345		564		294		723		438		1,326	

The table contains coefficients on the splines of the ESO variable; standard errors in parentheses. Results are based on model 1.4 in Table 8. Regressions include controls for firm size, leverage and SIC code.
Significance levels: $^{\dagger}p\leq.1$ *$p\leq.05$; **$p\leq.01$; ***$p\leq.001$.

Table 11: Results of Random Effects Regressions Using *RoA* by Country

	All		Germany		Spain		France		Italy		UK	
1st spline	.2204	*	-.0355		-.7010	*	.3104		.9575	***	-.1339	
	(.0978)		(.3091)		(.3337)		(.2607)		(.2601)		(.2053)	
2nd spline	.3146	***	.9724	**	.3057		.0273		.1944		.4055	*
	(.0838)		(.3217)		(.4110)		(.2290)		(.2648)		(.1701)	
3rd spline	.0663		-.7138	**	-5.0317	*	.2258		1.5622	***	.3470	*
	(.0720)		(.2627)		(2.1478)		(.1881)		(.2863)		(.1433)	
4th spline	.0954	*	.2278	†	2.8263	*	.1986	*	-1.0524	***	-.0721	
	(.0435)		(.1375)		(1.3513)		(.0999)		(.2514)		(.0786)	
5th spline	-.0834	***	-.1649		.7679	†	-.1793	***	.3290	***	.0892	***
	(.0114)		(.1050)		(.4091)		(.0235)		(.0755)		(.0164)	
Wald chi^2	11,287	***	2,565	***	2,314	***	1,673	***	2,570	***	779	***
N	2,673		447		252		627		348		999	

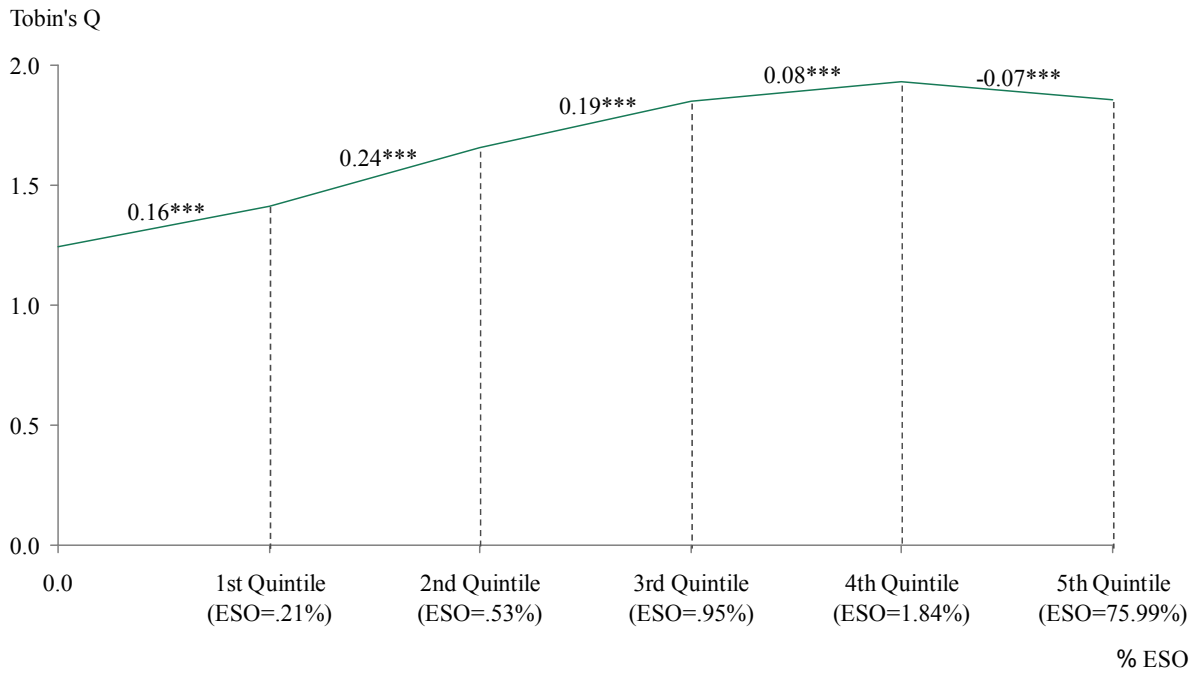
The table contains coefficients on the splines of the ESO variable; standard errors in parentheses. Results are based on model 2.4 in Table 8. Regressions include controls for firm size, leverage and SIC code.
Significance levels: $^{\dagger}p\leq.1$ *$p\leq.05$; **$p\leq.01$; ***$p\leq.001$.

Table 12: Results of Random Effects Regressions Using *sales per employee* by Country

	All		Germany		Spain		France		Italy		UK	
1st spline	-.0712	***	-.2959	***	-.0032		-.0271		.3474	***	-.0268	
	(.01131)		(.0344)		(.0684)		(.0339)		(.0639)		(.0179)	
2nd spline	.1897	***	.0850	*	-.1216	†	.3334	***	.0112		.2827	***
	(.0096)		(.0341)		(.0716)		(.0303)		(.0848)		(.0173)	
3rd spline	-.0529	***	.0103		.0872		-.1192	***	-.1893		-.0880	***
	(.0075)		(.0298)		(.1830)		(.0278)		(.1555)		(.0153)	
4th spline	-.0229	***	.1052	***	.1178		-.0598	***	-.0201		-.0102	
	(.0048)		(.0286)		(.1234)		(.0127)		(.1304)		(.0074)	
5th spline	.0239	***	-.0288	**	.0767		.0008		.1156	†	.0177	***
	(.0019)		(.0092)		(.1178)		(.003)		(.0693)		(.0042)	
Wald chi^2	37,977	***	11,986	***	6,864	***	10,788	***	1,961	***	7,154	***
N	3343		564		294		723		438		1324	

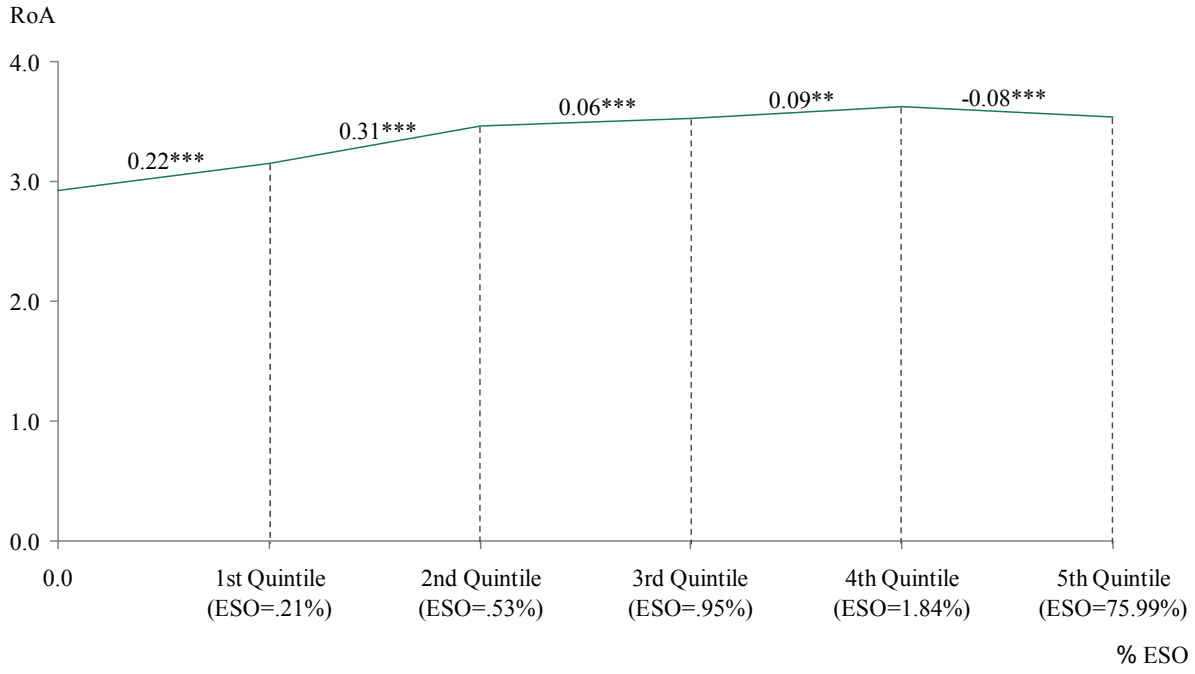
The table contains coefficients on the splines of the ESO variable; standard errors in parentheses. Results are based on model 3.4 in Table 9. Regressions include controls for firm size, leverage and SIC code.
Significance levels: $^{\dagger}p \leq .1$ *$p \leq .05$; **$p \leq .01$; ***$p \leq .001$.

Figure 1a: Spline Regression on Tobin's *Q*



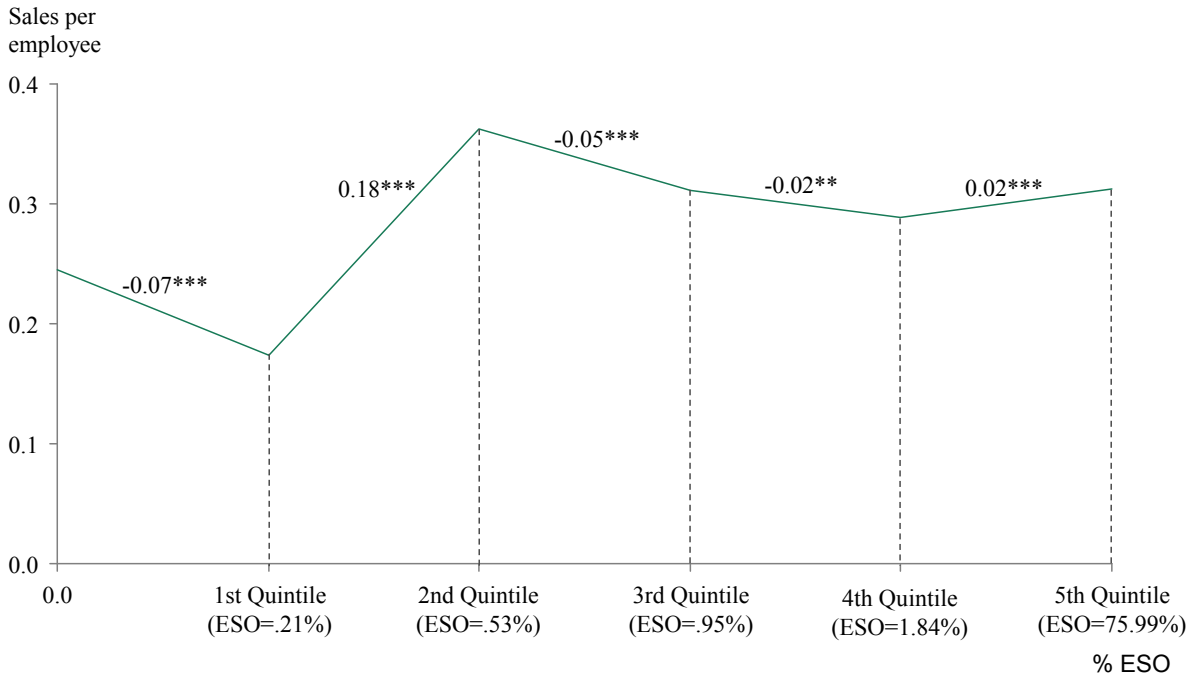
Note: Numbers above the line denote coefficients. Significance levels: ***p<.001.

Figure 1b: Spline Regression on *RoA*



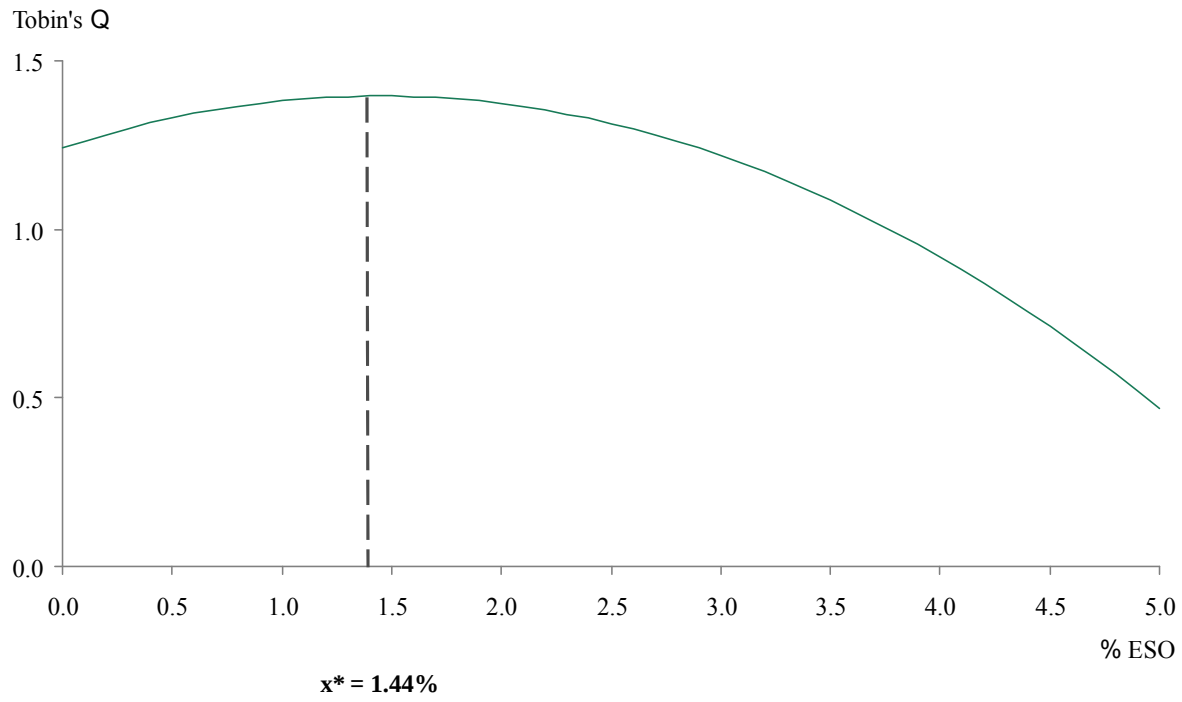
Note: Numbers above the line denote coefficients. Significance levels: **p<.01, ***p<.001.

Figure 1c: Spline Regression on *sales per employee*



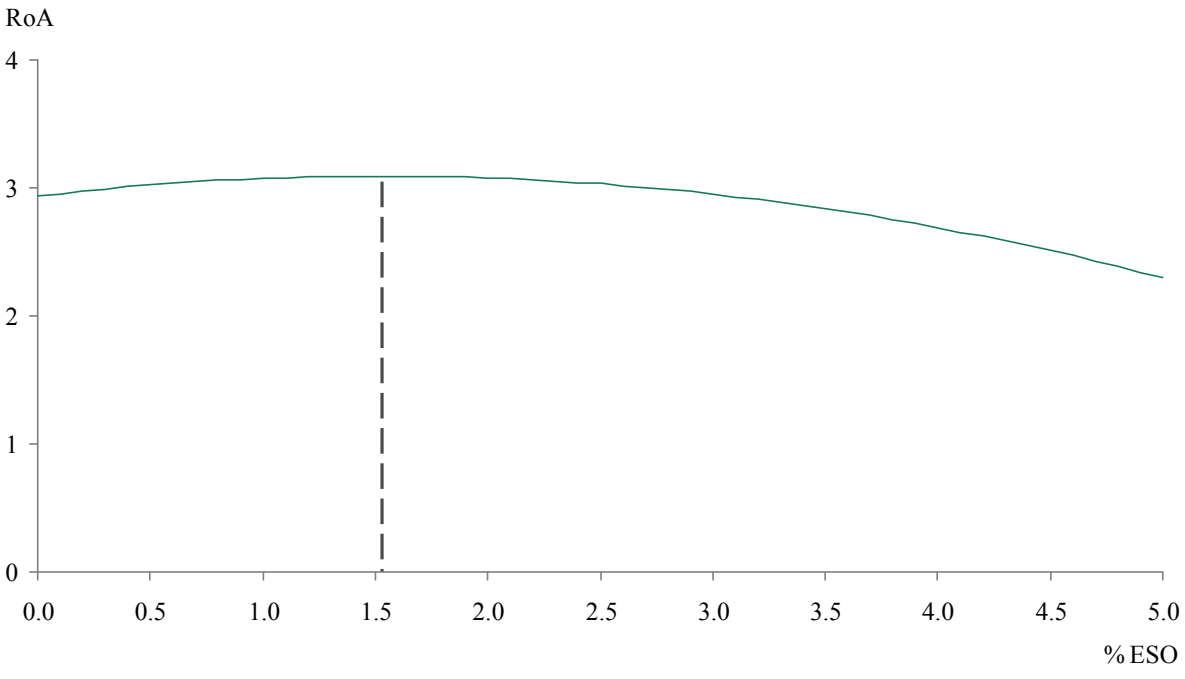
Note: Numbers above the line denote coefficients. Significance levels: ***p*<.01, ****p*<.001.

Figure 2a: Regressions with Quadratic Terms on *Tobin's Q*



x* = 1.44%

Figure 2b: Regressions with Quadratic Terms on *RoA*



x* = 1.53%