

Master Thesis  
MSc Economics of Markets and Organisations

**The effect of the (mis)alignment of interest between shareholder and  
CEO on employee downsizing**

An empirical research to how effective monitoring and CEO compensation structures affect the  
decision to downsize the firm's employees when facing downturn

by

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## Abstract

In firms with decreasing firm performance the incentives of shareholder and manager (CEO) are not aligned. Shareholders benefit from cost reduction, while the CEO benefits from managing large firms. This paper investigates mechanisms used to affect the manager's decision to downsize the firm's number of employees if firm performance is decreasing. The empirical research is based on conditional fixed effects negative binomial regression and ordinary least squares is used as a robustness test. Employing a global sample of 8,527 publicly traded firms with 46,075 observations using panel data over the years 2006-2019. The effect of ownership concentration, measured as size of the largest owner, on relative layoffs (RLO) for firms with decreasing firm performance is tested in a linear and quadratic regression concluding ambiguous results. The effect of financial alignment of CEO and shareholder on RLO is more clear and tested in two ways. First, the CEO compensation structure dependent on total shareholder return is hypothesised and empirically demonstrated to increase relative layoffs for firms with decreasing firm performance. Second, managerial ownership is hypothesised and concluded to correlate in a convex manner due to managerial entrenchment.

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## Acronyms

<b>CEO</b>	Chief Executive Officer, in this research manager is equivalent of CEO
<b>TSR</b>	Total Shareholder Return
<b>RLO</b>	Announced Relative Layoffs (percentage of total employees)
<b>MO</b>	Managerial Ownership
<b>ESG</b>	Environment, Social & Government
<b>U.S.</b>	United States
<b>CFENBR</b>	Conditional Fixed Effects Negative Binomial Regression
<b>OLS</b>	Ordinary Least Squares

# 1 Introduction

## 1.1 Background & hypothesis building

The agency problem refers to the misalignment of interest between shareholder and manager, in this paper manager refers to the highest manager of the firm, the Chief Executive Officer (CEO). The misalignment of interest between shareholder and CEO has different implications on various firm outcomes and in this paper the relation between shareholder and CEO regarding employee downsizing for firms with decreasing firm performance is investigated. If revenue or profitability of a firm decrease, generally total shareholder return (TSR) decreases along. Over the last decades, cutting (employee) costs, by retrenchment, is a common used tool to solve economic downturn of the firm (Datta and Basuil 2015; Gennard 2009; Marsono and Kamaruzaman 2008). However cutting employee costs most likely increases TSR there is no empirical prove of a long-term competitive advantage or even a long-term increase of firm performance (Guthrie and Datta 2008). Moreover, the CEO has no incentive to downsize the firm's number of employees since he benefits, monetary and non-monetary, from managing large firms (Stulz 1990; Bethel and Liebeskind 1993). Hence, for firms with decreasing firm performance there exists a misalignment of interest between principal (shareholder) and agent (CEO). Since the main interest of the CEO is not necessarily to increase the firm's shareholder return and the CEO benefits from managing large firms there's no incentive for the CEO to downsize the firm's number of employees. Yet, driven by high TSR, shareholders have enough reason to advocate downsizing. Since shareholders can not directly influence the decision-making process various tools are used to manipulate the behaviour of the CEO. This research focuses on mechanisms and tools used by the shareholder to affect the CEO's behaviour. First, the effectiveness of monitoring and subsequently two tools concerning financial alignment of the CEO's interest, CEO compensation structure dependence on shareholder return and managerial ownership, are investigated.

The first relation of interest is between the size of the largest shareholder, an important indicator of ownership concentration, and the relative layoffs (RLO, percentage of announced layoffs to total number of employees) of firms with decreasing firm performance. Early research has concluded positive correlation between the presence of blockholders (ownership of 5 percent and more) and retrenchment for firms in economic downturn (Bethel and Liebeskind 1993). Decreasing shareholder return motivates shareholders to bare the cost of effort and actively monitor the manager. The larger the size of the largest shareholder, and hence the more concentrated the ownership, the more effectively this monitoring can take place. Whereas dispersed ownership, where all shareholders own a relatively small proportion of the firm,

leads to the free-rider problem among owners (Fama and Jensen 1983). The benefit from monitoring is relatively small while the active shareholder bears the full cost of effort. Therefore a positive correlation between size of the largest shareholder and relative layoffs for firms with decreasing firm performance is expected. Yet, this hypothesis assumes all shareholders to be homogeneous within their own type, though owners or managers of investment funds can still differ in investment horizon, objectives and level of activity (Beyer, Larcker, and Tayan 2014). From this perspective a theory can be build that larger shareholders are more likely to have a long-term investment horizon and hence not necessarily advocate downsizing of the firm's number of employees. Whereas owners with a mediate level of ownership size still benefit from actively monitoring but might have a more short-term oriented investment horizon and hence have an incentive to advocate employee downsizing. Therefore an additional hypothesis expecting a concave relation between size of the largest owner and relative layoffs for firms with decreasing firm performance is tested.

Then, two tools that are commonly used by the principal to align the managerial interest with the shareholder's interest are explored. Without actively monitoring the manager, shareholders can modify the preferences and behaviour of the manager. The first tool to align the managerial interest with the shareholder's interest that is tested is making the compensation structure of the manager dependent on total shareholder return (TSR). Therefore a binary variable indicating whether the firm uses a CEO compensation structure dependent on TSR is the main variable of interest in the second analysis. Whether this compensation structure affects the decision to downsize the firm's number of employees has remained an unexplored field of research. Yet, if this structure is adopted by the firm, for firms with decreasing firm performance, the CEO's personal payoff is negatively affected and therefore it is hypothesised that the CEO will be more tempted to downsize the firm's number of employees.

Thereafter, I test whether managerial ownership (MO) affects the decision of the manager to downsize the firm's number of employees. Making the manager also an owner reduces to misalignment of interest between principal (owner) and agent (manager) and therefore it can be expected that managerial ownership leads to a higher level of relative layoffs (RLO) for firms with decreasing firm performance. On the other hand, mediate levels of managerial ownership lead to managerial entrenchment. Managerial entrenchment arises when mediate levels of managerial ownership increase the potency of the manager, without directly align the interest of the manager with the shareholders' interest. At this mediate level, managerial ownership strengthens the potency of the manager in the pursuance of his interest. Yet, the force of the relatively small part of ownership is not strong enough to modify the manager's personal



interest. Therefore, for low to mediate levels of managerial ownership the relative layoffs can be expected to decrease if the proportion of managerial ownership increases. Whereas for mediate to high levels of managerial ownership RLO can be expected to increase if the proportion of managerial ownership increases. Leading to a convex relation between managerial ownership and relative layoffs.

## 1.2 Methodology & data

The sample used in this paper consists out of 8,527 publicly listed firms worldwide with a total of 46,075 observations over the years 2006-2019. The construction of the sample is based on the sample as constructed by Refinitiv's ESG-ASSET4 database which is also the provider of data on the dependent variable "relative layoffs" (RLO). Data is complemented with data on ownership from Factset, data on CEO compensation structure from Worldscope and firm specific controls as firm size, number of employees and total revenues are also retrieved from Worldscope. For the third analysis regarding managerial ownership the sample is narrowed down to publicly traded U.S. firms due to the limited availability of global managerial ownership data. Managerial ownership data is retrieved from the Compustat Execucomp database, which puts focus on Northern American firms. Therefore the analysis on the first two topics, ownership size and CEO compensation alignment, has a global validity for publicly traded firms while the third analysis, on managerial ownership, is restricted to U.S. publicly traded firms.

The analysis of all hypothesis is built on conditional fixed effects negative binomial regression (CFENBR). Yet, the regression equations differ in order of polynomial regression. Since there is a theoretical ground for either a linear or concave relation between ownership size of the largest shareholder and RLO the relation is tested in a linear and quadratic regression analysis. The relation between CEO compensation alignment and RLO is only tested in a linear regression analysis since the main variable of interest is binary. Whereas the relation between managerial ownership and RLO is hypothesised to be convex and hence this relation is tested in a quadratic regression. To validate the results of conditional fixed effects negative binomial regression, all regressions are tested using ordinary least squares (OLS) to provide evidence on the robustness of results.

## 1.3 Results

The results regarding the effect of ownership concentration, measured as the size of the largest shareholder, on RLO for firms with decreasing firm performance are ambiguous. The linear

CFENBR analysis results in a (weakly) statistical significant result, but the coefficient points in the opposite direction as hypothesised. Giving rise to the theory that large shareholders demotivate large employee downsizing. Yet, this result is not supported by the robustness test. Furthermore, both analysis methods (CFENBR and OLS) do not conclude any statistical significant results regarding the quadratic relation. Hence, results are divergent and drawing an unambiguous conclusion on the effect of ownership concentration on RLO for firms with decreasing firm performance is, based on this analysis, not possible.

On the other hand, regarding the financial alignment tools, I can conclude correlations between financial alignment of the CEO's payoff and shareholder return. In line with the second hypothesis the results indicate that managers indeed appear to increase the RLO when the firm finds itself in decreasing firm performance by about 0.658 (CFENBR) if the compensation of the manager depends on TSR. The OLS analysis provides evidence on the robustness of results with a positive and statistical significant coefficient of 0.203. Yet, the economical significance of these results is debatable since the percentage change is very limited. Moreover, I find a convex and significant relation between managerial ownership and RLO for firms with decreasing firm performance with a minimum of RLO around 24% of managerial ownership (based on CFENBR), meaning that the optimum of managerial entrenchment is located around 24%. In other words, mediate levels of managerial ownership strengthen the potency of the manager in the pursuance of his interest without aligning his interest with the shareholders' interest.

This research is valuable in understanding the interaction between shareholder and manager and contributes to existing literature by refining the determinants needed to assess the employment risk faced by employees of a firm in economic downturn. It can be concluded that due to the complexity of the composition of shareholders the effect of ownership concentration is ambiguous. Depending on multiple factors as the investment horizon, level of activity and objectives it is hard to conclude any correlation between ownership size of the largest shareholder and relative layoffs of the firm. Empirically tested and demonstrated is that the relative layoffs for firms with decreasing firm performance is affected by financial alignment of the CEO. Either by making the compensation of the CEO dependent on TSR or transferring a proportion of ownership to the CEO.

## 2 Literature Review

KEY WORDS: Corporate governance, Agency theory, Ownership structure & concentration, Employee downsizing & Involuntary turnover, Retrenchment, Financial alignment

### 2.1 Academic relevance

After the invention of the agency theory by Berle and Means (1932) the agency theory is further developed to how it is known today by Ross (1973). Ross (1973) explained the theory in economical perspective by elaborating on the similarities and differences between employer and employee, state and government but also mentioned the problem in context of shareholder and manager. This specific relation has been a topic of research since Jensen and Meckling (1979) have further elaborated on the agency problem provoked by separation of ownership and control. Many literature has followed and still the problem subsists. The problem arises when the owner (principal) employs an agent to manage her interest. Since the interests of principal and agent are not perfectly aligned and the principal has imperfect information about the agent's contribution, the employment of an agent leads to the agency problem between manager and shareholder. Empirical research to the effect of ownership structures on many different firm outcomes has proven that the agency problem has been present since it has been described by the pioneers of the agency theory (Ross 1973; Jensen and Meckling 1979). Most researches to the effect of ownership concentration on some firm outcome conclude a decrease in welfare provoked by the agency theory. To name a few; research has concluded that rent-seeking activities of the agent lead to higher (agency) costs for the principal (Ang, Cole, and Lin 2000; Bebchuk and Fried 2003). Also, the agency problem is related with the level of leverage and corporate risk taking faced by the firm (Moh'd, Perry, and Rimbey 1998; Paligorova 2010). Furthermore, research has focused on the relation between ownership concentration and financial performance of the firm concluding contradictory and ambiguous results (Paniagua, Rivelles, and Sapena 2018; Lappalainen and Niskanen 2012). Still, there are many undiscovered topics where the agency problem most likely will lead to other inefficiencies. One could expect that in times of economic downturn for the firm, in general, manager and shareholder have different interests. The interest of shareholders will depend on its type and its potency in the decision-making process. Therefore, in this research the focus will be on three mechanisms to modify the managerial behaviour to the principal's interest.

However the results of the summation above do not directly say anything about the outcome we can expect in the research to ownership concentration on employee dismissal for firms with decreasing firm performance. It does indicate that firms where shareholders are more

concentrated, and hence more potent in the pursuance of their interest, have different firm outcomes than firms where ownership is more dispersed and the manager gains more power. Therefore, the empirical prove that ownership structures affect the business operations is a solid foundation for further research. This research is valuable in understanding the interaction between shareholder and manager and will improve the determinants needed to assess the employment risk faced by an employee of a firm with decreasing firm performance.

## 2.2 Monitoring and management of interest

The organisational structure of a firm depends on how residual claimant characteristics are established. If 100 percent of the residual claims belongs to the top-level decision agent, the organizational structure takes the form of a proprietorship, whereas residual claim ownership is restricted to major internal decision agents in closed corporations and partnerships. In contrast to open corporations, where there normally exists no restriction on ownership of residual claims<sup>1</sup> (Fama and Jensen 1983). It is common sense to realise that for all organisational structures the agency theory has different implications. Moreover, it is empirically proven that ownership structures affect the firm's financial outcome (Firer and Williams 2005; Pedersen and Thomsen 2003; Werner, Tosi, and L. Gomez-Mejia 2005). The different firm outcome induced by corporate governance can be realised through efficient or inefficient monitoring of the principal. The shareholder does not have a seat at the decision table and hence is not able to influence the decision-making process directly to succeed in the pursuance of her interest. Yet, the shareholder is able to influence the decision-making process in an indirect way. Through formal and informal contracts the shareholder is able to monitor the manager and influence the firm's operations and business. When the firm is owned by one or a few very potent shareholders, the shareholders have a strong position to monitor the firm successfully in the pursuance of their interest (Auvray and Brossard 2012). On the contrary, when ownership of the firm is widely dispersed, hence many shareholders with a relatively small proportion of ownership, monitoring and realising the interest of the shareholders in an efficient way will encounter many difficulties. Above all, because the shareholders are subject to the free-rider problem (Fama and Jensen 1983). Edmans (2009) theoretically describes that shareholders have two possibilities in reaction to corporate governance, either the exit or voice channel. Shareholders can simply divest their shares from portfolio which is referred to as the exit channel, or shareholders can decide to actively influence corporate governance. The larger the relative size of the shareholder, the more efficient the shareholder can pursue her interest and hence, in context of the two strategies as described by Edmans (2009) the more tempting the voice channel will be as the

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<sup>1</sup>Ofcourse, more (complex) structures exist as in nonprofit organisations who do not have any residual claims. But for this research I focus on profitable firms focusing on residual claims.

size of the largest shareholder increases. There are only a few shareholders, most likely sharing the same concerns, and the force of their control is much more potent than in the dispersed case.

The manager is facing an employment risk, his payments depend on the performance measures as settled by the principal and therefore, in general, the agent is assumed to be risk averse. Yet, in most cases, shareholders can diversify away the idiosyncratic risk and therefore are assumed to be risk neutral. The willingness to take risk has different implications on how decisions are made. As discussed, the ownership structure therefore is an important factor determining how decisions are made. This theory is emphasised by Mahrt-Smith (2005) who builds a theoretical model that shows, in line with Fama and Jensen (1983), that ownership dispersion grants managerial freedom and initiative. Hence, from existing literature it can be expected that ownership dispersion induces managerial interests to prevail, whereas ownership concentration induces shareholder's interest to be relatively more present. These expectations are in line with conclusions of researchers testing the effect of ownership dispersion on multiple different firm specific outcomes (Firer and Williams 2005; Paligorova 2010; Pedersen and Thomsen 2003; Werner, Tosi, and L. Gomez-Mejia 2005). Consequently, depending on who is more influential in the decision-making process (principal or agent), different firm outcomes can be expected.

### **2.3 Retrenchments and the misalignment of interest**

In this research I empirically test how ownership structures and financial alignment between principal and agent affect the relative layoffs of the firm for firms facing economic downturn. Economic downturn for the firm can have many different origins. It can for example be provoked by firm specific, industry specific or macroeconomic events (Gandolfi 2014). Over the last decades firms appear to try and solve the economic downturn by retrenchment and downsizing employee costs (Datta and Basuil 2015; Gennard 2009; Marsono and Kamaruzaman 2008; Marumoogae 2014; Trevor and Nyberg 2008). Though, these strategies do not necessarily induce a higher level of firm performance (Chadwick, Hunter, and Walston 2004; Guthrie and Datta 2008). Whether the economic downturn for the firm is induced by firm- or industry specific, or global events it has a large impact on the well-being of employees. The worker's fear of retrenchment and employee downsizing reduces the perceived job security. Yet, there exists no debate about the importance of perceived job security in existing literature. This perceived job security is an important root, often through the mediating role of job satisfaction and employee well-being, of employee performance (Kuhnert, Sims, and Lahey 1989; Kraimer et al. 2005; Imran, Majeed, and Ayub 2015; Sverke, Hellgren, and Näswall 2002). Clearly, the fear of employee downsizing has a negative impact on all employees ex ante and it has an even more negative impact on former employees who are dismissed ex post. But more surprisingly,

retrenchment by large dismissals also has a negative impact ex post on surviving employees which is referred to as the "survivor syndrome" (Travaglione and Cross 2006).

After reviewing multiple definitions of employee downsizing. Datta, Guthrie, et al. (2010) defines employee downsizing as follows: "*Employee downsizing is a planned set of organizational policies and practices aimed at workforce reduction with the goal of improving firm performance*" (Datta, Guthrie, et al. 2010). But if the aim of employee downsizing is improving firm performance and academic research has proven this resolution does not induce the desired effect, then why?

### ***2.3.1 Shareholder's interest***

One of the earliest researches in this field is conducted by Bethel and Liebeskind (1993). The results point out that the presence of blockholders indeed is positively correlated with restructuring. Yet, the results stem from data over 1981-1987 and will most likely be outdated since the role of shareholders has changed over time. Furthermore, the research does not assume shareholders to be a heterogeneous group of investors, by only distinguishing institutional investors from others. Though, it does prove that potent shareholders in principle motivate restructuring in times of downturn. Beyer, Larcker, and Tayan (2014) state that besides from the distinct between institutional investors and other investors, entitled as retail investors, shareholders also differ in terms of objectives, level of activity, size and investment horizon.

First, shareholders, or managers of the institution, participate in the firm with different motives. Their motives often reflect the ideology of the geographical location and culture they live and work in (Akerlof and Kranton 2005). An other important determinant is whether the shareholder or fund manager has a profit maximising obligation to the owner of the institution or not (Çelik and Isaksson 2013). This obligation determines to what extent the acting individual can pursue her ideology when monitoring the manager. Hence, in the case of decreasing firm performance it will most likely depend on the cultural norm, background and obligation of the shareholder or fund manager how to deal with issues regarding employees.

Second, the level of activity differs among shareholders. As described earlier, shareholders can actively influence corporate governance and use the so-called voice channel (Edmans 2009), shareholders can be more passive and benefit from the effort of other or divest the particular shares from portfolio and end the participation in the firm, the so-called exit channel (Edmans 2009). Research in, for example innovation has proven that shareholders possessing at least 10% of the firm (Shapiro et al. 2013) are able to influence the manager's decisions

regarding development and implementation of available resources in innovation activities (Belloc 2012). Thus, if the firm faces decreasing firm performance it depends on the shareholder's level of activity whether she decides to actively monitor the firm to turn the tide or not.

Third, the investment horizon of a shareholder can be predominantly short- or long-term focused. Short-term investors advocate and foster myopic behaviour of the manager whereas long-term investors discourage all value destroying behaviour of the manager leading to enhanced long-term firm performance (Garel 2017). Since employee downsizing does not necessarily improve the firm's long-term performance it will, according to this theory, mostly be the short-term investors who encourage employee downsizing.

Fourth, obviously a relatively large shareholder, a so-called blockholder, can more effectively influence the decision-making process. Since the proportion of ownership is large, the benefits from monitoring are large and the cost of effort is relatively small. On the other hand, research has evidenced that for relatively small shareholders the cost of effort and agency costs exceed the benefits since the shareholders have a less potent position in the pursuance of their interest (Belloc 2012; Fama and Jensen 1983). Hence, large shareholders are more potent in the persuance of their interest and the interest of the shareholder is more likely to prevail in firms with an active blockholder.

### *2.3.2 Managerial interest*

Managers enjoy monetary and non-monetary benefits from running larger and more complex organisations (Stulz 1990). Furthermore Bethel and Liebeskind (1993) argue that managers benefit more from growth and diversification of the firm than from the maximisation of shareholder value. Hence, unless the manager is pressured by- or financially aligned with the firm's shareholders, it is not in the interest of the manager to downsize the organisation. Yet, as stated earlier, firms with decreasing firm performance often decide to restructure the organisations by downsizing employees (Datta and Basuil 2015; Gennard 2009; Marsono and Kamaruzaman 2008; Marumoagae 2014; Trevor and Nyberg 2008). Datta, Guthrie, et al. (2010) emphasise the arguments of Stulz (1990) and Bethel and Liebeskind (1993) about the reasoning why managers would engage in dismissals. First of all, layoffs as a consequence of retrenchment is described as a managerial tool that signals the organisational intentions in order to bridge the gap between actual performance and shareholders' expectations. Another explanation provided by Datta, Guthrie, et al. (2010) is that employee downsizing is a top-down command from principal to agent to reduce labor costs and keep firm value high. It induces managers to create a greater willingness to seek efficiency enhancements via employee downsizing (Datta,

Guthrie, et al. 2010). Yet, it is argued that although employee downsizing reduces labor costs, it undermines long-term competitive advantages. Large employee dismissals will most likely disrupt the firm's network and relationships, erode skill bases and, as mentioned before, induce negative effects on productivity as a consequence of the survivor syndrome (Datta, Guthrie, et al. 2010). Hence, from existing literature it can be concluded that it is not in the interest of the manager itself but is merely a tool to satisfy the principal.

### *2.3.3 Misalignment of interest*

Early research of Bethel and Liebeskind (1993) has indicated that the presence of blockholders is positively correlated with retrenchment in firms with decreasing firm performance since ownership concentration leads to a more effective system of monitoring (Edmans and Holderness 2017; Datta, Guthrie, et al. 2010; Mahrt-Smith 2005). Therefore, the expectation of this research is to find a positive correlation between size of the largest shareholder (ownership concentration) and involuntary employee turnover, when the firm faces downturn. In line with this expectation, it is demonstrated that firms where ownership is more dispersed, the interest of the manager is more likely to prevail since the monitoring of the manager is subject to the free-rider problem (Fama and Jensen 1983; Mahrt-Smith 2005). Managers enjoy monetary and non-monetary benefits from running larger and more complex organisations (Stulz 1990) and hence it is not in the interest of the manager to downsize the organisation. The agency problem, as a consequence of the misalignment of interest between manager and shareholder, can be mitigated by effective monitoring and therefore I hypothesise shareholder's interest to prevail as the size of the largest shareholder increases, whereas managerial interests will be relatively more present as the size of the largest shareholder decreases and hence ownership is dispersed. Hence, in line with Bethel and Liebeskind (1993), the first hypothesis is constructed as follows:

*Hypothesis 1a: There is a positive relation between ownership size of the largest shareholder and relative layoffs for firms with decreasing firm performance.*

Yet, the argument that institutional investors and retail investors are two homogeneous groups is over time largely rejected. Especially Beyer, Larcker, and Tayan (2014) give a clear explanation in facets that make shareholders a heterogeneous group. The combination of the arguments that larger shareholders generally are more tempted to use the voice channel and will have a more long-term oriented investment horizon provides reason to question the linear relationship as hypothesised in hypothesis 1a. Long-term oriented shareholders using the voice channel will according to the combination of these theories discourage large employee downsiz-



ing. While a mediate level of ownership size of the largest shareholder, where shareholders are short-term oriented but large enough to use the voice channel leads to an increase in relative layoff for firms with decreasing firm performance. Hence, a concave relation between ownership size of the largest shareholder and relative layoffs can be expected. Therefore hypothesis 1b is constructed as follows:

*Hypothesis 1b: The relationship between the size of the largest shareholder and relative layoffs for firms with decreasing firm performance develops in a concave way.*

As the interest between principal and agent are conflicting in many cases the principal can, as described, monitor the manager. But the shareholder can also influence the decision-making process by incentivising the manager to take the decision that is in the interest of the shareholder. In the next two paragraphs two tools that can be used by the principal to financially align the interest of the agent with the interest of the shareholder are discussed. First dependence of the manager's compensation scheme and second managerial ownership.

## **2.4 Compensation alignment**

One of the solutions to the absence of monitoring due to the free-rider problem in firms where ownership is dispersed is incentive alignment. It is empirically proven that in firms where incentive alignment is present, monitoring is typically lower (Beatty and Zajac 1994; Zajac and Westphal 1994). Nyberg et al. (2010) demonstrate that financial alignment is a significant and positive predictor of shareholder return (TSR). The dependence of CEO compensation on shareholder return modifies the preferences and actions of the CEO towards the interest of the principal and therefore can be a useful tool of the shareholder to reduce the agency problem (Martin, Wiseman, and L. R. Gomez-Mejia 2019). Hence, without the reduction of the shareholder's welfare by the cost of effort of actively monitoring the manager, the shareholders can reduce the interest gap, and thus the agency problem, by making the payoff of the manager dependent on the payoff of the shareholders. Since in firms with decreasing firm performance TSR decreases as well, the personal payoff of the CEO is negatively affected. In light of downsizing employees when firm performance is decreasing this most likely reduces the manager's delight of managing large firms since his personal payoff is decreasing. Therefore it can be expected that the financial alignment mechanism by making the payoff of the manager depending on shareholder return leads to a higher level of layoffs for firms with decreasing firm performance. For this reason the second hypothesis is constructed as follows:

*Hypothesis 2: If the compensation of the manager at least partially depends on shareholder return, the relative layoffs of the firm increase for firms with decreasing firm performance.*

## **2.5 Managerial ownership**

An other tool to align incentives, is to transfer a proportion of ownership to the CEO. In literature this is referred to as managerial ownership. When the agent is, at least partially, the principal the incentives of manager and owner become more aligned (Belloc 2012; Li, Sun, and Yannelis 2018). Yet, there exists an emphasis about a distortion in this relationship. Morck, Shleifer, and Vishny (1988) empirically found a non-monotonic relationship between managerial ownership and firm performance and value. At mediate managerial ownership levels the manager is highly entrenched and hence more potent in the pursuance of his interest (Short and Keasey 1999; M. Beyer, Czarnitzki, and Kraft 2012). Managerial entrenchment arises at mediate managerial ownership levels when the potency of the manager increases, but the misalignment of interest subsists. As the proportion of ownership increases beyond mediate level, the interests of manager and shareholder become more aligned and the agency problem mostly vanishes. Therefore a convex relation between managerial ownership and the alignment of interest can be expected. Consequently, this leads to a convex relation between managerial ownership and involuntary turnover for firms with decreasing firm performance. At mediate managerial ownership levels the monetary and non-monetary incentives for CEO's managing large firms (Stulz 1990) are still present while the manager, due to managerial entrenchment, is more potent in the pursuance of his interest and hence RLO for firms with decreasing firm performance is expected to be relatively low. When the level of managerial ownership increases beyond this mediate level, the incentives of the principal will outweigh the interest of the manager and the relative layoffs for firms with decreasing firm performance increases along. As a result the relationship between managerial ownership and relative layoffs for firms with decreasing firm performance is expected to develop in a convex manner. Therefore the third hypothesis is constructed as follows:

*Hypothesis 3: The relationship between managerial ownership and relative layoffs for firms with decreasing firm performance develops in a convex way.*

## 3 Data

### 3.1 Sample

The sample construction is based on the sample as constructed by Refinitiv's ESG-ASSET4 database. The Refinitiv sample is based on circa 9.000 firms, covering 80% of global market cap, spanning 76 markets according to their webpage<sup>2</sup>. The Refinitiv ESG-ASSET4 database, former Thomson Reuters ESG-ASSET4 database, strives to be the industry standard for collection of Environment, Social and Governance data and information. It is stated by the data provider that it does only use and provide data that is officially disclosed or publicly traded to support the claim about the reliability of the provided data. Furthermore, Refinitiv is publicly recognised for the reliable provision of data on publicly traded firms and hence the most suitable data provider. Therefore, the ESG-ASSET4 database is selected to be the fundament of this sample and after dropping all missing values on the dependent variable the sample consists out of 9,266 firms and 64,446 observations. Information about the sample is complemented with ownership data retrieved from Factset. In the ideal situation Refinitiv would be the provider of ownership data as well, but unfortunately due to budget constraints retrieval of ownership data from Refinitiv is not possible. On the other hand, Factset is praised for its reliable ownership data and hence is a near perfect substitute for data on ownership. Yet, out of 9.266 firms, Factset provides a match on 8,527 firms and therefore the sample is limited to 8,527 firms with 46,075 observations.

To test the effect of managerial ownership the Compustat Execucomp database, provided by WRDS, is used. This database provides mostly data for Northern American companies and therefore, to test the third hypothesis it is not possible to use the full sample but restrict to firms in the Compustat database. After merger of the retrieved Compustat data with the current sample, only 9 non-US observations remain (3 Germany, 6 Canada) that have been dropped. Therefore, results of this third analysis will be limited to US public companies. This new sample, for convenience hereafter called sample B, consists out of 1.327 firms counting 8.778 observations<sup>3</sup>.

Sources and brief definitions of all variables are schematically presented in appendix A. Also, to verify that the dependent variable and all right hand side variables are not highly correlated, the correlation matrix can be found in appendix B. Descriptive statistics of the full sample can be found in table 1 and separated per country in table 2.

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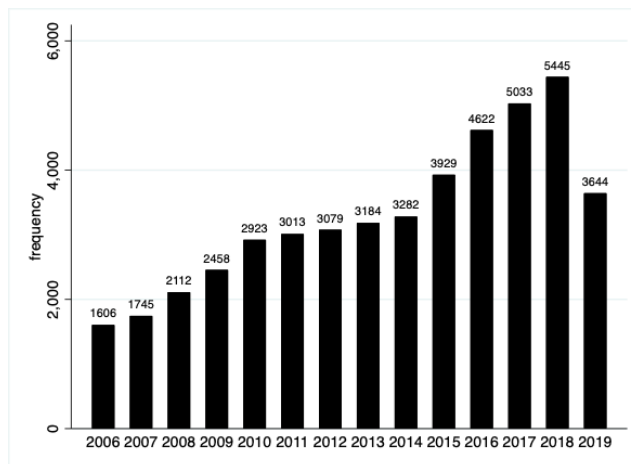
<sup>2</sup><https://www.refinitiv.com/en/financial-data/company-data/esg-data>

<sup>3</sup>Descriptive statistics of this new sample can be found in Appendix C

### 3.2 Time span

Since the research is focused on retrenchments the time span is based on a complete economic cycle. With the first signals of the so-called "Great Recession" in 2007 and the first signals of a new recession provoked by the COVID-19 pandemic in the beginning of 2020, the years 2006-2019 lead to a full high-to-high conjuncture analysis. The distribution of data availability during the years are presented in figure 1. The panel data is unbalanced since not all firms have available data for all years, leading to an average of 11.3 years per firm.

Figure 1: Number of observations, yearly



This figure presents the distribution of available data within the sample per year. On the x-axis year 2006-2019 and on the y-axis frequency.

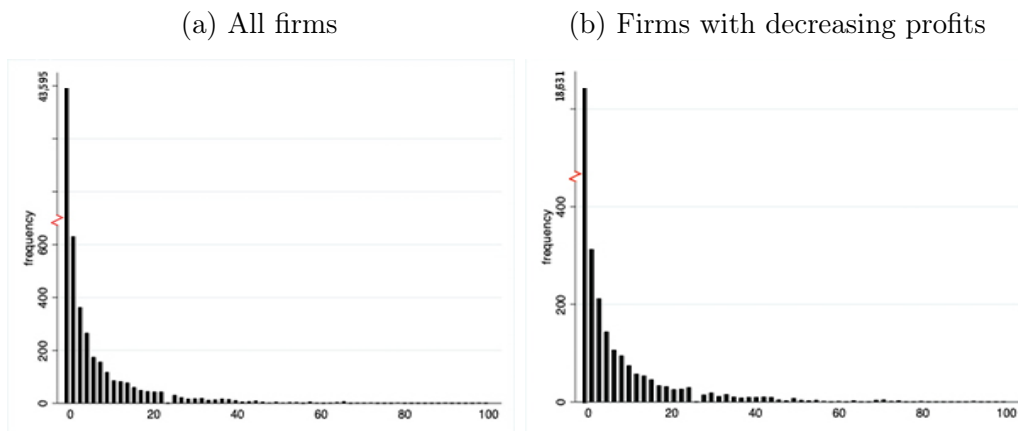
### 3.3 Dependent variable

This research contributes to existing literature by testing the effect of ownership concentration and financial alignment between principal and agent on employee dismissals for firms with decreasing firm performance in a recent time framework. To measure employee dismissals, relative layoffs (RLO) is used. The variable RLO (SOEQO10V) is a count variable and retrieved from the ASSET4-ESG database.

In table 1 a very low mean of RLO is presented (0.357%). This is most likely due to the fact that Refinitiv only collects announced layoffs. One can expect that individual dismissals due to under performance of that specific employee are generally not announced (except for executives). Yet, large employee layoffs are publicly announced which makes this variable perfectly suitable for this research since only large dismissals, with the aim of retrenchments, are included in the data. Still, a concern regarding the regression analysis of this dependent variable is the over-dispersion (variance larger than its mean, see table 1) and non-normal distribution (see figure 2). This problem of many zero values and over-dispersion in the dependent count variable

is largely solved by using the conditional fixed effects negative binomial regression method, further elaboration on this methodology will be provided in section 4.2.

Figure 2: Distributions relative layoffs



This figure presents the distribution of the dependent variable, RLO. The x axis presents the percentage of announced relative layoffs. The y axis presents the frequency. Note that the y axis skips a range of frequencies at the red twirl. The skewed dependent variable is in principle problematic, but the conditional fixed effects negative binomial panel regression accounts for skewed dependent count variables as explained in section 4.2.

## 3.4 Right hand side variables

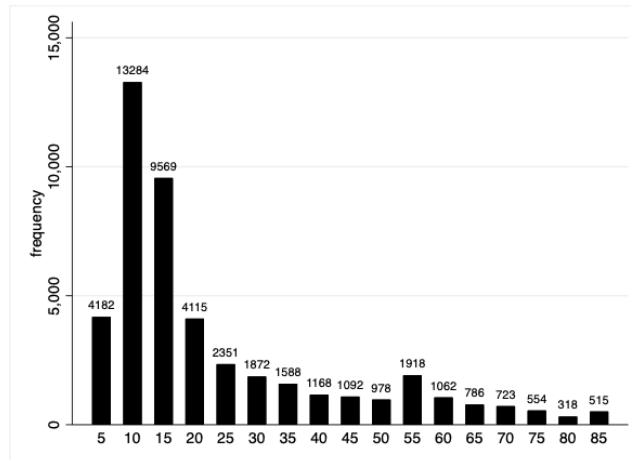
### 3.4.1 Size of the largest shareholder

For *Hypothesis 1a and 1b* the main explanatory variable is the size of the largest shareholder. This is a commonly used indicator of ownership concentration (Earle, Kucsera, and Telegdy 2005; Hamadi 2010; Scafarto et al. 2017). However the number of observations of the variable "size of the largest shareholder" is skewed, it is not common in recent literature to change the variable to its natural logarithm (Gul, Kim, and Qiu 2010; Paligorova 2010) and hence, the real values and number of observations are used. The categorised distribution of the variable can be found in figure 3, note that in this research the variable is treated as continuous but to give a graphical reproduction of the distribution, the variable is categorised in groups of 5%. Data is retrieved from Factset.

### 3.4.2 CEO compensation

Second, to test *hypothesis 2* the right hand side variable of interest is an indicator whether the compensation structure of the manager depends on shareholder return (TSR). Therefore a binary variable indicating whether the wage of the CEO depends on TSR is used to test *hypothesis 2*. Data is retrieved from the Worldscope database.

Figure 3: Distribution of ownership, per 5%



This figure presents the distribution of the size of ownership within the sample categorised per five percent over the full time span. This is the coefficient of interest in the first analysis testing hypothesis 1a and 1b. On the x-axis the categories of ownership size (per 5%) on the y-axis the frequency. Note that in the analysis size of ownership is continuous, but to give a rough indication about the distribution the variable is categorised.

### 3.4.3 Managerial ownership

Finally, to test *hypothesis 3* a continuous variable indicating how much percent of the shares is owned by the CEO is retrieved from the Compustat Execucomp database. The database provides data for all top-level managers but by adding a flag whether a top-level manager is CEO to the data file the data could be narrowed down to CEO data only by dropping all others. Compustat data is focused on Northern American firms therefore this relation is tested using a different sample descriptive statistics can be found in appendix C.

### 3.4.4 Delta

The frame of research to the effect of ownership structure on retrenchments is often based on an industry-specific or global recession (Bethel and Liebeskind 1993). One main assumption that has to hold to make the results of these researches valid is that all firms in the sample are affected by the recession. Yet, the assumption that all firms within one industry or country are affected by any financial crisis or recession in the same way can be questioned. Therefore, I make use of a firm performance delta. This is a binary variable indicating whether the firm has increasing ( $\delta=0$ ) or decreasing ( $\delta=1$ ) profits between time=  $t$  and time=  $t-1$  and is used to distinguish firms with decreasing firm performance from profitable firms during this given time span. Yet, the construction of this delta is exploratory in the sense that is not a common tool in existing literature. If the results of this empirical analysis provide a solid ground for further research, the delta can be expanded by accounting for duration and size of decreasing profits.

### *3.4.5 Controls in the model*

This section provides an as much as possible apples-to-apples comparison between firms with different ownership structures. All other important factors affecting the relative layoffs of the firm should be included to the model to extract the effect from our main coefficient. Many other researchers have conducted research to similar relations and provide reason to include their findings to the model. First of all, Edmans and Holderness (2017) underline the importance of firm size when researching ownership concentration since ownership concentration is negatively correlated with the size of the firm. Furthermore firm size affects employee turnover ratio in times of economic harassment (Duygan-Bump, Levkov, and Montoriol-Garriga 2015; Lai et al. 2016). Both conclude employees in relatively small firms to be more more vulnerable for dismissal than larger firms, especially small firms without solid HR practices (Lai et al. 2016). Therefore, the natural logarithm of total assets and the natural logarithm of the number of employees are used as control variables in order to extract the effect of firm size from the main coefficient.

Secondly, an important variable in research to how ownership structures affect any firm outcome is the type of owner. Many different types of shareholders have different incentives and intentions for the firm (Beyer, Larcker, and Tayan 2014). For example, family owners are generally more long-term oriented than investment funds since the goal of the family is to transfer the firm to the next generation (Anderson, Mansi, and Reeb 2003). In general, financial institutions as banks, mutual funds and financial companies will have a different impact on the firm than family owners or individuals (Paligorova 2010) partly because of their different investment horizon, level of activity and objectives (Beyer, Larcker, and Tayan 2014). If transferring the firm to the next generation is the main goal of the owner, it can be expected that dismissals are less likely to happen and hence not controlling for type of owner can underestimate the effect of ownership concentration. On the other hand, if financial institutions only focus on cash flows leading to higher employee turnover ratios in economic downturn, not including type of owner to the model overestimates the result of ownership concentration. Because there are many different types of ownership, see table 3, in our sample a dummy variable for each type is included in the model.

Thirdly, firm performance indicators, profitability of the firm and Tobin's q are included to the model. It is straightforward to see that profitability affects the decision to downsize the firm's number of employees and therefore profitability of the firm is an important control. Furthermore Tobin's q is used as a measure of intangible assets and/or resources and, in line with Villalonga (2004), an important determinant of the firm's sustainability of the competitive

advantage (Zorn et al. 2017). The variables determining both firm performance indicators are retrieved from Worldscope. Tobin's Q is measured as market capitalization of equity plus total debt divided by total assets and profitability is measured as net income plus after-tax interest expenses to total assets. Proper formulas of the firm performance indicators can be found in section 4.1.

Also, Edmans and Holderness (2017) emphasise the importance of including leverage in the model when researching the effect of ownership size. More leveraged firms have less equity which affects the ownership structure. At the same time, it is straightforward to see that highly leveraged firms will face other difficulties in downturn and hence will take a different decision regarding dismissals.

Furthermore Ferreira and Matos (2008) describe a reduction in monitoring when the shareholder is a domestic institution. A closer connection between shareholders and management leads to a higher level of tolerance and hence a reduction in monitoring. Therefore, especially when researching the effect of ownership concentration, controlling for domestic shareholders is important. A binary variable indicating whether the largest shareholder is domestic is included to the model. Moreover, in line with Beyer, Larcker, and Tayan (2014), domestic ownership represents similar ethical values of shareholder and manager.

Lastly, board characteristics will affect the decision-making process regarding employee downsizing for firms with decreasing firm performance. Especially the size of the board affects whether the board decides to downsize personnel. Yawson (2006) finds that the decision to downsize the firm's number of employees is unlikely to be taken when the size of the board is large. Therefore, board size is included to the model. The variable is retrieved from the ESG-ASSET4 database.



Table 1: Descriptive statistics

	N	mean	sd	min	max
<i>Dependent Variable</i>					
Relative Layoffs (%)	46,075	0.357	2.556	0	95
<i>Independent Variable</i>					
Shareholder Size	46,075	20.864	19.195	0	82.56
CEO Compensation	46,074	0.369	0.482	0	1
Managerial Ownership	8,778	1.693	4.434	0	63.416
Profitability Delta	46,075	0.436	0.496	0	1
<i>Control Variables</i>					
Size (log)	45,939	15.397	1.771	9.417	19.717
Number of Employees (log)	43,518	8.567	1.973	2.079	12.238
Leverage	45,936	.251	.195	0	0.919
Tobins' Q	45,826	1.806	1.397	0.63	9.686
Profitability	45,935	0.032	0.117	-.819	0.311
Board Size	45,965	10.041	3.51	1	44

In this table descriptive statistics for the full sample are presented. In column 1 the number of observations are reported, column 2 presents the mean of each variable and column 3 the standard deviation. Column 4 and 5 report the minimum and maximum value for each variable. Definitions and sources of the variables can be found in appendix A.

### 3.5 Concerns

The main concern about data collection for this research is that there exist no regulations about revelation of dismissals for publicly traded firms. Therefore, the data provider on dismissal data should be reliable enough to support the trustworthiness of this research. Yet, the public claim by Refinitiv that all data is thoroughly collected and researched strengthens the reliability of the provided data. Still, there might be employee retrenchments that are not publicly announced. Depending on the ownership structure of the firm this could lead to either an over- or underestimation of results. An other concern is the skewed dependent variable. By using conditional fixed effects negative binomial regression (CFENBR) that accounts for over-represented zeros in count data the problem is largely solved as explained in section 4.2 and appendix D.

Table 2: Descriptive statistics Country-level

Country	n Obs	n Firms	RLO (%)	Shareholder Size (%)	Finan. align.
United States	14992	2472	0.412	13.422	0.571
Japan	3913	339	0.154	14.367	0.002
United Kingdom	3717	475	0.557	13.957	0.788
Australia	3035	438	0.477	15.956	0.598
Canada	2757	338	0.44	13.943	0.526
Hong Kong	1491	172	0.066	45.341	0.042
China	1195	231	0.001	34.733	0.005
Germany	1026	147	0.784	25.171	0.198
France	1007	129	0.404	31.242	0.196
South Africa	914	121	0.335	23.658	0.302
Taiwan	903	106	0.027	15.033	0.012
South Korea	893	116	0.077	27.938	0.024
India	732	93	0.255	39.097	0.012
Brazil	727	95	0.131	32.242	0.026
Switzerland	655	96	0.634	19.335	0.244
Sweden	604	105	0.391	17.276	0.184
Italy	568	97	0.414	32.728	0.144
Spain	554	71	0.413	31.111	0.134
Netherlands	428	62	0.687	18.845	0.563
Malaysia	424	48	0.045	41.594	0.061
Singapore	371	33	0.027	39.921	0.164
Mexico	335	49	0.116	35.826	0.042
Belgium	319	43	0.207	29.769	0.082
Denmark	288	33	0.58	21.976	0.108
Poland	280	40	0.35	45.463	0.057
Russian Federation	272	33	0.004	53.372	0.044
Indonesia	260	33	0	55.743	0.012
Finland	254	31	1.512	18.374	0.394
Chile	250	37	0.008	47.563	0.036
Thailand	246	32	0.028	35.427	0.033
Norway	243	49	0.679	31.922	0.222
New Zealand	237	40	0.051	19.46	0.477
Greece	225	30	0.289	31.005	0.018
Philippines	181	21	0.017	41.979	0.066
Ireland	172	20	1.203	22.692	0.709
Austria	161	27	0.36	37.95	0.261
Turkey	156	35	0	44.124	0.013
Israel	140	16	0.586	31.929	0.007
Colombia	138	23	0	49.842	0.022
Portugal	131	16	0	33.789	0.366
Argentina	95	42	0.789	47.972	0
Peru	88	28	0	46.061	0
United Arab Emirates	88	21	0.92	51.609	0.023
Qatar	86	15	0.012	35.141	0
Egypt	78	10	0.013	32.379	0
Kuwait	61	10	0	26.24	0.016
Saudi Arabia	58	18	0	22.293	0.034
<i>Others (&lt;10 firms)</i>	337	57	.	.	.

In this table descriptive statistics for the full sample are presented, separated for each country. Columns 2 & 3 report the number of observations and number of firms per country. Column 3 the mean of the dependent variable per country. Column 4 & 5 the mean of the independent variable of interest for analysis 1 & 2 per country. Note that for analysis 3 only U.S. is used and descriptive statistics can be found in appendix C.

Table 3: Distribution of Shareholder Types

Shareholder types	N	Percentage
Investment Adviser	13015	28.25%
Public Company	6850	14.87%
Individual	6652	14.44%
Mutual Fund Manager	6589	14.30%
Government	2509	5.45%
Private Company	2328	5.05%
Venture Capital/Pvt Equity	1369	2.97%
Hedge Fund Manager	1356	2.94%
Holding Company	840	1.82%
Pension Fund Manager	816	1.77%
Subsidiary	594	1.29%
Operating Division	494	1.07%
Foundation/Endowment	452	0.98%
Trust/Trustee	435	0.94%
Sovereign Wealth Manager	345	0.75%
Pension Fund	274	0.59%
Insurance Company	255	0.55%
Private Banking/Wealth Mgmt	170	0.37%
Emp Stk Ownership Plan	158	0.34%
Extinct	154	0.33%
Open-End Fund	143	0.31%
Non-Profit Organization	73	0.16%
Pension & Life Product	35	0.08%
Joint Venture	34	0.07%
<i>Other</i>	135	<0.05%

In this table the distribution of types of owners in the period 2006-2019 is provided. All data regarding ownership is retrieved from Factset and type of ownership is categorised by Factset.

## 4 Methodology

### 4.1 Pre-analysis adjustments

The data is winsorised on the 1st and 99th percentile. Furthermore a stand is taken on lagging the variables or not. The decision to lag the explanatory variables or not differs from paper to paper in research to the effect of ownership on some firm outcome. Papers researching investment decisions, for example CSR, commonly choose to lag the explanatory variables (Dyck et al. 2019). The explanation for this is that the implementation of investment decisions generally takes time and hence the effect of ownership pressure today will be detectable after some time. In contrast, the decision to downsize the firm's number of employees is implemented in a very short time frame since the decision is made under financial pressure. Moreover, the data in this research is regarding the announcement of layoffs instead of the execution. Therefore empirical research to ownership structures on retrenchment commonly doesn't lag the right hand side variables. Though, since the data and methodology is available, results of the analysis using lagged right hand side variables are available upon request.

Some of the right hand side variables are not directly retrieved from databases. The variables used to compute the explanatory variables are. Below the formulas can be found to compute the undefined control variables.

$$Tobin's\ Q = \frac{Total\ Assets + Market\ Cap - SH\ equity}{Total\ Assets}$$

$$Leverage = \frac{Total\ Debt}{Total\ Assets}$$

$$Profitability = \frac{Net\ Income}{Total\ Assets}$$

Furthermore firm size (measured as total assets) is transferred to its natural logarithm. Likewise the natural logarithm is taken of the firm's number of employees. All variables are measured yearly.

## 4.2 Regression & analysis method

Most recent empirical researches to the effect of corporate governance on some firm outcome is based on Ordinary Least Squares (OLS) method (Bena et al. 2017; Paniagua, Rivelles, and Sapena 2018; Dyck et al. 2019). Yet, as discussed in section 3.3, the dependent (count) variable in the used panel data is over-dispersed and skewed. Therefore a different method to estimate the coefficients of interest is used. In appendix D all considered alternative methods are discussed and adequate arguments whether the considered method fits the purpose of this research are included. An important distinguish between true and excess zeros is made. Excess zeros are misinterpreted zeros that are for example missing values. While true zeros are real world zero values, in this case a value zero of relative layoffs truly means no announced employee downsizing. Due to the high reliability of the data provider (Refinitiv) on relative layoffs (RLO), it is assumed that the sample only contains true zeros.

From appendix D it is concluded that conditional fixed effects negative binomial regression (CFENBR) as proposed by Hausman, Hall, and Griliches (1984) is the most suitable method for the purpose of this research. Therefore the analysis will be done using CFENBR. In all three analysis the setup of controls will be similar. Yet, since each independent variable of interest is different the analysis will be done in three separate regressions. A brief explanation on the similarities of the regressions will be presented below.

Y represents all firm level control variables as described in section 3.4.5. A brief summary of these variables; the natural logarithm of total assets and the natural logarithm of the number of employees, a dummy variable for each type of owner, two important firm performance indicators Tobin's Q and profitability, the level of leverage and finally the size of the board. Another important control is type of ownership, these types are categorised by Factset and is included in the model by adding a dummy variable for each type.

Below the abbreviated regression equation of each analysis is presented, the full equation can be found in appendix E. Results will be presented for all firms in the sample and for firms with decreasing profits only. This to show whether the hypothesised effects of shareholder pressure are more present in firms with decreasing firm performance.

### 4.2.1 Regression hypothesis 1

To test hypothesis 1a "*There is a positive relation between ownership size of the largest shareholder and relative layoffs for firms with decreasing firm performance*" the main right hand side variable of interest is the size of the largest shareholder. To distinguish the effect of

the size of the largest shareholder for firms in general and firms with decreasing profits the results of regression for all firms and for firms with decreasing profits ( $\delta=1$ ) only are presented. The coefficient of Shareholder Size for firms with decreasing profits is the coefficient of interest and is hypothesised to be positive and significant.

$$\%RLO_{i,t} = \beta_0 + \beta_1 \text{Shareholder Size}_{i,t} + \gamma Y_{i,t} + \epsilon_{i,t} \quad (1)$$

Yet, due to the heterogeneity of shareholders a concave relation between ownership size and relative layoffs might exist. Therefore a similar but quadratic regression will be used to test hypothesis 1b *"The relationship between the size of the largest shareholder and relative layoffs for firms with decreasing firm performance develops in a concave way"*. Since a concave relation is expected, to reject the null hypothesis  $\beta_1$  is hypothesised to be positive and significant, while  $\beta_2$  is hypothesised to be negative and significant.

$$\%RLO_{i,t} = \beta_0 + \beta_1 \text{Shareholder Size}_{i,t} + \beta_2 (\text{Shareholder Size})^2 + \gamma Y_{i,t} + \epsilon_{i,t} \quad (2)$$

#### **4.2.2 Regression hypothesis 2**

The second hypothesis tested in this research is about the financial alignment between principal and agent. The main right hand side variable to test hypothesis 2 (*"If the compensation of the manager at least partially depends on shareholder return, the relative layoffs of the firm increase for firms with decreasing firm performance"*) is a binary variable, called CEO Compensation, indicating whether the CEO return depends on the shareholder return or not (yes=1, no=0). A positive and significant  $\beta_1$  is hypothesised and as before results for all firms in the sample and for firms with decreasing profits ( $\delta=1$ ) only will be presented.

$$\%RLO_{i,t} = \beta_0 + \beta_1 \text{CEO Pay}_{i,t} + \gamma Y_{i,t} + \epsilon_{i,t} \quad (3)$$

#### **4.2.3 Regression hypothesis 3**

The third hypothesis researches the relationship between managerial ownership and the relative layoffs for firms facing economic downturn. Note that this hypothesis uses a different sample as described in 3.1. The main right hand side variable to test the hypothesis *"The relationship between managerial ownership and relative layoffs for firms with decreasing firm performance develops in a convex way"* is the percentage of shares owned by the CEO, called Managerial Ownership (MO). Hypothesised is that, until a mediate level of MO, an increase in managerial ownership leads to a decrease in relative layoffs due to managerial entrenchment (hence, a negative  $\beta_1$ ). Above a certain, unknown, proportion owned by the CEO the alignment of

interest between principal and agent increases leading to an increase in relative layoffs for firms with decreasing firm performance ( $\beta_2$  is positive & significant). Also for this analysis, the overall result and the result for firms with decreasing firm performance only ( $\delta=1$ ) are presented. Because of the hypothesised managerial entrenchment the regression is quadratic and takes the form of a second order polynomial equation.

$$\%RLO_{i,t} = \beta_0 + \beta_1 MO_{i,t} + \beta_2 (MO)^2 + \gamma Y_{i,t} + \epsilon_{i,t} \quad (4)$$

From this equation, the optimum of managerial entrenchment can be derived using the following formula:

$$\frac{\partial \%RLO}{\partial MO} = \beta_1 + 2 * \beta_2 * MO = 0 \quad (5)$$

### 4.3 Robustness Test

Since most empirical research to a similar relation is based on Ordinary Least Squares (OLS) the robustness of results from CFENBR will be tested using OLS. After the interpretation of the results of CFENBR estimation, results of OLS estimation for all analysis as described in section 4.2 will be presented. It is expected that results point in the same direction as the CFENBR estimation which proves the robustness of results.

Though, the validity of OLS regression with a strongly skewed dependent variable can be questioned. Therefore a kernel density plot of the residuals, visualising to what extend the residuals of the regressions are normally distributed will be presented. Moreover, a standardised probability plot (P-P) of the residuals will be presented to give the reader insight in the distribution of residuals.

Since the the software implementation of CFENBR in, among others, STATA does not control for all stable covariates (Allison and Waterman 2002). It can be valuable for this research to manually control for all necessary stable covariates using OLS. Therefore, industry-, country- and year- dummies are included in order to include industry-, country- and year fixed effects to the model. To allow for variance within the sector within a specific year, year and industry fixed effects are interacted. Furthermore, the software implementation of CFENBR does not allow for clustered error terms. In the robustness test the error term is clustered at the firm level to allow for serial correlation over time within the firm. The full equations can be found in appendix F.

## 5 Results

### 5.1 The effect of ownership concentration

In table 4 the results of equation 1 are presented in column 3. This column presents the results of a linear regression analysis based on conditional fixed effects negative binomial regression. In the regression the effect of the size of the largest shareholder on relative layoffs (RLO) is tested. A positive and significant coefficient is hypothesised. Yet, with a (weakly) statistically significant coefficient of -0.00739 (t statistic is 2.54) the coefficient of the empirical analysis points in the opposite direction. However statistically significant, the economical significance is very limited due to the large amount of zeros in the model. A decrease of 0.00739 percentage point does not (or barely) change the risk of becoming unemployed for employees of firms with decreasing firm performance.

Since the use of the profitability delta is exploratory results for the full sample are presented in column 1 and 2. The negative statistically significant coefficient in column 1 indicates that the result as discussed above holds, regardless the performance between time= $t-1$  and time= $t$ .

Hypothesis 1b states a concave relation between ownership size and relative layoffs for firms with decreasing firm performance. The results of the analysis are presented in column 4. Again, results point in the opposite of the hypothesised direction. Yet, there is no empirical prove for a convex nor a concave relation since the coefficients are insignificant.

The negative linear relation in column 3 provides ground to build an earlier emphasised theory that the largest shareholder, in general, becomes more (personally) connected or long term oriented as the proportion of ownership increases. Hence, the top-down command or monitoring of the largest shareholder advocates downsizing employees for firms with decreasing firm performance less often. Resulting in a negative linear relation between size of the largest shareholder and relative layoffs (RLO). An other possible distortion in this analysis provoking a divergent result is the heterogeneity of shareholders within their type. In appendix G the coefficients of the dummies "type of shareholder" are presented. From the table it becomes clear that the coefficients of the type dummies do not lead to unambiguous results. The reason why the type dummies are included in the model is to extract the different interests, intentions and objectives of shareholders from the main coefficient. Yet, from the statistical insignificant coefficients of the type dummies it becomes clear that the intentions, interests and objectives of shareholders within their type are not homogeneous and hence different intentions, interests and objectives can still be present in the coefficient of interest.



### *5.1.1 Deeper insight*

To provide the reader with more intuition what this heterogeneity holds and why it provokes ambiguity of results, appendix G presents the estimated coefficients of each type dummy. Type dummies are included to extract the effect of working methods that are underlying to the type of shareholders from our coefficient of interest. This should largely capture the effect of objectives, level of activity and investment horizon and would together with the size of the largest shareholder provide a solid ground to make any statement about the effect of ownership concentration on RLO for firms with decreasing profits. Yet, as presented in appendix G the coefficients of the type dummies do not lead to unambiguous results. This provides reason to question the homogeneity of shareholders within their type and, at least partially, explains why shareholders monitor the firm in different directions when it comes to employee downsizing.

Hence, to discover the relation between ownership concentration and RLO the analysis should include more qualitative characteristics of the shareholder or the manager of the institution. In this research one qualitative characteristic is included namely, the binary variable indicating whether the owner is domestic or not. Since the effect of this control is significant more qualitative characteristics can lead to a more unambiguous result regarding ownership concentration. Gaspar, Massa, and Matos (2005) use a clever strategy calculating investor turnover ratio's per owner. In future research to the effect of ownership on relative layoffs this is a recommended control to include in the model. More hard to observe characteristics as for example the profit making obligation of the shareholder or intrinsic values regarding humanity or social welfare issues are worth to discover.

Since it is given that effective monitoring happens when ownership concentration increases it can be expected that these specific characteristics will have a stronger effect on RLO, either positive or negative, if ownership is concentrated.

Table 4: Regression results (CFENBR)

	All firms		Decreasing profits	
	(1) RLO%	(2) RLO%	(3) RLO%	(4) RLO%
<i>Variable of Interest</i>				
Ownership Size	-0.00738*** (0.00202)	-0.0117* (0.00604)	-0.00588** (0.00239)	-0.0106 (0.00734)
(Ownership Size) <sup>2</sup>		0.0000604 (0.0000804)		0.0000660 (0.0000973)
<i>Control Variables</i>				
Size	0.102*** (0.0217)	0.0998*** (0.0220)	0.144*** (0.0262)	0.141*** (0.0266)
Employee	0.519*** (0.0228)	0.519*** (0.0228)	0.440*** (0.0270)	0.440*** (0.0270)
Tobin's Q	-0.131*** (0.0302)	-0.132*** (0.0302)	-0.105*** (0.0395)	-0.106*** (0.0396)
Leverage	0.0539 (0.146)	0.0614 (0.146)	-0.0431 (0.173)	-0.0362 (0.174)
Profitability	-3.359*** (0.187)	-3.362*** (0.187)	-3.193*** (0.215)	-3.192*** (0.215)
Domestic	0.184*** (0.0567)	0.185*** (0.0567)	0.220*** (0.0704)	0.222*** (0.0706)
Board Size	-0.00472 (0.00828)	-0.00455 (0.00828)	0.00111 (0.00997)	0.00130 (0.00998)
Fixed Effects.	Yes	Yes	Yes	Yes
Type Dummy	Yes	Yes	Yes	Yes
Observations	41866	41866	18.503	18.503

This table presents the regression results of equation 1 (column 1 & 3) and 2 (column 2 & 4) based on conditional fixed effects negative binomial panel regressions. Column 3 and 4 are the columns of interest presenting the coefficients for firms with decreasing firm performance between time = t and time = t-1. The dependent variable is announced relative layoffs (RLO) and the main independent variable of interest is the size of the largest owner tested in a linear and quadratic equation. Data is retrieved from ESG-ASSET4, Factset and Worldscope. "Type Dummy" indicates control for type of owner. Robust standard errors are reported in parentheses. \*, \*\*, \*\*\* Indicate significance at respectively 10%, 5%, 1% levels.

## 5.2 The effect of CEO compensation alignment

In table 5 the results from conditional fixed effects negative binomial regression (CFENBR) of equation 2 are presented in column 4, where the binary variable indicating whether the CEO compensation structure depends on total shareholder return (TSR) is the main coefficient of interest. I conclude a positive correlation leading to an increase of 0.658 percentage point of relative layoffs for firms with decreasing firm performance if the CEO's compensation structure is dependent on TSR. This result is statistically significant, since the t statistic is 10.2 ( $0.658/0.0643$ ). Moreover, from column 2, it can be concluded that this positive correlation holds when there is no distinguish made between firms with increasing and decreasing firm performance. Hence, not only for firms with decreasing firm performance CEO compensation dependence on TSR leads to a higher level of relative layoffs this applies to firms in general (increase of 0.608 percentage point).

Yet, as earlier described, the economical significance is limited since a 0.658 percentage point increase is barely changing the risk for employees of becoming unemployed.

Table 5: Regression results (CFENBR)

	All firms		Decreasing profits	
	(1) RLO%	(2) RLO%	(3) RLO%	(4) RLO%
<i>Variable of Interest</i>				
Compensation Alignment	0.588*** (0.0522)	0.608*** (0.0528)	0.611*** (0.0681)	0.658*** (0.0643)
<i>Control Variables</i>				
Size		0.0833*** (0.0213)		0.149*** (0.0224)
Employee		0.522*** (0.0228)		0.390*** (0.0223)
Tobin's Q		-0.118*** (0.0296)		-0.0742** (0.0363)
Leverage		-0.0556 (0.145)		-0.0429 (0.156)
Profitability		-3.431*** (0.187)		-3.189*** (0.197)
Domestic		0.101* (0.0553)		0.186*** (0.0643)
Board Size		-0.00446 (0.00816)		0.00819 (0.00911)
Fixed effects	Yes	Yes	Yes	Yes
Type Dummy	Yes	Yes	Yes	Yes
Observations	46,074	41,865	20,075	18,502

This table presents the regression results of equation 3 based on conditional fixed effects negative binomial panel regressions. Column 4 is the column of interest presenting the coefficients for firms with decreasing firm performance between time = t and time = t-1. The dependent variable is announced relative layoffs (RLO) and the main independent variable of interest is a binary variable indicating whether the CEO compensation structure depends on TSR tested in a linear equation. Data is retrieved from ESG-ASSET4, Factset and Worldscope. "Type Dummy" indicates control for type of owner. Robust standard errors are reported in parentheses. \*, \*\*, \*\*\* Indicate significance at respectively 10%, 5%, 1% levels.

### 5.3 The effect of managerial ownership

To test hypothesis 3 a quadratic regression analysis based on conditional fixed effects negative binomial regression (CFENBR) is used. Due to managerial entrenchment, a convex relation between managerial ownership and RLO for firms with decreasing firm performance is expected. In table 6 the results are presented, column 2 presents the results of the regression as stated in equation 4. Important to note is that this regression analysis is based on the same sample, but narrowed down to U.S. firms only, descriptive statistics on this different sample can be found in appendix C. As hypothesised I do find evidence of a convex relation (column 2) and therefore succeed in rejecting the null hypothesis. The negative  $\beta_1$  indicates that RLO is decreasing for every percentage point increase of managerial ownership when CEO's own 0 to a mediate level of the firm's shares. The positive  $\beta_2$  indicates that if the level managerial ownership increases beyond this mediate level, RLO increases for every percentage point increase of managerial ownership. As a result the relation between managerial ownership and relative layoffs for firms with decreasing firm performance develops in a convex manner. With the 2 coefficients of interest an optimum of managerial entrenchment regarding relative layoffs can be calculated using equation 5. Substituting the coefficients in equation 5 gives:

$$\frac{\partial \%RLO}{\partial MO} = -0.134 + 2 * 0.00281 * MO = 0 \quad (6)$$

Deriving this gives the level of managerial ownership that leads to the minimum of relative layoffs

$$MO = 23.8 \quad (7)$$

Hence, from perspective of the worker, employees working for a firm where the CEO owns approximately 23.8% of the shares face a lower risk of being laid off than employees working for a firm where the CEO owns a smaller or larger proportion of the shares.

In column 3, as a robustness test the results of a linear equation are presented. As hypothesised this relation is strictly convex, there is no empirical prove for a linear relationship between managerial ownership and relative layoffs for firms with decreasing firm performance.

Yet, as in the analysis before the economical significance is debatable since the percentage change is limited.

Table 6: Regression results (CFENBR)

	All firms		Decreasing profits	
	(1)	(2)	(3)	(4)
	RLO%	RLO%	RLO%	RLO%
<i>Variable of interest</i>				
Managerial Ownership	-0.122*** (0.0353)	-0.134*** (0.0414)	-0.0124 (0.0185)	-0.224*** (0.0411)
(MO) <sup>2</sup>	0.00221*** (0.000711)	0.00281*** (0.000744)		0.00429*** (0.000697)
<i>Control Variables</i>				
Size	0.139*** (0.0427)	0.160*** (0.0487)	0.178*** (0.0484)	
Employee	0.477*** (0.0409)	0.358*** (0.0433)	0.358*** (0.0435)	
Tobin's Q	-0.205*** (0.0579)	-0.0277 (0.0639)	-0.0268 (0.0634)	
Leverage	0.236 (0.256)	-0.0393 (0.301)	0.0606 (0.299)	
Profitability	-3.403*** (0.446)	-3.375*** (0.483)	-3.355*** (0.485)	
Domestic	0.260* (0.151)	0.209 (0.178)	0.255 (0.179)	
Board Size	0.0617*** (0.0204)	0.0818*** (0.0236)	0.0822*** (0.0238)	
Fixed Effects	Yes	Yes	Yes	Yes
Type Dummy	Yes	Yes	Yes	Yes
Observations	8,237	3,523	3,523	3,734

Note that in this analysis the sample is narrowed down to U.S. firms (descriptive statistics of this new sample in appendix C). This table presents the regression results of equation 4 based on conditional fixed effects negative binomial panel regressions. Column 2 is the column of interest presenting the coefficients for firms with decreasing firm performance between time = t and time = t-1. The dependent variable is announced relative layoffs (RLO) and the main independent variable of interest is the size of managerial ownership tested in a quadratic equation, results of a linear equation are presented in column 3. Data is retrieved from ESG-ASSET4, Compustat Execucomp, Factset and Worldscope. "Type Dummy" indicates control for type of owner. Robust standard errors are reported in parentheses. \*, \*\*, \*\*\* Indicate significance at respectively 10%, 5%, 1% levels.

## 5.4 Robustness test

As explained in appendix D, the conditional fixed effects negative binomial regression (CFENBR) method fits the purpose of this research best. Yet, there are concerns that this method is not a true fixed effects method (Allison and Waterman 2002). Furthermore, the CFENBR method does not allow for clustered error terms. In Ordinary Least Squares (OLS) the possibility exists to manually include all meaningful stable covariates and cluster the error term. Since CFENBR accounts for the over-dispersed and skewed dependent variable and OLS includes all stable covariates and clustered error terms a combination of those two methods validates the outcome of the empirical analysis of this paper. Therefore, the robustness of CFENBR results is tested using OLS and presented in table 7.

To confirm the validity of OLS estimates appendix H presents the predicted kernel distribution and standardised probability plot of the residuals for all regressions. The distribution of the kernel density in figure 5, 6 and 7 is not completely normal but the standardised probability plot shows no major concerns and hence the OLS results can be accepted. In figure 8 the standardised probability plot shows a deviation from the normal distribution, yet this deviation is not very remarkable in the kernel density plot. Though, results of the fourth column should be interpreted with some caution.

Results of all analysis are presented in table 7 with column 1 and 2 presenting respectively the effect of ownership concentration, measured as size of the largest owner, on RLO in a linear (1) and quadratic (2) regression. Column 3 presents the effect of CEO compensation alignment on RLO and column 4 presents the effect of managerial ownership on RLO. In column 3 and 4, all coefficients point in the hypothesised direction and are in line with CFENBR estimates which proves the robustness of results. Moreover, for the analysis regarding managerial ownership substituting the estimates in equation 5 points at a minimum of RLO (an optimum of managerial entrenchment) at 12.7% which slightly differs from the CFENBR result (23.8%) but confirms the effect of mediate levels of managerial ownership.

The effect of ownership concentration remains ambiguous. Results of CFENBR analysis are significant but point in the opposite direction as hypothesised. Results of OLS analysis point in the hypothesised direction but are statistically insignificant. An explanation for this could be the same as the explanation for the unexpected results of CFENBR estimation. Namely, the heterogeneity of objectives and incentives of shareholders within their type as their level of activity and investment horizon (Edmans 2009; Beyer, Larcker, and Tayan 2014)<sup>4</sup>.

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<sup>4</sup>Appendix I presents the coefficients of type dummies based on OLS. The insignificance of coefficients from OLS estimation supports the claim about heterogeneity made in section 5.1 and 5.1.1.

Table 7: Ordinary Least Squares results

	(1)	(2)	(3)	(4)
	RLO%	RLO%	RLO%	RLO%
<i>Variable of Interest</i>				
Ownership Size	0.00164 (0.00190)	0.00291 (0.00655)		
(Ownership Size) <sup>2</sup>		-0.0000171 (0.0000766)		
CEO Compensation Alignment			0.203*** (0.0743)	
Managerial Ownership				-0.0996*** (0.0325)
(MO) <sup>2</sup>				0.00392*** (0.000869)
<i>Control Variables</i>				
Size	0.181*** (0.0557)	0.181*** (0.0288)	0.175*** (0.0282)	0.144*** (0.0377)
Employee	0.0996*** (0.0184)	0.0997*** (0.0184)	0.0968*** (0.0184)	0.0540 (0.0443)
Tobin's Q	0.0293 (0.0195)	0.0296 (0.0195)	0.0300 (0.0195)	0.0623 (0.0531)
Leverage	-0.126 (0.158)	-0.127 (0.157)	-0.137 (0.158)	-0.225 (0.391)
Profitability	-3.156*** (0.446)	-3.157*** (0.447)	-3.170*** (0.446)	-3.608*** (1.064)
Domestic	-0.0259 (0.0745)	-0.0264 (0.0745)	-0.0315 (0.0742)	-0.383 (0.374)
Board Size	0.00241 (0.0102)	0.00233 (0.0103)	0.00153 (0.0103)	0.0569* (0.0315)
Country fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Type Dummy	Yes	Yes	Yes	Yes
Adjusted R <sup>2</sup>	0.147	0.148	0.149	0.228
Observations	17330	17330	17329	7403

This table presents the regression results of equation 1, 2, 3 and 4 based on OLS panel regression. All columns present results for firms with decreasing firm performance between time = t and time = t-1. The dependent variable is announced relative layoffs (RLO). The coefficient of interest is Ownership size, CEO compensation and managerial ownership. Data is retrieved from ESG-ASSET4, Compustat Execucomp, Factset and Worldscope. "Type Dummy" indicates control for type of owner. Year and industry fixed effects are interacted to allow for variance within the industry within a specific year. Robust standard errors are clustered at the firm-level and reported in parentheses. \*, \*\*, \*\*\* Indicate significance at respectively 10%, 5%, 1% levels.



## 6 Conclusion & Limitations

### 6.1 Conclusion

However theory predicts that ownership concentration, due to effective monitoring, leads to higher relative layoffs for firms with decreasing firm performance. The empirical analysis fails to statistically prove this prediction. Moreover, coefficients based on conditional fixed effects negative binomial panel regression point in the opposite direction as hypothesised and are statistically significant while coefficients based on ordinary least squares point in the hypothesised direction but are statistically insignificant. Therefore the effect of size of the largest shareholder remains ambiguous.

Yet, the theoretical emphasis about financial alignment of the CEO's interest with the shareholder's (financial) interest is empirically tested and concluded. It becomes clear that financial alignment of the CEO's payoff, either by CEO compensation structure or by managerial ownership, affects the decision made to downsize the firm's number of employees. Dependence of the CEO's compensation on TSR is hypothesised and empirically demonstrated to increase the relative layoffs for firms with decreasing firm performance. The theory for managerial ownership is similar, apart from the fact that entrenched managers are more potent in the pursuance of their interest while the financial alignment is not strong enough to modify the manager's interest. Hence, a convex relation is hypothesised and concluded. The conducted OLS analysis, as a robustness test, is an important assessment to confirm the CFENBR results and proves the reliability of the rejected null hypothesis for both analysis by estimating statistically significant coefficients pointing in the hypothesised direction for hypothesis 2 and 3.

### 6.2 Limitations & recommendations

One of the most severe limitations in this research is the strength of the calculated delta. This delta does not account for the size or duration of decreasing profits. The delta indicates whether the firm made profit in the prior year or not. Hence, by including firms that only had one year of a very small negative profit, an underestimation of results might be present. Though, with the presence of this possible underestimation the statistical significance provides a solid ground for further research. Therefore, future research should expand this delta by accounting for duration and size of decreasing profits. A personal expectation is that improvement of the delta leads to a more severe economical significance.

Secondly, the results of ownership concentration are ambiguous since it is hard to control for all objectives and incentives of shareholders. However results of analysis 2 and 3 largely show that dependence on TSR increases RLO. The combination of CFENBR and OLS regarding analysis 1 does not lead to unambiguous results. Most likely since there are too many different objectives and incentives present than just the shareholder's focus on TSR. Moreover, the negative statistical significant coefficient from CFENBR analysis indicates that large shareholders are more personally connected or long-term oriented. Yet, these claims need to be verified by empirical research to investment horizon, ethic standards or point of view regarding social welfare of the shareholder. In this research extracting the effect of objectives and incentives from the coefficient of interest is done by including type of ownership dummies and a domestic indicator. Yet, this most likely does not completely extract all differences in objectives of shareholders. Hence, it is advised that future research expands the analysis by including more shareholder objective indicators as investment horizon and level of activity. A good example is the investor turnover ratio as calculated by Gaspar, Massa, and Matos (2005) that determines the investment horizon of shareholders. An other possibility would be an estimation of the preferred voice channel as described by Edmans (2009) as determinant of level of activity. But also core values and social welfare standards of the shareholder or institution are worth to discover.

Third, the assumption that only true zeros are included in the dependent variable (RLO) could possibly be violated. There is no statement made by Refinitiv, that firms who do not announce any layoffs are counted as missing values. If, and only if, Refinitiv counts firms who do not publicly announce anything regarding layoffs as value zero, there can exist excess zeros which would change the most suitable regression method, see appendix D.

Lastly, it is difficult to make any claim about causality in this research because it is hard to control for everything that affects the decision to downsize the firm's number of employees. The ideal experiment would be the randomisation of owners and ownership structures, CEO compensation and managerial ownership over firms. This would make a perfect apple-to-apple comparison since all else is equal. Yet, this randomisation process is impossible and making a perfect apple-to-apple comparison without randomisation by controlling for "all else" is very difficult. For example, embedded CEO's, that are appointed by the shareholder as CEO because their interests are aligned, make a different (less independent) decision. Yet, CEO embeddedness is hard to observe and therefore hard to control for. A final example, on September 30th 2020 Royal Dutch Shell (Shell) announces 7.000-9.000 employee dismissals to

reorganise under pressure of its shareholders to go green<sup>5</sup>. It is very hard to determine whether this shareholder pressure is due to the disappointing TSR of Shell or truly due to desire of shareholders for a greener organisation.

### 6.3 Discussion

From the empirical research it becomes clear that financial alignment of the CEO, by compensation structure or managerial ownership, increases the likelihood of downsizing the firm's employees when facing downturn. Yet, the effect of the potency of the shareholder in downturn stays ambiguous since the shareholders, even within their type, are too heterogeneous. Earlier research to types of shareholders, combined with the ownership concentration has proven unambiguous results regarding the effect of ownership concentration in a similar framework on firm outcomes as firm risk and firm value (Paligorova 2010; Pedersen and Thomsen 2003; Moh'd, Perry, and Rimbey 1998). Yet, all these firm outcomes are purely focused on cash flows and monetary benefits for the shareholders. The hypothesis (1a & 1b) are built from the same perspective, shareholders focus on TSR and depending on their type they decide whether or not employee downsizing is pushed as top-down command. Though, the results from this empirical analysis provide reason to develop a theory where shareholders base their decision regarding employee downsizing not purely on monetary gain but also on ethics and (intrinsic) value of the shareholder or institution regarding social welfare.

In the current set up I can not conclude ownership size of the largest shareholder to be an important determinant of the risk assessment for employees to become unemployed when the firm faces downturn. Yet, it can be expected that, when the right characteristics of the shareholder are included in the model ownership size of the largest shareholder strengthens the effect of these characteristics on the firms relative layoffs. Future research should discover the true determinants and the effect of ownership concentration that comes along. This research contributes to literature by empirically proving the effect of financial alignment of the CEO with total shareholder return and provides a solid ground for further research to the characteristics of shareholders or managers of an institution that determine whether shareholders advocate layoffs in firms with decreasing profits or not. Metaphorically speaking, the first layer of the onion is peeled. Yet, to discover what drives shareholders to advocate or demotivate employee downsizing there is more in dept research needed to completely understand the characteristics that determine the intentions of shareholders regarding employee downsizing in firms with decreasing profits.

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<sup>5</sup><https://www.shell.com/media/news-and-media-releases/2020/shell-third-quarter-2020-update-note.html>

# Appendices

## A Variable Specification

Variable	Database	Definition
<i>Dependent variable</i>		
Relative Layoffs	ESG - ASSET4	Announced Layoffs To Total Employees (SOEQO10V)
<i>Independent variables of interest</i>		
Ownership Size	Factset	Percentage of ownership (end-of-year) by the largest shareholder
CEO Compensation	ESG - ASSET4	CEO's compensation linked to total shareholder return (CGCPDP041)
Managerial Ownership	Compustat - Execucomp	Percentage of Total Shares Owned (SHROWN_TOT_PCT)
<i>Control variables</i>		
Size	Worldscope	Natural logarithm of total assets (WC02999)
Number of Employees	Worldscope	Natural logarithm of number of both full and part time employees (WC07011)
Leverage	Worldscope	Total debt (WC03255) divided by total assets (WC02999)
Tobins' Q	Worldscope	The sum of total assets (WC02999) and market value of equity (WC08001) minus book value of equity (WC03501) divided by total assets (WC02999)
Profitability	Worldscope	Net income before extraordinary items (WC01511) divided by total assets (WC02999)
Domestic owner	Factset	Holdings (end-of-year) by domestic shareholders
Board Size	Worldscope	Total number of board members at the end of fiscal year (CGBSDP060)
Type of owner	Factset	Classification of type of shareholder
<i>Fixed Effects</i>		
Country, Year, Industry	Bureau van Dijk	

This table presents information regarding data retrieval and definitions for the full sample. The definitions of used dependent and independent variables are presented in the third column. Furthermore it presents the original name of the variable (if available) and gives insight in the used sources.

## B Correlation Matrix

Table 8: Variable specifications

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) RLO%	1										
(2) Ownership Size	-0.031*	1									
(3) CEO Compensation	0.062*	-0.275*	1								
(4) Managerial Ownership	-0.003	0.205*	-0.125*	1							
(5) Size(log)	0.073*	0.055*	0.022*	-0.150*	1						
(6) Employee(log)	0.068*	0.049*	-0.016*	-0.036*	0.588*	1					
(7) Tobin's Q	-0.030*	-0.026*	0.001	0.075*	-0.374*	-0.137*	1				
(8) Leverage	0.016*	0.004	0.056*	-0.058*	0.149*	0.050*	-0.146*	1			
(9) Profitability	-0.076*	0.040*	0.008	0.038*	0.111*	0.194*	0.157*	-0.114*	1		
(10) Domestic	-0.005	-0.062*	0.026*	-0.023	0.061*	0.026*	-0.013*	0.041*	0.026*	1	
(11) Board Size	0.039*	0.052*	-0.056*	-0.148*	0.523*	0.393*	-0.157*	0.056*	0.056*	0.043*	1

This table presents the correlation matrix for the full sample. The full specifications and sources of each variable can be found in appendix A.

## C Descriptives Sample B

In this section tables and graphs describing the composition of Sample B, used to estimate the coefficients in equation 3 & 4, are provided.

Figure 4: Number of observations, yearly (Sample B)

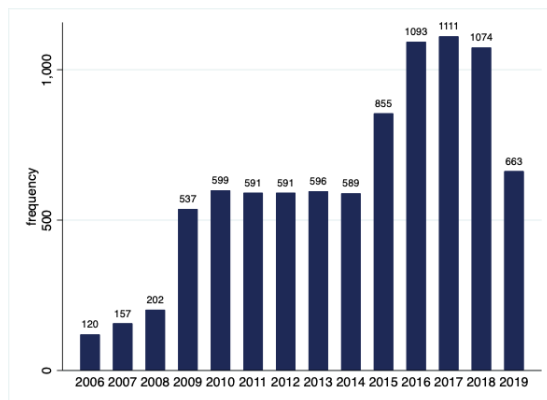


Figure 3 presents the distribution of available data within sample B per year. On the x-axis year 2006-2019 and on the y-axis frequency.

Table 9: Descriptive statistics (Sample B)

	count	mean	sd	min	max
<i>Dependent Variable</i>					
Relative Layoffs (%)	8778	.42	2.212	0	61
<i>Independent Variable</i>					
Managerial Ownership (%)	8778	1.693	4.434	0	63.416
<i>Control Variables</i>					
Size (log)	8773	15.555	1.53	10.798	19.717
Employee (log)	8680	8.742	1.753	2.079	12.238
Tobin's Q	8768	2.039	1.383	.63	9.686
Leverage	8772	.266	.199	0	.919
Profitability	8773	.05	.086	-.819	.311
Domestic	8356	.831	.374	0	1
BoardSize	8770	9.92	2.396	2	36

In this table descriptive statistics for the sample narrowed down to U.S. firms are presented. In column 1 the number of observations are reported, column 2 presents the mean of each variable and column 3 the standard deviation. Column 4 and 5 report the minimum and maximum value for each variable. Definitions and sources of the variables can be found in appendix A.

## D Considered alternative regression methods

Table 10: Regression Methods for analysis of count variable with over-represented zero

Method	Source	Description of method	Argument
Zero-inflated regression		Is applicable to most methods below and accounts for excess zeros. Excess zeros are non existing zeros that are included in the data due to misinterpretation of zeros. Excess zeros should often be interpreted as missing values.	Since the data provided by ESG-ASSET4 collects data about announcements and all missing values (hence firms without announcement) are dropped. It is assumed that excessive zeros do not exist within the sample and zero-inflated regression methods do not fit the data. An assumption made here is that all announced zeros are <i>true zeros</i> .
Poisson regression	(Zeileis, Kleiber, and Jackman 2008)	Belongs to the classical models for count data but is often limited because because the method is inappropriate for over-dispersion and excessive number of zeros in the dependent variable.	Since the data on RLO in the sample is over-dispersed (variance is much larger than the mean) this Poisson regression method does not fit the data.
OLS regression, log of dependent		The natural logarithm makes the distribution of the skewed variable generally more normally distributed. Yet, by taking the natural logarithm all zeros are excluded from the analysis.	The zero values are important in this analysis since the decision not to downsize the number of employees (leading to value 0) is also very important. Therefore taking the natural logarithm of the dependent variable does not fit the purpose of the research.
Conditional FE Negative Binomial Regression (CFENBR)	(Allison and Waterman 2002)	NB regression is very similar to poisson regression but deals with the over-dispersion by adding a parameter that allows the variance to exceed the mean.	This model seems to perfectly fit the over-dispersed, skewed dependent variable. The method accounts for a skewed dependent variable and over-dispersion in the dependent variable without dropping all 0-values of the count data.
Unconditional Negative Binomial regression estimator	(Allison and Waterman 2002)	The CFENBR estimator does not control for all stable covariates. Including dummy variables to represent the fixed effects is a better solution for a more precise estimate of the model.	Yet, since the large amount of dummies needed to represent all fixed effects estimators (many countries, industries, years and the interaction between year and industry) this estimation needs many iterations to calculate the coefficients. To give an idea, 2000 iterations took about 24 hours, while about 16 million are needed.

Concluding remark, since the extreme time consuming Unconditional Negative Binomial regression estimation, CFENBR is the best available method to conduct the analysis and find the coefficients of interest as described in Chapter 4.

## E Unabbreviated regressions (CFENBR)

Section 4.2 presents the abbreviated formula's used to test the hypothesis in this research. To give the reader insight in the full regression analysis the full formulas are presented below. The first equation is used to compute the linear relations, the second is used to compute the quadratic equations.

$$\begin{aligned} \%RLO_{i,t} = & \beta_0 + \beta_1 \text{variable of interest}_{i,t} + \beta_2 \text{Size}_{i,t} + \beta_3 \text{Employee}_{i,t} + \beta_4 \text{Tobin's } Q_{i,t} \\ & + \beta_5 \text{Leverage}_{i,t} + \beta_6 \text{Profitability}_{i,t} + \beta_7 \text{Domestic}_{i,t} + \beta_8 \text{Board Size}_{i,t} + \beta \text{Type Dummy}_{i,t} \\ & + \epsilon_{i,t} \end{aligned} \quad (8)$$

$$\begin{aligned} \%RLO_{i,t} = & \beta_0 + \beta_1 \text{variable of interest}_{i,t} + \beta_2 (\text{variable of interest})_{i,t}^2 + \beta_3 \text{Size}_{i,t} \\ & + \beta_4 \text{Employee}_{i,t} + \beta_5 \text{Tobin's } Q_{i,t} + \beta_6 \text{Leverage}_{i,t} + \beta_7 \text{Profitability}_{i,t} + \beta_8 \text{Domestic}_{i,t} \\ & + \beta_9 \text{Board Size}_{i,t} + \beta \text{Type Dummy}_{i,t} + \epsilon_{i,t} \end{aligned} \quad (9)$$

## F Unabbreviated regressions (OLS)

Section 4.3 describes the method used to test the robustness of results namely, Ordinary Least Squares. The equations are similar to the equations used in CFENBR, but industry-, country- and year- dummies are added in order to include industry-, country- and year fixed effects to the model. To allow for variance within the sector within a specific year, year and industry fixed effects are interacted. Furthermore, standard errors are clustered at firm level.

$$\begin{aligned} \%RLO_{i,t} = & \beta_0 + \beta_1 \text{variable of interest}_{i,t} + \beta_2 \text{Size}_{i,t} + \beta_3 \text{Employee}_{i,t} + \beta_4 \text{Tobin's } Q_{i,t} \\ & + \beta_5 \text{Leverage}_{i,t} + \beta_6 \text{Profitability}_{i,t} + \beta_7 \text{Domestic}_{i,t} + \beta_8 \text{Board Size}_{i,t} \\ & + \beta \text{Type Dummy}_{i,t} + \beta \text{Country Dummy}_{i,t} + \beta \text{Year Dummy}_{i,t} \\ & + \beta \text{Industry Dummy}_{i,t} + \beta \text{Industry Dummy}_{i,t} * \text{Year Dummy}_{i,t} + \epsilon_{i,t} \end{aligned} \quad (10)$$

$$\begin{aligned} \%RLO_{i,t} = & \beta_0 + \beta_1 \text{variable of interest}_{i,t} + \beta_2 (\text{variable of interest})_{i,t}^2 + \beta_3 \text{Size}_{i,t} \\ & + \beta_4 \text{Employee}_{i,t} + \beta_5 \text{Tobin's } Q_{i,t} + \beta_6 \text{Leverage}_{i,t} + \beta_7 \text{Profitability}_{i,t} + \beta_8 \text{Domestic}_{i,t} \\ & + \beta_9 \text{Board Size}_{i,t} + \beta \text{Type Dummy}_{i,t} + \beta \text{Country Dummy}_{i,t} + \beta \text{Year Dummy}_{i,t} \\ & + \beta \text{Industry Dummy}_{i,t} + \beta \text{Industry Dummy}_{i,t} * \text{Year Dummy}_{i,t} + \epsilon_{i,t} \end{aligned} \quad (11)$$



## G Regression results: Type dummies (CFENBR)

Table 11: Type dummy estimator CFENBR

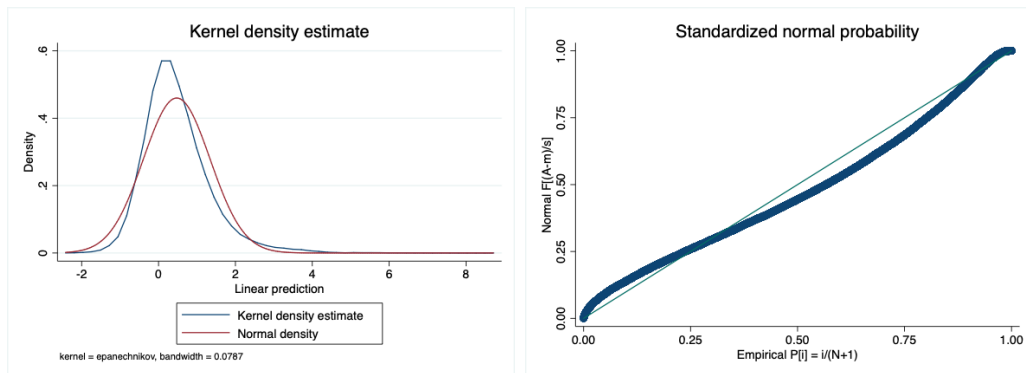
Type of owner	Linear	Quadratic
	(1)	(2)
	RLO%	RLO%
Broker	1.763 (1.173)	1.749 (1.173)
Emp Stk Ownership Plan	1.039* (0.628)	1.030 (0.629)
Exchange Traded Fund	-1.622 (1.452)	-1.645 (1.452)
Extinct	0.671 (0.709)	0.671 (0.710)
Family Office	-1.808 (1.517)	-1.690 (1.145)
Financing Subsidiary/SPE	-1.664 (1.143)	-1.678 (1.246)
Foundation/Endowment	0.320 (0.604)	0.335 (0.604)
Foundation/Endowment Manager	-1.793 (1.586)	-1.693 (1.586)
Fund of Funds Manager	-1.771 (1.337)	-1.623 (1.596)
Government	-0.115 (0.555)	-0.103 (0.556)
Hedge Fund Manager	0.839 (0.557)	0.843 (0.557)
Holding Company	0.313 (0.586)	0.329 (0.587)
Individual	-0.164 (0.548)	-0.147 (0.549)
Insurance Company	-0.705 (0.750)	-0.703 (0.750)
Investment Adviser	0.862 (0.535)	0.857 (0.535)
Investment Management Co	-1.617 (1.374)	-1.504 (1.372)
Joint Venture	-1.732 (1.766)	-1.624 (1.058)
Market Maker	-1.941 (1.990)	-1.769 (1.990)
Mutual Fd-Open End	-1.742 (1.320)	-1.693 (1.320)
Mutual Fund Manager	0.684 (0.537)	0.679 (0.538)
Non-Profit Organization	-0.979 (1.205)	-0.970 (1.206)
Open-End Fund	0.251 (0.912)	0.225 (0.913)
Operating Division	0.666 (0.591)	0.687 (0.592)

<b>Type of owner (continuation)</b>	<b>Linear</b>	<b>Quadratic</b>
Pension and Life Product	1.607*	1.614*
	(0.945)	(0.945)
Pension Fund	0.0760	0.0780
	(0.595)	(0.595)
Private Banking/Wealth Mgmt	0.751	0.760
	(0.750)	(0.750)
Private Company	-0.107	-0.100
	(0.561)	(0.561)
Private Eq Fd/Alt Invt	-.1994	-1.818
	(1.634)	(1.633)
Public Company	0.115	0.125
	(0.541)	(0.541)
Sovereign Wealth Fund	-1.662	-1.553
	(1.154)	(1.154)
Sovereign Wealth Manager	0.980*	0.971*
	(0.582)	(0.583)
Subsidiary	0.247	0.253
	(0.604)	(0.604)
Trust/Trustee	0.871	0.884
	(0.607)	(0.608)
Umbrella Fund	-1.883	-1.654
	(1.684)	(1.683)
Variable Annuity Fund	-1.705	-1.573
	(1.244)	(1.245)
Venture Capital/Pvt Equity	0.550	0.564
	(0.566)	(0.567)
Fixed effects	Yes	Yes
Type Dummy	Yes	Yes
Observations	18503	18503

This table presents the estimated coefficients for all type dummies from the analysis of equation 1 and 2 where the dummy of type;"pension fund manager" is taken as baseline. This type is chosen as baseline since this is not an extreme outlier and therefore shows whether other dummy variables statistically differ from the norm. Robust standard errors are clustered at the firm-level and reported in parentheses. \*, \*\*, \*\*\* Indicate significance at respectively 10%, 5%, 1% levels.

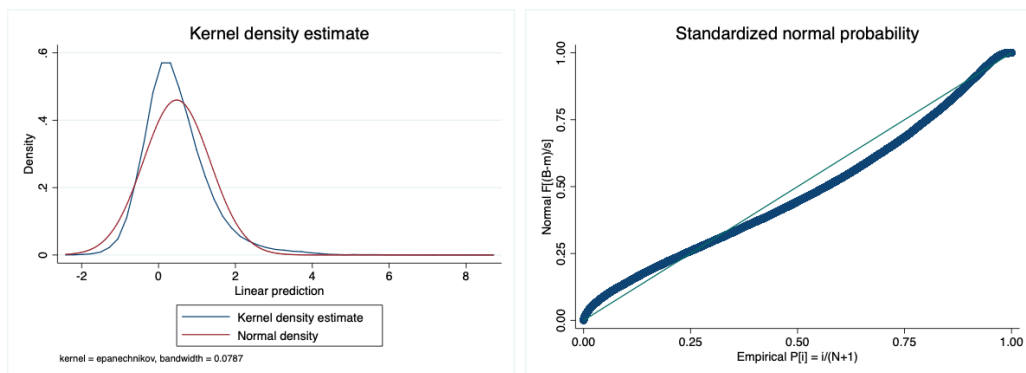
## H Distribution of residuals (OLS)

Figure 5: Linear OLS, equation 1



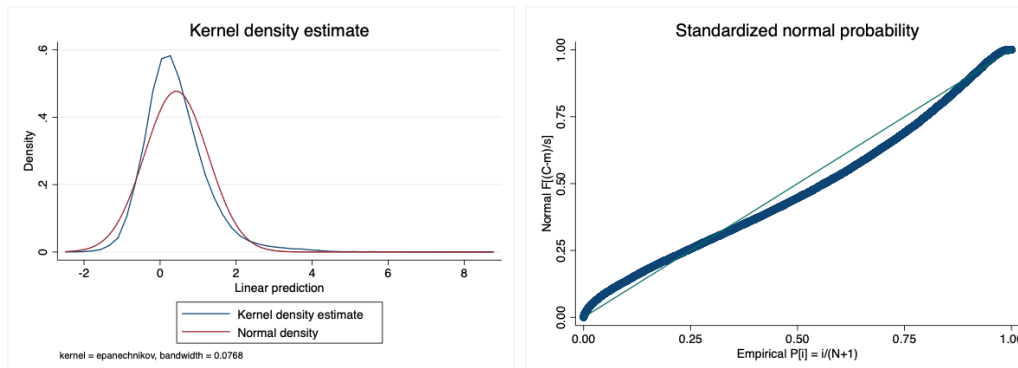
This table presents the predicted distribution of the residuals of the linear regression, based on OLS, of size of the largest owner on RLO for firms with decreasing profits.

Figure 6: Quadratic OLS, equation 2



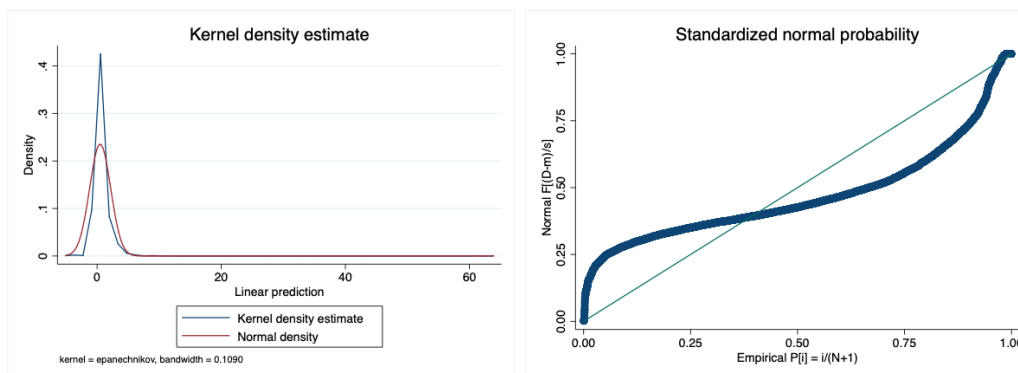
This table presents the predicted distribution of the residuals of the quadratic regression, based on OLS, of size of the largest owner on RLO for firms with decreasing profits.

Figure 7: Linear OLS, equation 3



This table presents the predicted distribution of the residuals of the linear regression, based on OLS, of a binary variable whether the CEO's compensation structure depends on TSR on RLO for firms with decreasing profits.

Figure 8: Quadratic OLS, equation 4



This table presents the predicted distribution of the residuals of the quadratic regression, based on OLS, of managerial ownership on RLO for firms with decreasing profits.

# I Regression results: Type dummies (OLS)

Table 12: Type dummy estimator OLS

Type of owner	Linear	Quadratic
	(1)	(2)
	RLO%	RLO%
Broker	-0.847 (0.656)	-0.843 (0.656)
Emp Stk Ownership Plan	0.546 (0.995)	0.547 (0.996)
Exchange Traded Fund	-0.312 (0.600)	-0.308 (0.600)
Extinct	0.407 (0.690)	0.403 (0.690)
Family Office	-0.631 (0.426)	-0.634 (0.426)
Financing Subsidiary/SPE	-1.237*** (0.427)	-1.248*** (0.430)
Foundation/Endowment	-0.344 (0.387)	-0.350 (0.388)
Foundation/Endowment Manager	-0.577 (0.528)	-0.582 (0.528)
Fund of Funds Manager	-0.418 (0.395)	-0.412 (0.396)
Government	-0.0369 (0.376)	-0.0421 (0.378)
Hedge Fund Manager	-0.200 (0.390)	-0.201 (0.390)
Holding Company	0.0610 (0.378)	0.0554 (0.378)
Individual	-0.0263 (0.338)	-0.0321 (0.338)
Insurance Company	-0.585 (0.369)	-0.585 (0.369)
Investment Adviser	-0.0742 (0.354)	-0.0739 (0.354)
Joint Venture	-0.0108 (0.391)	-0.0120 (0.392)
Market Maker	-0.755 (0.476)	-0.751 (0.477)
Mutual Fd-Open End	-0.596 (0.449)	-0.591 (0.449)
Mutual Fund Manager	-0.266 (0.361)	-0.265 (0.361)
Non-Profit Organization	-0.889** (0.392)	-0.893** (0.393)
Open-End Fund	-0.526 (0.396)	-0.521 (0.397)
Operating Division	-0.284 (0.418)	-0.291 (0.415)

<b>Type of owner (continuation)</b>	<b>Linear</b>	<b>Quadratic</b>
Pension & Life Product	-0.485 (0.487)	-0.488 (0.486)
Pension Fund	-0.500 (0.377)	-0.501 (0.377)
Private Banking/Wealth Mgmt	-0.501 (0.372)	-0.504 (0.373)
Private Company	-0.156 (0.346)	-0.160 (0.346)
Private Eq Fd/Alt Invt	-1.003** (0.478)	-1.000** (0.478)
Public Company	-0.177 (0.333)	-0.182 (0.334)
Sovereign Wealth Fund	-0.375 (0.391)	-0.379 (0.391)
Sovereign Wealth Manager	0.360 (0.528)	0.362 (0.528)
Subsidiary	-0.163 (0.457)	-0.167 (0.458)
Trust/Trustee	-0.0993 (0.401)	-0.104 (0.401)
Umbrella Fund	-0.652 (0.446)	-0.645 (0.446)
Variable Annuity Fund	0.0148 (0.477)	0.0250 (0.481)
Venture Capital/Pvt Equity	-0.0361 (0.382)	-0.0406 (0.383)
Country fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Observations	17330	17330

This table presents the estimated coefficients for all type dummies from the analysis of equation 1 and 2 where the dummy of type;"pension fund manager" is taken as baseline. This type is chosen as baseline since this is not an extreme outlier and therefore shows whether other dummy variables statistically differ from the norm. Robust standard errors are clustered at the firm-level and reported in parentheses. \*, \*\*, \*\*\* Indicate significance at respectively 10%, 5%, 1% levels.

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