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Does employee ownership reduce agency costs? Evidence from French listed companies

L'actionnariat salarié réduit-il les coûts d'agence ? Le cas des entreprises françaises cotées.

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Abstract: Employee stock ownership (ESO) is often associated with reductions in agency costs because it increases employee satisfaction and attachment to their company and aligns the interests of employees with those of their firm. Another stream of research argues that ESO may have the opposite effect on agency costs because it serves as a management entrenchment tool and leads to divergence between stakeholders. This paper examines the relationship between ESO and agency costs in France, which is a leading European country for ESO. Using a panel database of 125 firms over the period 2002–2016, we find an inverted U-shaped relationship between ESO and agency costs. That evidence highlights that low levels of ESO increase agency costs, which is consistent with managerial entrenchment mechanisms. The findings also suggest that beyond a certain point, ESO reduces agency problems because it links employee wealth to their firm's success.

Keywords: Agency costs, Audit fees, Corporate governance, Employee stock ownership, Shared capitalism, Corporate social responsibility

Résumé : L'actionnariat salarié (AS) est souvent associé à une diminution des coûts d'agence car il augmente la satisfaction des salariés et leur attachement à leur entreprise et aligne leurs intérêts avec ceux de l'entreprise. Un autre courant de recherche suggère que l'AS peut avoir l'effet inverse sur les coûts d'agence en servant l'enracinement des dirigeants. Il entraînerait une divergence entre les parties prenantes et diminuerait la valeur actionnariale. Cet article étudie la relation entre AS et coûts d'agence en France, un pays leader européen en matière d'AS. Nos analyses sur des données issues de 125 entreprises françaises cotées sur la période 2002-2016 mettent en évidence une relation en U inversé entre l'AS et les coûts d'agence. Nos résultats indiquent que des niveaux faibles ou élevés d'AS sont associés à des coûts d'agence élevés en raison de l'enracinement des dirigeants. Les résultats suggèrent aussi qu'au-delà d'un certain seuil, l'AS réduit les problèmes d'agence en liant le patrimoine des salariés à la performance de leur entreprise.

Mots clés : Coûts d'agence, Honoraires d'audit, Gouvernance d'entreprise, Actionnariat salarié, Partage du capital, Responsabilité sociale de l'entreprise

1 Introduction

Employee stock ownership (ESO) is a shared capitalism setting that allows employees to own shares in the company they work for and consequently obtain shareholder rights. Kruse et al. (2020) defined shared capital plans as "employment relations where the pay or wealth of workers is directly tied to workplace or firm performance." ESO has been developing expeditiously over recent decades and has recently been promoted by many countries, especially the US and France. In a 2020 report, Jared Bernstein, an economic advisor to current US President Joe Biden during his tenure as US vice president, looked into ways of promoting the development of ESO. There are 14 million employee owners working in 6,500 companies in the USA. In France, Minister of the Economy and Finance Bruno Lemaire has set an ambitious target of ensuring employees hold 10% of French companies' equity by 2030. Other countries, such as Canada, the UK and China, are following the same path. The Canadian federal government included exploring the employee ownership trust framework in its 2021 budget commitments; the number of employee-owned businesses in the UK experienced a 30% increase between January 2020 and June 2021; and in China, more than 500 public companies announced the opening of an equity share plan for employees in 2020.

According to the European Federation of Employee Share Ownership, employee ownership of European companies' capital increased by 29.03% between 2006 and 2016 (Mathieu, 2017). At a country level, France exhibits the highest percentage of capital held by non-managerial employees (4.01%). The survey also reveals a total of 8 million employee shareholders in Europe, including around 3 million in France alone, who owned 6.03% of French companies' capital in 2016 (nearly twice the European average of 3.2%). Compared to American companies, ESO in Europe is more common in large listed companies than in smaller firms (Kruse, 2016).

Bernstein (2020) provides several reasons for such enthusiasm about ESO by relying on the existing academic literature. ESO plans provide retirement savings (especially in the US where they are designed for that purpose) and align the interests of employees with those of shareholders. Companies with significant levels of ESO are more robust in their response to the business cycle and have lower rates of bankruptcy and liquidation during crises. They have also been found to outperform on sales, job growth, and productivity (Bernstein, 2020; US National Center for Employee Ownership).[1]

ESO is also developing in companies that aim to reduce internal conflicts by increasing employee motivation and loyalty, which, in turn, helps the company perform better and become more profitable (Hallock et al., 2004). Previous studies have confirmed such consequences, showing that increased ESO is associated with a fall in employee turnover rates (Blasi et al., 2010a) because employees are more motivated and more involved in company decisions (Pierce et al., 1991). Employee shareholders, through their representatives on the board of directors, also enhance companies' corporate governance and environmental performances (Nekhili et al., 2020).

A contrasting line of research highlights a "dark side" of ESO (Guedri & Hollandts, 2008, p. 462). Faleye et al. (2006) argued that ESO may push employees away from shareholder value maximization, stating that ESO is associated with lower levels of risk, lower growth rates, and fewer job opportunities. Similarly, Rauh (2006) found that ESO favors managerial entrenchment (Hollandts et al., 2018; Park & Song, 1995), as employees would be management's natural allies against takeover (Pagano & Volpin, 2005), with managers potentially implementing ESO to keep shares in "friendly hands" (Benartzi et al., 2007, p. 61). Other stakeholders may be concerned about giving employees decision-making rights via ESO

[1] https://www.nceo.org/articles/employee-ownership-by-the-numbers

because that may enable employees to fully control the firm, which may erode the company's value and, thus, shareholder value. Accordingly, ESO can be said to affect *agency costs* , which Jensen and Meckling (1976) defined as the aggregate costs of monitoring (incurred by the principal) and bonding (by the agent), along with residual loss. Such an effect may be either positive or negative, with employee owners taking on a dual role of agents and principals (Child & Rodrigues, 2003).

These two contrasting effects are based on the analysis of two agency relationships: the manager-employee versus the shareholder-manager relationship. In the former, employee ownership would influence the productivity of employees by giving them an interest in the results of their work (Carberry, 2011; Kruse, 2002; Kruse et al., 2010; O'Boyle et al., 2016). In the latter, employee ownership would be used by managers for the purpose of entrenchment. Employee shareholders would be the natural allies of managers (Benartzi et al., 2007; Pagano & Volpin, 2005), helping them counteract the market discipline.

Several works have sought to resolve the contraction between those two opposing effects by assuming curvilinear relationships, showing such a relationship between ESO and performance measures (Aubert et al., 2017; Faleye et al., 2006; Guedri & Hollandts, 2008; Kim & Ouimet, 2014) or managerial entrenchment (Hollandts et al., 2018). While the studies were carried out in France and the US, which are the two countries where ESO is most developed, they do not achieve similar results. Hollandts et al. (2018) found an inverted U-shaped relationship between ESO and management entrenchment, while Aubert et al. (2017) showed a U-shaped link between ESO and the cost of capital. In their study of French firms, Guedri and Hollandts (2008) argued that ESO has an inverted U-shaped relationship with accounting-based measures of performance, and that result was also supported by Kim and Ouimet (2014) in the US.

Although agency costs have been referred to extensively in previous literature on ESO, the relationship between ESO and agency costs has never been studied directly. Indeed, previous

studies mainly use measures of performance to measure agency problems (Anderson et al., 2003; Ang et al., 2000; Barroso et al., 2018; Singh & Davidson III, 2003). Such empirical tests cannot be considered as tests of agency theory; at best, they are tests of the relationship between ESO and performance. Accordingly, the motivation of this paper is to investigate the relationship between ESO and agency costs using direct measures for the latter. There are also formalized theoretical models of ESO (Aubert et al., 2014, 2009; Bruslerie & Deffains-Crapsky, 2003) that study agency costs in an employee ownership setting, but they do not provide empirical tests of the ESO-agency costs relationship. We therefore propose such a test.

As mentioned previously, from the point of view of agency theory, ESO has the specific feature of being at the crossroads of two agency relationships that have opposite effects on agency costs. Indeed, that is reflected in the search for an optimum situation as regards agency costs, which is represented by an inverted U-shaped relationship. To the best of our knowledge, this study is the first attempt to investigate the relationship between employee ownership and the direct proxies for agency costs commonly cited in the literature.

We chose to focus on France because it is the European country with the largest proportion of employee-owned shares, the highest number of employee owners, and the highest level of employee-owner representation on boards of directors. We used listed firms because the effect of ESO on employee participation in company decision-making is greater for publicly traded companies than private ones in France (Guery & Stevenot, 2017) and because ESO in Europe is more commonly observed in large companies than in smaller ones (Kruse, 2016).

Using three proxies for agency costs—the asset utilization ratio, overinvestment and audit fees—from a sample of 125 French listed companies between 2002 and 2016, our results reveal an inverted U-shaped relationship between ESO and agency costs. Our paper confirms the nonlinear effects of employee ownership by directly addressing the role of agency costs. We interpret our results as a confirmation that low levels of ESO are instrumentalized by the

management. Then, agency costs increase until a threshold is reached where the incentive motive of ESO outweighs the instrumental one resulting in lower agency costs. In other words, when the level of ESO is high enough, it becomes a real driver for aligning interests. Moreover, larger employee investments encourage employees to exercise closer control over their managers in the shareholders' best interest and remodels alliances inside the firm.

We contribute to the literature in several ways. First, we empirically study the link between ESO and agency costs by using direct measures for the latter. Although the relationship was long presumed to be negative (Barney, 1990a; Bova et al., 2015; Carberry, 2011), our evidence shows that it is, in fact, curvilinear with an inverted U-shaped pattern. Therefore, ESO can have both positive and negative effects on agency conflicts, depending on the level of implementation, and agency costs increase with ESO until they reach a level at which they decrease. Second, our study also provides evidence that ESO can protect minority shareholders in France—a civil law country where ownership concentration of large companies is very high (La Porta et al., 1997)—by reducing agency costs only through high levels of ESO. Finally, this is the first study, to the best of our knowledge, to link ESO to audit fees, revealing that audit risk changes significantly with different levels of ESO.

The paper is organized as follows: Section 2 presents a literature review investigating the relationship between ESO and agency costs. Section 3 presents the data and methodology. Section 4 presents our findings, and section 5 discusses the empirical results and concludes the paper by highlighting the main implications and limitations.

2 Literature and hypothesis development

ESO affects two main agency conflicts: the manager-employee relationship and the manager-shareholder relationship. In the former, it may result in a fall in agency costs (Pendleton, 2006)

thanks to the incentive mechanism. In the latter, conversely, ESO may increase agency costs because of management entrenchment (Benartzi et al., 2007). Focusing on agency costs allows us to specifically target the relationships characterized by asymmetric information, where ESO can affect performance through channels other than agency costs alone. Indeed, several parameters can affect accounting or financial performance without directly impacting agency costs.

On the positive side, ESO gives rise to significant tax benefits. It can also be used as a wage substitution mechanism. In both cases, ESO has a direct positive effect on performance by reducing costs without affecting agency relationships. In the manager-employee relationship, tax savings improve margins, and in the manager-shareholder relationship, fixed wages are replaced by risky equity-based compensation. In the latter case, Kruse et al. (2010) considered wage substitution as precisely one of the cases where financial participation does not produce incentive effects. On the negative side, the dilution of earnings per share is a mechanical consequence of ESO relying on newly issued shares. Beyond a certain threshold, Blasi et al. (2010b) concluded that a higher concentration of employee wealth in company shares may have a negative impact on employee behavior, stating that the market reaction to new share issuance is negative on average. Moreover, stock price volatility may have negative effects on workers' motivation. In both scenarios, we observed that ESO may affect performance for reasons other than those affecting agency costs.

2.1 ESO for instrumental purposes

Kim and Ouimet (2014) found that in large US companies, ESO is often implemented for nonincentive purposes i.e., *'instrumental motives*'. For example, focusing on the relationship between financing constraints and the implementation of ESO plans in the US, they argued that ESO serves "to conserve cash by substituting company stock for wages or to form an alliance

between employees and managers to discourage takeovers" (p. 1). Using the same arguments, Aubert et al. (2017) and Barney (1990b) highlighted a negative and nonlinear relationship between ESO and the cost of debt and profit sharing, respectively. In other words, ESO would allow a transfer of risk from lenders to employees—in line with the abovementioned wage substitution effect—resulting in a lower cost of debt. Furthermore, rather than motivating employees, such a situation puts extra pressure on them to work.

Another instrumental reason for developing ESO is management entrenchment. Pagano and Volpin (2005) emphasized a natural alliance between employees and managers against takeovers, and employee ownership would therefore favor that alliance to the detriment of shareholders. One argument states that employees in companies with ESO plans are highly unlikely to monitor their own managers effectively (Freeman et al., 2008). Hence, ESO may serve first as a management entrenchment tool. Moreover, ESO allows employees to take root in the company where they are equipped with corporate governance power that enables them to decide the fate of the firm at the expense of the shareholders. In fact, employee owners are generally more risk-averse than external shareholders and are likely to make decisions that are not in line with the latter (Kruse et al., 2010). Additionally, similar to other shared capitalism plans, ESO fosters free riding among employees, which would negatively affect the motivation of some opportunistic employees (Freeman et al., 2008).

2.2 ESO for incentive purposes

The *incentive motive* assumes a positive effect between ESO and performance because of a reduction in agency costs. Accordingly, implementing ESO in a company reduces the monitoring costs incurred by the principal, as ESO favors horizontal monitoring, i.e., employees monitoring each other (Freeman et al., 2008). Such co-monitoring can be a highly efficient technique, since monitoring by colleagues is more effective than a manager supervising the work of a big team of employees (Freeman et al., 2008). Additionally, co-

monitoring is crucial for employees who overperform and who would prefer to avoid allowing other employees to free ride on their effort. When studying the relationship between a company's ESO and its cost of capital, Barney (1990a) argued that ESO reduces agency conflicts. Oyer and Schaefer (2005, p. 100) further suggested that creating a link between an employee's wealth and the worth of the company "might overcome agency problems and motivate the employee to take actions that are in the firm's best interest."

The various effects of ESO on the firm's performance and governance rely on its effect on employees' work behavior (Caramelli, 2011). Research has indicated that ESO fosters employees' attachment to a firm, and has many positive effects on their attitude in the workplace (Blasi et al., 2014; Fakhfakh, 2004; Kruse et al., 2010, 2012). Pendleton (2006) suggested that ESO compensates for the negative incentives of individual motivations, and creates a more trustful environment at a company. ESO can also align the interests, goals, and objectives of employees with those of managers (Kruse et al., 2010) and the firm (Rosen et al., 2005). That alignment of interests also enhances the firm's disclosures, reducing information asymmetry and improving a company's corporate governance by making it more transparent (Bova et al., 2015). Overall, literature focusing on incentive has therefore claimed that ESO may mitigate incentive problems involved in the agency relationship between management and employees.

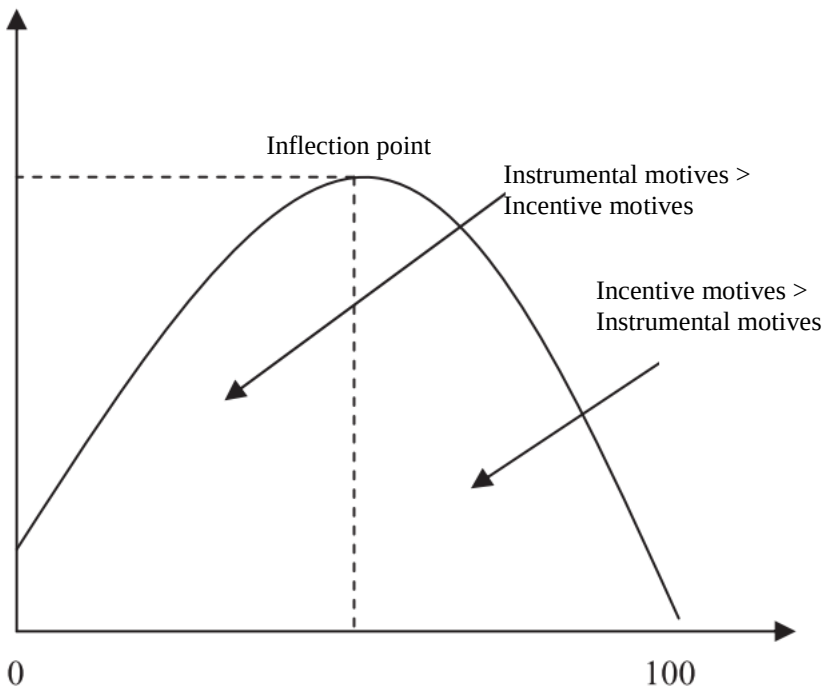
2.3 Hypothesis development

As shown above, because ESO can result in either of those contrary effects on agency problems, an inverted U-shaped relationship has been observed (Haans et al., 2015). Blasi et al. (Blasi et al., 1996) questioned whether low percentages of ESO are sufficient to produce positive behavioral effects. Additionally, low levels of ESO might cause external shareholders to worry that ESO serves only as a management entrenchment tool (Benartzi et al., 2007) and that low levels are unlikely to have positive effects on employees' motivation and, in turn, the

firm's overall performance. Furthermore, external shareholders perceive increased information asymmetry between them and internal shareholders, who have access to both internal and public information (Babenko & Sen, 2015). Lower levels of ESO may also be more easily instrumentalized by the management.

Beyond a certain level, however, employee ownership may become a real driver for aligning interests, thus reducing agency costs because the incentive motives would outweigh the instrumental ones. Indeed, larger employee investments in the company would encourage them to exercise closer control over their managers in the shareholders' interest. High ESO levels also entail more voluntary disclosures to the market, increasing a firm's transparency and reducing information asymmetry (Bova et al., 2015). Accordingly, we can expect ESO to have both a positive and negative effect on the level of agency conflicts in companies, as indicated in **Erreur ! Source du renvoi introuvable.Erreur ! Source du renvoi introuvable.**.

Figure 1: The hypothesized curvilinear effect of ESO on agency costs



The clash of those opposite effects would cause an inverted U-shaped relationship between the two variables. We argue that the relationship between ESO and agency costs is explained by

the additive combination of two latent functions into a quadratic relationship that reveals the net effect of X (ESO) on Y (agency costs). Those two latent functions resulting from two agency relationships are summed up in Table 1.

Table 1: Level of agency costs according to level of ESO

Level of ESO	0 to inflection point	Inflection point to 100%
Incentive motive (manager-employee relationship)	Null to weak	Strong
Instrumental motive (shareholder-manager relationship)	Strong	Weak to null
Overall effect on agency costs	Increase	Decrease

Based on the above, we formulate the following.

Hypothesis: There is an inverted U-shaped relationship between ESO and firms' agency costs.

3 Data and methodology

3.1 Data

Our sample consists of the 164 largest nonfinancial firms listed in France, based on the SBF 120 index, from 2002 to 2016.[2] The sample is based on the IODS corporate governance database, which was initially developed by Ginglinger et al. (2011) and used by Mohat and Alidou (2019) and Toe et al. (2017) to study ESO outcomes. The IODS data were not available after 2014, which meant we manually collected data on ESO and corporate governance from each company's annual report for 2015 and 2016. Financial data were obtained using Refinitiv Eikon and verified using the companies' audited financial statements. After excluding

[2] The number of unique firms is higher than 120 because some companies were delisted or removed, some others have merged, and new ones were added to the index during the period of analysis.

companies that did not have the necessary data for our analyses, our final sample is composed of 125 companies and 1,559 firm-year observations.[3]

3.2 ESO measure

To test our hypothesis, we use *EO* as the independent variable, calculated as the ratio of company shares owned by employees divided by total shares.

It can be argued that other aspects of ESO can also influence agency costs, such as its rate of diffusion (i.e., the percentage of the workforce that holds shares), the value of each employee's individual portfolio, and the size of the investment in ESO compared to salary. However, empirical research into those factors is often unfeasible, at least in our setting. Indeed, the rate of diffusion of ESO is not publicly available and neither is the individual value of the ESO portfolio. The relationship between ESO and average wages depends on the sociology of the workers, which in turn depends on the sector to which they belong. The building and public works sector employs more blue-collar workers than the consulting sector, for instance. In empirical analyses, that variance is often controlled by sector dummy variables. Accordingly, measuring ESO according to the percentage of capital held by employees synthesizes the notions mentioned above by also integrating the ownership structure.

In a theoretical model, De la Bruslerie and Deffains-Crapsky (2003) studied a large set of parameters involved in ESO and concluded that ESO measured as percentage of equity is one of the central variables that explain its effects. It has also been the most commonly used variables in the corporate governance and corporate finance literature (Aubert et al., 2017; Barney, 1990a; Ginglinger et al., 2011; Guedri & Hollandts, 2008; Mohat & Alidou, 2019; Toe

[3] Some of our regressions use fewer observations because of other missing values related to some specific control variables and because of lagged variables.

et al., 2017). In the remainder of the paper, *EO* therefore denotes the empirical measure of ESO.

3.3 Measures for agency costs

We use three different proxies to estimate the firm's agency costs: asset utilization, overinvestment, and audit fees. The use of the asset utilization ratio follows the approach of Ang et al. (2000) and Rashid (2013), who linked agency costs to the efficiency of asset utilization in a company, and is calculated as sales divided by total assets. Ang et al. (2000) claimed that the asset utilization ratio captures the efficiency of asset utilization and is inversely related to agency costs. Lower levels of the ratio may indicate bad investment decisions by managers (i.e., assets with negative net present values), management shirking (i.e., not following up on investments as needed to generate the expected revenues), or purchasing fruitless assets (Ang et al., 2000). Indeed, a firm that overinvests (indicating high agency costs) would have an excess of assets and thus a lower asset utilization ratio. Conversely, a higher asset utilization ratio suggests that the company is using its assets more efficiently to generate revenues, and therefore indicates lower agency costs. Hence, to ease the interpretation of our results, we use the opposite value of the ratio to estimate the level of agency costs, providing a ratio that increases for higher levels of agency costs:

$$UTILIZATION = -1 * \text{asset utilization ratio}$$

Overinvestment is our second proxy of agency costs. Prior research has suggested that firms with high agency costs tend to overinvest and engage in wasteful expenditures (Blanchard et al., 1994; Harvey et al., 2004; Hirth & Uhrig-Homburg, 2010). Richardson (2006, p. 162) argued that

> "the agency cost explanation introduced by Jensen (1986) and Stulz (1990) suggests that monitoring difficulty creates the potential for management to spend internally

generated cash flow on investments that are beneficial from a management perspective but costly from a shareholder perspective."

Therefore, we also estimate the firm's perceived agency costs according to its tendency to overinvest. We use Richardson's (2006) methodology to estimate the level of abnormal investments. First, we calculated the firm's total investments as the sum of capital expenditures, acquisitions, and research and development minus the receipts from disposal of property, plant and equipment:

$$I_{TOTAL,\,t} = CAPEX_{\,t} + Acquisitions_{\,t} + RD_{\,t} - SalesPPE_{\,t}$$

We then split the total investment (I_{TOTAL}) between (i) the required investment expenditures to maintain the assets in place ($I_{MAINTENANCE}$), and (ii) the investment expenditures on new projects (I_{NEW}).

$$I_{TOTAL,\,t} = I_{MAINTENANCE} + I_{NEW}$$

We then decomposed the value of investment (I_{NEW}) on new projects between (1) expected investment expenditures on positive NPV projects (I^*_{NEW}) and (2) abnormal investment (*OVERINVEST*). That decomposition is the result of the following regression:

$$I_{NEW,\,t} = \beta_0 + \beta_1\, V/P_{\,t-1}{}^{4} + \beta_2\, Leverage_{\,t-1} + \beta_3\, Cash_{\,t-1} + \beta_4\, Age_{\,t-1} + \beta_5\, Size_{\,t-1} + \beta_6\, Stock\ Returns_{\,t-1} + \beta_7\, I_{NEW,\,t-1} + \Sigma\, Year\ Indicator + \Sigma\, Industry\ Indicator$$

The fitted value from the above regression is the expected level of new investment (I^*_{NEW}). The residual—unexplained portion—of thatis regression represents the abnormal level of investment (*OVERINVEST*).[5] A positive (negative) value of abnormal investment represents an overinvestment (underinvestment) and, thus, higher (lower) agency costs.

[4] V/P is a measure of the opportunities of growth. It is the ratio of the value of the company (V_{AIP}) to the value of equity. $V_{AIP} = (1-\alpha r)BV + \alpha(1+r)X - \alpha rd$ with $\alpha=(\omega/(1+r-\omega)$ and $r=12\%$ and $\omega=0.62$. ω is the abnormal earnings persistence parameter from the Ohlson (1995) framework, BV is the book value of common equity, d is annual dividends and X is operating income after depreciation.

[5] Following Richardson (2006), abnormal investments are presented as a percentage of the firm-year's average total assets.

Audit fees paid to external auditors is our third proxy for agency costs. The aim of auditing is to mitigate agency problems by evaluating the accuracy of companies' annual reports on behalf of their owners, who cannot always control the fairness of the document (Ballwieser et al., 2012). Lafond and Roychowdhury (2008) underlined that a company's risk premium is influenced by its agency costs, which in turn affect its audit fees. Jensen and Payne (2005) showed that, with high agency costs, the demand for external audit increases as part of attempts to significantly reduce those costs. Therefore, audit fees and agency costs are positively correlated. Khalil et al. (2008) argued that the actions of insiders will generate a higher inherent risk and higher internal control risk. In a sample of Canadian firms, they found that greater agency problems are related to increases in auditors' efforts. Several other studies have also showed how auditors generally take agency problems into consideration before audit engagement and how that affects the audit fees indicator. That is, audit fees increase when the risk associated with the company is higher and when more agency conflicts exist (Gul et al., 2003; Gul & Tsui, 2001; Jensen & Payne, 2005; Khalil et al., 2008). In addition, Chan et al. (1993) suggested that audit fees are higher when there is a complete separation between ownership and control, i.e., more agency costs. Similarly, Clinch et al. (2012) stated that increased agency costs and information asymmetry entail demands for enhanced, more thorough audits, resulting in higher audit fees. Overall, the level of agency conflicts is a major determinant of audit effort and associated audit fees (Jensen & Payne, 2005), as the main function of external audits is to increase the confidence of shareholders (and other possible users) in a company's financial statements. Based on the evidence outlined above, we use audit fees, in their logarithmic form, as our third proxy for agency costs.

3.4 Empirical strategy

To test our hypothesis, we ran three main panel data regression models, in which the dependent variable is each of the three agency costs proxies used in our study and the independent variable is *EO*. Each model also employs a set of firm characteristics as control variables.

Models (1) and (2) study the effect of ESO on the asset utilization ratio and the abnormal investment. We use the same set of firm characteristics as control variables in both models.

$$UTILIZATION_t = \beta_0 + \beta_1 EO^2_t + \beta_2 EO_t + \beta_3 FCF_{t-1} + \beta_4 BOARD_{t-1} + \beta_5 QUICK_{t-1} + \beta_6 GROWTH_{t-1} + \beta_7 SIZE_{t-1} + \beta_8 ROA_{t-1} + \beta_9 LEVERAGE_{t-1} + \beta_{10} WC_{t-1} + \beta_{11} AGE + \varepsilon \qquad (1)$$

$$OVERINVEST_t = \beta_0 + \beta_1 EO^2_t + \beta_2 EO_t + \beta_3 FCF_{t-1} + \beta_4 BOARD_{t-1} + \beta_5 QUICK_{t-1} + \beta_6 GROWTH_{t-1} + \beta_7 SIZE_{t-1} + \beta_8 ROA_{t-1} + \beta_9 LEVERAGE_{t-1} + \beta_{10} WC_{t-1} + \beta_{11} AGE + \varepsilon \qquad (2)$$

In line with our hypothesis, we expect a negative and significant β_1 and a positive and significant β_2 but greater than $-2 * \beta_1$ in both models.[6]

Asset utilization and investments differed between industries and years. We therefore control for differences among the eight industries in our data by including a set of dummy variables, one for each one-digit SIC. We also add a binary variable for each year included in our sample.

We also control for firm size by adding the natural logarithm of total assets as a control variable (*SIZE*), for financial performance by using return on assets *(ROA)* and growth in sales *(GROWTH)*, for liquidity by using the quick ratio *(QUICK)*, for working capital *(WC)*, and for free cash flow by using an accounting-based measure of free cash flow *(FCF)*.[7] A company

[6] *EO* is a positive variable that can vary between 0% and 100%. In order to have a negative U-shaped relationship with *UTILIZATION*, the *EO* values of the inflection points of the functions should be included in the 0%–100% interval; otherwise, the relationship would be continuously positive or negative for the possible values of *EO*. Therefore, *EO* coefficient (β_2) in all the models should validate the following condition: $0 < \beta_2 < -2 * \beta_1$.

[7] In line with Richardson (2006), *FCF* is the cash flow beyond what is necessary to maintain assets in place and finance expected new investments. It is calculated as cash flow from operating activities (*OCF*) less maintenance

with a good (bad) financial performance is less (more) likely to overinvest and should have lower (higher) agency costs (Wu & Tu, 2007), and a company with high liquidity, improved short-term financial health and an increased free cash flow is more likely to invest more (Chen et al., 2016; Richardson, 2006). The company's leverage ratio *(LEVERAGE)* is also included in the models since a high leverage ratio entails high default risk and thus, higher agency costs (Chen & Yur-Austin, 2007). Additionally, we control for the size of the company's board of directors *(BOARD)*, which should reduce agency costs, and for the experience and expertise of the company staff via the age of the firm *(AGE)* (Ang et al., 2000).

Our third proxy for agency costs is an audit fee model, in accordance with Barroso et al. (2018) and Niemi (2005). It is expressed by the following equation (3):

$$AUDITFEES_t = \beta_0 + \beta_1 EO^2_t + \beta_2 EO_t + \beta_3 AUDITORS_t + \beta_4 BIG4_t + \beta_5 SIZE_t + \beta_6 LEVERAGE_t + \beta_7 GROWTH_t + \beta_8 UTILIZATION_t + \beta_9 ROA_t + \beta_{10} LOSS_t + \beta_{11} QUICK_t + \beta_{12} PTBV_t + \beta_{13} INT_t + \beta_{14} YEAREND_t + \varepsilon \quad (3)$$

In line with our hypothesis, we would expect a negative and significant β_1 and a positive and significant β_2 but lower than -2 * β_1.

The model also controls for other factors that affect the level of audit fees, such as firm size (*SIZE*), because auditors' tasks increase with a company's size (Gonthier-Besacier-Cerag & Schatt, 2007). *ROA* controls for the company's profitability (Hay et al., 2006), with *LOSS* being a binary variable that controls for years of negative profitability. We also control for a firm's leverage with the debt-to-assets ratio (*LEVERAGE*) and for its liquidity with the quick ratio (*QUICK*). Through that, we measure, respectively, the long- and short-term financial structures of the company, which reflect the firm's financial risk (Chaney et al., 2004). We also include

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expenditure plus *research and development expenditure* less I^*_{NEW}, as a percentage of the firm-year's average total assets: $FCF = OCF - I_{MAINTENANCE} + RD - I^*_{NEW}$

GROWTH to control for firms' growth in sales (Whisenant et al., 2003), *INT* for the complexity of financial operations (Barroso et al., 2018), and *UTILIZATION* for agency costs and the effective use of the company's assets. The market price to book value of the company's shares (*PTBV*) controls for information asymmetry, which increases audit fees (Frankel & Li, 2004).

Three auditor characteristics are also included: *AUDITORS* to control for the number of auditors; *BIG4* to check whether at least one of the auditors is a Big Four audit firm (i.e., Deloitte, EY, KPMG and PwC), as those companies usually charge higher audit fees (Choi et al., 2008; Francis & Yu, 2009); and *YEAREND*, with a binary variable of 0 when the company's financial year ends on 31 December (and 1 when it ends on a different date) to control for the auditor's busy period when performing the audit. Additionally, as analyses of robustness, we control for other ownership structure mechanisms that have proven to affect audit fees; that is, management (*MGT*) and blockholder (*MAJOR*) ownership.

We estimate our models using generalized least squares (GLS) regressions and employed the Hausman test (Hausman, 1978) to check whether we had to use fixed or random effects. The result of the test indicated that, based on our data, random effects are more efficient than fixed effects. We use robust standard errors corrected for heteroscedasticity to compute *p*-values. All continuous variables are winsorized at the first and 99th percentiles.[8]

The detailed calculation of all the variables used in the study as well as the source used for their collection are reported in Appendix A.

4 Results

4.1 Descriptive statistics and univariate analyses

[8] We also examine the linear effect of ESO on agency costs. Nontabulated findings suggest that ESO does not have a significant linear impact on our agency costs proxies.

Table 2 shows the descriptive statistics of the variables used in the study.

Table 2: Descriptive statistics

Variable	Mean	Median	Std. Dev.	Min.	Max.
EO	0.022	0.010	0.040	0.000	0.328
Asset utilization ratio	0.768	0.727	0.410	0.000	2.338
TURN (million €)	10,600	2,980	17,700	1.20	112,000
AGE	3.379	3.466	0.623	1.099	5.136
AUDIT (thousand €)	6,960	3,433	8,367	197	47,800
AUDITORS	2.184	2.000	0.423	1.000	4.000
BIG4	0.961	0.100	0.193	0.000	1.000
BOARD	11.749	11.000	3.725	3.000	24.000
ASSETS (million €)	17,200	5,080	31,600	97.6	276,000
LEVERAGE	0.264	0.249	0.159	0.004	0.859
FCF	0.004	0.004	0.006	-0.040	0.038
GROWTH	0.014	0.037	0.267	-1.869	0.636
ROA	0.043	0.044	0.062	-0.229	0.254
LOSS	0.157	0.000	0.364	0.000	1.000
OVERINVEST	0.000	-0.001	0.005	-0.011	0.050
QUICK	0.991	0.870	0.547	0.195	3.720
PTBV	2.010	1.610	2.834	-20.810	57.410
INT	0.531	0.587	0.290	0.000	1.000
WC	6.267	4.755	19.255	-186.201	104.332
YEAREND	0.129	0.000	0.336	0.000	1.000
MAJOR	0.365	0.340	0.266	0.00	0.999
MGT	0.067	0.016	0.137	0.00	0.736

Table 3: Correlation table

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1. EO	1.00																				
2. UTILIZATION	-.07***	1.00																			
3. OVERINVEST	-.026	.112***	1.00																		
4. AUDITFEES	.20***	-.01	-.00	1.00																	
5. FCF	-.03	-.19***	.05	.02	1.00																
6. WC	-.09***	-0.04	.07**	-.18***	.02	1.00															
7. BOARD	.22***	.14***	.06*	.64***	.02	-.13***	1.00														
8. AUDITORS	.03	.05**	-.08**	-.01	.03	.07**	.16***	1.00													
9. BIG4	.05*	.16***	.01	.18***	-.04	-.04	.09***	-.05**	1.00												
10. ASSETS	.23***	.21***	.03	.88***	-.05	-.12***	.45***	.04*	.17***	1.00											
11. LEVERAGE	.01	.23***	-.01	.01	-.14***	-.51***	.00	-.03	.01***	.10***	1.00										
12. GROWTH	-.02	.04*	.08**	-.11***	.00	.14***	-.06*	.01	-.07***	-.10***	.01	1.00									
13. ROA	-.04**	-.09***	.07**	-.01	.61***	.10***	.05	.05*	-.04	.02	-.09***	.16***	1.00								
14. LOSS	-.07***	.07***	-.05	-.06**	-.42***	-.00	-.07**	-.04	.07*	-.10***	.11***	-.13***	-.59**	1.00							
15. QUICK	-.09***	.09***	.11***	-.32***	-.23***	.56***	-.21***	-.07***	-.09***	-.36***	-.28***	.12***	-.04**	.06**	1.00						
16. PTBV	-.05**	-.05**	.15***	-.06**	.26***	.22***	-.06*	-.03	.01	-.09***	-.17***	.05**	.13***	-.04*	.12***	1.00					
17. INT	-.03	-.19***	.03	.29***	.12***	.14***	.13***	-.13***	.06**	.19***	-.19***	-.06**	.03	-.05*	.01	.02	1.00				
18. YEAREND	-.06**	-.01	-.09***	-.20***	-.16***	-.10***	-.16***	-.08***	.07***	-.20***	.13***	-.02	-.07***	.09***	-.09***	.04	.04	1.00			
19. MAJOR	-.01	-.10***	-.06*	-.20***	.09***	-.08***	-.05	.05**	-.05*	-.15***	-.07***	-.02	.05**	-.05**	-.07***	.03	-.20***	-.01	1.00		
20. MGT	.10***	.14***	.03	-.13***	.03	.02	-.11***	-.03	.01	-.16***	-.06**	.04	.09***	-.05*	.07***	-.04	-.10*	.04**	-.17*	1.00	
21. AGE	-.02	.07**	.01	.16***	-.01	-.01	.22***	.11***	.02	.17***	-.03	-.06**	.02	-.03	-.13***	-.01	.26***	-.03	.03	.11***	1.00

**** p <0.01, ** p <0.05, * p <0.1*

The sample's average level of *EO* is 2.3%. The average for audit fees and asset utilization ratio is €6.96 million and 0.768, respectively. The average for *OVERINVEST* is zero since they are calculated as residuals of a regression model. Moreover, around 85% of the firms show positive profitability, with an average return on assets of 4.1%, and an average debt-to-total-assets ratio of 25.9%. Finally, 96.1% of the companies have at least one Big Four audit firm among their independent external auditors.

The Pearson correlation matrix of the variables is presented in Table 3.

[Insert Table 3 Here]

The table highlights that employee share ownership (*EO*) is significantly correlated with two of the three proxies for agency costs used in this study. They are *UTILIZATION (-0.07; p-value <0.01)* and *AUDITFEES (0.20; p-value <0.01)*. Our hypothesis predicts a curvilinear relationship between ESO and agency costs, whose sign and significance could not be properly observed in this matrix. The correlation of ESO with each of the three proxies used for agency costs is different, i.e., positive with audit fees, negative with asset utilization and negative and not significant with overinvestment. Those divergences indicate that a multivariate analysis is required to study our hypothesis. We also assume nonlinear relationships that are not captured by bivariate correlations. Additionally, we notice that bigger companies have higher levels of ESO, as predicted by Kruse (2016), as well as a less efficient use of their assets and higher levels of audit fees. Figure 2 in the appendix reports the plots that relate the level of employee ownership to the three measures of agency costs.

4.2 Multivariate analyses

Table 4 presents the estimation of our models.

Table 4: The effect of ESO on agency costs

VARIABLES	Predicted sign	UTILIZATION	OVERINVEST	AUDITFEES
EO^2	-	-10.021**	-0.147**	-11.870***
		(4.176)	(0.072)	(4.680)
EO	+	3.537***	0.026*	2.969**
		(1.329)	(0.014)	(1.461)
FCF	+	-0.115	0.117	
		(1.388)	(0.074)	
BOARD	-	-0.002	-0.001*	
		(0.005)	(0.000)	
QUICK	+	0.030*	0.001	0.004
		(0.018)	(0.001)	(0.036)
GROWTH	-	0.006	-0.000	-0.089*
		(0.012)	(0.000)	(0.053)
SIZE	+	0.022	0.000*	0.603***
		(0.048)	(0.000)	(0.036)
ROA	-	-0.028	-0.004	-0.620*
		(0.066)	(0.007)	(0.347)
LEVERAGE	+	0.352***	0.002	-0.121
		(0.128)	(0.002)	(0.140)
WC	-/+	-0.001	0.000	
		(0.001)	(0.000)	
AGE	+	0.008	0.000	
		(0.058)	(0.000)	
AUDITORS	+			0.169***
				(0.050)
BIG4	+			0.295***
				(0.096)
UTILIZATION	-			-0.383***
				(0.098)
LOSS	+			0.004
				(0.036)
PTBV	+			0.001
				(0.001)
INT	+			0.062
				(0.073)
YEAREND	-			0.005
				(0.126)
Constant		-1.344	-0.011**	0.429
		(1.037)	(0.005)	(0.827)
Year effects		Included	Included	Included
Industry effects		Included	Included	Included
N		1,036	1,029	1,559
R^2		36.36%	16.39%	88.47%
Inflection point		17.64%	8.84%	12.51%

Robust standard errors are given in parentheses. *** p <0.01, ** p <0.05, * p <0.1.
Variables are defined in Appendix A

Column A in Table 4 considers the relationship between ESO and the asset utilization ratio and shows that *EO^2* has a significant negative relationship with *UTILIZATION* (cf. = -10.02, *p* <.05). The coefficient associated with *EO* is positive and significant (cf. = 3.537, *p* <.01) and lower than $-2*\beta_1$ (3.537 < 20.04). Therefore, the results confirm an inverted U-shaped relationship between *EO* and *UTILIZATION* and fail to reject the hypothesis, as both conditions stated in the previous section are met, in accordance with our expectations.

The evidence highlights an inverted U-shaped relationship between ESO and agency costs. For an average firm with a level of *EO* below the inflection point, a single standard deviation increase in the percentage of *EO* (4%) implies a decrease in the company's asset utilization ratio (an increase in *UTILIZATION*) of 12.5%. In contrast, for firms with levels of ESO above the regression's inflection point, the asset utilization ratio increases by 12.5% with a single standard deviation increase in *EO*. The results indicate that, for companies with a sufficiently high level of ESO, an increase in ESO entails more efficient use of company assets to generate revenues. However, the same increase generates a lower asset utilization ratio for companies with low levels of ESO.

Column B in Table 4 presents the results of the regression of *OVERINVEST* as a dependent variable. The coefficient associated with *EO^2* is negative and significant (cf. = -0.147, *p-value* <0.05) while that associated with *EO* is positive and significant at 10% and lower than $-2*\beta_1$ (cf. = 0.0257, *p-value* <0.1). The reported results lead to the same conclusions discussed above and validate an inverted U-shaped relationship between ESO and agency costs. They indicate that when a firm has low ESO levels (*EO*<8.84%), an increase in the percentage of shares owned by employees is more likely to increase the level of abnormal investments. On the other

hand, after the inflection point, an increase in *EO* generates a fall in a company's overinvestment.[9]

Column C in Table 4 presents the results of the curvilinear relationship hypothesized in model 3. The regression results fail to reject our hypothesis that an inverted U-shaped relationship exists between *EO* and *AUDITFEES*. Indeed, *EO^2* is significantly negatively correlated with *AUDITFEES* (β_1 = -11.870, p <.01), while the coefficient for *EO* is positive and significant (β_2 = 2.969, p <.05), validating both conditions of the inverted U-shaped relationship between *EO* and *AUDITFEES* (β_1 <0; and 0 <β_2 <-2β_1). The results of this regression denote that when *EO* is lower than 12.51%, its effect on *AUDITFEES* is positive, whereas if the value of *EO* is greater, it has a negative effect on *AUDITFEES*.[10] For an average firm with relatively low levels of ESO, an increase of one standard deviation in *EO* causes a 9.97% increase in audit fees. However, the same increase in the percentage of employee-owned shares in an average firm with high levels of ESO (*EO* > 12.51%) entails a 9.97% reduction in the fees charged by external auditors. The results suggest that when present in low levels, ESO serves as a managerial entrenchment mechanism rather than a tool that aligns employees' interests with those of external shareholders. Thus, in such cases, audit effort and, in turn, audit fees increase. However, higher ESO values are more likely to align the interests of employees, managers and shareholders, which leads to a fall in agency costs, thus reducing audit effort and audit fees.[11]

4.3 Robustness analyses

4.3.1 Alternative measure of ESO

[9] The parabola's inflection point is calculated as follows: $-\beta_2 / (2*\beta_1) = -0.026/(2*-0.147)$.
[10] The parabola's inflection point is calculated as follows: $-\beta_2 / (2*\beta_1) = -2.969/(2*-11.87)$.
[11] Previous studies suggest that audit fees are affected by other ownership structure measures, notably management and institutional ownership. We therefore included two additional independent variables in model 3 to control for the effects of blockholder and managerial ownership, respectively. The results (untabulated) remain insensitive to the inclusion of those measures.

We start our robustness analyses by using an alternative variable to measure ESO, based on the voting rights in the hands of a company's employees. We replaced the ratio of shares owned by employees (*EO)* with their ratio of voting rights *(EVR)* as the independent variable in all the abovementioned models. This alternative independent variable is calculated as the number of votes employee owners have at a company's general meetings divided by the total voting rights.[12] The average value of *EVR* (2.8%) is slightly higher than that observed for *EO* (2.3%). That is because, in France, shareholders gain double voting rights when they hold nominative shares for two or more years.[13] The result of the analysis, reported in Table 5, confirms our main findings.

[12] Research in human resource management and labor economics also measure ESO as the individual investment of each employee or the percentage of the workforce that own company stocks. We did not have access to those data because they are not publicly available.
[13] As per law no. 2014-384 (The Florange Law) of 29 March 2014.

Table 5: The effect of ESO on agency costs: alternative measure for ESO

VARIABLES	UTILIZATION	OVERINVEST	AUDITFEES
EVR^2	-6.808**	-0.103*	-7.792***
	(3.179)	(0.053)	(2.715)
EVR	2.803**	0.022*	2.279**
	(1.207)	(0.012)	(1.127)
FCF	-0.204	0.117	
	(1.405)	(0.074)	
BOARD	-0.001	-0.000	
	(0.005)	(0.000)	
QUICK	0.030*	0.001	-0.048
	(0.018)	(0.001)	(0.042)
GROWTH	0.006	-0.000	-0.089*
	(0.012)	(0.000)	(0.053)
SIZE	0.022	0.000*	0.604***
	(0.048)	(0.000)	(0.036)
ROA	-0.029	-0.004	-0.625*
	(0.067)	(0.007)	(0.347)
LEVERAGE	0.356***	0.002	-0.130
	(0.129)	(0.002)	(0.138)
WC	-0.0005	0.000	
	(0.0007)	(0.000)	
AGE	0.013	0.000	
	(0.059)	(0.000)	
AUDITORS			0.170***
			(0.050)
BIG4			0.296***
			(0.090)
UTILIZATION			-0.380***
			(0.098)
LOSS			0.004
			(0.036)
PTBV			0.001
			(0.001)
INT			0.063
			(0.073)
YEAREND			0.005
			(0.126)
Constant	-1.357	-0.010**	0.428
	(1.039)	(0.005)	(0.829)
Year effects	Included	Included	Included
Industry effects	Included	Included	Included
N	1,036	1,029	1,559
R^2	37.63%	20.22%	88.52%
Inflection point	20.59%	10.85%	14.62%

Robust standard errors are given in parentheses. *** p <0.01, ** p <0.05, * p <0.1. Variables are defined in Appendix A

Table 6: The effect of ESO on agency costs: Control for endogeneity

VARIABLES	UTILIZATION	OVERINVEST	AUDITFEES
L.UTILIZATION	0.175**		
	(0.088)		
L. OVERINVEST		0.230***	
		(0.041)	
L. AUDITFEES			0.126**
			(0.062)
EO^2	-6.904*	-0.367**	-17.290**
	(3.780)	(0.167)	(7.228)
EO	2.770*	0.051	3.517**
	(1.486)	(0.043)	(1.711)
FCF	-0.159	0.059	
	(1.011)	(0.041)	
BOARD	-0.003	0.000	
	(0.003)	(0.000)	
QUICK	-0.005	0.001	-0.058**
	(0.008)	(0.000)	(0.027)
GROWTH	0.002	0.001*	0.0002
	(0.006)	(0.000)	(0.004)
SIZE	-0.087***	-0.003***	0.393***
	(0.026)	(0.001)	(0.040)
ROA	0.017	0.006***	0.123
	(0.034)	(0.002)	(0.193)
LEVERAGE	-0.062	-0.009***	0.0765
	(0.073)	(0.003)	(0.120)
WC	0.000	0.000	
	(0.000)	(0.000)	
AGE	0.000	-0.005*	
	(0.098)	(0.003)	
AUDITORS			0.113***
			(0.036)
BIG4			0.052
			(0.149)
UTILIZATION			-0.118
			(0.078)
LOSS			0.013
			(0.025)
PTBV			0.0003
			(0.003)
INT			0.027
			(0.068)
YEAREND			0.186*
			(0.099)
Constant	1.291**	0.077***	3.960***
	(0.617)	(0.022)	(0.806)
Year and industry effects	Included	Included	Included
N	926	919	1,258
Wald chi-square	162.14***	129.53***	309.06***
Inflection point	20.06%	6.95%	10.17%

Robust standard errors are given in parentheses. *** p <0.01, ** p <0.05, * p <0.1.

4.3.2 Endogeneity test

We tested our models for endogeneity. Endogeneity is expected to exist if our proxies for ESO are correlated with unobserved variables in the regression models. To address that potential problem, we apply a generalized method of moments (GMM) estimator (Arellano & Bond, 1991). In particular, we add a one-year lagged level of our dependent variables as independent variables in each of the respective models. Such an approach deals with the endogeneity problems because the lagged dependent variable is also likely to be correlated with the model's error term.

We note that previous studies (e.g., Zhang, 2011) used a two-stage least square (2SLS) approach to control for endogeneity. However, we question whether that is the best strategy due to our research setting. Indeed, finding reliable and robust instruments for ESO is very challenging in the French context so the risk of using invalid instruments that might lead to weak results would be high. In addition, given the presence of heteroskedasticity in our models, a GMM estimator is more efficient than 2SLS (Söderbom, 2009). The estimation of our models using GMM estimators are presented in Table 6.

[Insert Table 6 Here]

The analysis reveals an inverted U-shaped effect of *EO* on our three agency costs proxies used as dependent variables. As such, we conclude that the results of the GMM estimations are qualitatively similar to the GLS regressions, suggesting that the primary results reported in Table 4 are robust when tested for endogeneity.

4.3.3 Other robustness tests

We ran a series of additional nontabulated robustness tests.[14] First, we modified Ang et al.'s (2000) measure of agency costs used in Model (1) by adjusting for industry-specific asset utilization ratios. In particular, we used the difference between firms' actual asset utilization ratio and the median asset utilization ratio for their industry. The results are in line with those reported in Column A in Table .

We used Ang et al.'s (2000) second proxy for agency costs, i.e., the operating expenses to annual sales ratio. The ratio measures agency costs incurred at the firm level, caused by managers' excess and perquisite consumptions. We also used Singh and Davidson III's (2003) alternative agency costs measure for discretionary managerial expenses, and the SG&A expenses to annual sales ratio. The results of the regression of the two additional proxies on ESO confirm the significant inverted U-shaped effect of ESO on agency costs.

We calculated the maximum (inflection) point in each model, and then ran two linear regression model tests for each one.[15] The first included *EO* values that were lower than the inflection point, and the second included only values that were higher than the inflection point. The results indicate that, for both models, *EO* values lower than the inflection point are significantly positively correlated with both our dependent variables, while higher values have a significant negative effect on the dependent variables, thus validating the inverted U-shaped relationship obtained in the main analyses.

We excluded observations for which *EO* was null to avoid bias from any absence of ESO plans. The goal of this analysis is to verify whether the level of ESO affects audit fees only when a company develops an ESO plan. Accordingly, the analysis excluded firms that decided not to

[14] All nontabulated results are available from the authors on request.
[15] The inflection point represents the ESO level at which the curve's direction of curvature changes. Those values are presented in the final row of Table 4.

implement ESO. The results do not differ from our main results and validate an inverted U-shaped relationship between ESO and agency costs.

We estimated model 3 using a Tobit statistical model (Tobin, 1958), which suits studies that have a censored dependent variable. Indeed, *AUDITFEES* is a variable that cannot have negative values. The results support the evidence provided by our main analyses. We also reestimate models 1 and 2 using the current rather than lagged values for the independent variables and the results are in line with our main evidence. Finally, we applied the UTEST Stata command developed by Lind and Mehlum (2010, p. 117) that "gives the exact necessary and sufficient conditions for the test of a U-shape.".[16] This test confirms the existence of a statistically significant inverted U-shaped relationship in all three models and, therefore, validates our main results and conclusions.

5 Discussion and conclusions

This study examines the relationship between ESO and agency costs, using a sample of 125 firms listed in France between 2002 and 2016. ESO is often implemented either for incentive or instrumental motives, which can be related to agency costs. As a result of that view, we hypothesize an inverted U-shaped relationship between ESO and agency costs.

Our results confirm the hypothesis and highlight an inverted U-shaped relationship between ESO, measured as the percentage of equity held by employees, and agency costs, measured by asset utilization ratio, overinvestment, and audit fees. Accordingly, our evidence reveals that low levels of ESO are related to high agency costs. Beyond a certain level, ESO becomes a real driver for aligning interests between shareholders and employees. Indeed, our findings suggest that significant levels of ESO contribute to remodeling the alliances inside a firm. This paper

[16] The UTEST is a Stata module that tests for a U-shaped relationship (Lind & Mehlum, 2007).

also contributes to the literature on the effects of ESO on audit pricing as, to the best of our knowledge, it is the first to analyze the empirical link between ESO and audit fees and suggests that audit fees are affected by changes in levels of ESO.

This research challenges previous findings that indicated the different effects of ESO on agency costs by showing a parabolic relationship. Previous literature noted either negative linear or different curvilinear relationships. For instance, Guedri and Hollandts (2008) found a curvilinear relationship between employee ownership and firm performance. Faleye et al. (2006) tested the impact of significant ESO (more than 5% of share capital) on corporate performance, valuation, investment, and risks. They showed that large ESO pushes away from rather than toward shareholder-value maximization. Our hypothesis is therefore in line with Hollandts et al. (2018), who observed a significant inverted U-shaped relationship between ESO and CEO entrenchment. We explain the differences compared to our findings through the focus on different dependent variables in different countries and different periods.

Overall, our evidence suggests that, in addition to direct effects on employee behavior, such as motivation, satisfaction, performance and involvement, and firm performance, ESO can also affect risks, agency costs, and audit effort. The results also indicate that ESO is not free from drawbacks and that, in order to generate benefits for employees, the company, and even the overall economy (Carberry, 2011; Kruse et al., 2010), ESO plans must be properly implemented, involving a significant portion of companies' shares.

Our study is not free from limitations. First, our research only investigates ESO in large companies listed in France, which raises questions about the generalizability of the results to other markets. That is because of the specificities of the business environment in France, which is a civil law country with little protection for minority shareholders. French companies have high levels of ownership concentration, leading to significant information asymmetry between blockholders and minority shareholders (La Porta et al., 1997), and high agency costs. The

inverted U-shaped relationship revealed in this paper suggests that high levels of ESO might provide some protection for minority shareholders in similar civil law countries. The context affects the implications of the results when applied to companies outside France, and even to smaller French firms with different characteristics. Future research should therefore test whether the inverted U-shaped relationship between ESO and agency costs is particular to France, or if the same effect can be observed in other countries.

Second, the independent variable used to measure ESO represents the percentage of shares owned by a firm's employees. Another variable for measuring the effect of ESO on agency costs might be the percentage of a firm's total employees who own shares in the company. That measure is another proxy for the corporate culture and relationship between employees and shareholders created under ESO, which can affect agency costs. Kim and Ouimet (2014) conclude that the number of employees who participate in ESO plans was as important as the number of shares employees owned when measuring the effects of ESO on employee incentives. Unfortunately, that measure was not publicly available in our research setting.

Finally, the number of observations in our sample is asymmetrically distributed with respect to the inflection point because the majority of French companies exhibit lower levels of ESO than the located maximums of the U-shaped curves found in this study. Although several robustness tests verify the validity of the inverted U-shaped relationship, a greater number of firms with relatively higher ESO levels need to be studied to confirm the results.

References

Anderson, R. C., Mansi, S. A., & Reeb, D. M. (2003). Founding family ownership and the agency cost of debt. *Journal of Financial Economics*, *68*, 263–285.

Ang, J. S., Cole, R. A., & Lin, J. W. (2000). Agency costs and ownership structure. *Journal of Finance*, *55*(1), 81–106.

Arellano, M., & Bond, S. (1991). Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. *The Review of Economic Studies*, *58*(2), 277–297.

Aubert, N., Garnotel, G., Lapied, A., & Rousseau, P. (2014). Employee ownership: A theoretical and empirical investigation of management entrenchment vs. reward management. *Economic Modelling*, *40*, 423–434.

Aubert, N., Grand, B., Lapied, A., & Rousseau, P. (2009). Is employee ownership so senseless. *Finance*, *Vol. 30*(2), 5–29.

Aubert, N., Kern, A., & Hollandts, X. (2017). Employee stock ownership and the cost of capital. *Research in International Business and Finance*, *41*, 67–78.

Babenko, I., & Sen, R. (2015). Do nonexecutive employees have valuable information? evidence from employee stock purchase plans. *Management Science*, *62*(7), 1878–1898.

Ballwieser, W., Bamberg, G., Beckmann, M., & Bester, H. (2012). *Agency theory, information, and incentives*.

Barney, J. B. (1990a). Employee stock ownership and the cost of equity in Japanese electronics firms. *Organization Studies*, *11*(3), 353–372.

Barney, J. B. (1990b). Profit sharing bonuses and the cost of debt: business finance and compensation policy in Japanese electronics firms. *Asia Pacific Journal of Management*, *7*(1), 49–64.

Barroso, R., Ben Ali, C., & Lesage, C. (2018). Blockholders' ownership and audit fees: The impact of the corporate governance model. *European Accounting Review*, *27*(1), 149–172.

Benartzi, S., Thaler, R. H., Utkus, S. P., & Sunstein, C. R. (2007). The law and economics of company stock in 401(k) plans. *The Journal of Law and Economics*, *50*(1), 45–79.

Bernstein, J. (2020). *Why aren't there more? Assessing barriers to ESOP creation*.

Blanchard, O. J., Lopez-de-Silanes, F., & Shleifer, A. (1994). What do firms do with cash windfalls? *Journal of Financial Economics*, *36*(3), 337–360.

Blasi, J. R., Conte, M., & Kruse, D. (1996). Employee stock ownership and corporate performance among public companies. *Industrial and Labor Relations Review*, *50*(1), 60–79.

Blasi, J. R., Freeman, R. B., Mackin, C., & Kruse, D. L. (2010a). Creating a bigger pie? The effects of employee ownership, profit sharing, and stock options on workplace performance. In *Shared Capitalism at Work: Employee Ownership, Profit and Gain Sharing, and Broad-Based Stock Options* (pp. 139–165). Cambridge, MA.

Blasi, J. R., Kruse, D. L., & Freeman, R. B. (2014). Evidence. In *The Citizen's Share: Reducing Inequality in the 21st Century* (pp. 167–194). Yale University Press.

Blasi, J. R., Kruse, D. L., & Markowitz, H. M. (2010b). Risk and lack of diversification under employee ownership and shared capitalism. In *Shared Capitalism at Work: Employee Ownership, Profit and Gain Sharing, and Broad-Based Stock Options* (pp. 105–136). University of Chicago Press.

Bova, F., Dou, Y., & Hope, O.-K. (2015). Employee ownership and firm disclosure. *Contemporary Accounting Research*, *32*(2), 639–673.

Bruslerie, H. D. La, & Deffains-Crapsky, C. (2003). Actionnariat salarié : application du contrat optimal entre salariés et actionnaires. *Finance, Revue de L'Association Française de Finance*, *24*.

Caramelli, M. (2011). Employee ownership and corporate performance: Toward unlocking the black box. In *Employee ownership and shared capitalism: New directions for research* (pp. 177–210).
Carberry, E. J. (2011). *Employee ownership and shared capitalism: New directions in research*. Labor and Employment Relations Association.
Chan, P., Ezzamel, M., & Gwilliam, D. (1993). Determinates of audit fees for quoted UK companies. *Journal of Business Finance & Accounting*, *20*(6), 765–786.
Chaney, P., Jeter, D., & Shivakumar, L. (2004). Self-selection of auditors and audit pricing in private firms. *The Accounting Review*, *79*(1), 51–72.
Chen, X. C., & Yur-Austin, J. (2007). Re-measuring agency costs: The effectiveness of blockholders. *Quarterly Review of Economics and Finance*, *47*(5), 588–601.
Chen, X., Sun, Y., & Xu, X. (2016). Free cash flow, over-investment and corporate governance in China. *Pacific Basin Finance Journal*, *37*, 81–103.
Child, J., & Rodrigues, S. B. (2003). Corporate Governance and New Organizational Forms: Issues of Double and Multiple Agency. *Journal of Management and Governance*, *7*, 337–360.
Choi, J.-H., Kim, J.-B., Liu, X., & Simunic, D. A. (2008). Audit pricing, legal liability regimes, and Big 4 premiums: Theory and cross-country evidence. *Contemporary Accounting Research*, *25*(1), 55–99.
Clinch, G., Stokes, D., & Zhu, T. (2012). Audit quality and information asymmetry between traders. *Accounting & Finance*, *52*(3), 743–765.
Fakhfakh, F. (2004). The effects of profit sharing and employee share ownership on quits: Evidence from a panel of French firms. *Advances in the Economic Analysis of Participatory and Labor-Managed Firms*, Vol. 8, pp. 129–147.
Faleye, O., Mehrotra, V., & Morck, R. (2006). When labor has a voice in corporate governance. *Journal of Financial and Quantitative Analysis*, *41*(3), 489–510.
Francis, J. R., & Yu, M. D. (2009). Big 4 office size and audit quality. *The Accounting Review*, *84*(5), 1521–1552.
Frankel, R. M., & Li, X. (2004). Characteristics of a firm's information environment and the information asymmetry between insiders and outsiders. *Journal of Accounting and Economics*, *37*, 229–259.
Freeman, R. B., Kruse, D. L., & Blasi, J. R. (2008). Worker responses to shirking under shared capitalism. In *Shared Capitalism at Work: Employee Ownership, Profit and Gain Sharing, and Broad-based Stock Options* (pp. 77–103). University of Chicago Press.
Ginglinger, E., Megginson, W. H., & Waxin, T. (2011). Employee ownership, board representation, and corporate financial policies. *Journal of Corporate Finance*, *17*(4), 868–887.
Gonthier-Besacier-Cerag, N., & Schatt, A. (2007). Determinants of audit fees for French quoted firms. *Managerial Auditing Journal*, *22*(2), 139–160.
Guedri, Z., & Hollandts, X. (2008). Beyond dichotomy: The curvilinear impact of employee ownership on firm performance. *Corporate Governance: An International Review*, *16*(5), 460–474.
Guery, L., & Stevenot, A. (2017). L'actionnariat salarié favorise-t-il la diffusion d'information aux salariés et leur participation aux décisions stratégiques ? Une question de gouvernance d'entreprise. *Management International*, *21*(4), 61–75.
Gul, F. A., Chen, C. J. P., & Tsui, J. S. L. (2003). Discretionary accounting accruals, managers' incentives, and audit fees. *Contemporary Accounting Research*, *20*(3), 441–464.
Gul, F. A., & Tsui, J. S. L. (2001). Free cash flow, debt monitoring, and audit pricing: Further evidence on the role of director equity ownership. *Auditing*, *20*(2), 71–84.
Haans, R. F. J., Pieters, C., & He, Z.-L. (2015). Thinking about U: Theorizing and testing U-

and inverted U-shaped relationships in strategy research. *Strategic Management Journal*, *37*(7), 1177–1195.
Hallock, D. E., Salazar, R. J., & Venneman, S. (2004). Demographic and attitudinal correlates of employee satisfaction with an ESOP. *British Journal of Management*, *15*(4), 321–333.
Harvey, C. R., Lins, K. V., & Roper, A. H. (2004). The effect of capital structure when expected agency costs are extreme. *Journal of Financial Economics*, *74*(1), 3–30.
Hausman, J. A. (1978). Specification tests in econometrics. *Econometrica: Journal of the Econometric Society*, *46*(6), 1251–1271.
Hay, D. C., Knechel, R. W., & Wong, N. (2006). Audit fees: A meta-analysis of the effect of supply and demand attributes. *Contemporary Accounting Research*, *23*(1), 141–191.
Hirth, S., & Uhrig-Homburg, M. (2010). Investment timing, liquidity, and agency costs of debt. *Journal of Corporate Finance*, *16*(2), 243–258.
Hollandts, X., Aubert, N., Ben Abdelhamid, A., & Prieur, V. (2018). Beyond Dichotomy: The Curvilinear Impact of Employee Ownership on CEO entrenchment. *Management International*, *22*(2), 112–127.
Jensen, K. L., & Payne, J. L. (2005). Audit procurement: Managing audit quality and audit fees in response to agency costs. *Auditing: A Journal of Practice & Theory*, *24*(2), 27–48.
Jensen, M. C. (1986). Agency costs of free cash flow , corporate finance , and takeovers. *The American Economic Review*, *76*(2), 323–329.
Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*, 305–360.
Khalil, S., Magnan, M. L., & Cohen, J. R. (2008). Dual-class shares and audit pricing: Evidence from the canadian markets. *Auditing: A Journal of Practice & Theory*, *27*(2), 199–216.
Kim, E. H., & Ouimet, P. (2014). Broad-based employee stock ownership: Motives and outcomes. *Journal of Finance*, *69*(3), 1273–1319.
Kruse, D. L. (2002). Research evidence on prevalence and effects of employee ownership. *Journal of Employee Ownership Law and Finance*, *14*(4), 65–90.
Kruse, D. L. (2016). Does employee ownership improve performance? *IZA World of Labor*.
Kruse, D. L., Blasi, J. R., & Freeman, R. B. (2010). Shared capitalism at work: Employee ownership, profit and gain sharing, and broad-based stock options. In *University of Chicago Press*.
Kruse, D. L., Blasi, J. R., & Freeman, R. B. (2012). *Does linking worker pay to firm performance help the best firms do even better?* (No. w17745).
La Porta, R., Lopez-De-Silanes, F., Shleifer, A., & Vishny, R. W. (1997). Legal determinants of external finance. *The Journal of Finance*, *52*(3), 1131–1150.
Lafond, R., & Roychowdhury, S. (2008). Managerial ownership and accounting conservatism. *Journal of Accounting Research*, *46*(1), 101–135.
Lind, J. T., & Mehlum, H. (2007). UTEST: Stata module to test for a U-shaped relationship. *Statistical Software Components*.
Lind, J. T., & Mehlum, H. (2010). With or without u? the appropriate test for a U-shaped relationship. *Oxford Bulletin of Economics and Statistics*, *72*(1), 109–118.
Mathieu, M. (2017). *Annual economic survey of employee share ownership in European countries*.
Mohat, I., & Alidou, D. (2019). L'actionnariat salarié influence-t-il le niveau de rémunération des dirigeants de sociétés cotées françaises ? Étude empirique sur l'indice boursier SBF 120 (2009-2015)1. *Finance Contrôle Stratégie*, *22*(22-2/3).
Nekhili, M., Boukadhaba, A., & Nagati, H. (2020). The ESG-financial performance relationship: Does the type of employee board representation matter? *Corporate Governance: An International Review*.

Niemi, L. (2005). Audit effort and fees under concentrated client ownership: Evidence from four international audit firms. *The International Journal of Accounting*, *40*(4), 303–323.
O'Boyle, E. H., Patel, P. C., & Gonzalez-Mulé, E. (2016). Employee ownership and firm performance: a meta-analysis. *Human Resource Management Journal*, *26*(4), 425–448.
Ohlson, J. A. (1995). Earnings, Book Values, and Dividends in Equity Valuation. *Contemporary Accounting Research*, *11*(2), 661–687.
Oyer, P., & Schaefer, S. (2005). Why do some firms give stock options to all employees?: An empirical examination of alternative theories. *Journal of Financial Economics*, *76*(1), 99–133.
Pagano, M., & Volpin, P. F. (2005). Managers, workers, and corporate control. *Journal of Finance*, *60*(2), 841–868.
Park, S., & Song, M. H. (1995). Employee stock ownership plans, firm performance, and monitoring by outside blockholders. *Financial Management*, *24*(4), 52.
Pendleton, A. (2006). Incentives, monitoring, and employee stock ownership plans: New evidence and interpretations. *Industrial Relations*, *45*(4), 753–777.
Pierce, J. L., Rubenfeld, S. A., & Morgan, S. (1991). Employee ownership: A conceptual model of process and effects. *Academy of Management Review*, *16*(1), 121–144.
Rashid, A. (2013). CEO duality and agency cost: Evidence from Bangladesh. *Journal of Management and Governance*, *17*(4), 989–1008.
Rauh, J. D. (2006). Own company stock in defined contribution pension plans: A takeover defense? *Journal of Financial Economics*, *81*(2), 379–410.
Richardson, S. (2006). Over-investment of free cash flow. *Review of Accounting Studies 2006 11:2*, *11*(2), 159–189.
Rosen, C., Case, J., & Staubus, M. (2005). Every employee an owner. Really. *Harvard Business Review*, *83*(6), 122–130.
Singh, M., & Davidson III, W. N. (2003). Agency costs, ownership structure and corporate governance mechanisms. *Journal of Banking & Finance*, *27*(5), 793–816.
Söderbom, M. (2009). *Instrumental Variables, 2SLS and GMM*.
Stulz, R. M. (1990). Managerial discretion and optimal financing policies. *Journal of Financial Economics*, *26*(1), 3–27.
Tobin, J. (1958). Estimation of relationships for limited dependent variables. *Econometrica*, *26*(1), 24–36.
Toe, S. D., Hollandts, X., & Valiorgue, B. (2017). La « face cachée » de l'actionnariat salarié : Etude empirique sur l'indice SBF 120 (2000-2014). *Finance Contrôle Stratégie*, (20–1).
Whisenant, S., Sankaraguruswamy, S., & Raghunandan, K. (2003). Evidence on the joint determination of audit and non-audit fees. *Journal of Accounting Research*, *41*(4), 721–744.
Wu, J., & Tu, R. (2007). CEO stock option pay and R&D spending: a behavioral agency explanation. *Journal of Business Research*, *60*(5), 482–492.
Zhang, W. (2011). *The Tradeoff between Employee Ownership and CEO Compensation: Evidence from Defined Contribution Pension Plans*.

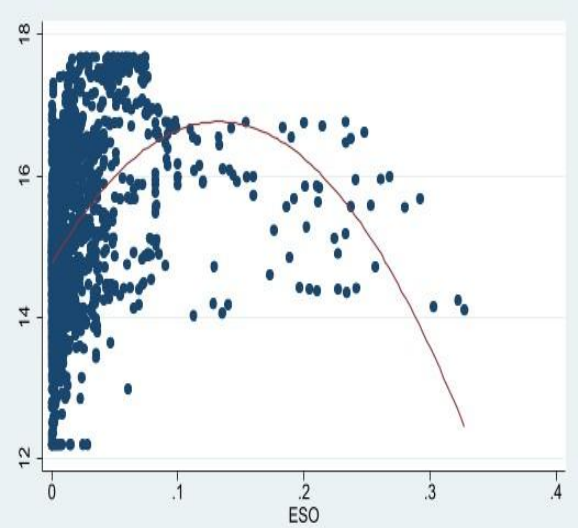
Appendix A: Descriptions of variables (in alphabetical order)

Variable	Definition	Source	Refinitiv Eikon fields
Acquisitions	Acquisition expenditures	Thomson Reuters	WC 04355
AGE	Age of the company	Thomson Reuters	WC 18272
Asset utilization ratio	Net revenues divided by total assets	Thomson Reuters	WC 08401
ASSETS	Total assets	Thomson Reuters	WC 02999
AUDIT	Audit-related service fees paid to the auditor	Thomson Reuters	WC 01801
AUDITFEES	Natural logarithm of *AUDIT*	Thomson Reuters	WC 01801
AUDITORS	The number of external auditors used by the company	IODS Financial statements	-
BIG4	A dummy variable of 1 if the firm has at least one Big Four external auditor; 0 otherwise	IODS Financial statements	-
BOARD	Number of members of the board of directors	IODS Financial statements	
CAPEX	Capital expenditures	Thomson Reuters	WC 04601
CASH	Cash and short-term investments	Thomson Reuters	WC 02001
EO	Shares owned by employees divided by the total shares outstanding	IODS Financial statements	-
EO^2	Squared value of shares owned by employees divided by the total shares outstanding	IODS Financial statements	-
EVR	Employees' voting rights to total voting rights	IODS Financial statements	-
FCF	Free Cash Flow as a percentage of the firm's average total asset.	Thomson Reuters	WC 04860 WC 01151 WC 01201
GROWTH	Increase in net sales divided by the previous years' net sales	Thomson Reuters	WC 07240
I^*_{NEW}	Expected value of new investments		
INT	Foreign sales divided by total sales	Thomson Reuters	WC 08731
$I_{MAINTENANCE}$	Investment expenditure necessary for the maintenance of assets. It is proxied by the reported depreciation and amortization	Thomson Reuters	WC 01151
LEVERAGE	Total debt to total assets ratio	Thomson	WC 08236

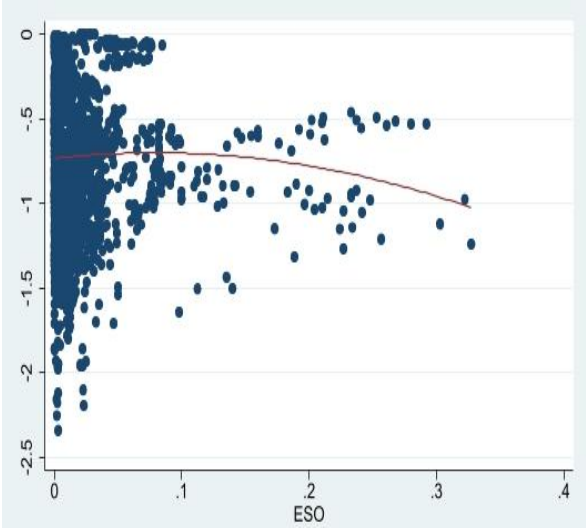
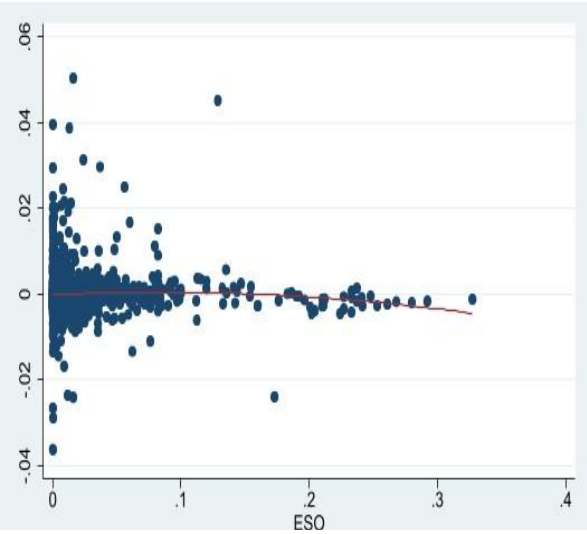
		Reuters	
LOSS	A binary variable of 1 if the company's net income is negative	Thomson Reuters	WC 04001
MAJOR	Blockholders' (>5%) ownership of the firm's capital divided by total shares	Thomson Reuters	WC 18370
MGT	Shares owned by management divided by the total shares outstanding	Thomson Reuters	WC 18370
OVERINVEST	Abnormal investments as a percentage of the firm's average total asset		-
PTBV	Market price to book value	Thomson Reuters	WC 05001 WC 05941
QUICK	Cash and its equivalents divided by current liabilities	Thomson Reuters	WC 08101
RD	Research and development expenditures	Thomson Reuters	WC 01201
ROA	Return on assets	Thomson Reuters	WC 08326
SalesPPE	Amount received from the sale of property, plant and equipment	Thomson Reuters	WC 04351
SIZE	Natural logarithm of the company's total assets	Thomson Reuters	WC 02999
STOCK RETURNS	Stock returns are measured as the stock's capital and dividend gains	Thomson Reuters	WC 08801
TURN	Total net sales	Thomson Reuters	WC 07240
UTILIZATION	(-1) * *Asset utilization ratio*	Thomson Reuters	WC 08401
V/P	Ratio of the value of the company (V_{AIP}) to the value of equity	Thomson Reuters	WC 05491 WC 04551 WC 01250 WC 08001
WC	Working capital as a percentage of the firm's average total asset	Thomson Reuters	WC 03151
YEAREND	A binary variable of 1 when the company's fiscal year does not end on December 31st	Financial statements	

Figure 2: Employee stock ownership (fitted values on x axis) and audit fees (panel A), asset utilization (panel B) and overinvestment (panel C)

Panel A



Panel B



Panel C